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Learning Module
PHONETICS AND PHONOLOGY

English Education Department - Syiah Kuala University

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ACKNOWLEDGEMENT

Besides all other things, a well-organized and curriculum-oriented teaching material is one of the major key components in the success of any course. These resources allow primary guidance towards systematic and in-depth understanding by the students. Regarding the English Phonetics and Phonology class, this teaching resource has been prepared in relation to the syllabus outlined by the program.

From basic to advanced, the topics that this book will cover in English phonetics and phonology include the introduction to the different speech sounds of the language, distinctive features of phoneme and allophone, and the study of the functions and distribution of these speech sounds within utterances. It is also reinforced with case studies, practical examples, and the work with the *Praat* software in order for students to be able to link theoretical knowledge with real pronunciation practice and acoustic analysis.

The idea is that this textbook shall be comprehensive but simultaneously easy to understand, logically sequenced, starting from more general premises through more specific or detailed aspects. Each chapter is well-structured in conformance with the learning objectives given at the beginning in order to fulfill the competencies expected to be acquired in each. Furthermore, the integration of Praat offers students the chance to work interactively with exercises reinforcing knowledge by directly analyzing speech sounds and suprasegmental features.

Many activities and practice exercises have been added in the teaching material to aid the students in the development of better comprehension and analytical powers. It is hoped that this structured resource will allow students to study English phonetics and phonology more systematically, with an emphasis on practical application, thereby helping them in their academic endeavors.

I would be contented with this instructional tool if it can provide worthy insights and an important guide for both teachers and learners to continually improve the learning process. In fact, despite my best efforts to produce comprehensive and informative material, I am ready to acknowledge that no work is beyond improvement. Constructive feedback is therefore welcomed and encouraged for further enhancement in the future.

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GUIDELINES

The success of the learning process depends much on discipline and perseverance on the part of students in following every step of the study process consistently. This module has been designed to support both independent and group learning, whether these take place on campus or off campus. This module is one comprehensive learning resource where explanation of materials will be provided to enable students to gain insight into the concepts. Following are the steps to be followed by students in effectively using this module:

1. Read and Understand Module Objectives

   The first thing one should do is to read and understand the module objectives. These objectives give the main guide in identifying which of the competencies or skills are targeted to be achieved after going through the module. By comprehending the objectives, it aids the students in focusing on the key aspects of the material under study.

2. Revision of Material Explanation

   Once the objectives of the student are known, a detailed revision of the material provided by the students must be done. In the explanation of each concept, it is clearly and logically defined so that it may be comprehensible. At this stage, he/she must read carefully and concentratedly for better understanding of each topic.

3. Discuss in Case of Difficulty

   For areas that students cannot seem to grasp, they are advised to discuss with friends. That through discussions, other views and insights can be shared to facilitate better understanding of the important but difficult concepts. Remaining issues not clarified in the discussion should then be opened to the instructor.

4. Weekly Reflection and Summarization

   To further reinforce this and allow students to solidify their learning, it is expected that students will make a weekly reflection, in their own words, summarizing what they have learned that week. This promotes consolidation of learning, aids in the remembering of important concepts, and identifies knowledge gaps. The practice of regular weekly reflections makes the review of material easier before exams or when discussions are held and therefore maintains participation and deeper learning of the subject matter.

5. Formative Tests and Worksheet Completion

   As for an evaluation step, students will have to take the formative tests and complete worksheets within the module. Formative tests contain features in themselves by assessing the understanding and revealing defects within the course. Meanwhile, the worksheets mean that in practice, students will apply concepts that would allow strengthening comprehension.

CHAPTER I
The Basic Concept and Objectives of Phonetics and Phonology

A. Program Learning Outcome (PLO)

Students are able to explain basic concept of phonetics and phonology, differentiate between phonetics and phonology, and state the purpose of studying phonetics and phonology.

B. Course Learning Outcome (CLO)

1. Demonstrate accuracy and precision in providing definition, reflecting a responsible attitude toward tasks (CLO-09)
2. Explain complex concept of phonetics and phonology in simple and easy-to-understand language (CLO-12)
3. Master the basic concept of Linguistics, including Phonetic and Phonology as a micro-linguistic branch (CLO-22)

C. Learning Material

1. The Study of Speech Sound in the Concept of Linguistics, the Language and Media

The study of speech sounds in linguistics refers to the research and analysis of the sounds produced in human language, focusing on how these sounds are produced, how they function within the language system, and how they influence meaning and communication in social interaction. In the context of linguistics, the study of speech sounds involves two main branches: phonetics, and phonology. However, to understand the subject matter covered, it is necessary to make a clear distinction between language and language media.

Language, in essence, is a system of symbols used by humans to communicate with other humans. Language is a characteristic feature of social humans that sets them apart from animals. Whenever we encounter a group or community of humans, we will certainly observe the presence of language within that group. If a foreigner wishes to join or socialize with that group, they

will certainly try to learn the language of the group. When two or more people from different language communities meet, they will undoubtedly attempt to create a specific communication system. Initially, they will likely use gestures, and over time, this will develop into verbal communication.

If we want to convey a message to someone using language, we can do so by writing the message in the form of a string of words or by telling or speaking that string of words. If we set aside the content or meaning of the message and treat both methods of delivery as physical objects or events, we will see that the two forms of words (written and spoken) are entirely different. The written form of the string of words will consist of black marks on a white surface in specific shapes (i.e., letters), while the spoken form of the string of words will consist of a sequence or string of sounds that continuously change from the beginning to the end of the sequence. Although the physical forms of the written and spoken strings of words differ, both forms carry the same message or meaning. In other words, the written and spoken forms of the string of words belong to the same language, but are manifested through different media: one media consists of shapes (letters), while the other consists of sounds.

Based on the explanation above, we can conclude that language is not bound to the media used. It is possible that language can be manifested through other media, such as hand gestures, reflections of light, light signals, flags, trumpet sounds, or Morse code, because language itself exists in the patterns formed by these media, not in the physical objects or events that create these media. By distinguishing language from its medium, we are actually making a distinction between the form of the substance that manifests it, which is not bound to it. We can refer to language as the form, while the medium is referred to as the substance.

2. Phonetics and Phonology, as Two Main Branches of The Study of Speech Sounds

It has been mentioned above that language is a system of symbols. The term *symbol* in this definition should be understood as the elements of language commonly referred to as *words*. These words are usually combined into larger units based on certain patterns. Words and combinations of words symbolize concepts, objects, events, or states, which are commonly referred to as *meanings*. It was also mentioned above that these symbols, namely words and

combinations of words, can be manifested through sounds, forms known as letters, or other media such as light, gestures, hand movements, and Morse code. This understanding ties directly into the definitions of phonetics and phonology in that both are concerned with how language, as a system, is realized through different media, specifically sounds. Therefore, two definitions can be drawn as follows:

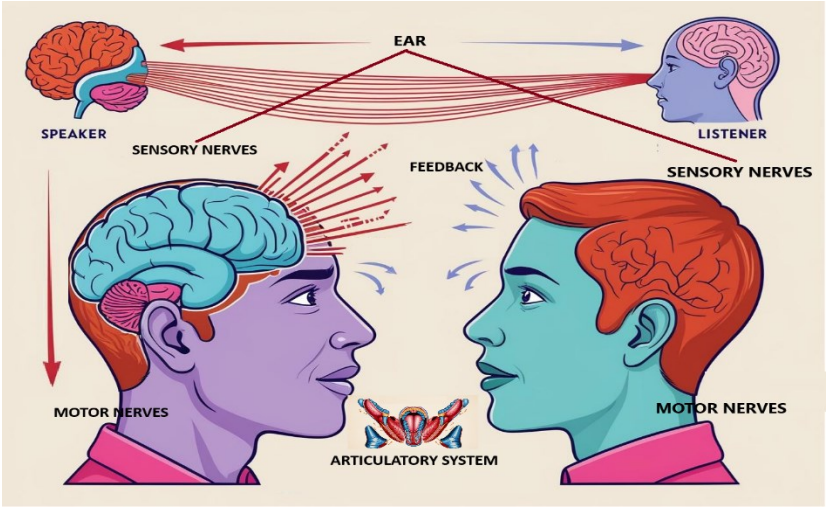
a. ***Phonetics*** deals with the physical aspects of speech sounds, including their articulation (how sounds are produced), acoustic properties (how sounds travel through the air), and auditory perception (how sounds are heard and interpreted by the listener). In this context, phonetics helps explain how the symbols or words in a language are physically realized through sound (Fromkin, Rodman, & Hyams, 2014). Additionally, according to Odden (2005), phonetics lays the groundwork for comparing and analyzing speech across different languages by detailing their articulatory and acoustic properties.
b. On the other hand, ***phonology*** focuses on the abstract, cognitive aspects of speech sounds and their patterns within a particular language (Radford, 2009). It looks at how sounds function within a specific language and how they are organized into systems. Phonology investigates the rules and patterns governing the combinations of sounds (such as which sounds can occur together) and their role in distinguishing meaning (Yule, 2010). Unlike phonetics, which is descriptive and universal, phonology is specific to each language and emphasizes how sounds are perceived as part of the linguistic structure.

In a nutshell, these definitions highlight the distinction between the physical production and perception of sounds (phonetics) and the way sounds are mentally organized and used to create meaning (phonology).

3. Roles of Phonetics in the Study of Linguistic Speech Sounds

Phonetics plays a pivotal role in understanding the processes through which speech is produced, transmitted, and perceived. It reveals how the brain conceptualizes, articulates, and perceives speech, which are essential stages in effective human communication. By examining the physical, cognitive, and perceptual dimensions of speech, linguistic phonetics illuminates the intricate mechanisms that enable seamless communication. This comprehensive

approach deepens our understanding of how speech functions at every level, bridging the gap between cognitive planning, motor execution, and auditory perception to ensure effective language use and interpretation. The leading ideas of those roles can be seen in Figure 1 below:



Linguistic Stage → Physiology Stage → Acoustic Stage → Physiology Stage → Linguistic Stage

Figure 1.
The stages of communication from the speaker's brain to the listener's

According to Denes and Pinson (1963), communication begins in the speaker's brain to listeners, which has three main functions in the communication process: creativity, transmission, and listening. These functions can be further elaborated within the context of linguistic phonetics.

a. The Creative Function

In linguistic phonetics, this stage involves the cognitive process where the brain conceptualizes the intended message and selects the appropriate linguistic structures. The brain must choose specific phonemes, the smallest units of sound that distinguish meaning, and organize them into words and sentences. This step encompasses the mental planning of not just the content but also the sound patterns (phonotactics) and stress patterns that will be used. The creative function ensures that the speaker can convey subtle nuances and emphases through prosody, which includes intonation and rhythm.

b. The Transmission Function

Linguistic phonetics places significant emphasis on this function as it involves the articulation of speech. The brain coordinates with the motor

cortex to signal the muscles responsible for speech production, including the tongue, lips, and vocal cords. This stage involves the execution of speech sounds, where articulatory phonetics explains how different sounds are produced by manipulating the vocal tract. For instance, the creation of voiced or voiceless sounds requires specific actions of the vocal folds, while nasal and oral sounds are distinguished by the opening or closing of the velum. Transmission is crucial for converting abstract phonological representations into actual spoken language that can be perceived by listeners.

c. The Listening Function

In this context, auditory phonetics is essential. The brain decodes sound waves received through the ears to interpret speech. This involves recognizing different phonemes and understanding the acoustic properties of speech sounds, such as pitch, loudness, and duration. Auditory feedback during speech production allows the speaker to adjust their articulation in real time, ensuring accurate pronunciation and effective communication. The brain's ability to parse these auditory signals supports the feedback loop in communication, where speakers can assess how their messages are being received and modify their speech accordingly.

These three functions creativity, transmission, and listening align closely with the stages of phonetics: conceptualization, articulation, and perception. Each function corresponds to a critical role in the communication process, as linguistic phonetics bridges the gap between the cognitive planning involved in speech, the physical act of articulation, and the auditory processing that allows for interpretation by the listener.

4. Roles of Phonology in the Study of Linguistic Speech Sounds

Phonology is essential in understanding the systematic organization and functional role of speech sounds within specific languages, providing insight into how these sounds contribute to meaning, structure, and communication. Again, different from phonetics, which studies the physical production and perception of speech sounds, phonology focuses on how sounds operate within the rules and patterns of a language.

a. Phonemes and Allophones

Phonology examines phonemes—the smallest sound units capable of differentiating meaning in a language. For example, in English, the difference between /p/ in pat and /b/ in bat signifies a shift in meaning, illustrating the role of phonemes. However, not all sound variations within a language change meaning. Allophones are variations of the same phoneme that do not affect meaning, such as the aspirated /p/ in ***pin*** versus the unaspirated /p/ in ***spin***. Research, including that by Odden (2019), emphasizes how phonology studies these variations and determines the rules that govern their occurrence, thereby explaining the mental representation of sounds.

b. Phonological Processes

Phonology delves into the systematic changes that sounds undergo within specific linguistic contexts, known as phonological processes. These include phenomena such as assimilation, where sounds become more like neighboring sounds (e.g., input pronounced as [ˈɪmpʊt]), and elision, where sounds are omitted for ease of pronunciation (e.g., comfortable pronounced as [ˈkʌmftəbl]). Current studies, such as those by Hyman (2018), provide comprehensive analyses of these processes, illustrating their importance in understanding spoken language fluidity and naturalness.

c. Prosodic Features

Beyond individual phonemes, phonology encompasses prosody—elements such as stress, intonation, and rhythm. These features influence how sentences are understood and convey nuances of meaning, emotion, or emphasis. For instance, intonation can turn a statement into a question (e.g., You're coming?). Research by Jun (2018) shows that prosodic analysis aids in interpreting spoken discourse and understanding language-specific rhythmic patterns, enhancing communication effectiveness.

d. Theoretical Frameworks and Models

Advances from 2015 to 2024 have seen a refinement of phonological theories, including Optimality Theory (Prince & Smolensky, 2004; updated by McCarthy 2016) and feature geometry. These models help linguists understand how phonological constraints interact to produce the most optimal outputs in spoken language. Such theoretical perspectives offer

frameworks for analysing complex linguistic phenomena, supporting cross-linguistic comparisons, and understanding sound patterns in less-studied languages.

e. Applications in Language Learning and Technology

The practical applications of phonology extend to language teaching, speech recognition, and artificial intelligence. For example, understanding phonological rules helps learners of English or other languages improve their pronunciation and listening skills. Software and applications utilizing speech synthesis and recognition also benefit from incorporating phonological data to enhance accuracy and user experience. Research into applied phonology by Bird and Klein (2019) highlights how these insights contribute to educational and technological advancements.

In conclusion, phonology is integral to linguistic analysis as it explains the functional role of sounds in communication, how they are mentally represented, and the rules that dictate their usage. The contributions from recent works (e.g., Odden, 2019; Jun, 2018) affirm its relevance in contemporary linguistics and its applications in broader fields such as language teaching and technology. This ongoing research enriches our understanding of language structure and fosters cross-linguistic awareness, showing that phonology remains a dynamic and essential field of study.

D. Summary

The program learning outcomes (PLO) focus on enabling students to understand the basic concepts of phonetics and phonology, differentiate between the two, and recognize their importance in linguistic studies. The course learning outcomes (CLO) aim for students to demonstrate precision in definitions, explain complex concepts simply, and master the fundamentals of phonetics and phonology as essential branches of linguistics. The course content covers the study of speech sounds, exploring how language functions through different media like speech and writing. It also highlights the distinction between phonetics, which deals with the physical aspects of speech sounds, and phonology, which focuses on how sounds function within a language system.

Phonetics plays a crucial role in understanding speech production, transmission, and perception. It covers the processes involved in conceptualizing, articulating,

and hearing speech, facilitating effective communication. Phonology, on the other hand, examines the cognitive organization of sounds in a language, such as phonemes, allophones, and phonological processes like assimilation and elision. It also looks at prosodic features like stress and intonation, which influence meaning and structure in communication. Both fields are vital for understanding language and its applications, with phonology also contributing to fields like language learning, technology, and artificial intelligence.

E. Formative Test (Weekly Assignments)

Reflecting on the distinctions between phonetics and phonology, how do you think understanding the physical production of speech sounds (phonetics) and the cognitive organization of these sounds within a language (phonology) influences our communication, both in everyday conversation and in media contexts? How can these insights be applied in real-world scenarios, such as language learning or technology?

F. Worksheet

Write a reflection essay of at least 250 words on the given topics. Ensure your reflection is coherent, well-organized, and thoughtful. Incorporate personal insights and examples where appropriate.

G. Rubrics

1. Assignment Rubric

Table 1.
Reflection Essay Rubric

Criteria	Description	Points
Clarity and Coherence	The essay is clear and easy to follow. Ideas are logically organized and well-connected throughout the reflection.	10
Depth of Reflection	The reflection demonstrates deep thinking and engagement with the topic. It shows personal insights, critical thinking, and an understanding of the subject matter.	10

Relevance to the topics	The essay stays focused on the assigned topic, with relevant examples and discussion that directly address the key points of the prompt.	10
Use of Examples and Personal Insight	Includes specific examples or personal experiences that help illustrate the points made. The essay connects theory or concepts to real-world situations.	10
Organization and Structure	The essay is well-structured, with an introduction, body, and conclusion. Transitions between paragraphs are smooth, and the writing flows logically.	10

Grade Descriptions:

Total Points (100%) : 50
Minimum to Pass (70%) : 35 Points

2. Attitude Assessment Rubric

Table 2.
Attitude Assessment Rubric – Classroom Activity

Criteria	Excellent	Good	Satisfactory	Need Improvement
Class Participation	Actively participates in discussions and activities, consistently contributing thoughtful and relevant ideas.	Participates in discussions and activities, often contributing relevant ideas.	Participates occasionally, but contributions may be less relevant or frequent.	Rarely participates, often disengaged or hesitant to contribute.
Respect for Others	Always listens attentively, respects others' opinions, and encourages a collaborative environment.	Listens attentively and respects others' opinions, with occasional encouragement of peers.	Generally, listens and respects others, though occasionally interrupting or dismissing ideas.	Frequently interrupts or disregards others' opinions.
Responsibility and Punctuality	Always on time, meets deadlines, and takes full responsibility for assigned tasks.	Generally, on time, meets most deadlines, and takes responsibility for tasks.	Occasionally late, sometimes misses deadlines, and may lack responsibility in group work.	Often late, misses deadlines, and shows little responsibility for tasks.
Motivation and Initiative	Consistently demonstrates strong motivation, takes initiative in class activities, and is proactive in seeking improvement.	Shows motivation and sometimes takes initiative, but may not always seek extra opportunities.	Shows limited motivation and rarely takes initiative beyond the minimum expectations.	Lacks motivation, rarely shows initiative, and avoids going beyond basic requirements.
Professionalism	Demonstrates a high level of professionalism, including appropriate language, behavior, and attire.	Demonstrates professionalism, but occasionally shows minor lapses in language, behavior, or attire.	Shows some professionalism, but occasionally unprofessional in behavior or attire.	Frequently unprofessional in behavior, language, or attire.

Collaboration and Teamwork	Always works well in teams, offering support and cooperation to others, and resolving conflicts effectively.	Works well in teams, cooperates with others, and contributes to resolving conflicts.	Occasionally contributes to teamwork, but may struggle with cooperation or conflict resolution.	Rarely contributes to teamwork, often resistant to cooperation or resolving conflicts.

Grade Descriptions:

Excellent (4) : The student consistently exceeds expectations in all aspects of attitude and behavior.
Good (3) : The student meets expectations and occasionally exceeds them.
Satisfactory (2) : The student meets some expectations but needs improvement in certain areas.
Needs Improvement (1) : The student frequently falls short of expectations and requires significant improvement.

Total Points (100%) : 24 Points
Minimum to Pass (70%) : 16.8 Points

Excellent : 85−100%
Good : 70−84%
Satisfactory : 50−69%
Needs Improvement : 0−49%

CHAPTER II
Analyzing Speech Sounds

A. Program Learning Outcome (PLO)

Students are able to analyze speech sounds by understanding vocal tract anatomy and performing linguistic transcriptions effectively.

B. Course Learning Outcome (CLO)

1. Demonstrate responsibility and independence in analyzing vocal tract anatomy and linguistic transcriptions (CLO-09).
2. Perform accurate and quality analysis of speech sounds and transcriptions with measurable outcomes (CLO-12).
3. Master the basic concepts of linguistics, focusing on phonetics and phonology as core components (CLO-22).

C. Learning Material

1. Vocal Tract Anatomy and Articulatory Properties

This section introduces the foundational principles of speech sound production, emphasizing the anatomy of the vocal tract and the articulatory properties that influence sound formation. As Roach (2009) highlights, understanding these elements is essential for analyzing and describing the physiological processes underlying human speech, providing a critical foundation for further studies in phonetics and phonology.

a. Vocal Tract Anatomy

The vocal tract is a complex system of anatomical structures that plays a crucial role in the production of speech sounds. According to Allan, et.al (2010), the vocal tract serves as the conduit through which air flows from the lungs and is shaped into distinct speech sounds. This process involves the interaction of various anatomical components, including the lungs, larynx, pharynx, oral cavity, and nasal cavity. Understanding the anatomy of the vocal tract is fundamental for exploring the articulatory system, which refers to the specific mechanisms by which these structures work together to modify airflow and create different speech sounds. The articulatory properties of speech sounds,

such as their place and manner of articulation, are directly influenced by the configuration and movement of these anatomical structures. This section will explore the key components of the articulatory system, as outlined by Allan et al. (2010), to provide a deeper understanding of how speech sounds are produced.

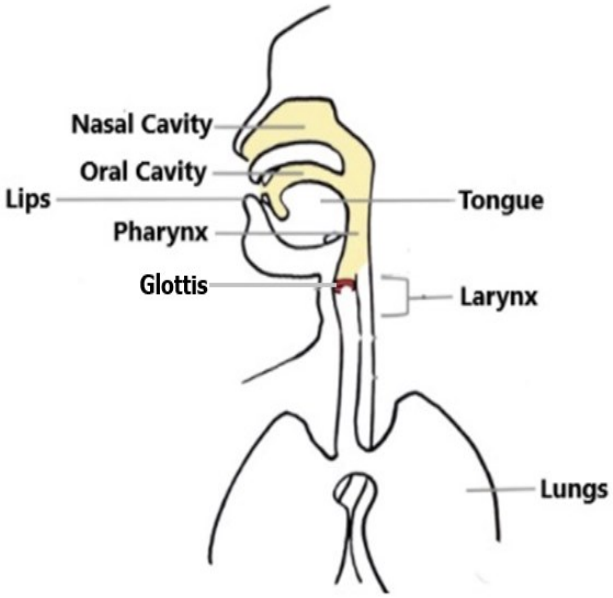


Figure 2.
Vocal Tract Anatomy

1) **The Lungs**

The lungs serve as the source of airflow, which is the driving force behind speech production. Air is pushed upward through the trachea and into the larynx. According to Ladefoged and Johnson (2015) and Allan et.al (2010), this airflow is manipulated to create voiced or voiceless sounds, forming the basis of phonation.

2) **The Larynx (Voice Box)**

Located at the top of the trachea, the larynx houses the vocal cords (or vocal folds), which vibrate to produce voiced sounds. Allan et al. (2010) note that the tension and position of these folds play a role in regulating pitch and intensity, and this is critical for distinguishing voiced from voiceless sounds. The larynx is central in creating phonemic contrasts in languages.

3) **The Pharynx**

The pharynx acts as a resonating chamber connecting the larynx to the oral and nasal cavities, playing a crucial role in shaping speech sounds. It influences the resonance of airflow, which is vital for distinguishing vowels and consonants. Clark, Yallop, and Fletcher (2007) explain that the pharynx's shape and size change as the tongue and other articulators move, affecting the pitch and tone of sounds. Allan et al. (2010) further emphasize that the pharynx is essential in vowel production, helping modify resonance to create distinct vowel sounds. Additionally, it contributes to the production of fricatives and nasals by altering the resonance of the airflow, making it an essential component of speech production.

4) **The Oral Cavity**

The oral cavity includes movable and immovable articulators that determine the place and manner of articulation for most speech sounds:

a) **Movable articulators**

The tongue, lips, and soft palate (velum) adjust their position to create different sounds.

b) **Immovable articulators**

The teeth, alveolar ridge, and hard palate serve as points of contact or constriction. Ladefoged and Johnson (2015) emphasize that these interactions between articulators produce a variety of consonants and vowels.

5) **The Nasal Cavity**

The nasal cavity is involved in producing nasal sounds, such as [m], [n], and [ŋ] (Allan, et.al, 2010). The velum controls airflow into the nasal cavity; when lowered, air passes through the nose, creating nasal resonance (Catford, 2001).

6) **The Tongue**

As the most versatile articulator, the tongue shapes the airflow by adjusting its height, backness, and position. It is critical in vowel production and contributes to consonantal distinctions (Roach, 2009).

7) The Lips

The lips play a role in producing bilabial sounds (e.g., [p], [b], [m]) and rounded vowels (e.g., [u]). Their shape and position influence the acoustic properties of sounds (Clark, Yallop, & Fletcher, 2007).

8) The Glottis

The glottis, located in the larynx between the vocal cords, is important for controlling certain speech sounds. Allan et al. (2010) explain that the glottis helps produce glottal stops, such as the catch in the throat heard in words like "uh-oh" or "button." It also plays a role in producing fricatives by partially constricting the airflow, as seen in sounds like [h] in English. Roach (2009) further notes that the position of the glottis influences the production of both voiced and voiceless sounds, with its state of tension or relaxation affecting the airflow through the vocal cords.

b. Articulatory Properties

1) Place of Articulation

According to Allan et al. (2010), place of articulation refers to the specific location in the vocal tract where the airflow is constricted or obstructed to produce speech sounds.

a) Bilabial

According to Allan et al. (2010), bilabial sounds are characterized by the use of both lips to create either a stop or a nasal sound. McMahon (2002) also describes these sounds as those where both lips make contact, blocking the airflow until it is released.

Examples:

/p/ (as in *pat*)

/b/ (as in *bat*)

/m/ (as in *mat*)

b) Labiodental

Burridge and Stebbins (2016) note that labiodental sounds are created by the interaction of the lower lip and upper teeth, which produces friction, a defining feature of the fricative sounds in English. McMahon (2002) also highlights labiodental as the point where the lip touches the teeth to create turbulent airflow.

Examples:

/f/ (as in *fun*)

/v/ (as in *van*)

c) Dental

Odden (2005) identifies dental sounds as involving the tongue's contact with the teeth. Allan, et al. (2010) expand on this by showing that dental sounds are typically voiced or voiceless fricatives in English.

Examples:

/θ/ (as in *think*)

/ð/ (as in *this*).

d) Alveolar

McMahon (2002) notes that alveolar sounds involve the tongue's contact with the alveolar ridge, a key articulation point for both stops and fricatives in English. Odden (2005) further explains that the alveolar place of articulation is critical in distinguishing between various speech sounds, particularly stops and nasals.

Examples:

/t/ (as in *tap*) /z/ (as in *zoo*)

/d/ (as in *dog*) /n/ (as in *no*)

/s/ (as in *sun*) /l/ (as in *lip*)

e) Palatal

According to Burridge and Stebbins (2016), palatal sounds are formed by the interaction of the tongue and the hard palate, creating either fricative or approximant sounds. Allan, et al. (2010) also highlight the palatal region for producing both voiced and voiceless fricatives in English.

Examples:

/ʃ/ (as in *ship*) /ʒ/ (as in *measure*)

/j/ (as in *yes*)

f) Velar

McMahon (2002) identifies velar sounds as those where the back of the tongue makes contact with the velum, often producing stop or nasal sounds. Odden (2005) also describes velar sounds as important articulatory features, particularly for stop sounds in English.

Examples:

/k/ (as in *cat*) /ŋ/ (as in *sing*)

/g/ (as in *go*)

g) Glottal

Burridge and Stebbins (2016) discuss the glottis as a significant point of articulation for sounds that involve a constriction at the vocal cords. Allan, et al. (2010) further expand on this by explaining that glottal sounds, like the glottal stop, do not involve the typical tongue placements seen in other places of articulation.

Examples:

/h/ (as in *hat*)

the glottal stop /ʔ/ (as in the pause in *uh-oh*)

2) Manner of Articulation

The manner of articulation categorizes how speech sounds are produced based on the way airflow is modified within the vocal tract.

a) Stops (Plosives)

Stops (plosives) are formed by creating a complete closure in the vocal tract, which temporarily stops the airflow. When the closure is released, it results in a burst of sound, as seen in sounds like:

/p/, /b/, /t/, /d/, /k/, and /g/

b) Fricatives

In contrast, fricatives involve a partial constriction of the vocal tract, forcing the air through a narrow passage, which creates friction. Examples of fricatives include:

/f/, /v/, /θ/, /ð/, /s/, /z/, /ʃ/, and /ʒ/

c) Affricatives

Affricates combine characteristics of both stops and fricatives. The sound begins with a complete closure, similar to a stop, but the closure is released into a constriction, producing a fricative-like sound. Common examples include

/ʧ/ as in chip and /ʤ/ as in judge

d) Nasals

Nasals are characterized by the lowering of the velum, allowing airflow to pass through the nasal cavity while the oral cavity remains blocked. Examples of nasals include:

/m/, /n/, and /ŋ/

e) Liquids

Liquids allow airflow to pass around the sides or along the centre of the tongue without creating turbulence. Liquids are further divided into lateral liquids, such as /l/, where air flows around the tongue's sides, and rhotic, such as /r/, where airflow involves tongue curling or bunching.

f) Glides

Glides are often referred to as semi-vowels due to their vowel-like quality. They involve a gliding motion of the tongue toward or away from a vowel position without significant constriction:

/w/ and /j/

3) Voicing

According to Allan et al. (2010) in The English Language and Linguistics Companion, voicing is a critical feature in the classification of consonants, referring to whether the vocal cords vibrate during sound production.

a) Voiced

Voiced sounds occur when the vocal cords are brought close together and vibrate as air passes through them. This vibration creates a buzzing quality in the sound. Examples of voiced consonants, that are inherently voiced, include:

Stops : /b/, /d/, /g/

Fricatives : /v/, /ð/, /z/, /ʒ/

Affricates : /dʒ/ (as in "judge")

Nasals : (/m/, /n/, /ŋ/),

Liquids : (/l/, /r/), and

Glides : (/w/, /j/)

b) Voiceless

Voiceless sounds, on the other hand, are produced with the vocal cords apart, allowing air to flow freely through the glottis without vibration. These sounds rely solely on the positioning of the articulators. Examples include:

Stops : /p/, /t/, /k/

Fricatives : /f/, /θ/, /s/, /ʃ/

Affricates : /ʧ/ (as in "chip").

4) Aspirated

According to Allan et al. (2010), aspiration refers to a burst of breath that accompanies the release of certain stop consonants. This extra puff of air occurs when the stop is produced with an open glottis, allowing air to escape freely after the articulatory closure is released. Characteristics of Aspirated Sounds can be seen below:

a) Aspiration is typically observed in voiceless stops, such as /p/, /t/, and /k/, particularly when they occur at the beginning of a stressed syllable.

b) For example, the /p/ in *pin*, the /t/ in *top*, and the /k/ in *cat* are aspirated. However, these sounds are unaspirated when following /s/, as in *spin*, *stop*, and *skit*.

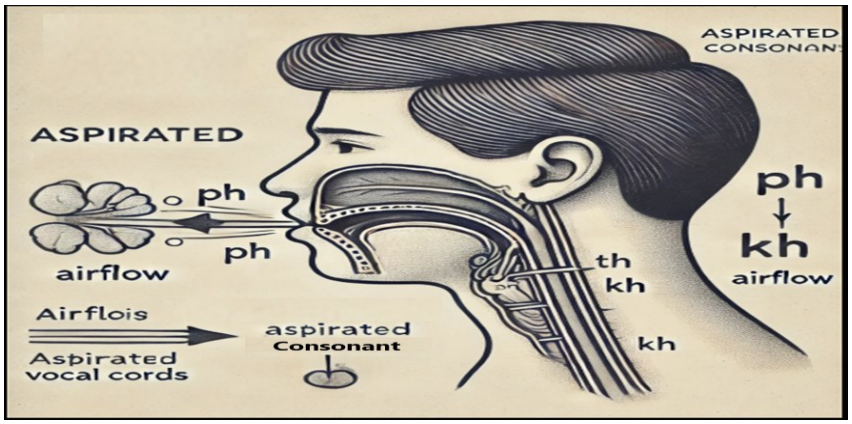


Figure 3.
Aspiration Illustration

Aspirated sounds are transcribed with a superscript *h* in phonetic notation, e.g., [p^h], [t^h], [k^h]. However, we need to highlight that the aspiration does not create meaning contrasts in English, yet it is phonemic

in some languages, such as Hindi or Thai, where aspirated and unaspirated stops distinguish words.

5) Rounded vs Unrounded (Vowels- Lips)

According to Allan et al. (2010), the distinction between rounded and unrounded vowels refers to the position of the lips during vowel production. This feature is crucial in categorizing vowel sounds and can influence the acoustic quality of the vowel.

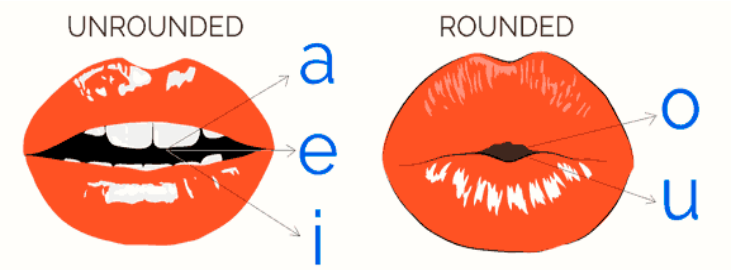


Figure 4.
Unrounded and Rounded Illustration

a) In rounded vowels, the lips are pursed or rounded, creating a smaller opening for the sound to pass through. Rounded vowels are typically found among back vowels. Examples in English include:
/u:/ as in *food* /oʊ/ as in *go* /ʊ/ as in *book*

b) In unrounded vowels, the lips are relaxed and spread, resulting in a more open articulation. These are commonly observed in front vowels. Examples in English include:
/i:/ as in see /ɪ/ as in *bit* /ɛ/ as in *bed*

6) Front, Central, and Back (Vowels-Tongue)

According to Allan et al. (2010), the classification of vowels as front, central, or back is based on the horizontal position of the tongue during articulation. This distinction is a fundamental aspect of vowel categorization and significantly affects the acoustic properties of the vowel.

a) Front vowels are produced with the tongue positioned forward in the mouth, close to the alveolar ridge or hard palate. For example, the vowel sounds in see, bit, and cat are *front vowels.*

b) Central vowels are produced with the tongue positioned midway between the front and back of the oral cavity. Examples of central vowels are the vowel sounds in *sofa and bird.*

c) Back vowels are produced with the tongue positioned toward the back of the mouth, near the soft palate. For instance, the vowel sounds in food, book, and father are *back vowels.*

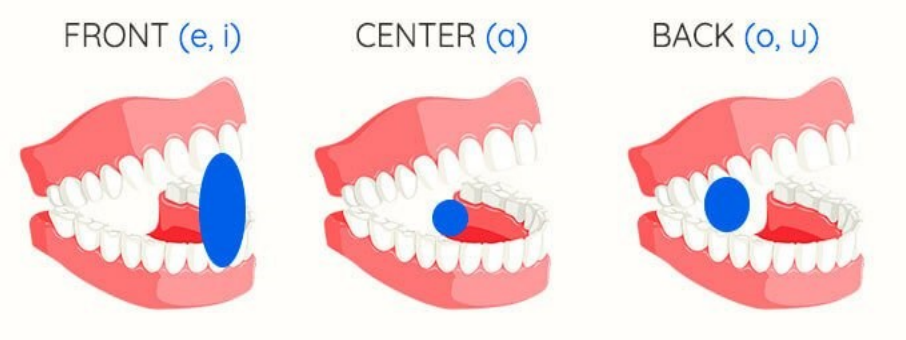


Figure 5.
Tounge Position

Allan, et al. (2010) explain that the horizontal tongue positioning, along with other features like lip rounding, helps linguists understand the articulatory and acoustic characteristics of vowels. This classification is particularly useful in studying vowel systems across languages.

2. International Phonetic Alphabet (IPA) and Linguistics Transcription

The International Phonetic Alphabet (IPA) is a comprehensive system of symbols used to represent the speech sounds (phonemes) of all human languages. It was created by the International Phonetic Association in the 19th century to standardize the representation of speech sounds, ensuring that linguists and language practitioners could accurately transcribe and analyze pronunciation across different languages without ambiguity.

ɪ	iː	ʊ	uː	ɪə	eɪ	International Phonetic Alphabet	
ship /ʃɪp/	sheep /ʃiːp/	put /pʊt/	you /juː/	hear /hɪə/	name /neɪm/		
e	ə	ɜː	ɔː	ʊə	ɔɪ	əʊ	sound
ten /ten/	letter /letə/	girl /gɜːl/	saw /sɔː/	poor /pʊə/	toy /tɔɪ/	no /nəʊ/	symbol
æ	ʌ	ɑː	ɒ	eə	aɪ	aʊ	chart
cat /kæt/	sun /sʌn/	car /kɑː/	hot /hɒt/	where /weə/	my /maɪ/	how /haʊ/	
p	b	t	d	tʃ	dʒ	k	g
pot /pɒt/	bed /bed/	tap /tæp/	door /dɔː/	chair /tʃeə/	jam /dʒæm/	come /kʌm/	gum /gʌm/
f	v	θ	ð	s	z	ʃ	ʒ
four /fɔː/	very /veri/	think /θɪŋk/	the /ðə/	son /sʌn/	zoo /zuː/	she /ʃiː/	vision /vɪʒən/
m	n	ŋ	h	l	r	w	j
man /mæn/	nose /nəʊz/	angry /æŋgri/	happy /hæpɪ/	late /leɪt/	red /red/	want /wɒnt?/	yes /jes/

Figure 6.
International Phonetic Alphabet (IPA)

The primary purpose of the IPA is to provide a consistent and universal set of symbols for the sounds of speech. Unlike traditional spelling systems, which are often inconsistent and vary across languages (for example, the English letter "c" can represent different sounds in cat and circle), the IPA uses a single symbol to represent a specific sound. This makes it especially valuable for language learning, linguistics research, and phonetic analysis, as it allows for precise and accurate transcription of speech.

The IPA divides speech sounds into two main categories: **consonants** and **vowels**. Each of these categories is further subdivided according to various articulatory features such as place of articulation, manner of articulation, and voicing for consonants, and tongue position, tongue height, and lip rounding for vowels.

a) Consonants in the IPA are represented by symbols that reflect their place of articulation (where the sound is produced in the vocal tract), manner of articulation (how the sound is produced), and whether they are voiced (whether the vocal cords vibrate during production) or voiceless (no vibration of the vocal cords) as forementioned.

b) Vowels are sounds that are produced without significant constriction of airflow. They are categorized based on the position of the tongue and the shape of the mouth during articulation. As outlined in the preceding discussion on ***vowel lips and vowel tongue***.

The IPA provides a set of symbols that correspond to specific sounds, ensuring that each symbol represents a unique phoneme as a part of ***linguistic transcription***. For example:

[The symbol /tʃ/ represents the "ch" sound in *chair* as in [tʃeə(r)]]

[The symbol /θ/ represents the "th" sound in *think* as in [θɪŋk]]

IPA transcription is especially useful in language education and linguistics, as it helps in representing pronunciation in a standardized form, making it easier to compare sounds across languages. It can also show nuances in

Let's Practice!

pronunciation that are not captured by traditional spelling.

D. Summary

The Program Learning Outcome (PLO) aims to equip students with the ability to analyze speech sounds through understanding vocal tract anatomy and performing linguistic transcriptions effectively. The Course Learning Outcomes (CLOs) focus on fostering responsibility and independence in analyzing vocal tract anatomy and linguistic transcriptions, ensuring accurate analysis of speech sounds, and mastering fundamental linguistics concepts with a particular emphasis on phonetics and phonology. By achieving these outcomes, students will gain proficiency in analyzing speech sounds and transcriptions while developing a deeper understanding of linguistics' core components.

The course material is structured around the anatomy of the vocal tract and its articulatory properties, essential for understanding speech sound production. Key anatomical components such as the lungs, larynx, pharynx, oral cavity, nasal cavity, and tongue, along with their roles in shaping speech sounds, are explored in depth. Additionally, articulatory properties such as place and manner of articulation, voicing, aspiration, and the distinction between rounded and unrounded vowels are examined. This comprehensive approach ensures that students not only grasp the physiological mechanisms of speech production but also develop the skills necessary for phonetic transcription and linguistic analysis.

E. Formative Test (Weekly Assignments)

1. Reflecting on the role of the vocal tract in producing speech sounds, how do you think understanding its anatomy enhances our ability to analyze and interpret different languages? Consider how concepts like place and manner of articulation contribute to linguistic transcriptions and the representation of speech sounds.
2. Practice by recoding your own voice, transcribing with IPA symbols and analysing the one for each consonant and vowel sound place of articulation from the following vocabularies:

   Think Thing Chalk Water Measure

   Note : ANY TYPE OF DICTIONARY IS NOT ALLOWED

F. Worksheet

1. Write a reflection essay of at least 250 words on the given topics. Ensure your reflection is coherent, well-organized, and thoughtful. Incorporate personal insights and examples where appropriate.
2. Record your own voice by pronouncing the given words clearly and slowly.
3. IPA Transcription

   Think

   IPA Transcription : _____

   Thing

   IPA Transcription : _____
4. Consonant and Vowel Sounds Analysis

   Think

   Sounds : _____

   Place of Articulation : _____

   Thing

   Sounds : _____

   Place of Articulation : _____

G. Rubrics

1. Assignment Rubric

Table 3.
Reflection Essay Rubric

Criteria	Description	Points
Clarity and Coherence	The essay is clear and easy to follow. Ideas are logically organized and well-connected throughout the reflection.	10
Depth of Reflection	The reflection demonstrates deep thinking and engagement with the topic. It shows personal insights, critical thinking, and an understanding of the subject matter.	10
Relevance to the topics	The essay stays focused on the assigned topic, with relevant examples and	10

	discussion that directly address the key points of the prompt.	
Use of Examples and Personal Insight	Includes specific examples or personal experiences that help illustrate the points made. The essay connects theory or concepts to real-world situations.	10
Organization and Structure	The essay is well-structured, with an introduction, body, and conclusion. Transitions between paragraphs are smooth, and the writing flows logically.	10

Grade Descriptions:

Total Points (100%) : 50
Minimum to Pass (70%) : 35 Points

Table 4.
Transcription and Analysis Criteria

Criteria	Description	Points
Voice Recording Quality	Clear recording with all words pronounced accurately and distinctly.	10
IPA Transcription Accuracy	The student accurately transcribes each word using IPA symbols. Each sound (consonant and vowel) must be correctly represented.	10
Sound Analysis	The student analyzes each sound for place of articulation accurately.	10
Adhere to Guideline	Fully follows the instructions, avoiding dictionary use and providing original work.	10

Grade Descriptions:

Total Points (100%) : 40
Minimum to Pass (70%) : 28 Points

2. Attitude Assessment Rubric

Table 5.
Attitude Assessment Rubric – Classroom Activity

Criteria	Excellent	Good	Satisfactory	Need Improvement
Class Participation	Actively participates in discussions and activities, consistently contributing thoughtful and relevant ideas.	Participates in discussions and activities, often contributing relevant ideas.	Participates occasionally, but contributions may be less relevant or frequent.	Rarely participates, often disengaged or hesitant to contribute.
Respect for Others	Always listens attentively, respects others' opinions, and encourages a collaborative environment.	Listens attentively and respects others' opinions, with occasional encouragement of peers.	Generally, listens and respects others, though occasionally interrupting or dismissing ideas.	Frequently interrupts or disregards others' opinions.
Responsibility and Punctuality	Always on time, meets deadlines, and takes full responsibility for assigned tasks.	Generally, on time, meets most deadlines, and takes responsibility for tasks.	Occasionally late, sometimes misses deadlines, and may lack responsibility in group work.	Often late, misses deadlines, and shows little responsibility for tasks.
Motivation and Initiative	Consistently demonstrates strong motivation, takes initiative in class activities, and is proactive in seeking improvement.	Shows motivation and sometimes takes initiative, but may not always seek extra opportunities.	Shows limited motivation and rarely takes initiative beyond the minimum expectations.	Lacks motivation, rarely shows initiative, and avoids going beyond basic requirements.

Professionalism	Demonstrates a high level of professionalism, including appropriate language, behavior, and attire.	Demonstrates professionalism, but occasionally shows minor lapses in language, behavior, or attire.	Shows some professionalism, but occasionally unprofessional in behavior or attire.	Frequently unprofessional in behavior, language, or attire.
Collaboration and Teamwork	Always works well in teams, offering support and cooperation to others, and resolving conflicts effectively.	Works well in teams, cooperates with others, and contributes to resolving conflicts.	Occasionally contributes to teamwork, but may struggle with cooperation or conflict resolution.	Rarely contributes to teamwork, often resistant to cooperation or resolving conflicts.

Grade Descriptions:

Excellent (4) : The student consistently exceeds expectations in all aspects of attitude and behavior.
Good (3) : The student meets expectations and occasionally exceeds them.
Satisfactory (2) : The student meets some expectations but needs improvement in certain areas.
Needs Improvement (1) : The student frequently falls short of expectations and requires significant improvement.

Total Points (100%) : 24 Points
Minimum to Pass (70%) : 16.8 Points

Excellent : 85−100%
Good : 70−84%
Satisfactory : 50−69%
Needs Improvement : 0−49%

CHAPTER III
Segmental Sounds

A. Program Learning Outcome (PLO)

Students are able to analyze and differentiate phonemes and allophones in spoken language, apply phonological rules to explain sound variations, and effectively transcribe linguistic data, demonstrating an understanding of how phonological processes like assimilation, deletion, and insertion shape language patterns and speech production.

B. Course Learning Outcome (CLO)

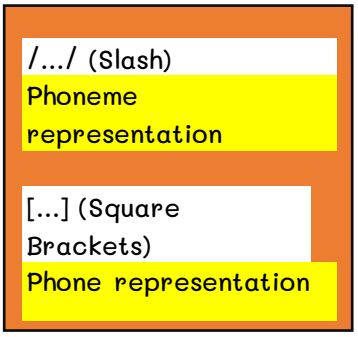
1. Demonstrate responsibility and independence in analyzing phonemes, allophones, and phonological rules (CLO-09).
2. Perform accurate and quality analysis of phonological processes (assimilation, deletion, insertion, etc.) in spoken language with measurable outcomes (CLO-12).
3. Master English language skills at least equivalent to a post-intermediate level to effectively analyze, transcribe, and communicate phonological concepts (CLO-20).
4. Demonstrate proficiency in the basic concepts of linguistics, with a particular focus on phonemes, allophones, and the application of phonological rules (CLO-21).

C. Learning Material

Segmental sounds refer to the individual, discrete units of sound in speech, including consonants and vowels, which form the building blocks of spoken language. These sounds are "segments" because they are the smallest elements of speech that can be analyzed and distinguished from one another within a given linguistic system. Segmental sounds are studied in detail in both phonetics (the physical production and acoustic properties of sounds) and phonology (how these sounds function within a language's system). The segmental sounds are categorized into Phoneme and Allophones.

1. Phonemes and Allophones

Phonological rules are essential in describing how sounds change in different linguistic environments. They govern the pronunciation of words in natural speech, often reflecting the dynamic, evolving nature of language. These rules help us understand how abstract sounds (phonemes) are realized in actual spoken forms (allophones) and how these variations contribute to meaning and communication in a language.



The phonemes are the smallest distinctive sound units in a language that differentiate meaning (Allan, et.al, 2010). They exist as abstract entities in the mental representation of a language and are not tied to specific pronunciations. Phonemes are identified by analyzing pairs of words that differ in only one sound in the same position, known as minimal pairs. For instance, in English, "bat" and "pat" form a minimal pair, as they differ only in the initial sounds /b/ and /p/, leading to entirely different meanings. This demonstrates how phonemes function as the core units of a language's sound system, governing how sounds combine to create meaningful words.

Then, Allophones, in contrast, are the physical variants or realizations of a phoneme that occur in actual speech. These variations do not alter the meaning of a word, as they are perceived by native speakers as the same underlying phoneme. For example, the English phoneme /p/ has two common allophones: the aspirated [p^h], which occurs at the beginning of words like "pin," and the unaspirated [p], found after /s/ in words like "spin." Allan, et.al (2010) notes that allophones often occur in complementary distribution, meaning they appear in specific, non-overlapping phonetic environments. In other cases, they may exhibit free variation, where either variant can be used interchangeably without affecting meaning, such as the final /t/ in "cat," which may be pronounced as an unreleased [t̚] or as a fully articulated [t].

The distinction between phonemes and allophones highlights the layered structure of language sound systems, where the abstract and physical aspects interact. Phonemes operate on the phonological level, defining how sounds are organized in the mental lexicon, while allophones are governed by phonetic and

articulatory factors that influence their realization in speech. Allan, et.al (2010) emphasizes that understanding this relationship is crucial for exploring how speakers process and produce sounds while maintaining meaning and consistency within their language.

2. Minimal Pairs

Minimal pairs are pairs of words in a language that differ by only one phoneme in the same position, and this difference leads to distinct meanings. The phoneme change may occur in the initial, medial, or final positions of the word. Minimal pairs are crucial in phonological analysis as they help linguists determine the phonemes in a given language. These pairs are especially useful because they allow for the identification of sounds that create contrasts in meaning. See the following table below:

Table 6.
Minimal Pairs

Minimal Pairs		Phoneme	Transcription
Bat	Pat	/b/ vs /p/	[bæt] vs [pæt]
Kit	Bit	/ ɪ/ vs / ɪ:/	[kɪt] vs [bɪt]
Hip	Hit	/p/ vs /t/	[hɪp] vs [hɪt]

In English, the words "*bat*" and "*pat*" differ only in the initial sound (/b/ vs. /p/), yet this small change alters the word's meaning entirely. In other languages, minimal pairs may also help identify contrasts that are not immediately obvious to speakers of languages with different phonemic systems. For instance, the distinction between "*kit*" and "*bit*" in English reveals a contrast between two vowel sounds, /ɪ/ and /ɪ:/, which are phonemic in English but might not be in languages with fewer vowel distinctions, such as Bahasa Indonesia "*paku*" and "*baku*" with the contrast between /p/ and /b/ in the initial position makes these two words distinct, but there is no distinction based on vowel length or slight differences in vowel quality.

Scan for more Minimal Pairs

3. Phonological Rules

According to Allan et al. (2010), phonological rules are generalizations that describe the systematic and predictable patterns of sound organization and changes in a language. These rules explain how the underlying abstract representations of sounds, or phonemes, are realized as specific surface forms, or allophones, depending on the linguistic context. Phonological rules reveal the relationship between the mental representation of sounds and their actual pronunciation, demonstrating the structured and rule-governed nature of a language's sound system.

Key characteristics of phonological rules include their systematic nature, as they operate consistently within a language, and their context-dependence, as they apply based on specific phonetic environments such as neighbouring sounds, stress patterns, or syllable structure. These rules also serve functional purposes, simplifying articulation, ensuring clarity, and maintaining efficiency in communication by adapting sounds to their surrounding context. Depending on how sounds are modified, phonological rules can be classified into various types, including assimilation, insertion, deletion, metathesis, and others, each representing a unique process of sound alteration in a language.

a) Categorizations of Phonological Rules

1) Assimilation

Assimilation occurs when a sound becomes similar to a neighbouring sound in one or more phonetic features (e.g., place, manner, or voicing). It simplifies articulation by making sounds easier to pronounce in sequence.

Example in English:
"Input" → phoneme /n/ sound often becomes a bilabial [m] before phoneme bilabial /p/, resulting in [ˈɪnpʊt] → [ˈɪmpʊt]

Example in Indonesian:
"*Tanpa*" → phoneme /n/ may assimilate to the place of articulation of /p/, becoming [tampa] in fast speech

Assimilation highlights how speech adjusts dynamically to promote fluency and ease in connected speech. It can occur within words or across word boundaries, often going unnoticed by speakers but

playing a significant role in natural language flow. This process also reflects language-specific tendencies, as different languages have varying degrees and types of assimilation.

2) Insertion (Epenthesis)

Insertion (or epenthesis) occurs when a sound is added to a word, often to make it easier to pronounce. See the followings:

Example in English:

"Athlete", some speakers insert a schwa, pronouncing it as [ˈæθəˌlit] instead of [ˈæθˌlit]

"Film", pronouncing it as [filəm] instead of [film]

Example in Indonesian:

"*Keluar*" might be pronounced as [kəlu.ar], with a clear schwa added between the consonant's /k/ and /l/ in some speech contexts.

This process helps ensure smoother speech transitions, particularly in casual or rapid speech, and can vary depending on the speaker's dialect or speech patterns. Furthermore, the sound insertion also happens in plural forms. In words like "matches" [ˈmæʧɪz], the /ɪ/ sound is inserted between the voiceless consonant /ʧ/ and the voiced /z/ sound to help with the articulation and ensure smoother pronunciation.

3) Deletion (Elision)

Deletion occurs when a sound is omitted, often in rapid or casual speech. See the example below:

Example in English:

"I don't know", many speakers reduce it to [aɪ dʌn noʊ] or even [aɪ dən noʊ], omitting the /t/

Example in Indonesian:

"*Tidak tahu*" is often reduced to "*tak tahu*" or [taʔ tau], deleting the first syllable /ti/ in informal contexts.

Additionally, the deletion is also occurred in non-rhotic accent or dialect, such as in British English (BrE). The non-rhotic refers to a type of accent or dialect in which the /r/ sound is not pronounced in certain positions, typically when it occurs at the end of a syllable or before a

consonant. In non-rhotic accents, the /r/ is often only pronounced when it occurs before a vowel.

Example in BrE and AmE:

"Car" is pronounced as [kɑː] in BrE, not [kɑːr] in AmE.
"Dark", the /r/ is omitted when speaker uses BrE [dɑːk] instead of [dɑːrk] in AmE.

Simply, the non-rhotic accent (BrE) is in contrast to rhotic accents, such as in American English (AmE), where the /r/ sound is pronounced more consistently, regardless of its position in the word.

4) Flapping

Flapping is a process where a stop consonant, like /t/ or /d/, is pronounced as a quick tap of the tongue against the alveolar ridge, resembling [ɾ].

Example in English:
"Butter", is often pronounced as a flap, resulting in **[ˈbʌɾə]**.

Flapping is not typical in standard Bahasa Indonesia but can occur in certain regional dialects where stops are softened in rapid speech.

Example in Indonesian – *Batak Language*:
"*Ganda*", is often pronounced as a flap, resulting in **[ˈgaɾa]**.

Additionally in English, flapping occurs when [t] or [d] is flanked by vowels or syllabic consonants (as in "butter" previously), when the preceding vowel is usually stressed and the following is unstressed (as in writing → [ˈraɪɾɪŋ]), and when the word boundaries in connected speech (as in "What is it?" → [wʌɾɪzɪt]).

5) Aspiration

Aspiration is a phonetic rule involving a strong burst of breath that accompanies the articulation of voiceless plosive consonants, such as [pʰ], [tʰ], and [kʰ]. It occurs due to the timing between the release of the plosive and the onset of vocal cord vibration for the following vowel. In English, this phenomenon is most prominent when voiceless stops [p], [t], and [k] occur at the beginning of stressed syllables, but it does not occur after [s], where these stops remain unaspirated.

Example in English:

"Pin" [pʰɪn] is pronounced as aspirated on /pʰ/, releasing a strong burst of breath – **Aspirated.**

"Spin" [Spɪn] has no burst of breath – **Unaspirated.**

6) Devoicing

Devoicing is a phonological process in which a sound, typically a consonant, loses its voicing, meaning it is pronounced without vibration of the vocal cords. This occurs when a voiced sound (a sound produced with vocal cord vibration, such as /b/, /d/, /g/, /z/) changes into its voiceless counterpart (a sound produced without vocal cord vibration, such as /p/, /t/, /k/, /s/). Devoicing often happens in certain phonological environments, such as: Plural Suffix /s/ and Final Obstruent Devoicing. See the followings:

Example in English:

"Dogs" is devoiced on [s] become [z], pronouncing as [dɔgz] instead of [dɔgs] – Plural Suffix /s/

Then, "bag' is also devoiced on [g] *voiced* to [k] *voiceless*, as in [bæg] become [bæk] – Final Obstruent Devoicing

In English, the plural morpheme /s/ can change depending on the voicing of the final consonant in the base word. If the word ends with a voiced consonant, the plural suffix is pronounced as [z], but if the word ends with a voiceless consonant, the plural suffix is pronounced as [s]. Additionally, in some English dialects, especially in casual speech, final voiced obstruent (such as /b/, /d/, /g/) can be devoiced at the end of words, becoming their voiceless counterparts.

7) Glottalization

Glottalization occurs when a sound, such as a voiceless stop (e.g., [t], [k]), is produced with a constriction or closure at the glottis, creating a glottal stop [ʔ] as part of the articulation. This can involve complete replacement of the original consonant or simply a secondary articulation.

Example in English:

"City" [ˈsɪʔi], where the [t] is replaced with a glottal stop [ʔ], instead of [/ˈsɪti/].

The glottalization can occur in three specified environments, such as: *word final position (as in "cat" - [kæʔ], before pause (as in "that's it" - [ðæʔ s ɪt], and specific dialects (such as British (BrE) as in "bottle" - [ˈbɒʔl],* further highlighting the variation in how sounds are articulated based on regional or casual speech patterns. This phenomenon simplifies the articulation of certain words and is a characteristic feature of informal or rapid speech in these contexts.

b) Phonological Notation

Phonological notation refers to the way phonological rules and sound patterns are represented in writing. There are formal and informal types of phonological notation, each serving different purposes and contexts. Here is a breakdown:

1) Formal Phonological Notation

Formal notation is highly standardized and is typically used in linguistics to precisely represent sounds, phonological rules, and transformations. It uses the International Phonetic Alphabet (IPA) to clearly represent individual sounds (e.g., /p/, /t/, [ʃ], [aʊ]) and focuses on phonemes. Phonological rules in formal notation describe how sounds change in different environments using symbols like arrows, slashes, and brackets. These rules specify the exact context, such as which sounds come before or after a particular sound or where they appear in a word. The purpose of formal notation is to provide clear and consistent representations of sounds, avoiding any confusion.

Formal Notation Symbols:	
/.../	= Segment of Phoneme
→	= Become
[...]	= Phone representation
/__	= In condition of / when
___#	= Word boundary
$__	= Syllable Initial
__$	= Syllable final

Example of Formal Notation as in Assimilation Rule:

/n/ → [m] / __ [p]

This rule can be read that /n/ becomes [m] *in condition of* before a bilabial stop like /p/, such as in "input" [ˈɪmpʊt]. See the following example for Aspirated Rule:

/p, t, k/ → [p^h, t^h, k^h] / #___

This rule states that the plosives /p/, /t/, and /k/ become aspirated [p^h], [t^h], and [k^h] at the beginning of a word.

In conclusion, formal phonological notation is crucial in linguistics because it provides a precise, consistent, and universally recognized way of documenting sound patterns, transformations, and rules. It enables linguists to analyze and represent phonological processes clearly and accurately, allowing for a deeper understanding of how language works at the sound level.

2) Informal Phonological Notation

Informal phonological notation is less standardized and typically used in contexts where precision is not the primary focus. It is commonly employed in language teaching, especially for beginners, or in casual settings where a detailed phonological analysis is unnecessary. Unlike formal notation, which adheres strictly to the International Phonetic Alphabet (IPA) and precise rule structures, informal notation simplifies the representation of sounds and phonological processes. This approach allows for more accessible descriptions of sound changes without requiring specialized knowledge of phonetics or linguistic terminology. Informal notation is often used to convey general patterns or phenomena in a way that is easy for learners to understand and apply.

For example - Flapping Rule in English (Informal):

> "The t or d sound changes to a flap in words like 'butter' when it is in the middle of a word between vowels"

The example above is a more casual description of the phonological phenomenon without specifying the formal rule structure or IPA symbols. It simplifies the concept for easier understanding, making it accessible for people who may not be familiar with formal linguistic analysis.

D. Summary

The course focuses on the analysis and understanding of phonemes, allophones, and phonological rules to develop students' ability to demonstrate responsibility and independence in applying these concepts. The main learning

outcomes include mastering the identification and analysis of phonological processes such as assimilation, insertion, and deletion, with measurable results in real-world speech. Students are also expected to achieve proficiency in English language skills to effectively analyze, transcribe, and communicate phonological ideas, meeting at least a post-intermediate level of competence. The course emphasizes the importance of phonological rules and their role in shaping spoken language, illustrating how abstract phonemes are realized in speech as allophones, which helps differentiate meaning without altering the essence of the word.

Learning materials are designed to deepen students' understanding of phonemes and allophones by exploring examples from English and other languages, such as minimal pairs. These minimal pairs, like "bat" vs. "pat," are crucial for identifying phonemes and understanding how slight variations in sound can alter meaning. Phonological rules, including assimilation, insertion, and deletion, are explored through practical examples to show how sounds in connected speech change in predictable and context-dependent ways. The course also highlights the dynamic nature of language, with processes like flapping, aspiration, and devoicing illustrating the various ways speech adapts for efficiency and clarity. Through these topics, students gain a comprehensive understanding of how phonological systems function in both theory and practice.

E. Formative Test

1. Reflecting on the relationship between phonemes and allophones, how do you think understanding their distinctions helps us analyze language more effectively? What challenges did you encounter while identifying phonemes and their allophones or analyzing phonological processes? How did these experiences enhance your understanding of connected speech patterns?
2. Analyze Phoneme, Allophone, and Phonological Rules from the following minimal pair list:

   Cat – cut Work – walk Live – Leave Shy – Sigh

   Please – Fleas

F. Worksheet

1. Write a reflection essay of at least 250 words on the given topics. Ensure your reflection is coherent, well-organized, and thoughtful. Incorporate personal insights and examples where appropriate.

2. Phoneme, Allophone, and Phonological Rules Analysis

Cut

Phoneme : _____

Allophone : _____

IPA transcription : _____

Phonological Rules : _____

Note: PHONOLOGICAL RULES MUST INCLUDE BOTH FORMAL AND INFORMAL DESCRIPTION

G. Rubrics

1. Assignment Rubrics

Table 7.
Reflection Essay Rubric

Criteria	Description	Points
Clarity and Coherence	The essay is clear and easy to follow. Ideas are logically organized and well-connected throughout the reflection.	10
Depth of Reflection	The reflection demonstrates deep thinking and engagement with the topic. It shows personal insights, critical thinking, and an understanding of the subject matter.	10
Relevance to the topics	The essay stays focused on the assigned topic, with relevant examples and discussion that directly address the key points of the prompt.	10
Use of Examples and Personal Insight	Includes specific examples or personal experiences that help illustrate the points made. The essay connects theory or concepts to real-world situations.	10
Organization and Structure	The essay is well-structured, with an introduction, body, and conclusion.	10

	Transitions between paragraphs are smooth, and the writing flows logically.	

Grade Descriptions:

Total Points (100%) : 50
Minimum to Pass (70%) : 35 Points

Table 8.
Transcription and Analysis Criteria

Criteria	Description	Points
Phoneme Identification	Accurately identify phonemes and their allophones, providing clear distinctions between them.	10
IPA Transcription Accuracy	Correctly transcribe the given words into IPA symbols, ensuring accurate representation of the phonemes.	10
Phonological Rules Analysis	Provide clear and accurate explanations of how phonological rules work in the examples.	10
Adhere to Guideline	Fully follows the instructions, avoiding dictionary use and providing original work.	10

Grade Descriptions:

Total Points (100%) : 40
Minimum to Pass (70%) : 28 Points

2. Attitude Assessment Rubric

Table 9.
Attitude Assessment Rubric – Classroom Activity

Criteria	Excellent	Good	Satisfactory	Need Improvement
Class Participation	Actively participates in discussions and activities, consistently contributing thoughtful and relevant ideas.	Participates in discussions and activities, often contributing relevant ideas.	Participates occasionally, but contributions may be less relevant or frequent.	Rarely participates, often disengaged or hesitant to contribute.
Respect for Others	Always listens attentively, respects others' opinions, and encourages a collaborative environment.	Listens attentively and respects others' opinions, with occasional encouragement of peers.	Generally, listens and respects others, though occasionally interrupting or dismissing ideas.	Frequently interrupts or disregards others' opinions.
Responsibility and Punctuality	Always on time, meets deadlines, and takes full responsibility for assigned tasks.	Generally, on time, meets most deadlines, and takes responsibility for tasks.	Occasionally late, sometimes misses deadlines, and may lack responsibility in group work.	Often late, misses deadlines, and shows little responsibility for tasks.
Motivation and Initiative	Consistently demonstrates strong motivation, takes initiative in class activities, and is proactive in seeking improvement.	Shows motivation and sometimes takes initiative, but may not always seek extra opportunities.	Shows limited motivation and rarely takes initiative beyond the minimum expectations.	Lacks motivation, rarely shows initiative, and avoids going beyond basic requirements.
Professionalism	Demonstrates a high level of professionalism, including appropriate language, behavior, and attire.	Demonstrates professionalism, but occasionally shows minor lapses in language, behavior, or attire.	Shows some professionalism, but occasionally unprofessional in behavior or attire.	Frequently unprofessional in behavior, language, or attire.

Collaboration and Teamwork	Always works well in teams, offering support and cooperation to others, and resolving conflicts effectively.	Works well in teams, cooperates with others, and contributes to resolving conflicts.	Occasionally contributes to teamwork, but may struggle with cooperation or conflict resolution.	Rarely contributes to teamwork, often resistant to cooperation or resolving conflicts.

Grade Descriptions:

Excellent (4) : The student consistently exceeds expectations in all aspects of attitude and behavior.
Good (3) : The student meets expectations and occasionally exceeds them.
Satisfactory (2) : The student meets some expectations but needs improvement in certain areas.
Needs Improvement (1) : The student frequently falls short of expectations and requires significant improvement.

Total Points (100%) : 24 Points
Minimum to Pass (70%) : 16.8 Points

Excellent : 85−100%
Good : 70−84%
Satisfactory : 50−69%
Needs Improvement : 0−49%

CHAPTER IV
Suprasegmental Sounds

A. Program Learning Outcome (PLO)

Students can identify and analyze suprasegmental features such as pitch, tones, intensity, intonation patterns, length, and syllable and word stress in spoken language. They understand how these features affect meaning, communication, and speech clarity. Additionally, students can transcribe and explain the role of these suprasegmental features in shaping speech production and interpretation across different contexts.

B. Course Learning Outcome (CLO)

1. Demonstrate responsibility and independence in analyzing suprasegmental features such as pitch, intonation, rhythm, and stress (CLO-09).
2. Perform accurate and high-quality analysis of suprasegmental processes in spoken language with measurable outcomes, including pitch, tone, intensity, and syllable stress (CLO-12).
3. Master English language skills at least equivalent to a post-intermediate level to effectively analyze, transcribe, and communicate suprasegmental concepts fluently, accurately, and acceptably (CLO-20).
4. Demonstrate proficiency in the basic concepts of linguistics, with a particular focus on suprasegmental features like stress, pitch, and rhythm (CLO-21).

C. Learning Material

Suprasegmentals are crucial elements in phonetics and phonology that extend beyond individual sounds (consonants and vowels) and affect larger units of speech such as syllables, words, and phrases. These features are integral to the structure and interpretation of spoken language as they influence how speech is perceived and understood in context. Unlike segmental sounds, which focus on individual consonants and vowels, suprasegmentals shape the broader patterns and dynamics of speech, contributing to the rhythm, melody, and emphasis within communication. They provide critical cues that listeners rely on to identify meaning, speaker

intention, and emotional tone, making them essential for effective spoken interaction.

According to Burridge and Stebbins (2016), suprasegmentals facilitate the cohesion and flow of speech, serving as a bridge between linguistic elements and their social or emotional resonance. They are instrumental in distinguishing meaning that might otherwise remain ambiguous, as variations in these features can significantly alter the interpretation of an utterance. Allan, et al. (2010) further emphasize that the study of suprasegmentals is foundational for understanding not only linguistic structure but also the pragmatics of communication, as these features often transcend purely linguistic boundaries to incorporate cultural and contextual nuances. By examining suprasegmentals, linguists gain insight into how spoken language operates at a systemic and functional level. There are some key concepts for suprasegmentals in Phonetics and Phonology, they are Pitch, Intensity, Tones, Intonation Patterns, Word Stress, Duration and Timing (Length). Respectively, these key concepts will be explained in the followings:

1. **Pitch, Tones, and Intensity**

   Pitch, intensity, and tone are fundamental features of suprasegmental sounds that contribute significantly to the meaning and expressiveness of spoken language. These elements are closely related to the acoustic properties of speech and are essential for the modulation of utterance, allowing speakers to convey different meanings, emotions, and grammatical distinctions (Burridge & Stebbins, 2016).

   The first, pitch refers to the perceived highness or lowness of a sound. It is primarily determined by the frequency of the sound wave, with higher frequencies corresponding to higher pitches and lower frequencies to lower pitches. In language, pitch plays a crucial role in distinguishing meanings, especially in tonal languages (Allan et al., 2010). Pitch helps convey linguistic contrasts such as questions versus statements, and it can also signal emotions like surprise or anger. It is essential in both intonation and tone. For example, in English, pitch changes are often used in intonation patterns (Burridge & Stebbins, 2016).

   In English, the question "Are you coming?" is typically said with a rising pitch at the end, indicating a question. Conversely, the statement "You are coming" has a falling pitch at the end, indicating a declarative sentence (Allan,

et al., 2010). However, in Mandarin, pitch directly affects the meaning of words because it is a tonal language. For instance:

"bā" (爸) with a high-level tone means "father."
"bà" (罢) with a falling tone means "stop."
"bǎ" (把) with a falling-rising tone means "hold."

In Burridge & Stebbins (2016), these words differ only in pitch pattern, highlighting the role of pitch in conveying distinct meanings. In correlation to pitch, tone refers to the use of pitch patterns at the level of individual syllables or words to convey meaning. In tonal languages, tone can change the meaning of a word completely. For example, in Mandarin as forementioned, different tonal patterns on the same syllable result in different meanings.

Additionally, tone is also present in non-tonal languages, such as English, in the form of intonation, but it does not alter the fundamental meaning of words (Burridge & Stebbins, 2016), as in “really?” in “you really did that?” suggests surprise or disbelief. In English, tone is more associated with intonation (how the pitch rises and falls in phrases and sentences), but again it is not with the meaning of individual words.

Furthermore, In Indonesia, tone and pitch do influence meaning, but unlike tonal languages such as Mandarin, the pitch variations in Indonesian are not as rigidly tied to word meaning. In Indonesian, pitch and tone often play a role in expressing emphasis, mood, or the emotional tone of a speaker, but they are not typically used to distinguish words from one another at a lexical level.

For example:

"*Bisa*?" (with a rising intonation) means "Can you?" or "Is it possible?" as a question, expressing uncertainty or inquiry.

"*Bisa*!" (with a falling intonation) can be used to emphasize capability or assurance, such as "Yes, I can!" or "I am able to!"

In this way, pitch in Indonesian adds nuance to the message but is not as phonematically significant as it is in languages like Mandarin, where tone changes can distinguish entirely different words.

Then, Intensity refers to the loudness or softness of a sound. It is influenced by the amplitude of the sound wave. Intensity is an important aspect of speech because it affects the prominence of syllables or words in an utterance

(Burridge & Stebbins, 2016). Intensity helps to emphasize certain words or syllables, making them more prominent. This is critical for word stress and intonation. For instance, louder sounds often signal stress, emphasis, or importance, while softer sounds can indicate lesser emphasis or subordination.

In English, the phrase "I did tell you!" might have the word "did" stress with higher intensity to emphasize the action. Conversely, in Indonesian, the phrase "*Saya akan pergi*" (I will go) might emphasize the word "akan" with increased intensity to stress the future tense (Burridge & Stebbins, 2016). In Mandarin, intensity may correlate with emotional expression rather than tone. For example, speaking loudly can convey excitement or anger, while speaking softly can signal calmness or a question (Allan et al., 2010).

2. Intonation Patterns

Intonation Patterns are a key feature of suprasegmental sounds, referring to the variations in pitch that occur throughout an utterance. These patterns help convey meaning beyond individual words, influencing the emotional tone, intent, and structure of speech. Intonation is not confined to single sounds but spans entire phrases or sentences. It can signal whether a sentence is a statement, question, command, or exclamation, and can reflect attitudes such as uncertainty, excitement, or emphasis. In English, for example, a rising intonation at the end of a sentence typically indicates a question, while a falling intonation signals a declarative statement. Intonation plays a crucial role in the clarity and interpretation of speech, allowing speakers to express subtle nuances in meaning (Burridge & Stebbins, 2016).

In English, intonation patterns are often divided into five broad categories: rising and falling intonation.

a) Rising Intonation

Rising intonation occurs when the pitch of the voice rises at the end of a sentence or phrase. This pattern is commonly used in yes-no questions, incomplete thoughts, and uncertainty. Rising intonation can suggest that the speaker is expecting a response or is unsure about the information they are presenting.

Example:

"Are you coming to the party?" (Yes-no question)

"I think we should... go to the store?" (Incomplete thought or uncertainty)

b) Falling Intonation

Falling intonation happens when the pitch of the voice falls at the end of a sentence. This is the most common intonation pattern for statements, commands, and wh-questions (questions starting with words like who, what, where, etc.). Falling intonation typically conveys certainty, finality, or completion.

Example:

"I am going to the store." (Statement)

"Where are you going?" (Wh-question)

"Close the door." (Command)

c) Flat Intonation

Flat intonation refers to a speech pattern where the pitch of the voice remains relatively steady without noticeable rises or falls throughout an utterance. This type of intonation can create a monotone effect, often conveying a lack of emotional variation or emphasis. It is less dynamic compared to rising or falling intonation and can signal several things depending on the context. Flat intonation is often used in certain situations, such as:

Example:

“Yes, I understand” – boredom

(Without any rise or fall in pitch, signaling a lack of interest)

"Welcome to the event” – formal or scripted speech

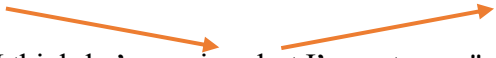
(A typical greeting where flat intonation is used to keep the tone neutral and formal)

d) Fall-rise Intonation

Fall-rise intonation begins with a fall in pitch and then rises towards the end. This pattern is often used to express uncertainty, doubt, or politeness, or to soften a statement, making it sound less direct. It is also used in

disclaimers or hedging to indicate that the speaker is not completely sure about what they are saying.

Example:



"I think he's coming, but I'm not sure." (Uncertainty/Doubt)

"It's kind of expensive..." (Hedging, softening the statement)

e) Rise-fall Intonation

Rise-fall intonation occurs when the speaker's pitch rises and then falls within the same utterance. This pattern is often used to express emotions such as surprise, excitement, disbelief, or strong emphasis. It adds a dynamic quality to speech and is common in expressive language, signalling that the speaker feels strongly about what they are saying.

Example:

"Wow, that's INCREDIBLE!" (Shows excitement or astonishment.)

"What a beautiful day!" (Expressing delight.)

Intonation patterns differ significantly across languages, which can lead to variations in how sentences are perceived by speakers of different languages. For instance, Mandarin, a tonal language, uses pitch changes to distinguish meaning at the word level, while English typically uses intonation to indicate sentence-level meaning. In Indonesian, intonation also plays a crucial role in distinguishing statements from questions. For example, a sentence like *"Dia pergi"* (He/She is going) will have a falling intonation in a statement, while a rising intonation in *"Dia pergi?"* can turn the same words into a question. Moreover, intonation in Indonesian can indicate emotional tone, such as surprise or doubt, without altering the meaning of individual words but by changing the overall pitch pattern across a sentence (Burridge & Stebbins, 2016). This shows how intonation not only adds meaning but also reflects the emotional intent and speaker's attitude, contributing significantly to communication.

3. Length

In phonetics and phonology, length in suprasegmental sounds refers to the relative duration of speech sounds such as vowels, consonants, or syllables within a linguistic context. Suprasegmental features are properties of speech that extend over more than a single segment (phoneme), influencing syllables, words, or entire phrases. Length can affect rhythm, intonation, and stress patterns, and its role varies across languages. There are three characteristics of length in suprasegmental sounds, as follows:

a) Phonemic Length

In some languages, length is phonemic, meaning it differentiates word meanings. It means that the phenomenon in some languages where the duration of a sound (vowel or consonant) is contrastive, meaning that changing the length of a sound can lead to differences. In these languages, length is not just a stylistic or prosodic feature but a critical aspect of the phonological system. See the followings in Thai:

Example:

“พี่” [phìː] means older siblings with long /iː/, while “ผี” [phīː] means ghost with shorter /i/.

Phonemic length plays a crucial role in maintaining lexical distinctions in many languages, including Thai. It is an essential aspect of phonological systems and is particularly significant in poetry, music, and oral traditions where rhythm and phonemic contrasts converge.

b) Prosodic Role and Non-Phonemic Length

In both English and Indonesian, the lengthening of sounds plays a crucial role in shaping rhythm, stress, and intonation, which in turn affects meaning, emotion, and emphasis. English is a stress-timed language, meaning the rhythm is determined by stressed syllables that occur at regular intervals, with unstressed syllables falling in between them more quickly.

For instance, in the sentence:

“The *cat sat* on the *mat*”

The stressed syllables (*cat, sat, mat*) provide the rhythmic backbone, while the unstressed syllables (*on the*) are compressed. This rhythm contrasts with syllable-timed languages like Indonesian, where each syllable typically takes the same duration.

In the Indonesian example:

"*Saya pergi ke pasar*" (I go to the market)

Every syllable is given roughly equal time, resulting in a steady, predictable rhythm. In English, the manipulation of length is especially important in poetry and formal speech.

For example, in iambic pentameter, as seen in the line:

"Shall I compare thee to a summer's day?"

The lengthening of stressed syllables creates a rhythmic flow that not only contributes to the musicality of the speech but also highlights key words and emotions. This use of length variation is less common in Indonesian, where stress usually falls on the penultimate syllable and does not significantly alter the meaning of the word. Consequently, Indonesian speech tends to maintain a more consistent rhythm. Lengthening sounds in English can also signal different sentence types, as in the example:

"*He's coming*?"

The final syllable is lengthened and the pitch rises, signaling a question. Similarly, in expressions of emotion, such as:

"Whaaat?! You're kidding!"

Which is lengthened vowels emphasize surprise or excitement. In contrast, in Indonesian, particularly in traditional storytelling or *Hikayat* recitations, vowel lengthening is used more subtly, adding dramatic emphasis and enhancing the narrative flow (Cruttenden, 2014; Ladefoged & Johnson, 2015). Although both English and Indonesian use non-phonemic length for prosodic purposes, such as emphasis and rhythm, this lengthening does not alter the lexical meaning of words. Instead, it serves to add nuance, rhythm, and emotional depth to speech, showcasing the significant role of prosody in both languages.

4. Syllable and Word Stress

a) Syllable

A syllable is the smallest rhythmic unit in speech, consisting of a single, unbroken sound. It plays a central role in the structure of words and serves as the foundation for understanding stress and intonation. According to Ladefoged & Johnson (2015), a syllable typically contains a vowel (nucleus) and may include consonants before it (onset) or after it (coda). The combination of these elements determines the structure of the syllable. See the detail of elements of the syllable below:

1) Onset

The onset of a syllable refers to the consonants that appear before the vowel (nucleus) in the syllable. It is optional in many languages, meaning some syllables may not have an onset at all. In English, most syllables have an onset, but not all. See the followings:

"pen" (/pɛn/), the onset is /p/
(the consonant before the vowel)
"Street" (/strit/), the onset is **/str/**
(the consonant cluster – more than one consonant)

2) Nucleus

The nucleus is the central part of a syllable and is always the vowel (or vowel-like sound). It is the core of the syllable and is required for a syllable to exist in most languages, including English. The nucleus carries the syllable's primary sonority (auditory prominence), meaning it is usually the loudest and clearest part of the syllable.

"pen" (/pɛn/), the nucleus is /ɛ/
(the vowel sound)

3) Coda

The coda refers to the consonants that follow the nucleus within the syllable. Like the onset, the coda is optional. Not all syllables have a coda; syllables that do not have a coda are referred to as "open syllables," while those with a coda are "closed syllables."

"pen" (/pɛn/), the coda is /n/
(the consonant after the vowel – closed syllable)

"see" (/siː/), there is no coda
(The syllable is considered open because it ends in the vowel sound and doesn't have a consonant following it)

Additionally, in a typical syllable, the onset, nucleus, and coda work together to form a phonological unit, as forementioned in “pen”. Again, it is important to note that not every syllable has all three components, such as in “see”. In languages like English, syllables with just a nucleus and coda are very common (closed syllables), and so are syllables with an onset and nucleus. Understanding syllables' structure is crucial to grasping the rules of stress, rhythm, and pronunciation patterns in a language.

b) Word Stress

Word stress directly depends on syllables, as stress is applied to one or more syllables in a word. According to Crystal (2008), syllables serve as the canvas for suprasegmental features like stress, rhythm, and intonation, highlighting their integral role in spoken language. Word stress refers to the prominence given to one syllable within a word, making it stand out compared to the others (Roach, 2009). Word stress is crucial for distinguishing meanings and ensuring clear communication. There are two types of word stress, those are:

1) Primary Stress

Primary stress is the strongest emphasis placed on a syllable in a word. This syllable is pronounced more forcefully, with a higher pitch, longer duration, and greater loudness compared to others. The primary stress, in transcription, is marked with a superscript vertical line (‘) before the stressed syllable. See the example below:

‘record (noun) vs re’cord (verb)

in the word "record" (/ˈrek.ɔːd/ as a noun), the first syllable /rek/ is stressed. In contrast, as a verb (/rɪˈkɔːd/), the second syllable /kɔːd/ carries the stress.

2) Secondary Stress

Secondary stress is a weaker emphasis compared to primary stress. It often occurs in polysyllabic words and helps maintain the

rhythm of speech. While it is not as strong as primary stress, it is stronger than unstressed syllables. It is marked in transcription with a subscript vertical line (ˌ) before the stressed syllable. For example:

"international" (/ˌɪn.təˈnæʃ.nəl/)

in the word *"international"* (/ˌɪn.təˈnæʃ.nəl/), the secondary stress is on /ˌ**ɪn**/, while the primary stress is on /ˈ**næʃ**/.

3) Unstressed Syllables

Unstressed syllables receive little or no emphasis. These syllables are pronounced with less force, shorter duration, and often reduced vowels (like /ə/ or /ɪ/). Unstressed syllables create contrast with stressed ones, making the stressed syllables stand out more clearly.

"banana" (/bəˈnæ.nə/)

in the word *"banana"* (/bəˈnæ.nə/), the first and last syllables **/bə/** and **/nə/** are unstressed, while the middle syllable **/næ/** is stressed.

Furthermore, English stress patterns follow predictable rules in many cases, but irregularities arise due to borrowed words, historical influences, and exceptions. Understanding these patterns can aid in accurate pronunciation and fluency. Below are the key stress patterns in English:

1) Stress in One-Syllable Words

One-syllable words are generally stressed unless they serve as weak forms in speech, such as grammatical function words (*a*, *the*, *and*). For instance, words like *cat*, *dog*, and *book* are stressed because they carry lexical meaning. This principle aligns with the stress-timed nature of English, where content words tend to be emphasized (Kelly, 2019).

2) Stress in Two-Syllable Words

a) Noun and Adjectives

Two-syllable nouns and adjectives often carry stress on the first syllable, as seen in words like *TAble*, *WINdow* (nouns), and *HAPpy*, *CLEver* (adjectives). This is a predictable stress rule in English (Ladefoged & Johnson, 2015).

b) Verbs

In two-syllable verbs, stress typically falls on the second syllable, such as in *reCORD* and *deCIDE*. This distinction between

nouns/adjectives and verbs reflects English's stress system, which aids in grammatical differentiation (Ashby & Maidment, 2021).

3) **Stress in Longer Words**

a) **Suffixation -ic**

Words ending in -ic generally place stress on the syllable preceding the suffix, such as poeTIC and athLEtic. This stress pattern is consistent for this suffix category (Celce-Murcia et al., 2010).

b) **Suffixation -ity**

Words with the suffix -ity often have stress two syllables before the suffix, as in eLECtricity and reSPONsibility. The stress-shifting nature of -ity affects word rhythm and pronunciation (Hewings, 2012).

c) **Suffixation -ion**

The stress in words ending with -ion typically falls on the syllable directly before the suffix, as in attenTION and comPLEtion. This pattern is a standard feature of English derivational morphology (McMahon, 2020).

4) **Stress in Compound Words**

Stress in compound words generally follows predictable patterns depending on the type of compound and its grammatical function. These patterns are crucial for distinguishing compounds from phrases, as stress placement can alter meaning and clarify whether the elements of the compound form a unified concept or remain separate entities. In English, stress patterns in compounds often serve as a phonological marker of semantic unity, ensuring that listeners interpret them as a single lexical item rather than two distinct words (Allan, et al., 2010). There are three kinds of compound words, those are:

a) **Compound Nouns**

A compound noun is a type of noun formed by combining two or more words to create a single lexical unit that represents a specific concept, object, or entity (Plag, 2003). In compound nouns, the primary stress is usually on the first element.

For example,

BLACKboard or *FOOTball*

receive stress on the first part, differentiating them from phrases like *black board*, where stress is more evenly distributed. This pattern is a distinctive feature of English stress rules for compound nouns, helping clarify their semantic unity (Allan, et al., 2010).

b) Compound Adjectives

A compound adjective is an adjective formed by combining two or more words to modify a noun. A word stress in compound adjective often places on the second element to highlight their descriptive nature.

For instance,
bad-TEMPERED or *old-FASHIONED*,

the second element receives more prominence. This stress pattern reinforces the idea that compound adjectives describe a single, unified characteristic rather than two separate ideas (Roach, 2009)

c) Compound Verb

A compound verb is a verb formed by combining two or more words that function together as a single verb to express an action, state, or occurrence. Compound verbs tend to carry primary stress on the second element.

As seen in verbs like
underSTAND or *overCOME*.

This stress placement often reflects the action-oriented meaning of the compound verb and its functional complexity within a sentence. It also aligns with English's tendency to stress the most semantically significant part of the verb (Kelly, 2019).

5) Exceptions and Irregularities

a) Borrowed Words

Borrowed words are words that a language adopts from another language and incorporates into its vocabulary, often with little or no modification. Borrowed words frequently retain the stress patterns of their source languages.

For example,
hoTEL and *balLET*

showcase stress patterns influenced by French, while others from Latin or Greek may follow their original stress rules. These borrowed patterns reflect the historical influence of other languages on English and contribute to its diverse phonological system (Allan, et al., 2010).

b) Irregular words

Irregular words are words that do not follow standard patterns of spelling, pronunciation, or grammatical inflection typically observed in a language. These words often deviate from predictable linguistic rules, requiring speakers and learners to memorize their forms. Irregular words exhibit stress patterns that deviate from typical rules.

For instance,
detail in British English (*DEtail*)
detail in American English (*deTAIL*).

Such irregularities often arise from historical linguistic changes or regional variations in pronunciation (Hewings, 2012).

Stress patterns in English play a vital role in pronunciation and meaning differentiation. While one-syllable words are typically stressed, the stress placement in two-syllable and longer words often follows predictable rules tied to grammatical category, suffixes, and compound structures. Exceptions and irregularities enrich the complexity of English phonology.

D. Summary

The course focuses on the analysis of suprasegmental features, including pitch, tone, intensity, intonation patterns, length, and syllable/word stress in spoken language. Students will learn to identify these features and understand their role in shaping meaning, communication, and speech clarity. Additionally, they will develop the skills necessary to transcribe and explain how suprasegmentals influence speech production and interpretation across different contexts. This knowledge will enable students to apply suprasegmental analysis both theoretically and practically, thus enhancing their ability to analyze language at an advanced level.

The course emphasizes the significance of pitch, intensity, intonation, length, and stress as fundamental elements of speech. These features vary across languages and are integral to conveying meaning and emotional tone. For instance, pitch is crucial in tonal languages like Mandarin, while in English and Indonesian, it often

signals emphasis or intonation in questions. Intensity highlights key words, and intonation patterns help distinguish sentence types and emotional tone. Length and syllable/word stress are also critical for speech rhythm and emphasis. By analyzing these suprasegmentals, students will gain a deeper understanding of their function in communication, both within familiar and cross-linguistic contexts.

E. Formative Test

1. Weekly reflection, how do you think suprasegmental features like pitch, tone, intensity, intonation patterns, length, and syllable/word stress contribute to effective communication?
2. Syllabification and Word Stress Analysis
   a. Write the following words and divide them into syllables:
      Photography Communication Umbrella
      Advertisement Celebrate
   b. Explain the process of dividing each word into syllables and the rules that apply.
   c. Identify and mark the primary stressed syllable in each of the words above using stress markers (e.g., ˈphoˌtography).
   d. Use each word in a sentence and underline the word.
   e. Record your voice reading the sentences, paying attention to correct word stress and natural pronunciation

F. Worksheet

1. Write a reflection essay of at least 250 words on the given topics. Ensure your reflection is coherent, well-organized, and thoughtful. Incorporate personal insights and examples where appropriate.
2. Syllabification and Word Stress Analysis
   Photography
   Syllable and its rule : _____
   Word stress : _____
   Application : _____
3. Record your own voice by reading the made-up sentences

G. Rubrics

1. Assignment Rubrics

Table 10.
Reflection Essay Rubric

Criteria	Description	Points
Clarity and Coherence	The essay is clear and easy to follow. Ideas are logically organized and well-connected throughout the reflection.	10
Depth of Reflection	The reflection demonstrates deep thinking and engagement with the topic. It shows personal insights, critical thinking, and an understanding of the subject matter.	10
Relevance to the topics	The essay stays focused on the assigned topic, with relevant examples and discussion that directly address the key points of the prompt.	10
Use of Examples and Personal Insight	Includes specific examples or personal experiences that help illustrate the points made. The essay connects theory or concepts to real-world situations.	10
Organization and Structure	The essay is well-structured, with an introduction, body, and conclusion. Transitions between paragraphs are smooth, and the writing flows logically.	10

Grade Descriptions:

Total Points (100%) : 50
Minimum to Pass (70%) : 35 Points

Table 11.
Syllabification and Word Stress Analysis

Criteria	Description	Points
Syllabification Accuracy	Correctly dividing the given words into syllables and providing a clear and accurate explanation of the rules for syllabification.	10
Stress Marking	Accurate identification of the primary stressed syllables and proper usage of stress markers in the transcription of the words.	10
Sentence Usage	Effective use of the words in meaningful sentences with proper grammar and clarity.	10
Pronunciation Clarity	Clear and accurate pronunciation of the sentences in the recorded audio, demonstrating correct syllabification and word stress.	10

Grade Descriptions:

Total Points (100%) : 40
Minimum to Pass (70%) : 28 Points

2. Attitude Assessment Rubric

Table 12.
Attitude Assessment Rubric – Classroom Activity

Criteria	Excellent	Good	Satisfactory	Need Improvement
Class Participation	Actively participates in discussions and activities, consistently contributing thoughtful and relevant ideas.	Participates in discussions and activities, often contributing relevant ideas.	Participates occasionally, but contributions may be less relevant or frequent.	Rarely participates, often disengaged or hesitant to contribute.
Respect for Others	Always listens attentively, respects others' opinions, and encourages a collaborative environment.	Listens attentively and respects others' opinions, with occasional encouragement of peers.	Generally, listens and respects others, though occasionally interrupting or dismissing ideas.	Frequently interrupts or disregards others' opinions.
Responsibility and Punctuality	Always on time, meets deadlines, and takes full responsibility for assigned tasks.	Generally, on time, meets most deadlines, and takes responsibility for tasks.	Occasionally late, sometimes misses deadlines, and may lack responsibility in group work.	Often late, misses deadlines, and shows little responsibility for tasks.
Motivation and Initiative	Consistently demonstrates strong motivation, takes initiative in class activities, and is proactive in seeking improvement.	Shows motivation and sometimes takes initiative, but may not always seek extra opportunities.	Shows limited motivation and rarely takes initiative beyond the minimum expectations.	Lacks motivation, rarely shows initiative, and avoids going beyond basic requirements.
Professionalism	Demonstrates a high level of professionalism, including appropriate language, behavior, and attire.	Demonstrates professionalism, but occasionally shows minor lapses in language, behavior, or attire.	Shows some professionalism, but occasionally unprofessional in behavior or attire.	Frequently unprofessional in behavior, language, or attire.

Collaboration and Teamwork	Always works well in teams, offering support and cooperation to others, and resolving conflicts effectively.	Works well in teams, cooperates with others, and contributes to resolving conflicts.	Occasionally contributes to teamwork, but may struggle with cooperation or conflict resolution.	Rarely contributes to teamwork, often resistant to cooperation or resolving conflicts.

Grade Descriptions:

Excellent (4) : The student consistently exceeds expectations in all aspects of attitude and behavior.
Good (3) : The student meets expectations and occasionally exceeds them.
Satisfactory (2) : The student meets some expectations but needs improvement in certain areas.
Needs Improvement (1) : The student frequently falls short of expectations and requires significant improvement.

Total Points (100%) : 24 Points
Minimum to Pass (75% : 16.8 Points

Excellent : 85−100%
Good : 70−84%
Satisfactory : 50−69%
Needs Improvement : 0−49%

CHAPTER V
Praat Application Introduction – Segmental Sound Analysis

A. Program Learning Outcome (PLO)

Students can identify and analyze segmental features, particularly vowel sounds, using the Praat application. They demonstrate the ability to extract and interpret formant values (F1, F2) and visualize vowel placement in relation to tongue height and backness.

B. Course Learning Outcome (CLO)

1. Demonstrate responsibility and independence in analyzing segmental features, particularly vowel sounds, through the use of the Praat application (CLO-09).
2. Perform accurate and high-quality analysis of segmental vowel features by extracting and interpreting formant values (F1, F2) and visualizing vowel placement based on tongue height and backness (CLO-12).
3. Master English language skills at least equivalent to a post-intermediate level to effectively analyze, transcribe, and interpret segmental features, particularly vowel sounds, fluently and accurately (CLO-20).
4. Demonstrate proficiency in the basic concepts of linguistics, with a particular focus on the acoustic and articulatory properties of vowel sounds (CLO-21).

C. Learning Material

1. Introduction to Praat Application

To get started with phonetic and phonological analysis using Praat, follow these steps to download, install, and set up the software. Once installed, you'll work with two main windows—each serving a specific purpose to help you manage, analyze, and visualize speech sounds.

a. Setting Up Praat – Downloading and Installing the Application

To begin using Praat, the first step is to visit the official Praat website (www.praat.org).

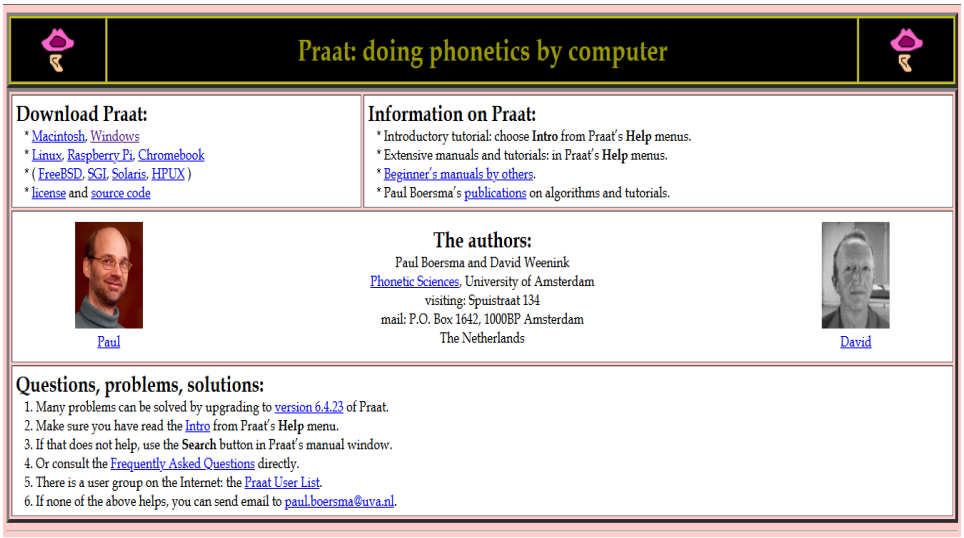


Figure 7.
The front page of the Praat website

You need to download the latest version of the software that is compatible with your operating system (Windows, macOS, or Linux). This ensures that you are using the most up-to-date and secure version, which includes all the latest features and bug fixes. Once the software is downloaded, follow the installation prompts to complete the installation process and successfully set up Praat on your computer. This will prepare you to start analyzing speech sounds with the software.

b. Lunch Praat

Beforehand, this tutorial introduces the basic procedures of PRAAT, a versatile tool for speech analysis. The application offers a wide range of features, including spectrographic analysis, articulatory synthesis, and more. This tutorial is designed for students studying Phonetics and Phonology, particularly beginners in speech analysis. It emphasizes using PRAAT to analyze both segmental and suprasegmental aspects of speech. In this section, it focuses on introductory and segmental analysis on vowels.

After you downloaded the praat.exe program, then double click it. There will be two types of windows will appear, see the followings:

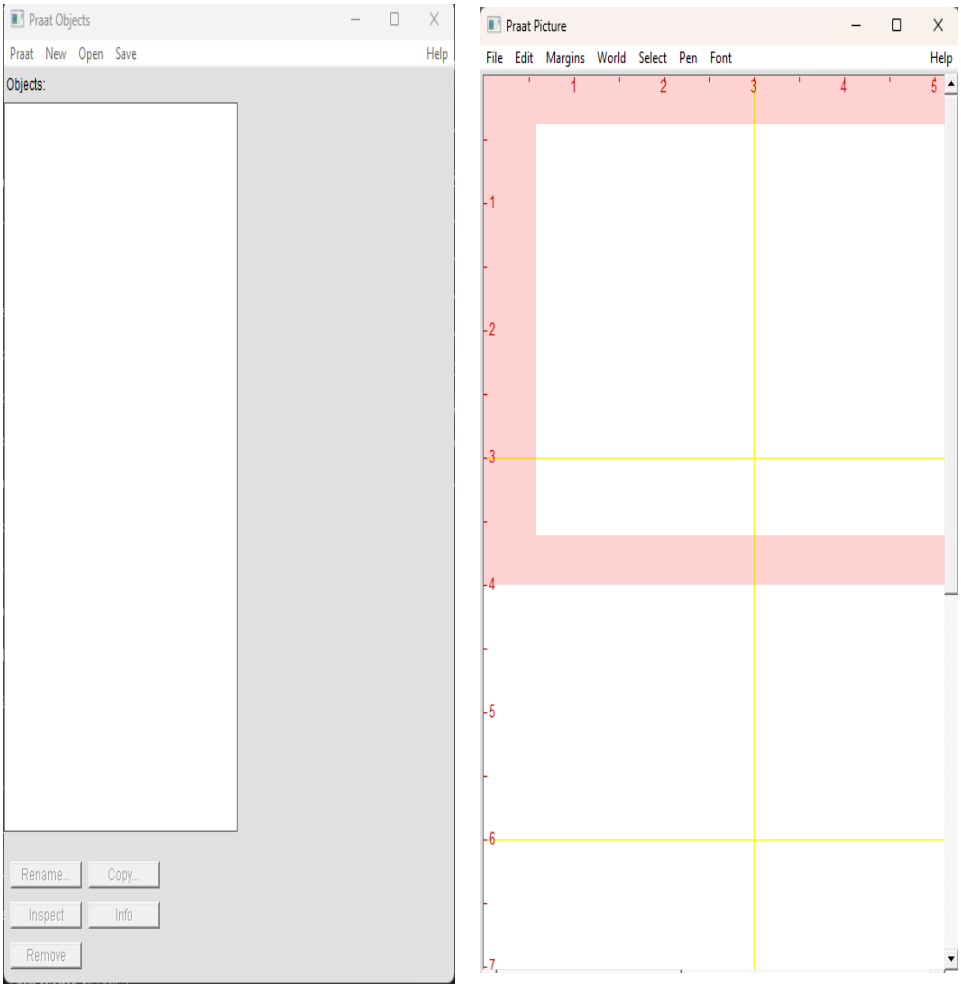


Figure 8.
The Praat Displays

The window on the left is called the "Praat Objects" window, where you will typically see a list of your speech files, known as "objects" in Praat. These files can either be created from scratch or imported from existing files (will be explained in the following section). On the right is the "Praat Picture" window, used for plotting graphs. These graphs can be saved in various formats, such as EPS PostScript3 or Windows Metafile, for word processing purposes, or printed directly using the "Print" option (CTRL+P) in the File menu.

You can find detailed information about the program and its procedures in the Praat manual. Simply click the Help button in the main menu of the Praat Objects window. If you do this (try it now) and select Praat Intro, you will see a list of available options.

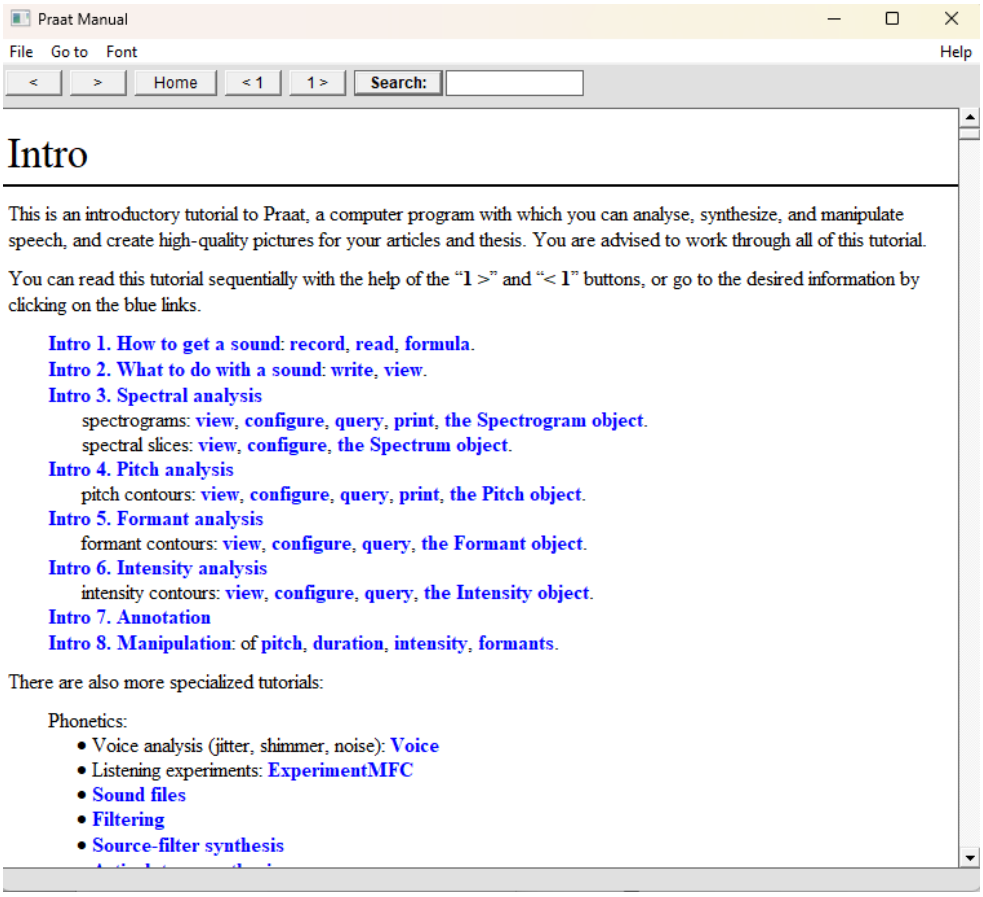


Figure 9.
The Praat Intro

Most options are straightforward, and you can explore them on your own. The tutorials are particularly helpful as they provide detailed guidance on handling specific topics in Praat. For those interested in automating tasks, the "Scripting" tutorial (found under the "General" menu) is highly recommended. Additionally, the Praat website offers a "Frequently Asked Questions" section that addresses common user concerns and a "What's New?" section to keep you updated on recent program changes.

The most commonly used option in the "Help" function is the "Search Praat Manual," which allows users to quickly find information. Some functions also have shortcut keys; for instance, this option uses Command-M. Click on it now, and the following window will appear.

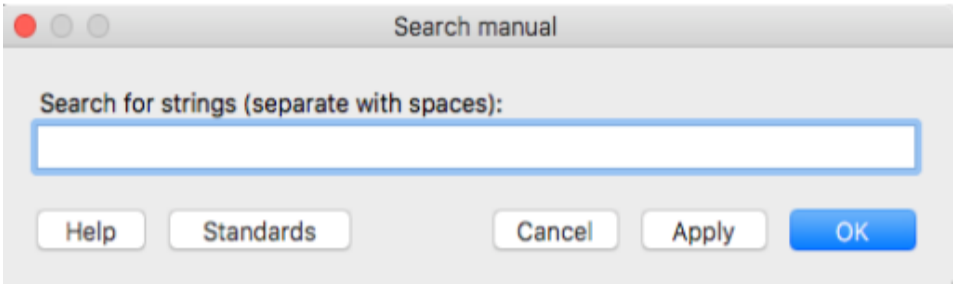


Figure 10.
The Praat Search Manual

To search, simply type a keyword or phrase into the empty space in the window, and you'll see all the relevant information available on your topic. For example, try searching for information on the following topics:

Format Pitch Intensity etc.

You will find out that some searches yield numerous results, while others produce only a few options. *Keep in mind that you can access the Help function from anywhere within the program. Additionally, many procedures include specific help options accessible directly from their window menus, such as the "Help" button in the Search Manual window mentioned above.*

2. Sound Input: Importing and Recording Audio

a. Importing Sample Audio

Load an Existed Audio File you can follow the procedures below:

1) In the Praat Objects window, select Open > Read from file....

2) Navigate to the location of your audio file (e.g., WAV or MP3) and select it.

3) The audio file will now appear as an object in the Praat Objects window.

Now you have successfully loaded your audio file into Praat, and you are ready to begin analyzing it.

b. Recording Audio

Before starting recording speech sample for the analysis, it is important to configure your sound card settings correctly. On a Mac, open System Preferences and select Sound, ensuring that the correct input and output devices are chosen. To avoid disturbing others, consider using high-quality

headphones for audio output. Additionally, using an external microphone is recommended, as the built-in microphones on most laptops and computers often have limited frequency range and sound quality. Creating speech sound manually, you can follow these steps:

1) Open the PRAAT Objects window and select New from the main menu.
2) Choose Record mono Sound for single-channel recordings or Record stereo Sound for two-channel recordings. Stereo recordings result in larger file sizes and are useful for specific purposes, like recording both speech and EGG signals.

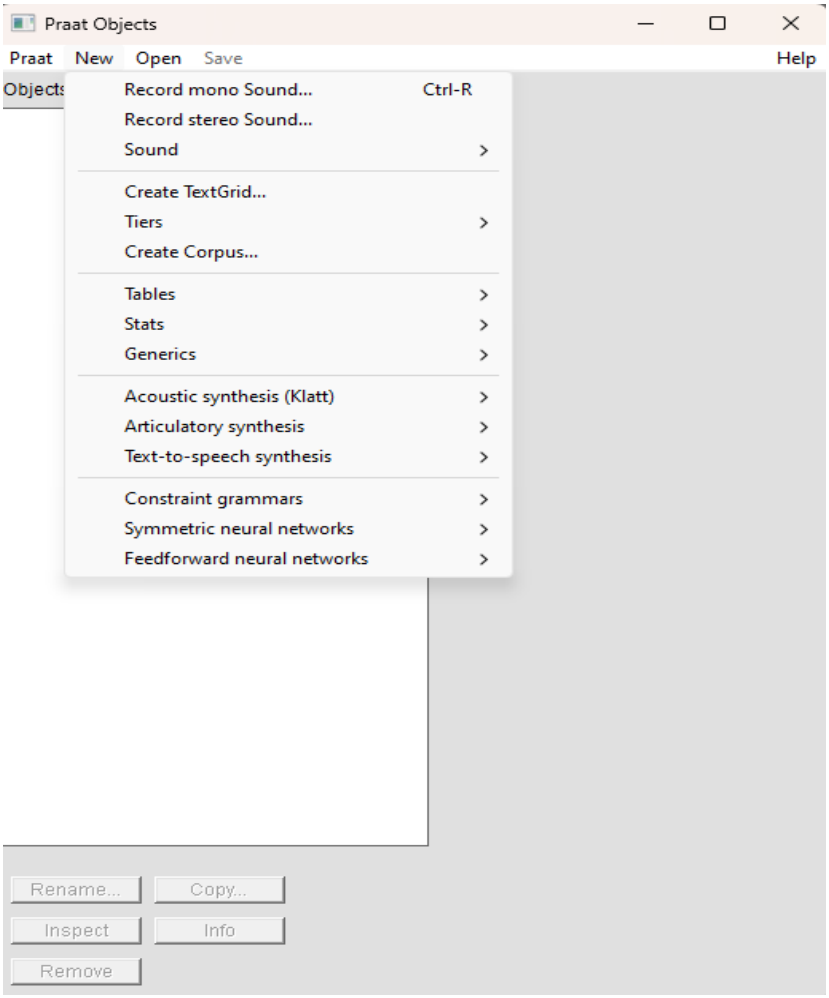


Figure 11.
The Praat Recording Menu

3) The SoundRecorder window will open. Select the desired sampling rate:

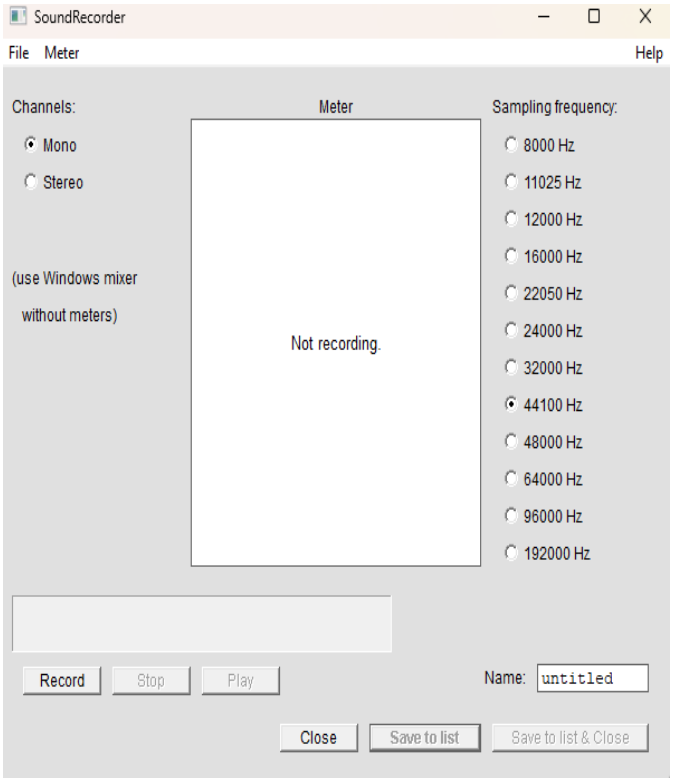


Figure 12.
The Praat Sound Recorder

- 22k Hz (default), suitable for most cases.
- 11k Hz, use if disk space is limited.
- 44k Hz, choose for higher-quality recordings, keeping in mind larger file sizes.

4) Connect a high-quality microphone to your computer's MIC input (avoid the Line Input). Click Record, then speak the sentence "*we stop doing the right thing*" three times without pausing for breath. Monitor the input level using the green bars. Click Stop when done.
5) Review the recording by clicking Play. If you are satisfied, name the recording in the Name box (e.g., we stop) and click Save to list. The sound object will now appear in the PRAAT Objects window.
6) In the PRAAT Objects window, you can rename the sound object by clicking Rename and typing a new name. Assigning clear, descriptive names is a good practice.

3. Acoustic Analysis of Vowels

Before analyzing vowels, we need to understand related concepts such as formants and spectrograms. The details are as follows:

a. Formant of Vowels

A formant is a concentration of acoustic energy around a particular frequency in the speech wave. There are several formants, each at a different frequency, roughly one in each 1,000Hz band. Each formant corresponds to a resonance in the vocal tract. We distinguish one vowel from another by the differences in these overtones. According to Lagefoged (2006), each vowel has three formants, i.e. three overtone pitches. The first formant (F1) is inversely related to vowel height. The second formant is related to the degree of backness of a vowel. Formants can be seen in a wideband spectrogram as dark bands.

b. Spectrogram of English Vowels

A spectrogram visually represents sound in three dimensions: time on the x-axis, frequency on the y-axis, and intensity shown by the darkness of the frequencies.

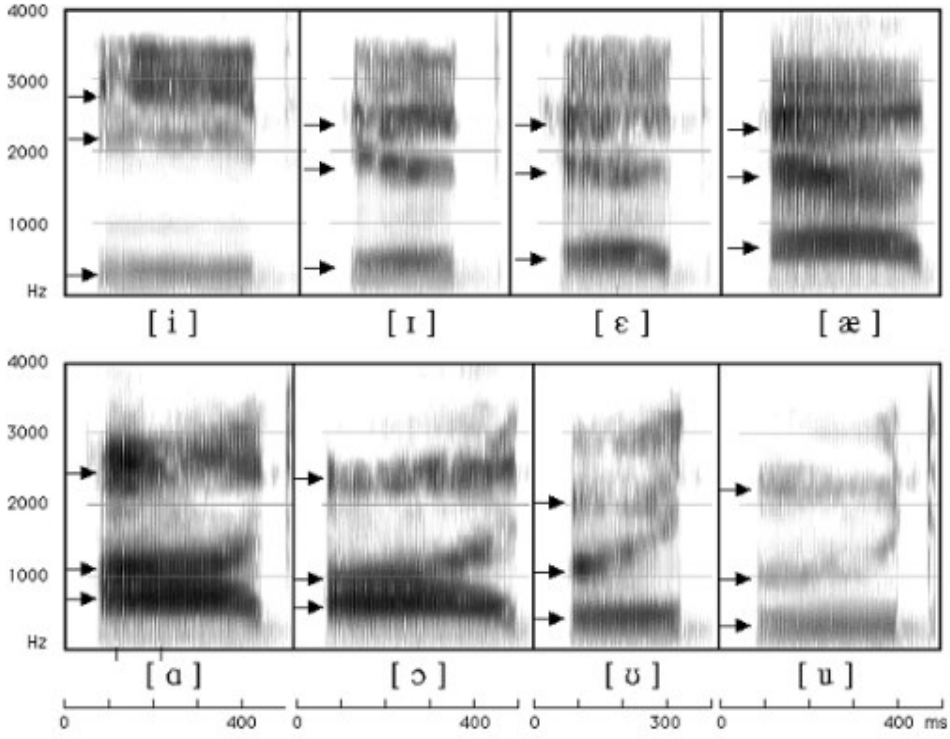


Figure 13.
The Spectrogram – American English

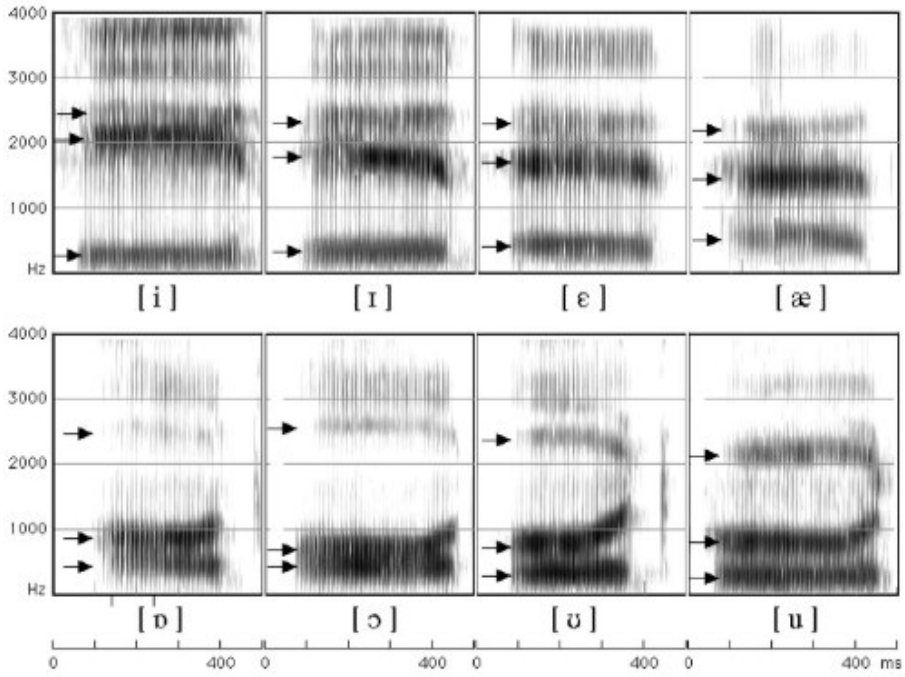


Figure 14.
The Spectrogram – British English

Remarks:

1) The horizontal scale shows time intervals in second(s) and the vertical scale shows frequency in Hz
2) Only front and back vowels are presented in the pictures, /ə/ and /ɜ/ in middle position are not included
3) The IPA fonts in Ladefoged (2006) and Roach (2009) have the following equivalences:

Table 13.

Equivalences of IPA fonts

Words	Ladefoged (2006)	Roach (2009)	Words	Ladefoged (2006)	Roach (2009)
feet	/i/	/iː/	bird	/ɜ/	/ɜː/
hard	/ɑ/	/ɑː/	bed	/e/	/e/
food	/u/	/uː/	attend	/ə/	/ə/
lord	/ɔ/	/ɔː/	book	/ʊ/	/ʊ/
dear	/ɪə/	/ɪə/	care	/eə/	/eə/
cake	/eɪ/	/eɪ/	tour	/ʊə/	/ʊə/

Ladefoged (2006) represents the American perspective in phonetics, often with a focus on General American (GA) English pronunciation while Roach (2009) represents the British perspective, particularly received Pronunciation (RP) or Standard British English.

c. Analysis of Vowels Process

Before we start to plot the vowels, let's review on how to extract formant values.

1) Position the cursor in a stable and middle part of the sound and do the following
2) Go to "View & Edit "→" Formants" →"Formant Listing", which will give you values for $F1, F2, F3$ and $F4$, along with the time point at which the measures were taken. Make sure you tick "show formants" before getting praat info of formants.

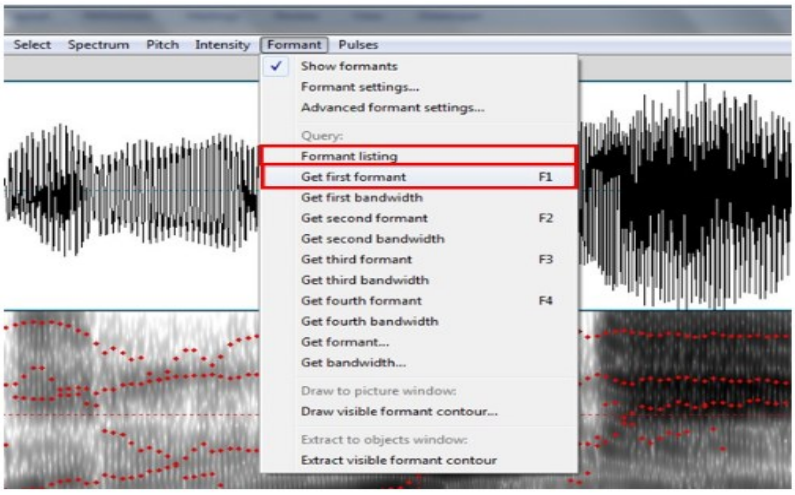


Figure 15.
Praat Formant Listing Feature

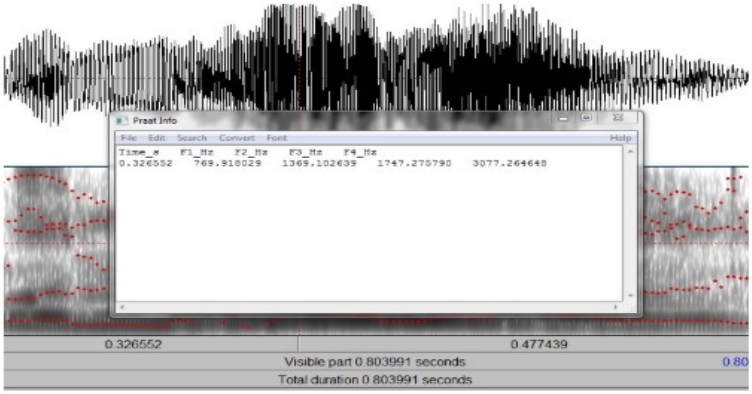


Figure 16.
Praat Info of Formants

3) After getting F1 and F2 of the vowels from Praat, what we need to consider is how to present them in an informative way. Hung (2000: 341) has given us a good example to show the vowels.

Table 14.

Formants (F1 and F2) Informative Presentations

Item	F1	F2	Duration (ms)
heed	292	2352	177
hid	285	2410	126
head	668	1863	179
had	652	1877	132
hud	695	1235	152
hard	818	1182	174
herd	524	1389	169
hawed	568	866	181
hod	460	875	176
whod	289	813	220
hood	296	935	163

Item	F1	F2	Duration (ms)
heat	351	2401	131
hit	320	2426	108
bet	629	1872	161
bat	609	1885	190
hut	813	1323	97
heart	879	1171	183
hurt	531	1414	161
caught	548	881	183
cot	557	872	141
hoot	319	950	116
hook	333	919	176

4) Finally, once you have your graph, you can interpret the results. This means looking at the vowel positions on the graph and understanding their phonetic characteristics. See the following:

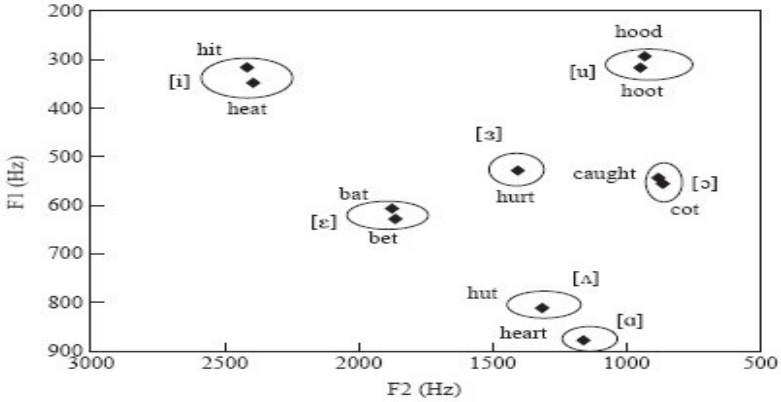


Figure 17.
Vowel Positions – Phonetic Characteristics

For example, vowels with lower F1 values are produced with a higher tongue position, and vowels with higher F2 values are produced with a more forward tongue position.

D. Summary

The course focuses on the analysis of segmental features, particularly vowel sounds, using the Praat application. Students will learn to extract and interpret formant values (F1 and F2) to analyze and visualize vowel placement based on tongue height and backness. Through this process, they will develop the skills necessary to identify, transcribe, and explain vowel features, enhancing their understanding of acoustic and articulatory properties. This knowledge enables students to apply segmental analysis both theoretically and practically, improving their ability to analyze language at an advanced level.

The course emphasizes the significance of vowel sounds as essential components of speech, focusing on their acoustic representation through formant values and their articulation in terms of tongue position. By analyzing these features with Praat, students will deepen their understanding of vowel systems across different dialects and languages and their role in clear communication. This analysis provides a strong foundation for advanced linguistic study and practical applications in speech analysis.

E. Formative Test

1. Students individually reflect on how they will use Praat to identify segmental features and write down their thoughts or strategies.
2. Using Praat, analyze the vowel sounds in the following words: *seat*, *set*, *suit*, and *sought*.
    a. Extract and record the formant values (F1 and F2) for each vowel.
    b. Measure the duration of each vowel sound and record it.
    c. Place each vowel on a vowel chart, indicating its tongue height and backness, based on the formant values (F1 and F2).
    d. Transcribe the vowel sounds using IPA symbols.

F. Worksheet

1. Write a reflection essay of at least 250 words on the given topics. Ensure your reflection is coherent, well-organized, and thoughtful. Incorporate personal insights and examples where appropriate.
2. The analysis result in PDF format

G. Rubrics

1. Assignment Rubrics

Table 15.
Reflection Essay Rubric

Criteria	Description	Points
Clarity and Coherence	The essay is clear and easy to follow. Ideas are logically organized and well-connected throughout the reflection.	10
Depth of Reflection	The reflection demonstrates deep thinking and engagement with the topic. It shows personal insights, critical thinking, and an understanding of the subject matter.	10
Relevance to the topics	The essay stays focused on the assigned topic, with relevant examples and discussion that directly address the key points of the prompt.	10
Use of Examples and Personal Insight	Includes specific examples or personal experiences that help illustrate the points made. The essay connects theory or concepts to real-world situations.	10
Organization and Structure	The essay is well-structured, with an introduction, body, and conclusion. Transitions between paragraphs are smooth, and the writing flows logically.	10

Grade Descriptions:

Total Points (100%) : 50
Minimum to Pass (70%) : 35 Points

2. Praat Analysis Rubrics

Table 16.
Praat Rubrics

Criteria	Excellent (5)	Good (4)	Satisfactory (3)	Need Improvement (2)
Understanding of Praat	Demonstrates full understanding and proficient use of Praat tools for analysis with no error.	Shows good understanding and use of tools, with minimal errors.	Basic understanding of tools with some significant errors.	Limited or incorrect use of Praat tools, showing a lack of understanding.
Analysis Quality	Comprehensive and detailed analysis of segmental sound with clear comparisons.	Good analysis with relevant points and comparisons, though lacking detail in some areas.	Basic analysis with general observations; some important elements are missed.	Incomplete or unclear analysis with minimal relevant observations.
Collaboration and Pair Work	Actively engages with partner, shares insights, and contributes equally; demonstrates strong teamwork.	Works well with partner, contributes fairly and shares insights.	Participates in pair work but with unequal contribution or limited interaction.	Minimal contribution to pair work or poor collaboration.

Presentation of Findings	Clear, well-organized presentation with detailed explanations and insightful conclusions	Organized presentation with clear explanations but lacks depth in some areas.	Presentation is understandable but lacks organization and depth.	Unclear or disorganized presentation with minimal explanation or insight.
Engagement in Discussion	Actively engages in class discussions and provides thoughtful feedback to peers.	Participates in discussions with relevant comments but less frequently.	Limited participation in discussions; contributions are basic.	Minimal or no participation in discussions.

Description for scoring:

16 – 20 Pts is considered Excellent

11-15 Pts is considered Good

6-10 Pts is considered Satisfactory

5 Pts or below is considered needs improvement

3. Attitude Assessment Rubric

Table 17.
Attitude Assessment Rubric – Classroom Activity

Criteria	Excellent	Good	Satisfactory	Need Improvement
Class Participation	Actively participates in discussions and activities, consistently contributing	Participates in discussions and activities, often contributing relevant ideas.	Participates occasionally, but contributions may be less relevant or frequent.	Rarely participates, often disengaged or hesitant to contribute.

	thoughtful and relevant ideas.			
Respect for Others	Always listens attentively, respects others' opinions, and encourages a collaborative environment.	Listens attentively and respects others' opinions, with occasional encouragement of peers.	Generally, listens and respects others, though occasionally interrupting or dismissing ideas.	Frequently interrupts or disregards others' opinions.
Responsibility and Punctuality	Always on time, meets deadlines, and takes full responsibility for assigned tasks.	Generally, on time, meets most deadlines, and takes responsibility for tasks.	Occasionally late, sometimes misses deadlines, and may lack responsibility in group work.	Often late, misses deadlines, and shows little responsibility for tasks.
Motivation and Initiative	Consistently demonstrates strong motivation, takes initiative in class activities, and is proactive in seeking improvement.	Shows motivation and sometimes takes initiative, but may not always seek extra opportunities.	Shows limited motivation and rarely takes initiative beyond the minimum expectations.	Lacks motivation, rarely shows initiative, and avoids going beyond basic requirements.
Professionalism	Demonstrates a high level of professionalism, including appropriate language, behavior, and attire.	Demonstrates professionalism, but occasionally shows minor lapses in language, behavior, or attire.	Shows some professionalism, but occasionally unprofessional in behavior or attire.	Frequently unprofessional in behavior, language, or attire.
Collaboration and Teamwork	Always works well in teams, offering support and cooperation to others, and resolving conflicts effectively.	Works well in teams, cooperates with others, and contributes to resolving conflicts.	Occasionally contributes to teamwork, but may struggle with cooperation or conflict resolution.	Rarely contributes to teamwork, often resistant to cooperation or resolving conflicts.

Grade Descriptions:

Excellent (4) : The student consistently exceeds expectations in all aspects of attitude and behavior.

Good (3) : The student meets expectations and occasionally exceeds them.
Satisfactory (2) : The student meets some expectations but needs improvement in certain areas.
Needs Improvement (1) : The student frequently falls short of expectations and requires significant improvement.

Total Points (100%) : 24 Points
Minimum to Pass (75% : 16.8 Points

Excellent	: 85−100%
Good	: 70−84%
Satisfactory	: 50−69%
Needs Improvement	: 0−49%

CHAPTER VI
Praat Application Continuity – Suprasegmental Sound Analysis

A. Program Learning Outcome (PLO)

Students can identify and analyze suprasegmental features, particularly word stress, using the Praat application. They demonstrate the ability to extract and interpret acoustic properties such as pitch and duration to determine stress patterns in spoken language.

B. Course Learning Outcome (CLO)

1. Demonstrate responsibility and independence in analyzing suprasegmental features, particularly word stress, through the use of the Praat application (CLO-09).
2. Perform accurate and high-quality analysis of word stress by extracting and interpreting acoustic properties such as pitch and duration to determine stress patterns in spoken language (CLO-12).
3. Master English language skills at least equivalent to a post-intermediate level to effectively analyze, transcribe, and interpret suprasegmental features, particularly word stress, fluently and accurately (CLO-20).
4. Demonstrate proficiency in the basic concepts of linguistics, with a particular focus on the acoustic properties of pitch and duration in analyzing word stress (CLO-21).

C. Learning Material

1. Lexical Stress Analysis

In English we usually find that simple words consisting of two or more syllables have a strong stress on one of these syllables and a weak stress on the remaining syllable or syllables. Stress plays an important role in communication, for it distinguishes different meanings when the stress is put in different positions. "All stressed syllables in words have one characteristic in common, and that is prominence. Prominence is produced by four main factors: (i) loudness (intensity), (ii) length, (iii) pitch (Fundamental Frequency/F0), (iv)

quality. Generally, these four factors work together in combination, but experimental work has shown that these factors are not equally important; the strongest effect is produced by pitch, and length is also a powerful factor. Loudness and quality have much less effect" (Roach 2009:74).

Stress is shown through higher pitch, greater intensity (loudness), or longer vowel length. To analyze stress, you should use various acoustic tools in Praat, such as the waveform, spectrogram, and pitch contour. See the following figure:

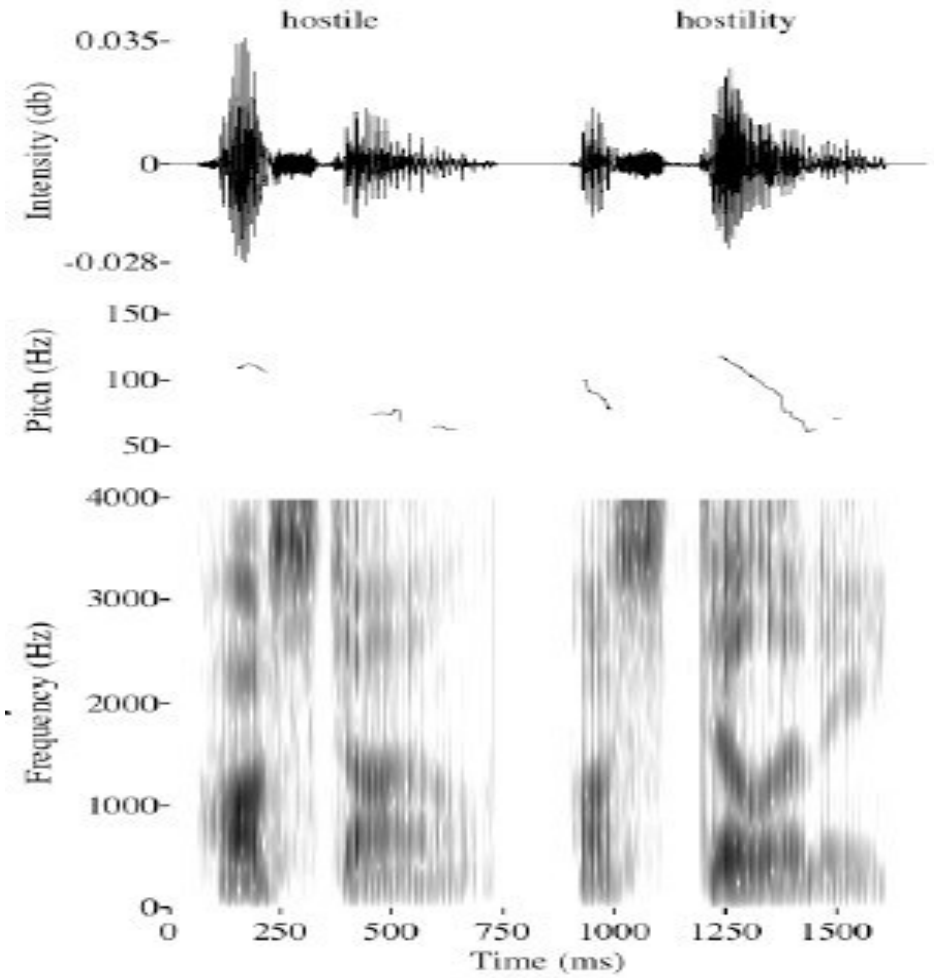


Figure 18.
Waveform, Spectrogram, and Pitch Contour

Note:

At the top, the waveform indicates the greater intensity of the stressed syllable. In the middle, it shows the higher pitch shown in the pitch track. At the bottom, the spectrogram indicates the greater length of the stressed syllable.

To get those various elements of acoustic analysis, you can follow the following standard procedure in Praat to analyze the stress.

a. Open the sound file in Praat ("Open" → "read from files…")
b. Select the file and click "View and Edit" on the right side
c. In the Edit window, select Spectrum → Show spectrogram (the default setting is showing the spectrogram) and then select "Pitch" → "Show pitch", and you will see the following window Figure.

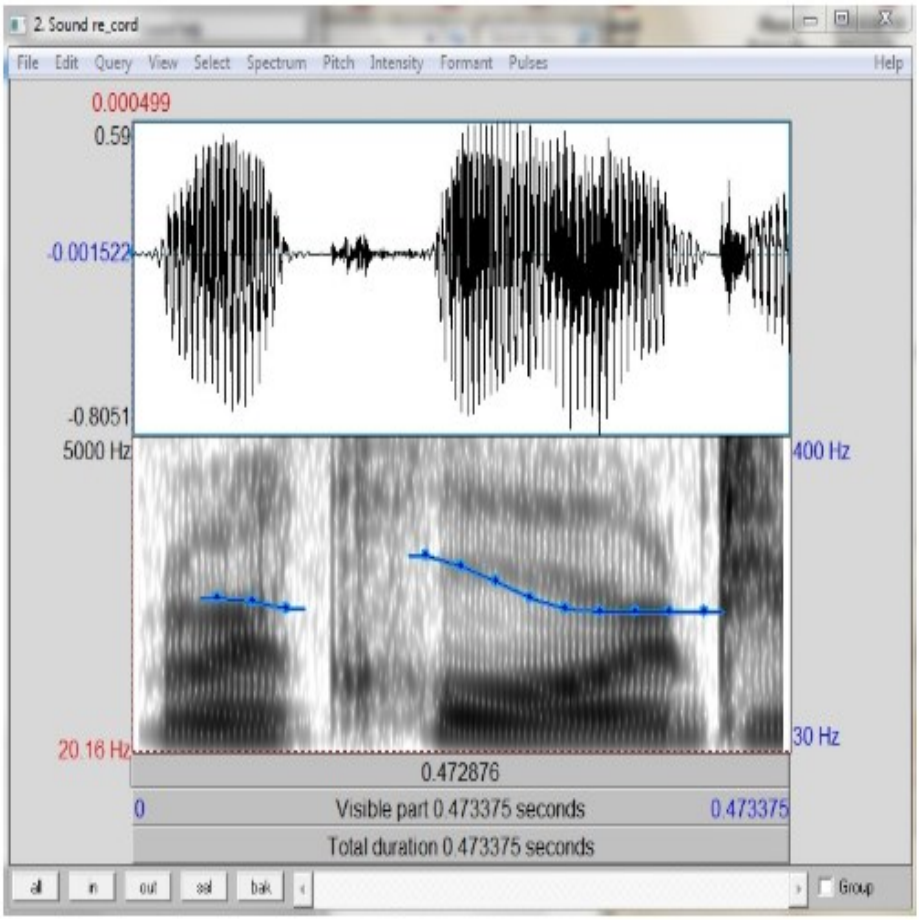


Figure 19.
Spectrogram and Pitch Contour

The pitch analysis is laid over on the spectrogram, but when you export them to the Praat objects list they will be treated as separate objects.

d. To export different windows, you can go to "Spectrum" and then choose "Extract visible spectrogram", then a new file will appear in your Praat objects list as 'Spectrogram untitled' in

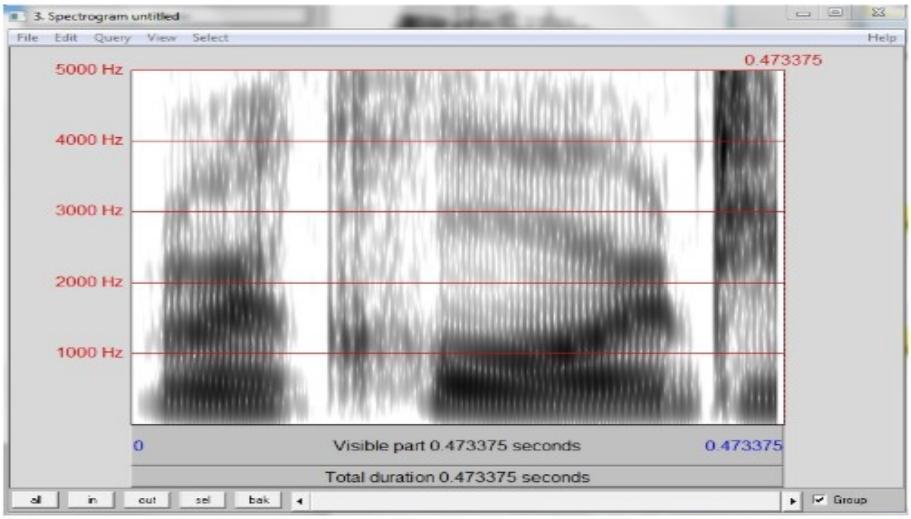


Figure 20.
Extract Visible Spectrogram

e. Then go to "Pitch" and choose "Extract visible pitch contour", and then a new file will appear in your Praat objects list as 'Pitch untitled'as shown in

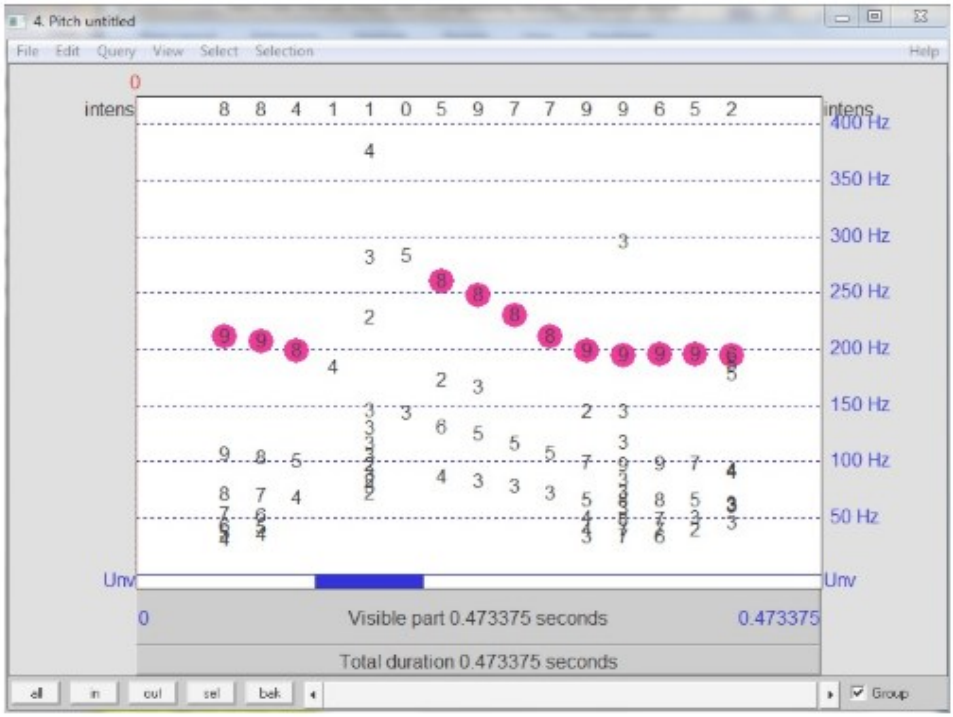


Figure 21.
Extract Visible Pitch Contour

f. You can also draw the graphics of the waveform by selecting "File" → "draw visible sound".

g. You can also draw the graphics of pitch track by selecting "Pitch" → "draw visible pitch contour".

h. You can also draw the graphics of the spectrogram by selecting "Spectrogram" → "paint visible spectrogram". See the followings:

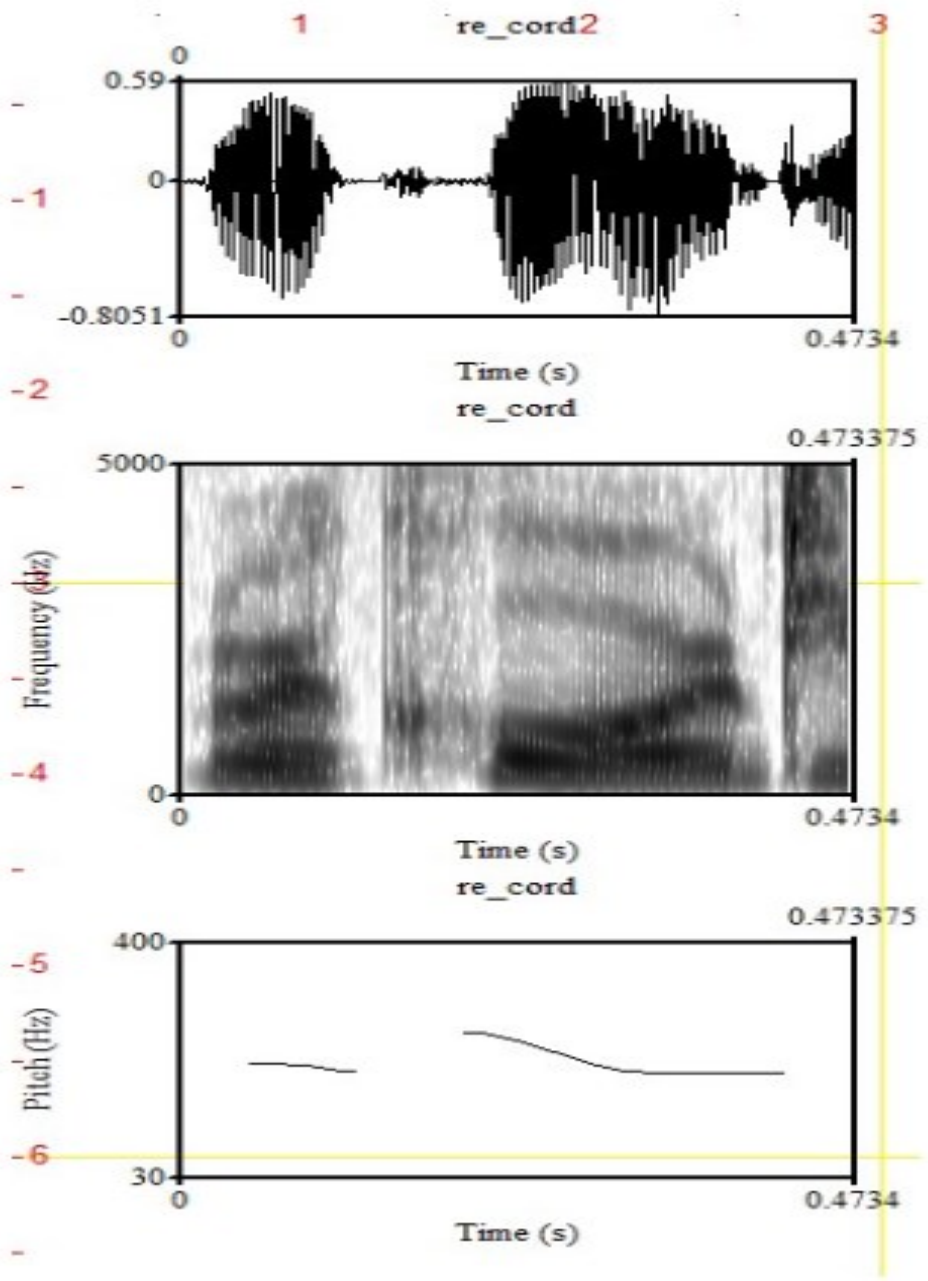


Figure 22.
The Graphics of The Waveform

Let's look at two examples of analysis of lexical stress in Praat:

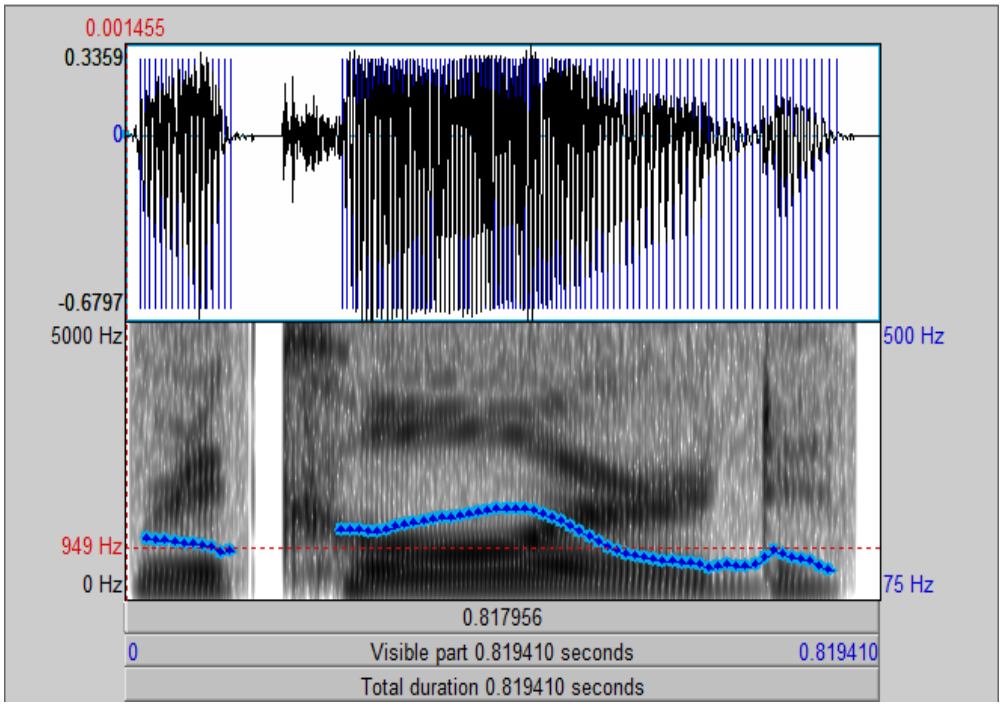


Figure 23.
Record /rɪˈkɔːd/

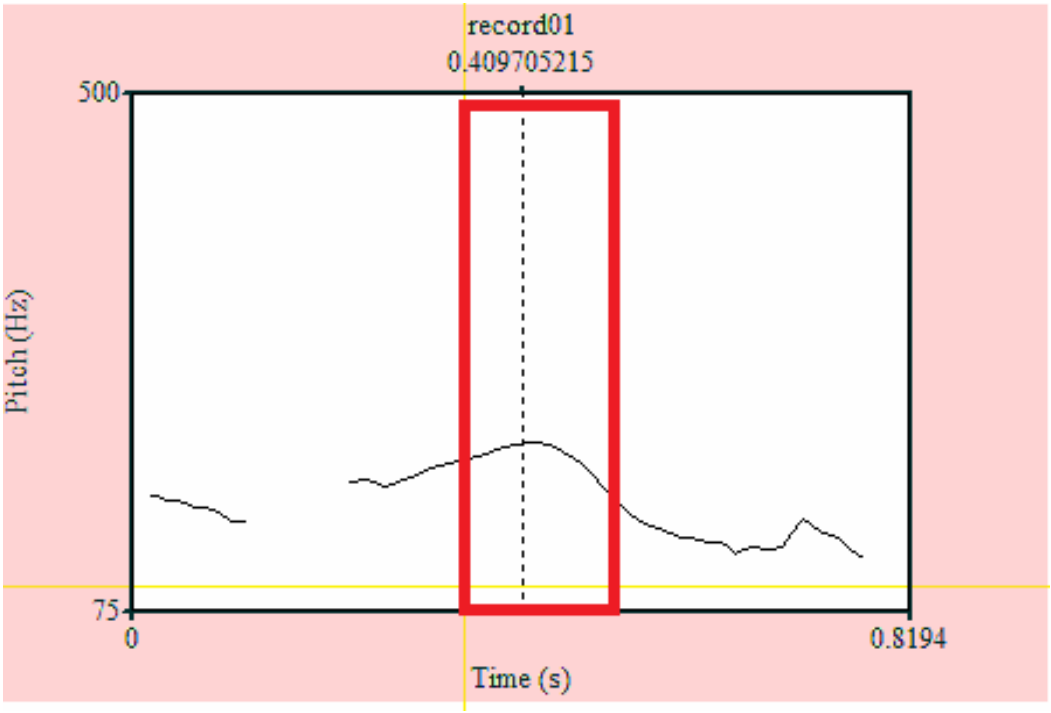


Figure 24.
Pitch contour of reCORD

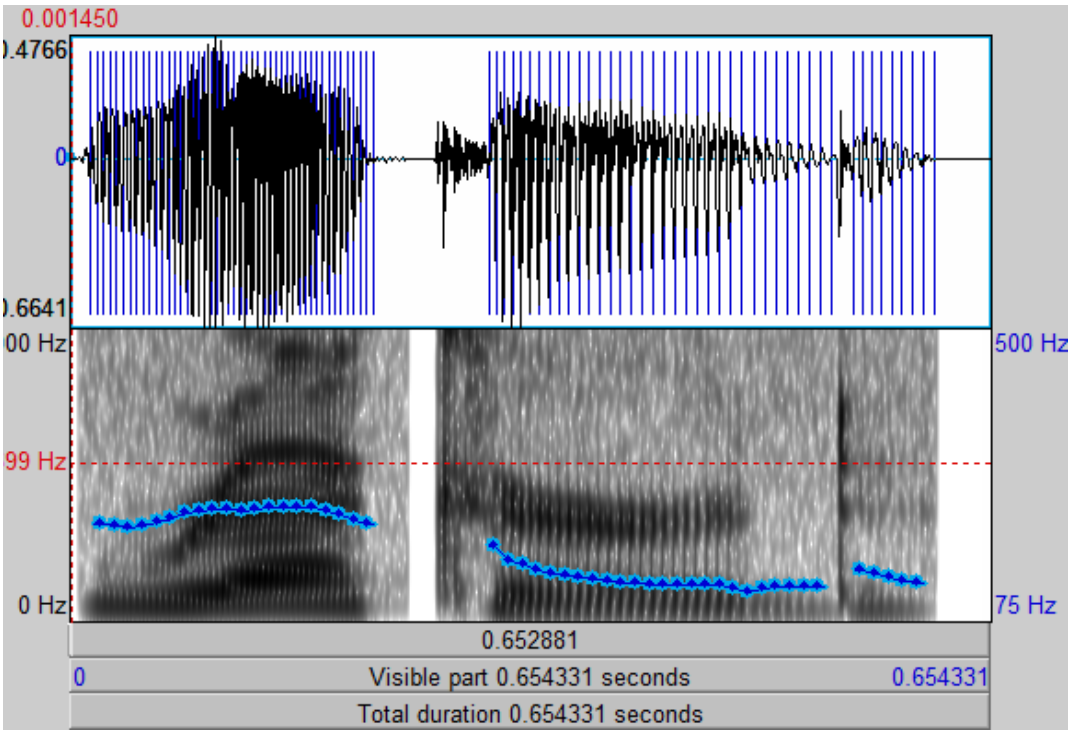


Figure 25.
Record /ˈrekɔːd/

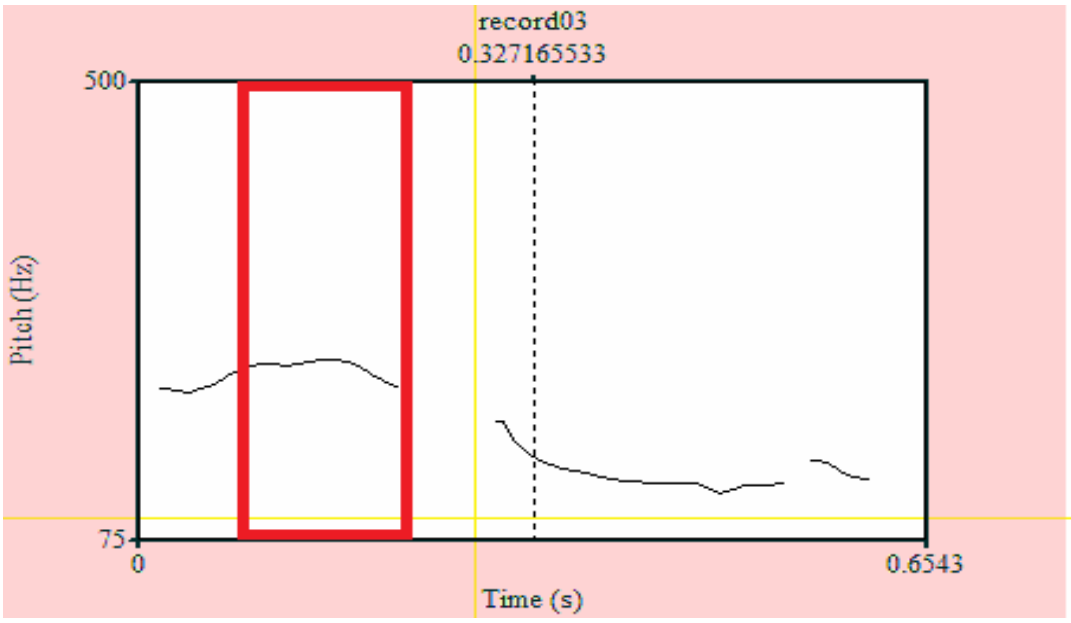


Figure 26.
Pitch contour of REcord

The word "record' is divided into two parts –"re-" and "-cord".

a. In the first one, re'cord, the stress is put on the second syllable.

   1) In "re-", the pitch is falling down, while in "-cord", the pitch is rising, especially in the part of vowel.

2) The stressed syllable is higher than unstressed one. And the duration of the second syllable "-cord" is longer than the first.

b. In the second one, the stress is put on the first syllable.

1) It is obvious that the duration of the first syllable "re-" is much longer than the one in the first example. And the pitch is rising in the first syllable.

2) In the second syllable, the duration is shorter and the pitch is falling down.

The table below shows this more clearly:

Table 18.

Lexical Stress Analysis "Record" in Two Different Functions

	Pitch (Hz)	Duration (S)		Pitch (Hz)	Duration (S)
re-	160	0.132	ˈ-cord	172	0.615
ˈ**re-**	230	0.240	-cord	137	0.356

2. Intonation Analysis and International Phonetic Alphabets (IPA) Transcription

This section explores the analysis of linguistic intonation using Praat, including the integration of the International Phonetic Alphabet (IPA) transcription. It is important to understand that English intonation is significantly influenced by the emotions and attitudes of native speakers, which are expressed through different types of sentences. Furthermore, in Praat-based analysis, pitch plays a crucial role in distinguishing tones, such as rising and falling patterns. Pay close attention to the following steps:

a. Input the existing audio or record your own for the analysis as usual.

b. Select the sound in the object list and click Annotate in the menu list on the right side → select To TextGrid…

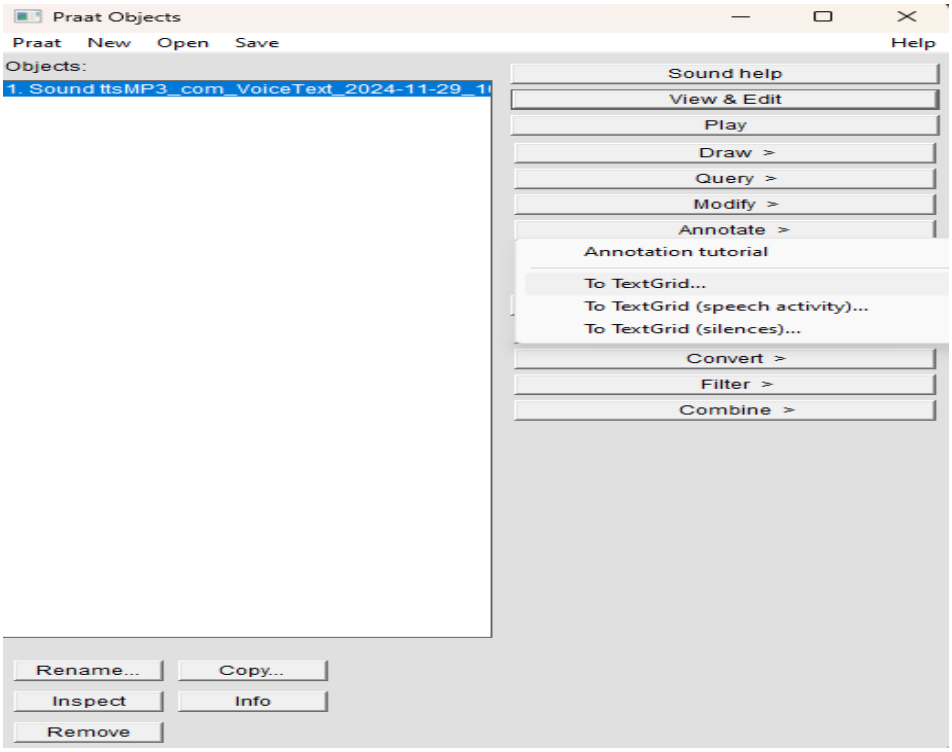


Figure 27.
Annotate Menu

c. A new display will show up, then rename all the tiers name (Mary John Bell) with specific terminology (such as British, American, Indian, etc) and click OK.

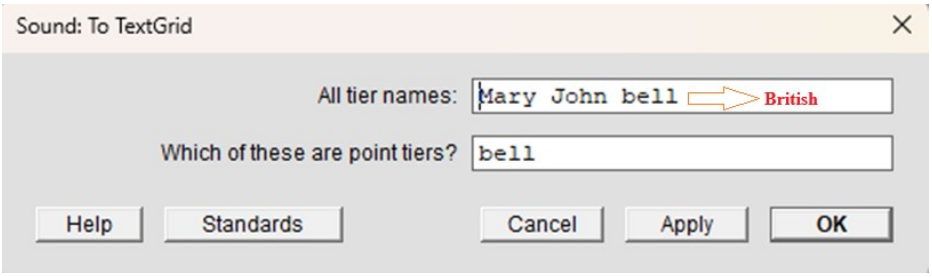


Figure 27.
Sound: To TextGrid

d. Two objects will now appear in the object list.

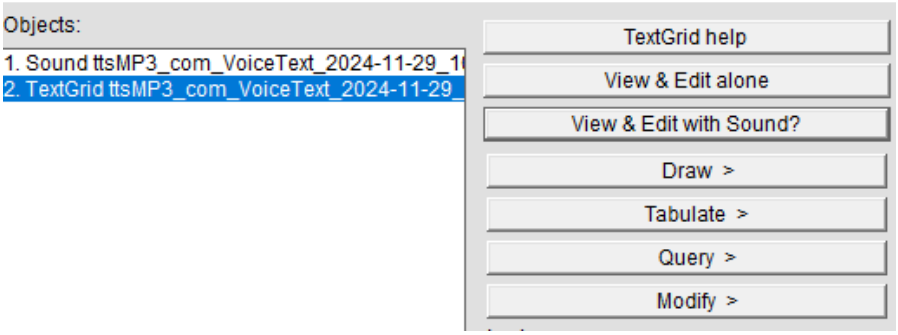


Figure 28.
New Object Lists after To TextGrid

e. Highlight both objects → click View & Edit.

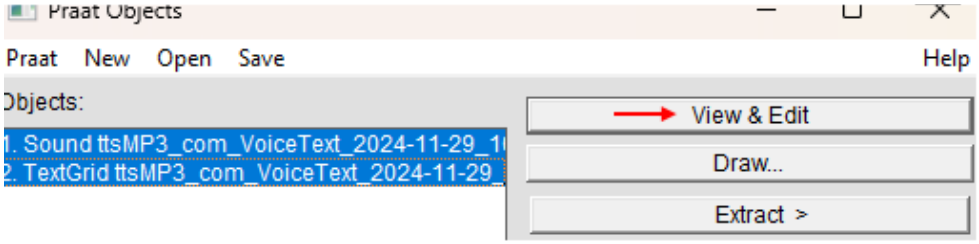


Figure 29.
View & Edit

f. A graph will appear; ensure only Pitch is ticked, as Spectrogram is optional.

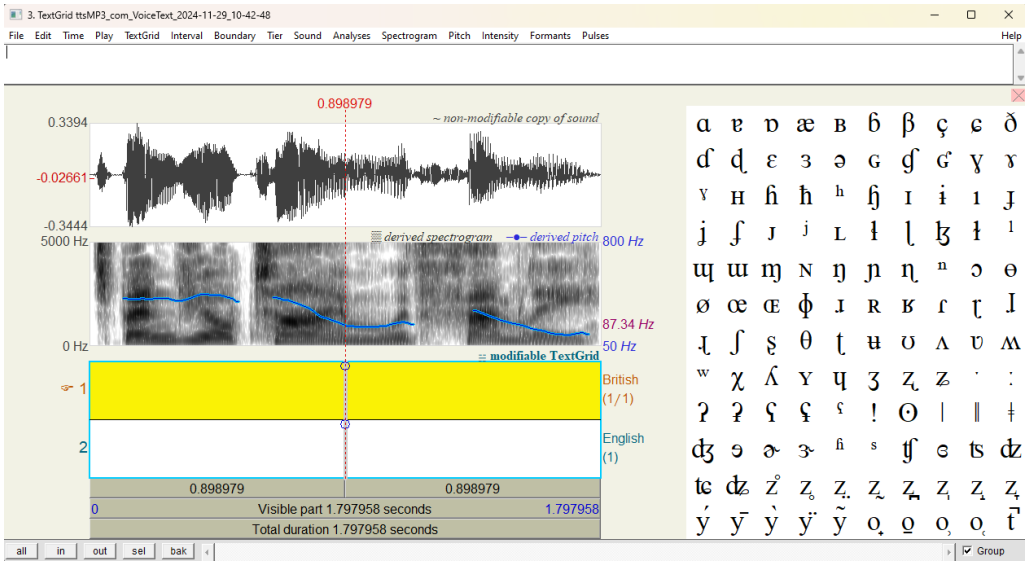


Figure 30.
Pitch Contour and Spectrogram Displays

g. Before proceeding further, transcribe each word in the sentence by blocking a segment (tier) on the graph for a specific word.

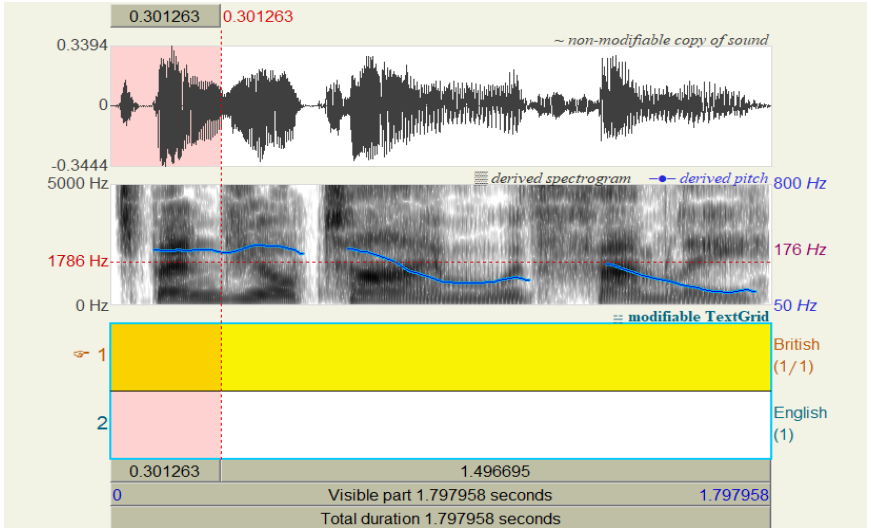


Figure 31.
Segmentation Words

h. Then go to the Boundary menu at the top → select Add on Selected Tier.

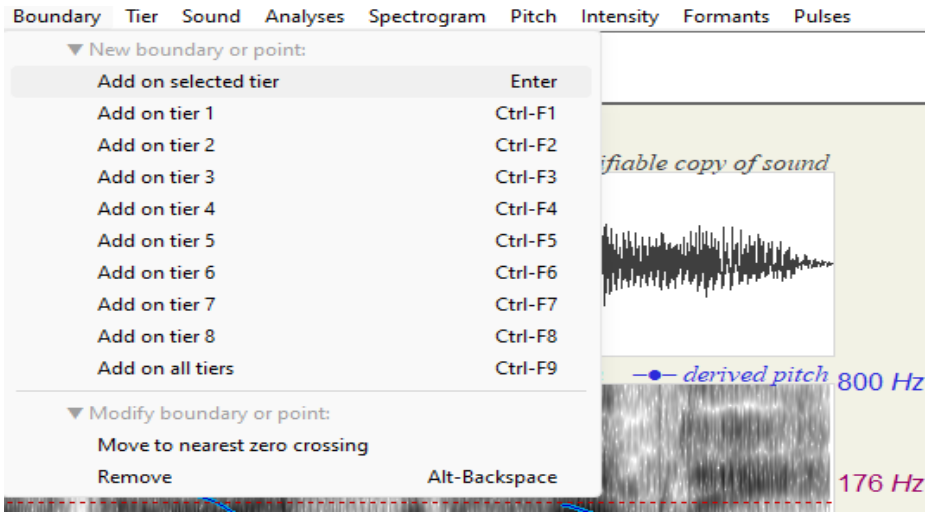


Figure 32.
Add on Selected Tier for Specific Word

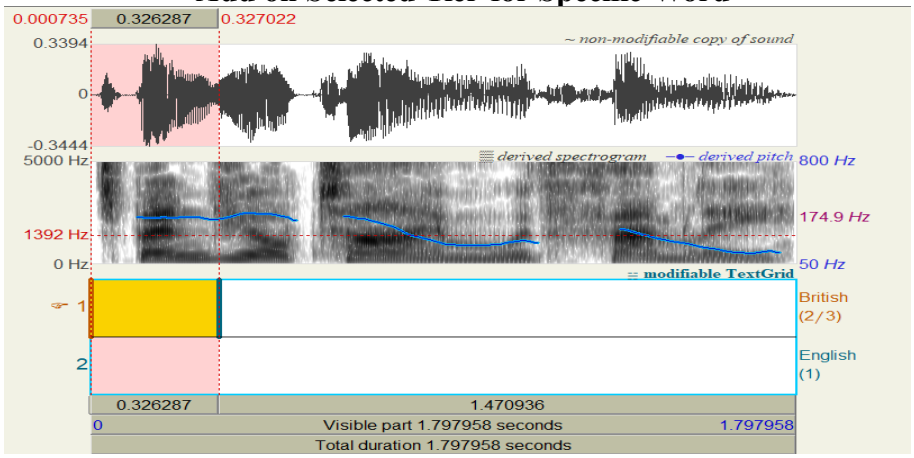


Figure 33.
Display after Segmentation of tier 1

i. Repeat this process for all remaining words.

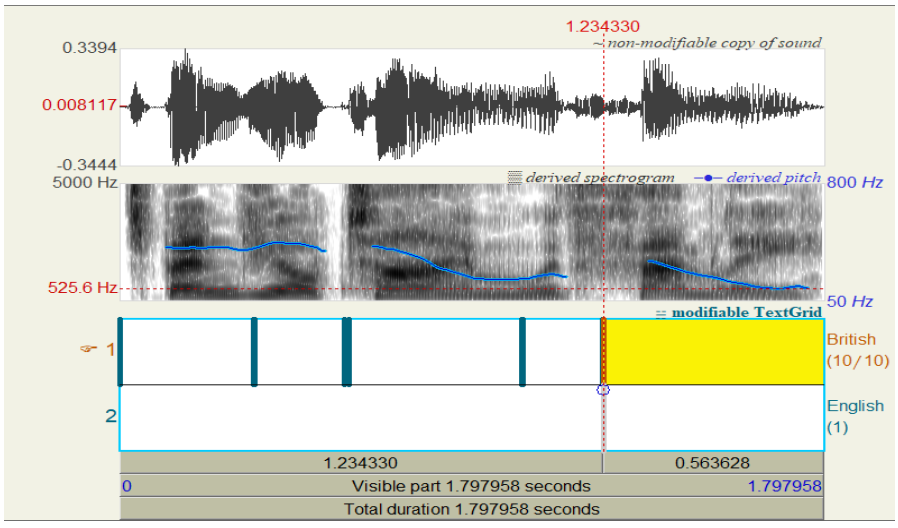


Figure 34.
Display after Segmentation of tier 2

j. Select a boundary, then add the IPA transcription for a specific word using your computer keyboard in the Note Pane (the box at the top) or by clicking the IPA symbols provided on the right side.

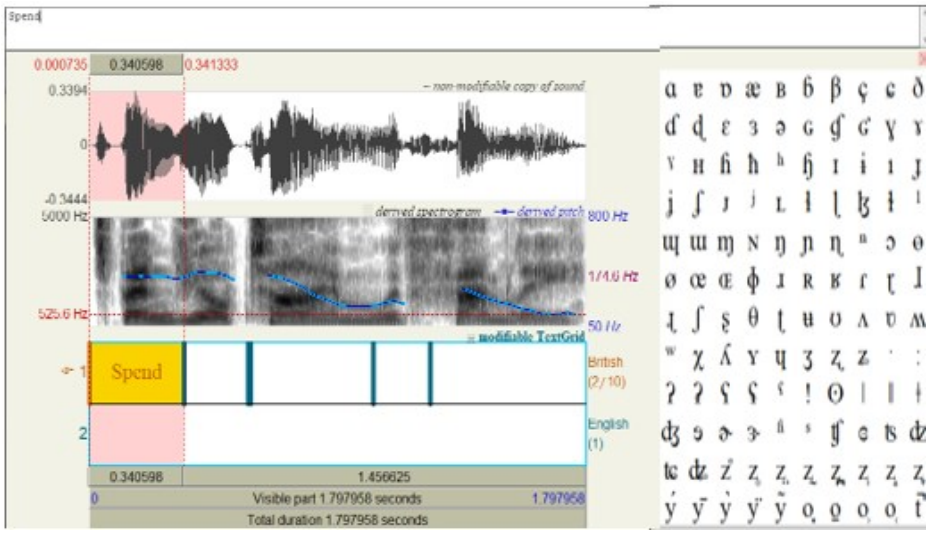


Figure 35.
IPA Transcription Process 1

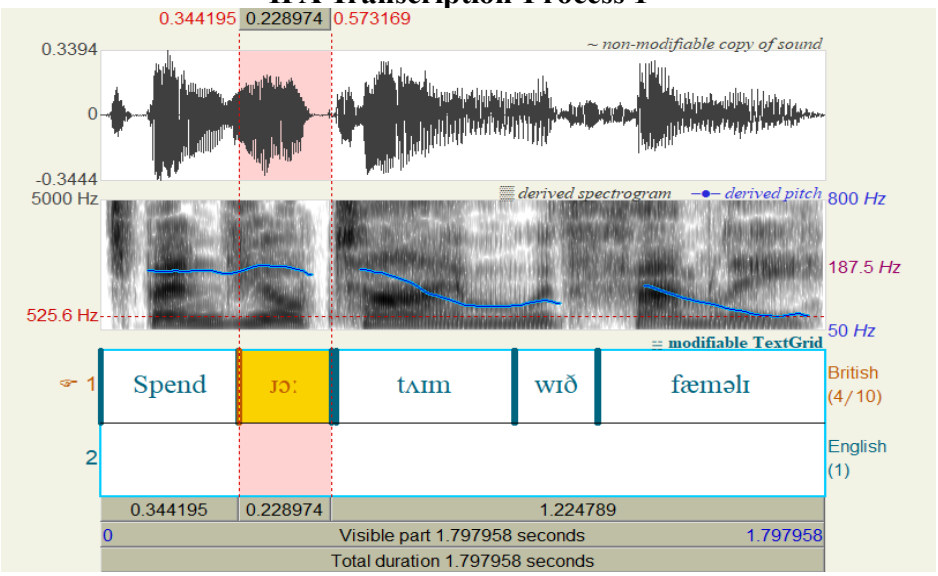


Figure 36.
IPA Transcription Process 2

Note:
Avoid using any dictionary for IPA transcription, as dialectal variations (such as Japanese, Indian, or Singaporean English) may result in different transcriptions.

k. After transcribing all the words, examine the pitch contour (for red line, I used external application that is paint ensuring tones for the sentence and blue line is the result pitch contour).

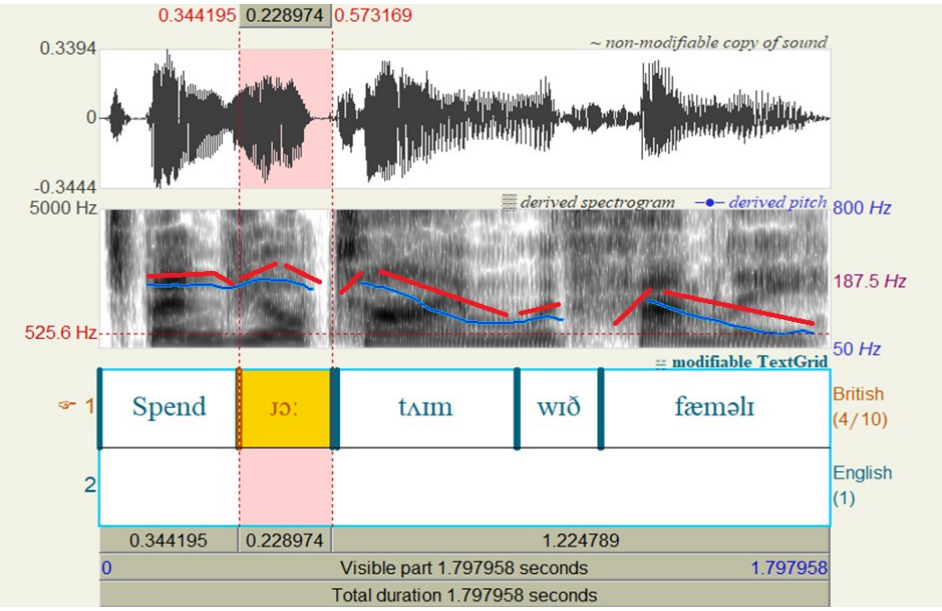


Figure 37.

Intonation Analysis: British Accent

As explained in the previous chapter, falling intonation occurs in command or imperative sentences, such as "spend your time with family." Using Praat, as shown in the figure above, it is clear that this imperative sentence has a falling tone. This intonation pattern typically conveys a sense of certainty, finality, or completion, signalling to the listener that the speaker's message is conclusive and that the thought or instruction has been fully expressed. Now the question arises: do all languages have the same pattern of intonation? The answer is not necessarily. Let's compare the tone analysis graphic expressed in the Japanese below.

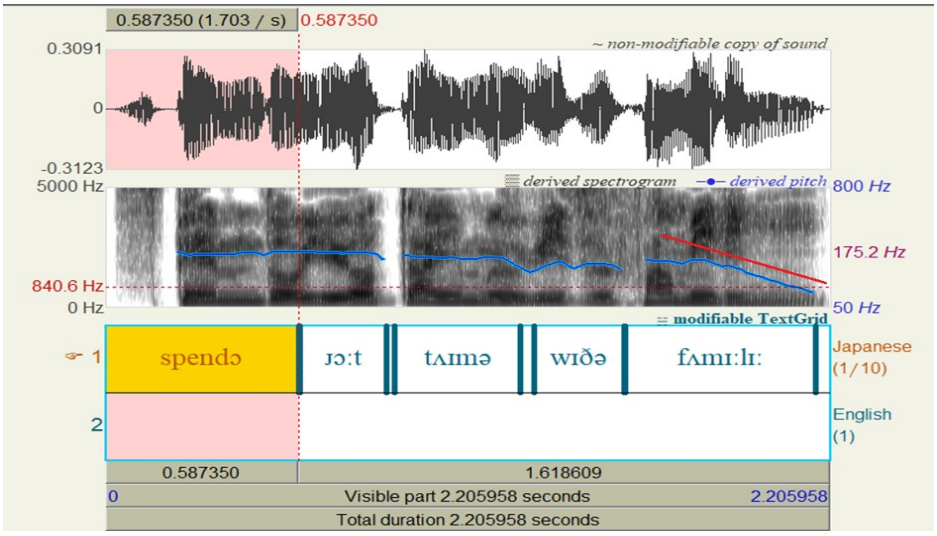


Figure 38.

Intonation Analysis: Japanese Accent

The intonation of English pronunciation with a Japanese accent carries a slightly different emphasis. The tone analysis graph using Praat shows a flatter pattern compared to the British intonation previously discussed. This difference is due to the characteristic pitch patterns of Japanese speakers when speaking English, which often results in a more level or even intonation. Unlike the British intonation, which tends to have more noticeable rises and falls, the Japanese accent in English may not show as dramatic shifts in pitch. This flatter intonation is influenced by the prosodic features of the Japanese language, where pitch variations are generally less pronounced than in English, leading to a more monotone or steady pitch when speaking English. In the case of the sentence "*spend your time with family*," falling intonation only occurs at the end of the sentence on the word "family" marking the completion of the thought. However, this falling tone is much less prominent in the Japanese accent, making the intonation appear more even throughout the sentence.

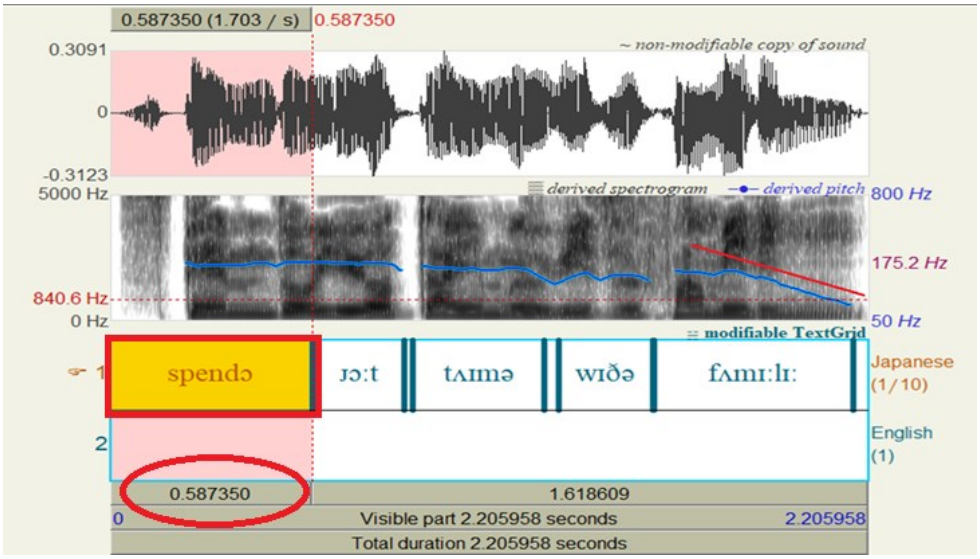


Figure 39.
Duration of speech for word “spend”
in Japanese-Accented English

Again, the phenomenon where a Japanese speaker pronounces "spend" as "spendo" is an example of L1 interference or vowel substitution. In Japanese, there is no short vowel sound like the /ɪ/ in "spend," so it is often replaced with a more familiar vowel sound like /o/. This results in a pronunciation closer to /ˈspendɔ/ which is pronounced in 0.58s. In contrast,

the British English pronunciation of "spend" is transcribed as /spend/, where the vowel sound is /e/ (a short /e/ sound) in 0.34s.

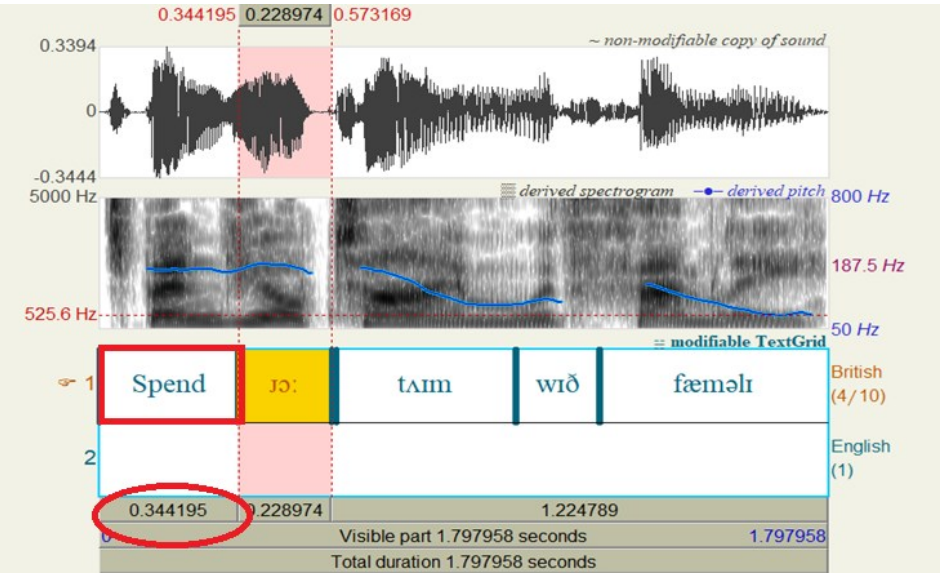


Figure 40.
Duration of speech for word "spend"
in British English

This difference highlights how the phonological structure of a speaker's native language can influence their pronunciation length of sounds in a second/foreign language. This explanation also applies to several other words that experience assimilation (neighbouring sounds; "your time" → [ɹɔːttʌɪmə]) and reflection (such in [tʌɪmə] and [wɪðə]).

D. Summary

The course centers on the analysis of suprasegmental features, particularly word stress, using the Praat application. Students will explore acoustic properties such as pitch and duration to identify and analyze stress patterns in spoken language. Through this analysis, they will gain insights into how suprasegmental features shape meaning, enhance speech clarity, and impact communication in various linguistic contexts. Additionally, students will develop the ability to transcribe and interpret these features, applying their knowledge to both theoretical and practical language studies.

The course highlights the significance of suprasegmental features such as pitch, duration, and stress as essential elements of spoken language. These features vary across dialects and languages, such as British English, American English, Indian English, and Japanese-accented English, and play a critical role in conveying

meaning and emotion. For example, pitch can signal emphasis or intonation, while duration distinguishes stressed from unstressed syllables, contributing to speech rhythm. By analyzing these features using Praat, students will deepen their understanding of the acoustic properties of language and their application in advanced linguistic analysis across diverse English varieties and other linguistic systems.

E. Formative Test

1. Students individually reflect on how they will use Praat to identify suprasegmental features and write down their thoughts or strategies.
2. Pair Phase with AI Audio Samples (ttsmp3.com in Non-native such as India, Japanese and so on, also Native Either BrE or AmE) and Self-Recording Analysis (Students' own voice). Students use Praat to analyze the audio samples for word stress position and intonation in different dialects.

   Students choose 1 of the followings:

   Concentration Command Project Adress

   Students also analyse this made-up sentence in various dialects:

   "Are you coming to the party?"

F. Worksheet

1. Write a reflection essay of at least 250 words on the given topics. Ensure your reflection is coherent, well-organized, and thoughtful. Incorporate personal insights and examples where appropriate.
2. The analysis result in PDF format.

G. Rubrics

1. Assignment Rubrics

Table 19.
Reflection Essay Rubric

Criteria	Description	Points
Clarity and Coherence	The essay is clear and easy to follow. Ideas are logically organized and well-connected throughout the reflection.	10
Depth of Reflection	The reflection demonstrates deep thinking and engagement with the topic. It shows personal insights, critical thinking, and an understanding of the subject matter.	10
Relevance to the topics	The essay stays focused on the assigned topic, with relevant examples and discussion that directly address the key points of the prompt.	10
Use of Examples and Personal Insight	Includes specific examples or personal experiences that help illustrate the points made. The essay connects theory or concepts to real-world situations.	10
Organization and Structure	The essay is well-structured, with an introduction, body, and conclusion. Transitions between paragraphs are smooth, and the writing flows logically.	10

Grade Descriptions:

Total Points (100%) : 50
Minimum to Pass (70%) : 35 Points

2. Praat Analysis Rubrics

Table 20.
Praat Analysis

Criteria	Excellent (5)	Good (4)	Satisfactory (3)	Need Improvement (2)
Understanding of Praat	Demonstrates full understanding and proficient use of Praat tools for analysis with no error.	Shows good understanding and use of tools, with minimal errors.	Basic understanding of tools with some significant errors.	Limited or incorrect use of Praat tools, showing a lack of understanding.
Analysis Quality	Comprehensive and detailed analysis of pitch, word stress, and intonation with clear comparisons.	Good analysis with relevant points and comparisons, though lacking detail in some areas.	Basic analysis with general observations; some important elements are missed.	Incomplete or unclear analysis with minimal relevant observations.
Collaboration and Pair Work	Actively engages with partner, shares insights, and contributes equally; demonstrates strong teamwork.	Works well with partner, contributes fairly and shares insights.	Participates in pair work but with unequal contribution or limited interaction.	Minimal contribution to pair work or poor collaboration.

Presentation of Findings	Clear, well-organized presentation with detailed explanations and insightful conclusions	Organized presentation with clear explanations but lacks depth in some areas.	Presentation is understandable but lacks organization and depth.	Unclear or disorganized presentation with minimal explanation or insight.
Engagement in Discussion	Actively engages in class discussions and provides thoughtful feedback to peers.	Participates in discussions with relevant comments but less frequently.	Limited participation in discussions; contributions are basic.	Minimal or no participation in discussions.

Description for scoring:

16 – 20 Pts is considered Excellent

11-15 Pts is considered Good

6-10 Pts is considered Satisfactory

5 Pts or below is considered needs improvement

3. Attitude Assessment Rubrics

Table 21.
Attitude Assessment Rubrics – Classroom Activity

Criteria	Excellent	Good	Satisfactory	Need Improvement
Class Participation	Actively participates in discussions and activities, consistently contributing	Participates in discussions and activities, often contributing relevant ideas.	Participates occasionally, but contributions may be less relevant or frequent.	Rarely participates, often disengaged or hesitant to contribute.

	thoughtful and relevant ideas.			
Respect for Others	Always listens attentively, respects others' opinions, and encourages a collaborative environment.	Listens attentively and respects others' opinions, with occasional encouragement of peers.	Generally, listens and respects others, though occasionally interrupting or dismissing ideas.	Frequently interrupts or disregards others' opinions.
Responsibility and Punctuality	Always on time, meets deadlines, and takes full responsibility for assigned tasks.	Generally, on time, meets most deadlines, and takes responsibility for tasks.	Occasionally late, sometimes misses deadlines, and may lack responsibility in group work.	Often late, misses deadlines, and shows little responsibility for tasks.
Motivation and Initiative	Consistently demonstrates strong motivation, takes initiative in class activities, and is proactive in seeking improvement.	Shows motivation and sometimes takes initiative, but may not always seek extra opportunities.	Shows limited motivation and rarely takes initiative beyond the minimum expectations.	Lacks motivation, rarely shows initiative, and avoids going beyond basic requirements.
Professionalism	Demonstrates a high level of professionalism, including appropriate language, behavior, and attire.	Demonstrates professionalism, but occasionally shows minor lapses in language, behavior, or attire.	Shows some professionalism, but occasionally unprofessional in behavior or attire.	Frequently unprofessional in behavior, language, or attire.
Collaboration and Teamwork	Always works well in teams, offering support and cooperation to others, and resolving conflicts effectively.	Works well in teams, cooperates with others, and contributes to resolving conflicts.	Occasionally contributes to teamwork, but may struggle with cooperation or conflict resolution.	Rarely contributes to teamwork, often resistant to cooperation or resolving conflicts.

Grade Descriptions:

Excellent (4) : The student consistently exceeds expectations in all aspects of attitude and behavior.

Good (3) : The student meets expectations and occasionally exceeds them.
Satisfactory (2) : The student meets some expectations but needs improvement in certain areas.
Needs Improvement (1) : The student frequently falls short of expectations and requires significant improvement.

Total Points (100%) : 24 Points
Minimum to Pass (70%) : 16.8 Points

Excellent	: 85−100%
Good	: 70−84%
Satisfactory	: 50−69%
Needs Improvement	: 0−49%

Formative-1

1. Weekly Reflection

Understanding the distinctions between phonetics and phonology significantly enhances communication by providing insights into how sounds are produced and organized within a language. Phonetics, focusing on the physical production and acoustic properties of speech sounds, allows us to grasp how articulation and sound variations occur in different contexts. For example, understanding how sounds are made can help non-native speakers adjust their pronunciation to align more closely with native-like patterns, improving intelligibility in everyday conversation and media presentations. Phonology, on the other hand, examines how these sounds function and interact within a specific language's system. It explains why certain sounds are considered meaningful or interchangeable in one language but not in another. This cognitive understanding aids in recognizing patterns like stress, intonation, and phoneme distinctions, which are crucial for effective communication and emotional expression. These insights have practical applications in various real-world scenarios. In language learning, phonetics helps learners develop accurate pronunciation, while phonology supports the mastery of rhythm and stress patterns. For instance, distinguishing minimal pairs (e.g., "bat" vs. "pat") is essential for comprehension and fluency. In technology, these concepts are vital for developing speech recognition systems, text-to-speech applications, and linguistic AI, which rely on accurate phonetic transcription and phonological rules to process and generate human-like speech. By integrating phonetics and phonology, individuals can communicate more effectively and design tools and methods that bridge linguistic gaps, enhancing understanding in diverse social and technological contexts.

Formative-2

1. Weekly Reflection

Understanding the anatomy of the vocal tract is essential for analyzing and interpreting speech sounds across different languages. The vocal tract, consisting of the lungs, larynx, pharynx, oral cavity, nasal cavity, tongue, lips, and glottis, plays a central role in speech production. The lungs generate airflow, which is the driving force behind phonation. The larynx produces voiced sounds through vibrating vocal cords, while the pharynx shapes sound resonance, particularly for vowels, and contributes to nasals and fricatives. The oral cavity includes movable articulators like the tongue and lips, which adjust to produce various sounds, while immovable structures like the teeth and alveolar ridge serve as constriction points.

This anatomical understanding is critical for the concepts of place and manner of articulation. Place of articulation refers to where in the vocal tract airflow is constricted to create a specific sound, such as dental for [θ] or alveolar for [t]. Manner of articulation explains how airflow is manipulated—whether it's fully blocked (as in stops), partially obstructed (as in fricatives), or allowed to flow freely (as in vowels). These distinctions are vital for accurate linguistic transcription using the International Phonetic Alphabet (IPA).

Ultimately, understanding vocal tract anatomy and its articulatory processes enhances our ability to distinguish and analyze sounds. This knowledge aids in language learning, pronunciation teaching, and the development of speech technologies, ensuring accurate sound representation and communication across languages.

2. Theoretical Analysis

IPA Transcription

Think
IPA Transcription : /θɪŋk/
Thing
IPA Transcription : /θɪŋ/
Chalk
IPA Transcription : /ʧɔːk/
Water
IPA Transcription : /ˈwɔːtər/
Measure
IPA Transcription : /ˈmeʒər/

Consonant and Vowel Sounds Analysis

Think
Sounds : /θ/, /ɪ/, /ŋ/, /k/
Place of Articulation:
/θ/ : dental (voiceless)
/ɪ/ : front, high, lax vowel
/ŋ/ : velar (voiced)
/k/ : velar (voiceless)
Thing
Sounds : /θ/, /ɪ/, /ŋ/
Place of Articulation:
/θ/ : dental (voiceless)
/ɪ/ : front, high, lax vowel
/ŋ/ : velar (voiced)
Chalk
Sounds : /ʧ/, /ɔː/, /k/
Place of Articulation:
/ʧ/ : palatal (voiceless)
/ɔː/ : back, mid, tense vowel
/k/ : velar (voiceless)

Water
Sounds : /w/, /ɔː/, /t/, /ər/
Place of Articulation:
/w/ : bilabial (voiced)
/ɔː/ : back, mid, tense vowel
/t/ : alveolar (voiceless)
/ər/ : central, mid, unstressed vowel (rhotic)
Measure
Sounds : /m/, /ɛ/, /ʒ/, /ər/
Place of Articulation:
/m/ : bilabial (voiced)
/ɛ/ : front, mid, lax vowel
/ʒ/ : palato-alveolar (voiced)
/ər/ : central, mid, unstressed vowel (rhotic)

Students' Recording in mp3 format

Formative-3

1. Weekly Reflection

Reflecting on the relationship between phonemes and allophones, I realize that understanding their distinctions greatly enhances our ability to analyze language more effectively. Phonemes are the smallest units of sound that can change meaning, while allophones are variations of a phoneme that do not affect the meaning. Recognizing these differences helps me appreciate how subtle changes in sound production can lead to different speech patterns and meanings. For example, the phoneme /p/ can be aspirated as [p^h] in "pat" or unaspirated as [p] in "spa," but both sounds are perceived as the same in most contexts, depending on their position in a word.

However, identifying phonemes and their allophones can be challenging, especially when analyzing languages with complex phonological processes like assimilation or elision. For instance, in connected speech, sounds may change due to their surrounding context, making it difficult to determine the underlying phoneme. I encountered this challenge when analyzing rapid speech or reduced forms in English, where sounds may disappear or merge, such as in the phrase "gonna" for "going to."

These challenges have deepened my understanding of connected speech patterns, as they highlight the fluidity of spoken language. They also demonstrate how listeners rely on context and experience to interpret these variations. By examining these processes, I've become more aware of the natural flexibility in language, which is essential for teaching pronunciation and understanding dialectal differences. Understanding phonemes and allophones

enriches my analysis of spoken language, making me more attuned to its nuances.

2. Theoretical Analysis

Cat – Cut

Phonemes : /æ/ (in "cat") vs. /ʌ/ (in "cut")

Allophones : The vowel sounds /æ/ and /ʌ/ are distinct phonemes in English, so they don't represent allophones of the same phoneme.

Phonological Rule :

a. Formal notation
   /æ/ → /ʌ/ /*C*_ (before a voiceless consonant like /t/)
b. Informal notation
   The difference between /æ/ and /ʌ/ in these minimal pairs is an example of a vowel shift. The rule can be seen as a vowel alternation in unstressed vs. stressed syllables, with /æ/ occurring in the stressed syllable (cat) and /ʌ/ often appearing in unstressed syllables in other contexts (such as "cut").

Work – Walk

Phonemes : /ɜː/ (in "work") vs. /ɔː/ (in "walk")

Allophones : These are distinct phonemes /ɜː/ and /ɔː/ in English and not allophones of the same phoneme.

Phonological Rule :

a. Formal notation
   /ɜː/ → /ɔː/ /*C*_ (before a voiceless stop like /k/)
b. Informal notation
   The difference between /ɜː/ and /ɔː/ shows a vowel change. This rule can be attributed to a regional or dialectal variation where certain vowel sounds alternate, especially in accents such as Received Pronunciation (RP) vs. General American English, where the pronunciation of words like "work" and "walk" differs in terms of vowel quality.

Live – Leave

Phonemes : /ɪ/ (in "live") vs. /iː/ (in "leave")

Allophones : /ɪ/ and /iː/ are distinct phonemes in English.

Phonological Rule :

a. /ɪ/ → /iː/ /__V' (before a stressed syllable, vowel lengthening rule)
b. Informal notation
   The difference between /ɪ/ and /iː/ is typically governed by stress. In "live," the /ɪ/ sound occurs in a stressed syllable, while in "leave," the /iː/ sound occurs in a stressed position, representing a tense vowel. This change is consistent with vowel lengthening in stressed syllables, a common phonological rule in English.

Shy – Sigh

Phonemes : /ʃ/ (in "shy") vs. /s/ (in "sigh")

Allophones : /ʃ/ and /s/ are distinct phonemes in English and not allophones of the same phoneme.

Phonological Rule :

a. Formal notation
   /ʃ/ → /s/ /__C^h (before a voiceless stop like /t/)
b. Informal notation
   The difference between /ʃ/ and /s/ is an example of a voiceless fricative sound change. The rule involves a shift in the manner of articulation between the two sounds: /ʃ/ is a postalveolar fricative, whereas /s/ is an alveolar fricative. The voicing and place of articulation differ, resulting in distinct phonemes that change the meaning of the words.

Formative-4

1. Weekly Reflection

Suprasegmental features like pitch, tone, intensity, intonation patterns, length, and syllable/word stress are crucial for effective communication. They enhance the clarity and emotional impact of speech, helping listeners understand not just the literal meaning but also the speaker's intent and emotions. Pitch and tone are essential in conveying emotions and differentiating meanings in languages. In English, for example, a rising pitch at the end of a sentence often signals a question, while a falling pitch indicates a statement. In tonal languages, pitch can change the meaning of a word entirely. Intensity, or loudness, is also important as it allows speakers to emphasize key words or ideas, making the message clearer. This can draw attention to important information or contrast ideas within a sentence.

Intonation patterns guide the flow of speech. They help listeners understand the structure of sentences and the speaker's attitude. For instance, a rising intonation might signal uncertainty or a question, while a falling intonation suggests finality. Length and stress also affect meaning. Stressing a different syllable in a word can change its meaning, such as "record" (noun) vs. "record" (verb). Similarly, stressing the right words in a sentence can change the emphasis or focus, altering the interpretation of the message. These suprasegmental features are vital in ensuring that communication is not only accurate but also engaging and expressive, helping both the speaker and listener convey and interpret the full depth of a message.

2. Theoretical Analysis

Photography

Syllable and its rule : pho-ˈtog-ra-phy
The word is divided into four syllables. The rule for syllabification is based on vowel-consonant patterns, where each syllable contains at least one vowel sound, and syllables typically end with consonants.

Word stress : phoˈtog‿ra‿phy
The primary stress falls on the second syllable "-tog," which is typical for words with multiple syllables where the stress is placed earlier in the word.

Application:

In the sentence, “Photography is an art that captures moments in time,” the word photography is emphasized on the second syllable to reflect its primary stress. In normal speech, this means that the “tog” part should be slightly louder and more pronounced, helping convey the correct meaning and rhythm of the word.

Communication

Syllable and its rule : com-mu-ni-ca-tion

The word is divided into five syllables, with each part being separated according to the vowel sounds. The rule follows that syllables are generally divided where vowel sounds occur.

Word stress : com‿mu‿niˈca‿tion

The primary stress falls on the fourth syllable “-ca,” which is typical for multi-syllable words in English where the stress tends to shift to later syllables.

Application :

In the sentence, “Effective communication is crucial for team success,” the stress on the fourth syllable “ca” makes the word stand out in the sentence, helping it flow naturally.

Umbrella

Syllable and its rule : um-brel-la

The word is divided into three syllables, following the basic rule of syllable separation based on vowel sounds.

Word stress : um‿brel‿la

The primary stress is on the second syllable, “brel,” as it’s common for words with three syllables to have the stress placed on the middle syllable.

Application:

In the sentence, “I forgot my umbrella at home this morning,” the word umbrella is stressed on the second syllable to ensure correct pronunciation and clarity.

Advertisement

Syllable and its rule : ad-ver-tise-ment

This word is divided into four syllables, and syllables are formed based on vowel-consonant patterns where each syllable typically contains one vowel sound.

Word stress : ad‿ver‿tise‿ment

The primary stress falls on the second syllable “-ver.”

Application:

In the sentence, “The advertisement on the billboard caught my attention,” the emphasis is placed on the second syllable of the word, allowing the word to sound natural in the context.

Celebrate

Syllable and its rule	: cel-e-brate This word is divided into three syllables, following vowel-consonant rules and natural breaks in speech.
Word stress	: ˈcel‿e‿brate The primary stress is on the first syllable "cel."
Application	: In the sentence, "We plan to celebrate her birthday this weekend," the word celebrate has the first syllable stressed, helping to highlight the importance of the event.

Students' Recording in mp3 format

Formative-5

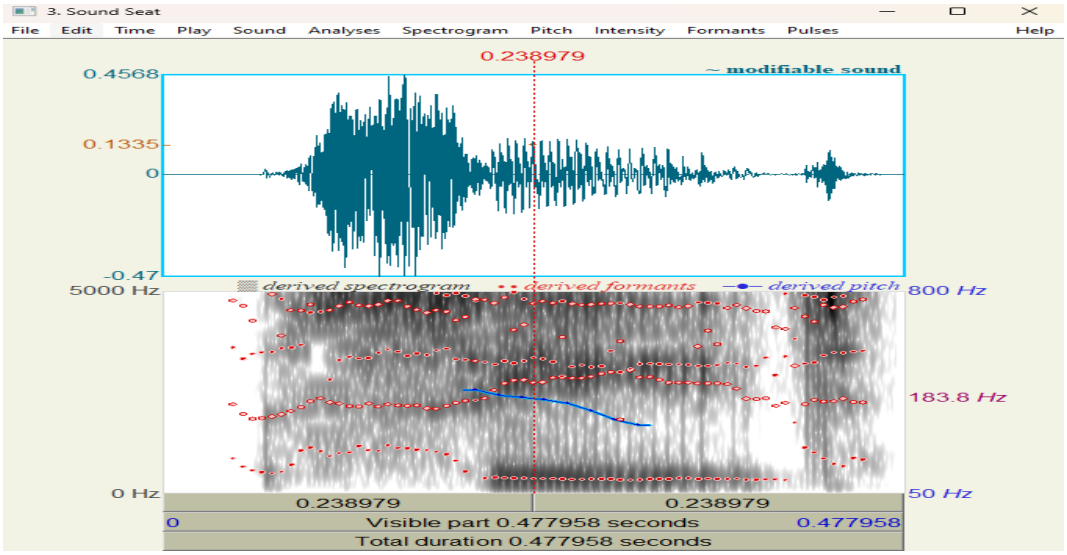
1. Weekly Reflection

Using Praat to identify segmental features is a valuable way to analyze speech sounds. I plan to start by importing a clear audio file into Praat and examining the waveform and spectrogram. My focus will be on identifying individual sounds, observing how vowels and consonants are produced, and understanding their acoustic properties. For vowels, I will analyze the formants, particularly F1 and F2, to determine the tongue's position in terms of height and backness. For consonants, I will look at voicing and place and manner of articulation by observing patterns in the spectrogram and the intensity of sounds.

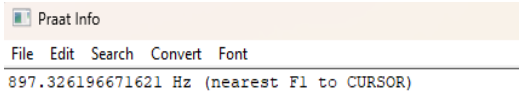
I also plan to use Praat's annotation tools to label and analyze sounds in specific contexts. This will allow me to study patterns like the influence of surrounding sounds on target segments. For example, observing how a vowel changes when it occurs before a nasal consonant will help me understand phonological processes better. Working with Praat allows me to see the connection between speech sounds and their acoustic representation. It also helps me develop a more precise ear for identifying features in natural speech. This process is not only about using software but also about improving my understanding of how speech works at a fundamental level. It's an opportunity to explore the richness of spoken language in a structured and insightful way.

2. Praat Analysis for Segmental Sounds (Vowel)

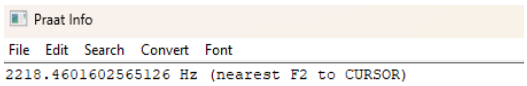
Formants – Seat (Samples)



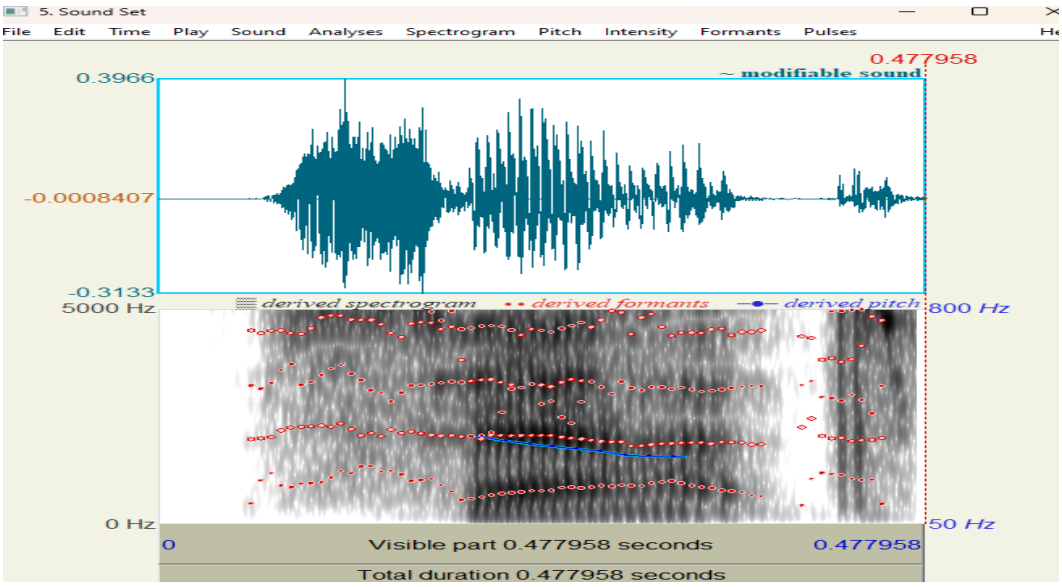
Formant 1 - Seat



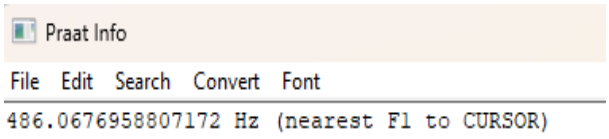
Formant 2 - Seat



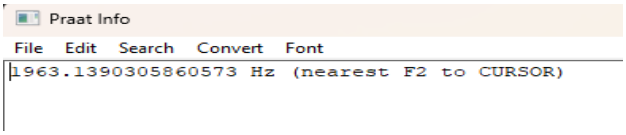
Formants – Set (Samples)



Formant 1 - Set



Formant 2 - Set



Data Presentation (Sample)

Item	F1	F2	Duration (Ms)
Seat	897	2218	477.9
Set	486	1963	420.8
Suit	…	…	…
Sought	…	…	…

Vowel Chart Placement (Sample)

	Front	Central	Back	Description
High	[i]			/i/ such in "seat" is located in the high-front-unrounded position on the vowel chart.
Mid	[e]			/ɛ/ such in "set" is located in the mid-front-unrounded position on the vowel chart.
Low	…..	…..	……	……

Formative-6

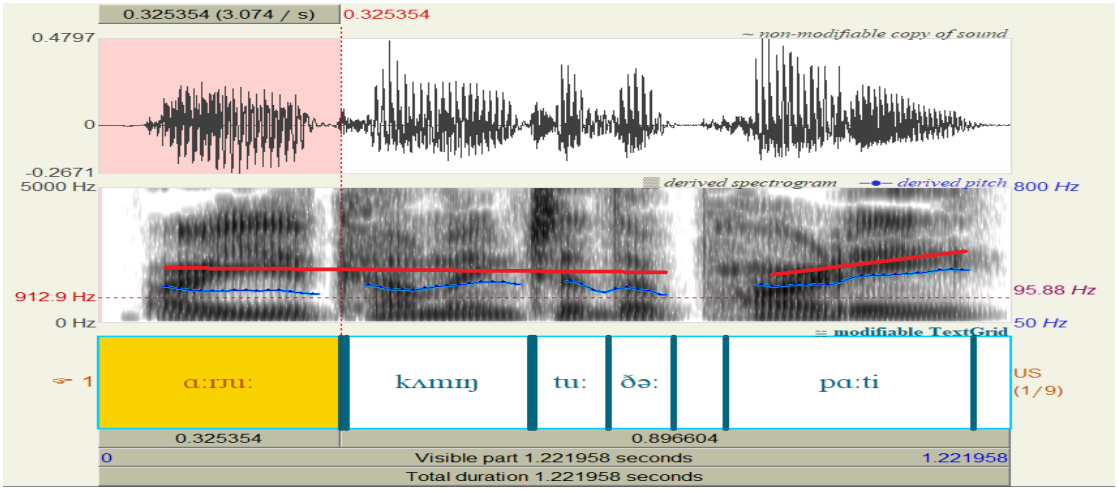
1. Weekly Reflection

Using Praat to identify suprasegmental features has been an exciting experience. I find it helpful to visualize pitch, stress, and intonation patterns, which are often hard to notice just by listening. My approach is to focus on specific parts of a speech sample, like phrases or individual words, and observe their pitch and intensity in the spectrogram. To analyze stress, I pay attention to louder and longer syllables. For intonation, I look at how the pitch moves through the sentence—whether it rises, falls, or stays level. Sometimes, it's challenging to notice small differences, especially in connected speech, but I plan to practice with various sentence types and accents to improve.

Praat helps me understand how suprasegmental features like stress and intonation affect meaning. For example, knowing which words are stressed can reveal the focus of a sentence, and understanding pitch movement can show

emotions or intentions. This will also help me improve my pronunciation and listening skills. Using Praat has changed how I listen to speech. It has made me more aware of how these features are used in communication. I hope to continue using it to deepen my understanding and apply what I learn to both academic tasks and daily conversations.

2. Praat Analysis for Suprasegmental Sounds

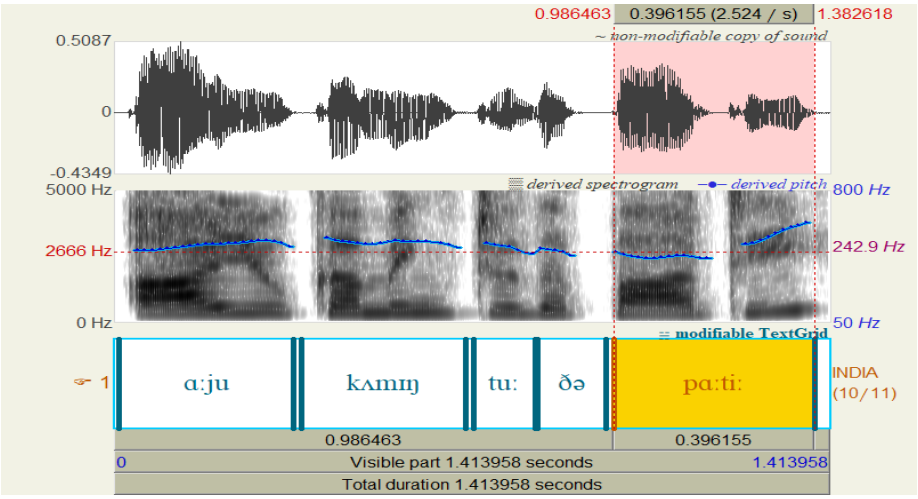


Intonation 1 - AmE

The sentence is a yes-no question, which typically has a rising intonation pattern in English (American English for this analysis). This means the pitch will likely rise toward the end of the sentence, particularly on the final syllable "party." The sentence can be divided into two main intonation phrases:

a. "Are you coming" (neutral or slightly rising tone)
b. "to the party?" (rising tone).

The speaker may stress certain words depending on intent. For instance, stressing "party" emphasizes the event, while stressing "you" can make the question more personal. Let's compare with other Indian English.



Intonation 2 – Indian-Accented English

The sentence is a yes-no question, and in Indian-accented English, it exhibits a dynamic intonation pattern. The pitch rises sharply at the end of the sentence, particularly on the syllable "ti:" in "party," which is noticeably elongated. The sentence can be divided into two main intonation phrases:

a. "Are you coming" (with reduced prominence due to assimilation of are you)
b. "To the party?" (marked by a sharp rise in pitch and stress on party).

Stress is positioned mainly at the beginning of content words throughout the sentence, such as *coming* and *party,* while function words are de-emphasized. This pattern reflects a blend of stress-timed rhythm and intonation influenced by Indian language speech habits.

GLOSSARIUM

A

Acoustic Analysis: The study of sound waves generated during speech, often using software like Praat.
Allophone: A variant of a phoneme that does not change the meaning of a word.
Articulation: The physical production of speech sounds by the vocal organs.

B

Broad Transcription: A phonetic transcription that uses simple symbols to represent phonemes without detailing subtle variations.

C

Coarticulation: The overlapping of articulatory processes during speech production.
Consonant: A speech sound produced with a partial or complete closure of the vocal tract.

D

Diphthong: A complex vowel sound that begins with one vowel and glides into another within the same syllable.
Duration: The length of time a speech sound is produced, significant in distinguishing stress or syllable length.

E

Elision: The omission of a sound or syllable in connected speech.
Epenthesis: The insertion of an additional sound in a word for ease of pronunciation.

F

Formants: Resonant frequencies of the vocal tract that shape vowel quality.

G

Glottal Stop: A speech sound made by obstructing airflow in the vocal cords.

H

Homophone: Words that sound the same but differ in meaning and/or spelling.
Hypernasality: Excessive nasal resonance in speech sounds.

I

Intensity: The loudness or amplitude of a speech sound.
IPA (International Phonetic Alphabet): A standardized system for transcribing the sounds of speech.

J

Juncture: The pause or boundary that signals word or phrase divisions in speech.

L

Length: The duration of a sound, often distinguishing long vowels from short vowels.
Linguistic Transcription: The written representation of speech sounds using symbols like the IPA.

M

Manner of Articulation: Describes how airflow is modified to produce different consonant sounds.
Minimal Pair: Two words that differ in only one sound, illustrating the phonemic contrasts.

N

Nasal Sound: A sound produced by allowing air to escape through the nose.

O

Onset: The initial consonant or consonant cluster of a syllable.

P

Phoneme: The smallest unit of sound that can change the meaning of a word.
Pitch: The perceived frequency of a sound, important in tone and intonation.
Praat: A software application for analyzing and visualizing speech sounds.

Q

Quality: The distinguishing characteristic of vowel sounds, determined by tongue position and lip shape.

R

Resonance: The amplification and modification of sound as it passes through the vocal tract.
Rhythm: The pattern of sounds and silences in speech.

S

Segmental Sounds: Individual speech sounds, including vowels and consonants.
Syllable: A unit of pronunciation containing a vowel sound, with or without surrounding consonants.
Stress: The emphasis placed on a syllable or word in speech.
Suprasegmental Features: Speech characteristics like pitch, tone, stress, and intonation.

T

Tone: A pitch variation that distinguishes word meaning in tonal languages.
Transcription: The process of representing spoken sounds in written form.

U

Utterance: A complete unit of speech in spoken language.

V

Vocal Tract: The system of organs involved in producing speech sounds, including the mouth, nose, and throat.
Vowel: A speech sound produced without significant constriction in the vocal tract.

W

Word Stress: The emphasis placed on a specific syllable in a word.

Z

Zero Allophone: A phoneme realized as the absence of a sound in certain contexts.

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