A QUANTITATIVE ANALYSIS OF ENGLISH QUESTIONS INTONATION ACCURACY

(A Study on English Education Students of IAIN Curup from the Rejang Tribe)

UNDERGRADUATE THESIS

Submitted in partial fulfillment of the Bachelor's degree in English Language Education Study Program

By

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A QUANTITATIVE ANALYSIS OF ENGLISH QUESTIONS INTONATION ACCURACY: A STUDY ON ENGLISH EDUCATION STUDENTS OF IAIN CURUP FROM THE REJANG TRIBE

Oleh

Nafisah Kamal

Sebuah skripsi yang diajukan untuk memenuhi salah satu syarat memperoleh gelar Sarjana Pendidikan pada Fakultas Tarbiyah

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Assalamualaikum Warahmatullahi Wabarakatuh

Semoga Ibu selalu dalam Kesehatan dan lindungan dari Allah SWT, dalam setiap urusannya.

Setelah mengadakan pemeriksaan dan juga perbaikan penting, maka kami berpendapat bahwa skripsi atas nama **Nafisah Kamal (22551034)** sebagai Mahasiswa dari Program Studi Tadris Bahasa Inggris, dengan judul **"A Quantitative Analysis of English Questions Intonation Accuracy: A Study on English Education Students of IAIN Curup from the Rejang Tribe"** sudah dapat diajukan dalam Sidang Munaqasah di Institut Agama Islam Negri (IAIN) Curup.

Demikian Permohonan ini kami ajukan, besar harapan kami agar Ibu menyetujui hal ini, Terima kasih.

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MOTTO AND DEDICATION

MOTTO

" *Radiate softly, work silently, and let your journey be your most beautiful masterpiece*."

—Nafisah Kamal—

DEDICATION

This beautiful milestone is wholeheartedly dedicated to the anchors of my life: my beloved father, my dearest mother, and my wonderful sisters. Thank you for showering me with endless love, for being my haven, and for cheering me on through every season of this journey.

Above all, I dedicate this to myself for staying soft in a hard world, for every silent tear wiped, and for blooming so beautifully despite all the storms.

ABSTRACT

Nafisah Kamal	:	A Quantitative Analysis of English Questions Intonation Accuracy: A Study on English Education Students of IAIN Curup from the Rejang Tribe
Advisor	:	Dr. Leffi Noviyenty, M.Pd.
Co-Advisor	:	Dr. Prihantoro, SS., M.Pd.

L1 phonological interference in English intonation is a common challenge among EFL learners, particularly speakers of syllable-timed regional languages such as Rejang. This study analyzes the accuracy of English question intonation produced by Rejang-speaking English Education students at IAIN Curup and measures the extent of L1 phonological interference. A descriptive quantitative approach was used, with data collected through two instruments: a Reading Aloud Task (RA) and a Discourse Completion Task (DCT). Twenty students were selected via purposive sampling. Recordings were analyzed using Praat to extract F0 values and identify pitch contour patterns (Rising, Flat, or Falling). Of 800 utterances analyzed, the overall intonation accuracy rate was 76.0%, with an L1 interference level of 24.0%, categorized as Low. The dominant patterns were Rising for Yes/No questions (78.0%) and Falling for WH-questions (75.0%), consistent with standard English norms. A paired sample *t*-test showed no significant difference between RA and DCT performance ($p > .05$), indicating stable intonation ability across speech contexts. The study concludes that Rejang-speaking English Education students at IAIN Curup demonstrate good English question intonation accuracy despite low-level L1 interference, informing more contextually responsive pronunciation instruction for EFL learners with regional language backgrounds.

Keywords: *English question intonation, accuracy, Rejang tribe, L1 phonological interference, Praat, prosody.*

GLOSSARY OF KEY TERMS

Accuracy — The extent to which a participant's produced intonation conforms to the standard English intonation pattern for a given question type, as determined through acoustic analysis using Praat.

Acoustic Analysis — The objective measurement of speech using acoustic parameters such as fundamental frequency (F0), pitch contour, and pitch range to describe pronunciation and intonation.

Discourse Completion Task (DCT) — A data collection instrument in which participants respond orally to a written situational prompt, eliciting spontaneous speech production in a controlled context.

EFL (English as a Foreign Language) — A context in which English is learned in a country where it is not the primary language of communication, such as Indonesia.

Final F0 — The fundamental frequency measured at the final syllable of an utterance, used to determine the direction of the terminal pitch movement.

F0 (Fundamental Frequency) — The rate of vocal fold vibration per second, measured in Hertz (Hz), which is the acoustic correlate of perceived pitch. In this study, F0 values of the first and last syllables of each utterance were extracted to determine pitch contour direction.

Intonation — The systematic use of pitch movement across an utterance to convey meaning, grammatical structure, and pragmatic intent. In English questions, intonation typically rises for Yes/No questions and falls for WH-questions.

L1 (First Language / Mother Tongue) — The language acquired naturally from birth. In this study, L1 refers to the Rejang language spoken natively by the participants.

L1 Phonological Interference — The unconscious transfer of phonological features — including pitch patterns, rhythm, and stress — from a speaker's native language into their production of a second or foreign language.

Pitch Contour — The shape of F0 movement across an utterance, classified in this study as Rising (final F0 > initial F0 by ≥10 Hz), Falling (final F0 < initial F0 by ≥10 Hz), or Flat (difference < 10 Hz).

Pitch Range — The difference between the highest fundamental frequency (F0 maximum) and the lowest fundamental frequency (F0 minimum) within an utterance, reflecting the extent of pitch variation.

Praat — A free, open-source software for phonetic analysis developed by Paul Boersma and David Weenink at the University of Amsterdam, used in this study to extract F0 measurements and visualize pitch contours.

Prosody — The suprasegmental features of speech, including pitch, stress, rhythm, and tempo, that operate above the level of individual sounds and contribute to meaning and naturalness in spoken language.

Reading Aloud Task (RA) — A data collection instrument in which participants read a scripted text containing embedded target sentences, used to elicit controlled speech production.

Rejang Language — An Austronesian language spoken by the Rejang ethnic community in Bengkulu Province, Indonesia. As a predominantly syllable-timed language, it differs prosodically from English, which is stress-timed, and may influence English intonation production among Rejang-speaking learners.

Stress-timed Language — A language in which stressed syllables recur at roughly equal intervals, causing unstressed syllables to be compressed. English is a stress-timed language.

Syllable-timed Language — A language in which syllables are produced at roughly equal intervals of time, regardless of stress. Rejang and Indonesian are syllable-timed, in contrast to English, which is stress-timed.

WH-Questions — Information-seeking questions introduced by interrogative words such as *what, who, where, when, why,* and *how*. According to Standard English intonation, WH-questions typically end with a falling pitch contour.

Yes/No Questions — Closed-ended questions that can generally be answered with *yes* or *no*. In Standard English, these questions are typically produced with a rising intonation pattern.

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CHAPTER I
INTRODUCTION

A. Background of The Study

In the era of globalization and Industry 5.0, English plays a crucial role as an international lingua franca in communication, education, and technology.[1] In the field of second language (L2) acquisition, speaking proficiency is often considered the primary measure of fluency. However, effective speaking involves more than vocabulary and grammar; it also requires phonological accuracy, particularly in suprasegmental features such as intonation, to ensure unambiguous communication.[2]

English learners in Indonesia face significant challenges due to typological differences between Indonesian (and regional languages) and English. English is a stress-timed language that relies heavily on rhythm and intonation contour, whereas most languages in Indonesia, including Rejang, are syllable-timed. This prosodic difference frequently leads to phonological interference, where the melodic habits of the mother tongue are unconsciously transferred into English speech production.[3]

The Rejang tribe is the largest indigenous ethnic group in Bengkulu Province, particularly in the Rejang Lebong, North Bengkulu, Kepahiang, and

[1] Abdul Rosyid Syam, *An Investigation of Intelligibility and Lingua Franca Core Features in Indonesian Accented English* (Doctoral Dissertation, Coventry University, 2023), 15.

[2] Adristi Larassati et al., "Using Praat for EFL English Pronunciation Class: Defining the Errors of Question Tags Intonation," Language Circle: Journal of Language and Literature 16, no. 2 (2022): 331.

[3] Uriel Weinreich, *Languages in Contact: Findings and Problems* (The Hague: Mouton, 1957), 11; Senowarsito N. Ardini and Sunarya, "An Acoustic Study of Jonglish Community: Javanese-accented Speech," *Forum for Linguistic Studies* 6, no. 2 (2024): 1164.

Lebong regencies, with approximately 400.000 speakers (Erikson, 2010). The Rejang language (bahasa Rejang) belongs to the Austronesian family, specifically the Malayo-Polynesian branch, and has its own traditional script known as Aksara Kaganga. The language is divided into three main dialect groups: Rejang Lebong, Rejang Curup, and Rejang Kepahiang.

Importantly for this study, the intonation patterns of Rejang differ significantly across these dialect groups. Based on an interview conducted with a Rejang language consultant during the preliminary phase of this study, speakers from the urban (pasar) area of Curup are generally perceived to use rising intonation across question types, whereas speakers from mountainous areas tend to produce a softer, sometimes descending intonation.[4] According to Mr. Dibul, this difference in intonation reflects the geographical and cultural characteristics of the speakers; mountain-dwelling communities tend to speak more gently due to their quiet, forest environment, while market communities develop a more dynamic prosodic pattern. This inter-dialectal variation in Rejang intonation patterns makes it particularly interesting to investigate how Rejang-speaking students, who represent a blend of these dialect backgrounds, produce English questions intonation.

At IAIN Curup, many English Education students are native speakers of the Rejang language who use it as their primary means of daily communication. Before the main study, the researcher conducted a preliminary survey on April 27, 2026, involving 13 English Education students through an online chat. The survey aimed to identify the types of questions most frequently used by students

[4] Mr. Dibul, Rejang language consultant, interview by author, Curup, Bengkulu, June 12, 2026.

in their daily academic communication. The responses indicated that asking about class schedules, borrowing items, requesting permission, and asking for word meanings were among the most common situations. These findings were used to develop authentic question prompts for the research instrument.

In addition, a preliminary observation involving four English Education students was conducted to explore their production of English questions intonation. The preliminary observation suggested that the participants tended to apply rising intonation to most question types, including WH-questions, suggesting a possible influence of their first language. Although the observation was limited in scope, it provided an initial indication that warranted further investigation through systematic acoustic analysis using Praat.

The significance of correct English questions intonation for this population is particularly high. As English Education students and future English teachers, these participants are expected to serve as accurate pronunciation models for their future students. An intonation error, such as applying a Rising tone to a WH-question, can lead to pragmatic failure: the listener may misinterpret the speaker's intent, perceiving a genuine WH-question as either a repetition question or an emotionally charged utterance (Wells, 2006). This has direct implications for the communicative competence of future teachers in professional educational settings.

The decision to focus on questions rather than other sentence types is driven by three rationales. First, questions provide the most distinct binary contrast in English intonation: Yes/No questions require Rising intonation and WH-questions require Falling intonation, allowing for a rigorous and

unambiguous accuracy measurement. Second, questions are among the most frequent communicative acts in academic settings, making them highly relevant to the participants' daily EFL context. Third, preliminary observations suggest that questions are specifically the domain where Rejang dialect interference is most pronounced and systematic, making them the most productive focus for this quantitative investigation.

Previous studies on phonological interference in Indonesia have primarily focused on segmental features, such as vowel pronunciation among Banjar dialect speakers and consonantal variations among Acehnese speakers[5] using qualitative or small-sample approaches. Studies addressing suprasegmental features, particularly intonation accuracy measured through objective acoustic tools, remain limited. The study by Ardini and Sunarya (2024) on Javanese-accented English (Jonglish) provides the closest methodological parallel, but it is limited to the Javanese dialect and does not extend to the Rejang linguistic community.[6] The study by Larassati et al. (2022), while using Praat to analyze question tag intonation among EFL learners, does not address the specific prosodic characteristics of any regional Indonesian dialect.[7]

This study directly addresses this gap. Based on the reviewed literature, no previous study has specifically measured English questions intonation

[5] Anisya Marsya Sunanda et al., "Pengaruh Dialek Banjar terhadap Pelafalan Bahasa Inggris," Jurnal Linguistik, Sastra, dan Pengajaran Bahasa (JLLLT) 5, no. 1 (2025): 48.

[6] Senowarsito N. Ardini and Sunarya, "An Acoustic Study of Jonglish Community: Javanese-accented Speech," Forum for Linguistic Studies 6, no. 2 (2024): 1167.

[7] Adristi Larassati et al., "Using Praat for EFL English Pronunciation Class: Defining the Errors of Question Tags Intonation," Language Circle: Journal of Language and Literature 16, no. 2 (2022): 331.

accuracy among Rejang-speaking EFL students using an objective acoustic measurement tool such as Praat.[8] By applying Praat software to extract Fundamental Frequency (F0) data, the acoustic correlate of perceived pitch, this study provides an empirical, data-driven account of pitch patterns and intonation accuracy in this specific population. The findings are expected to provide not only a novel data point in the Indonesian regional dialect interference literature but also actionable insights for pronunciation instruction at IAIN Curup and similar institutions serving Rejang-speaking English learners.

To collect data across both scripted and spontaneous speech conditions, this study employs two instruments: Reading Aloud (RA) and Discourse Completion Task (DCT). The RA task provides a controlled, scripted production condition, while the DCT elicits more naturalistic, spontaneous question production in response to everyday academic scenarios. By comparing performance across both instruments, this study offers a more comprehensive and valid triangulation of intonation accuracy than would be possible with a single instrument alone.

Based on this background, this study is therefore entitled: **"A QUANTITATIVE ANALYSIS OF ENGLISH QUESTIONS INTONATION ACCURACY: A Study on English Education Students of IAIN Curup from the Rejang Tribe."**

[8] Fitra Amaliah, "Analysing Students' Error in Pronouncing Minimal Pair Words by Using Praat Application of English Program at IAIN Parepare" (Undergraduate Thesis, IAIN Parepare, 2021), 10.

B. Identification of the Problem

1. Students frequently struggle to execute the correct rising and falling pitch at the end of sentences, resulting in intonation patterns that deviate from standard English norms, a discrepancy whose overall extent has not yet been empirically measured.[9]
2. The prosodic features and melodic patterns of the Rejang dialect are systematically transferred into English speech, causing persistent intonation deviations, particularly an over-application of rising intonation to WH-questions.[10]
3. There is a tendency among students to produce Flat or level intonation, failing to apply the necessary dynamic pitch variation.[11]
4. There is a lack of objective, empirical data on the specific nature and degree of Rejang dialect interference on English question intonation production among English Education students at IAIN Curup.[12]

C. Limitation of the Problem

The researcher acknowledges several limitations of this study, which should be considered when interpreting the findings and when planning future research.

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[9] Adristi Larassati, dkk., "Using Praat for EFL English Pronunciation Class: Defining the Errors of Question Tags Intonation," *Language Circle: Journal of Language and Literature* 16, no. 2 (2022): 332.

[10] Anisya Marsya Sunanda, dkk., "Pengaruh Dialek Banjar terhadap Pelafalan Bahasa Inggris," *Jurnal Linguistik, Sastra, dan Pengajaran Bahasa (JLLLT)* 5, no. 1 (2025): 55.

[11] Syam, "An Investigation of Intelligibility and Lingua Franca Core Features in Indonesian Accented English," 40.

[12] Fitra Amaliah, "Analysing Students' Error in Pronouncing Minimal Pair Words by Using Praat Application of English Program at IAIN Parepare" (Undergraduate Thesis, IAIN Parepare, 2021), 1; see also Ardini and Sunarya, "An Acoustic Study of Jonglish Community," 1167.

First, the sample was only taken from IAIN Curup students. Most of the students come from the Curup dialect area of the Rejang language. At least three main dialect groups of the Rejang language exist, namely Rejang Curup, Rejang Lebong, and Rejang Kepahiang, with different intonation characteristics, as confirmed by the Rejang language expert consulted in this study. Because dialect subgroup membership was not systematically controlled as a variable in the sampling process, the findings are most accurate for the phonological patterns of the Curup dialect variety and may not be fully generalizable to Rejang speakers from other dialect regions. Future studies are encouraged to stratify participants by dialect subgroup to allow for inter-dialectal comparison.

Second, the acoustic measurement in this study relied on a two-point F0 measurement approach, comparing the F0 value at the initial and final syllable of each utterance using a ±10 Hz threshold. While this method provides a reproducible and practically applicable classification of pitch contour direction across a large dataset of 800 utterances, it represents a simplification of the full intonation contour, which in natural speech involves continuous pitch movement across the entire utterance. A more granular analysis using time-normalized F0 trajectories or tonal annotation frameworks (such as ToBI) would yield a more detailed phonological description but would require substantially greater analytical resources.

Third, the DCT instrument, while effective in eliciting spontaneous question production, provides a written prompt in Bahasa Indonesia, which may add a translation processing stage not present in fully naturalistic conversation. This potential artifact of the instrument design means that the DCT condition in

this study is not equivalent to unscripted real-world conversational speech, although it is more spontaneous than the RA task. In this work, no perceptual data from native or proficient English listeners were obtained, so the communicative effect of the intonation patterns identified here, i.e., whether the errors produced actually lead to pragmatic miscommunication in real interaction, is an open empirical question for future research.

D. Research Questions

Based on the identification and limitation of the problem, the research questions are:

1. What are the specific pitch patterns produced by English Education students of the Rejang tribe when performing English questions?
2. What is the level of English question intonation accuracy among Rejang-speaking English Education students based on Praat analysis?

E. Objectives of the Study

Corresponding to the research questions, the objectives of this study are:

1. To identify and describe the specific pitch patterns (Rising, Flat, and Falling) produced by English Education students of the Rejang tribe when performing English questions in both Reading Aloud and DCT conditions.
2. To determine the level of English questions intonation accuracy by calculating the percentage of accurate and inaccurate intonation responses based on Praat F0 analysis.

F. Significance of the Study

1. Theoretical Significance

This study provides empirical evidence on how the Rejang dialect, a regional language that has been understudied in the phonological interference literature, influences English suprasegmental features, specifically question intonation. The findings contribute a novel data point to the growing body of literature on Indonesian regional dialect interference in English, complementing existing studies on Javanese-accented (Ardini & Sunarya, 2024), Banjar-accented (Sunanda et al., 2025), and Acehnese-accented English (Suhery et al., 2024). Methodologically, this study demonstrates the application of Praat-based F0 analysis as a reliable quantitative tool for measuring intonation accuracy in regional EFL contexts.

a. Practical Significance

1) For English Lecturers:

This study provides valuable insights and contributions for lecturers in teaching pronunciation. By understanding the specific intonation errors made by students from the Rejang tribe, lecturers can develop more targeted teaching materials and strategies to help students minimize their native language interference and improve their oral performance.

2) For Students:

The results of this study can help students, especially those from the Rejang tribe, to become more aware of their own intonation patterns. By recognizing their common mistakes, students can focus more on practicing the correct rising and falling tones in English.

3) For the Institution (IAIN Curup):

This research can serve as a basis for the department to evaluate and enhance the quality of speech-related courses, ensuring that students meet the required standards of English pronunciation as future English teachers.

CHAPTER II
LITERATURE REVIEW

A. Theoretical Framework.

This chapter presents relevant theories and comprehensive information related to the research topic, establishing a robust theoretical foundation for data analysis. It examines the fundamental concepts of phonetics and phonology as the scientific study of sound, and explores the nature of English intonation, including tone patterns across various question types.[13] Additionally, the chapter addresses the theory of language interference and the impact of local dialects, with particular emphasis on the Rejang dialect, on second language production. A review of pertinent previous studies is also provided to identify research gaps, which are subsequently synthesized into a framework guiding the implementation of this study.

1. Phonetics and Phonology.

Linguistic studies examine the sounds of language through two interrelated yet distinct branches: phonetics and phonology. Syam (2023), in his research on English accents in Indonesia, emphasizes that distinguishing between these branches is essential for analyzing the influence of the mother tongue on the target language.[14]

Phonetics is a branch of linguistics that looks at the physical sounds of language, not their role in meaning. It studies how people make sounds

[13] J.C. Wells, *English Intonation: An Introduction* (Cambridge: Cambridge University Press, 2006), 1.

[14] Abdul Rosyid Syam, "An Investigation of Intelligibility and Lingua Franca Core Features in Indonesian Accented English" (Doctoral Dissertation, Coventry University, 2023), 32.

(articulatory phonetics), how these sounds travel as waves (acoustic phonetics), and how listeners hear them (auditory phonetics).[15] In this study, phonetics is important because researchers will use Praat software to analyze pitch movement.

Phonology is a branch of linguistics that examines the sound system and the functional role of sounds within a specific language. In contrast to phonetics, phonology focuses on whether sound differences can distinguish meaning (phonemic). It encompasses two primary aspects: segmental features, such as vowels and consonants, and suprasegmental features, including intonation, stress, and rhythm.[16] According to Sunanda et al. (2025), insufficient understanding of the English phonological system frequently leads to phonological transfer from regional languages.

The primary distinction between phonetics and phonology concerns their scope: phonetics is universal and applies to all humans, whereas phonology pertains to specific languages. In this study, phonological analysis served to differentiate standard intonation patterns in English from those in the Rejang dialect. Phonetic analysis was employed to measure the accuracy of these tone movements scientifically and objectively.

2. Classification of English Questions

In English linguistics, the categorization of questions involves a complex interplay between syntactic structure, pragmatic function, and phonological realization. According to the foundational framework

[15] Peter Ladefoged dan Keith Johnson, *A Course in Phonetics*, 7th ed. (Stamford: Cengage Learning, 2015), 2.
[16] David Crystal, *A Dictionary of Linguistics and Phonetics*, 6th ed. (Oxford: Blackwell Publishing, 2008), 365.

established by Quirk et al. (1985) in *"A Comprehensive Grammar of the English Language,"* questions are primarily categorized based on the type of information they seek and their grammatical formation.[17] Furthermore, Wells (2006) and Roach (2000) emphasize that these structural categories are intrinsically linked to specific "Nuclear Tones" or pitch movements.[18] The following are the comprehensive classifications of English questions:

a. Yes/No Questions

Yes/No questions, also referred to as "polar questions," are designed to seek confirmation or denial of a proposition. Structurally, these questions are characterized by "Subject-Operator Inversion," where the auxiliary verb is moved to the initial position (e.g., *"Is the lecturer in the office?"*). Betty Azar (2002) notes that when no auxiliary is present, the "do-support" is required.[19] From a phonological perspective, Wells (2006) argues that the unmarked (standard) intonation for Yes/No questions is a Low Rise tone.[20] This rising pitch signals that the utterance is syntactically a question despite the speaker's potential expectations. Within this research, this category also encompasses various pragmatic speech acts, such as Requests (e.g., *"Can you lend me your dictionary?"*) and asking for Permission.

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[17] Randolph Quirk et al., A Comprehensive Grammar of the English Language (London: Longman, 1985), 806.

[18] Peter Roach, English Phonetics and Phonology: A Practical Course, 3rd ed. (Cambridge: Cambridge University Press, 2000), 150.

[19] Betty Schrampfer Azar, Understanding and Using English Grammar, 3rd ed. (New York: Pearson Education, 2002), 58.

[20] J.C. Wells, English Intonation, 37.

b. Wh-Questions

Wh-questions are initiated by interrogative pronouns or adverbs such as *who, what, where, when, why,* and *how*. These are often called "information questions" because they seek specific content rather than a simple affirmation. Syntactically, they involve the movement of the Wh-element to the front of the sentence. Unlike Yes/No questions, Roach (2000) and Wells (2006) explain that Wh-questions typically carry a Falling tone (High Fall).[21] The falling pitch indicates a definite inquiry. If a Wh-question is spoken with a rising tone, it often changes the pragmatic meaning to a "repetition question," indicating that the speaker did not hear or understand the previous information.

c. Declarative Questions

A crucial category highlighted by Quirk et al. (1985) is the declarative question. These sentences possess the grammatical structure of a statement (Subject + Verb) but function as questions through the speaker's use of Rising intonation.[22] For example, *"You have submitted the assignment?"* serves as an inquiry only through its prosodic marking. This category is particularly significant for this study, as it tests the participants' ability to utilize pitch as the sole indicator of an interrogative force, which is a common area where phonological interference from the Rejang dialect may occur.

[21] Peter Roach, English Phonetics and Phonology (2000), 153.
[22] Randolph Quirk et al., A Comprehensive Grammar of the English Language, 814.

d. Alternative Questions

Alternative questions present the listener with two or more distinct choices, typically connected by the conjunction *"or"* (e.g., *"Should we meet on Monday or Tuesday?"*). Wells (2006) describes the intonational "contour" of these questions as a sequence: a Rise on the first option(s) followed by a Fall on the final option.[23] This falling tone at the end signals that the list of choices is exhausted and complete.

e. Tag Questions

Tag questions consist of a declarative or imperative statement followed by a short interrogative "tag" (e.g., *"You are a student, aren't you?"*). The intonation of the tag is highly versatile. According to Roach (2000), a Rising tag indicates a genuine question where the speaker is uncertain, whereas a Falling tag indicates that the speaker is confident and merely seeking agreement or confirmation.[24]

f. Rhetorical Questions

Rhetorical questions have the syntactic form of a question but are not intended to elicit an answer. Instead, they are used for stylistic effect or to make a point (e.g., *"Who doesn't want to pass the exam?"*). While they often follow the intonation of the question type they resemble, Wells (2006) suggests they frequently carry an exaggerated Falling tone to convey strong emotional emphasis or sarcasm.[25]

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[23] J.C. Wells, English Intonation, 43.
[24] Peter Roach, English Phonetics and Phonology (2000), 156.
[25] J.C. Wells, English Intonation, 48.

g. Exclamatory Questions

As noted in Quirk et al. (1985), exclamatory questions have the structure of a Yes/No question but function as an exclamation (e.g., *"Hasn't she grown!"*). Despite their interrogative form, they are phonologically realized with a Falling tone, reflecting their exclamatory nature.[26]

3. English Intonation and Question Types

Intonation is fundamentally defined as the melody of speech, characterized by the continuous rise and fall of the speaker's voice pitch. Unlike tonal languages, where pitch changes distinguish individual words, English utilizes intonation as a critical suprasegmental feature to convey grammatical structure, information focus, and speaker attitude. Larassati et al. (2022) emphasize that intonation is a vital component of communicative competence; even when a speaker's grammar and segmental sounds are technically correct, improper intonation can lead to significant misinterpretation or unnatural speech patterns. In English phonology, intonation performs a primary grammatical function by signaling the end of an utterance and identifying the specific sentence type through two main pitch movements, which are falling and rising intonation.

According to Wells (2006) in his book *English Intonation: An Introduction*, English intonation operates through three systems: Tonality (how speech is divided into tone units), Tonicity (which syllable carries the nucleus or pitch accent), and Tone (the direction of pitch movement at the

[26] Randolph Quirk et al., A Comprehensive Grammar of the English Language, 825.

nuclear syllable). This study focuses on tone, specifically the terminal pitch direction at the end of each question utterance as measured by Praat F0 analysis. Wells emphasizes that English questions follow a systematic rule: Yes/No questions typically require a Rising Tone (↖)to signal that the speaker is seeking confirmation. In contrast, WH-questions (beginning with *Who, What, Where, When, Why, How*) are standardly produced with a Falling Tone (↘). This distinction is crucial because using the wrong tone can lead to unnatural speech or pragmatic confusion for the listener.

The first movement, known as falling intonation (↘), occurs when the pitch of the voice drops on the last stressed syllable of a sentence, providing a sense of finality and certainty. Furthermore, falling intonation is the standard requirement for WH-questions, those beginning with who, what, where, when, why, and how, where the focus remains on the specific information being requested rather than seeking a simple confirmation. However, as noted by Syam (2023) in his investigation of Indonesian-accented English, many EFL learners struggle to maintain this finality, frequently replacing it with a flat or misplaced pitch influenced by their local dialects.[27]

Conversely, the second movement is rising intonation (↗), which is characterized by a pitch that moves upward at the end of an utterance. This pattern is predominantly used in Yes/No questions to signal that the speaker is seeking confirmation or a simple affirmative or negative response. A significant challenge for Indonesian speakers, as highlighted in

[27] J.C. Wells, *English Intonation: An Introduction* (Cambridge: Cambridge University Press, 2006), 15.

the acoustic study by Ardini and Sunarya (2024), is the tendency to apply a high tone at the end of sentences regardless of the sentence type.[28] This phenomenon, which is observed in various regional accents, including the "Jonglish" community and potentially other ethnic dialects, creates a rising effect that can make the utterance sound like an uncertain question. From an acoustic perspective, these intonation patterns are manifested through the variation of Fundamental Frequency *(F0).* By utilizing software such as Praat, as suggested in the works of Amaliah (2021) and Larassati (2022), these pitch contours can be measured quantitatively to provide scientific, data-driven evidence of whether students successfully execute the rising or falling movements according to English phonological standards.[29]

Wells (2006) and Roach (2000) establish the following canonical pitch patterns for English question types:

1) Yes/No questions, which seek confirmation or denial (e.g., 'Did you finish the assignment?'), are canonically produced with a Rising intonation (Low Rise or High Rise), signaling that the utterance is incomplete and requires a response.
2) WH-questions, which seek specific information and begin with words such as who, what, where, when, why, or how (e.g., 'What time does the class start?'), are canonically produced with a Falling intonation (High Fall), signaling a definitive request for information.

[28] Senowarsito N. Ardini and Sunarya, "An Acoustic Study of Jonglish Community: Javanese-accented Speech," Forum for Linguistic Studies 6, no. 2 (2024): 1167.
[29] Adristi Larassati et al., "Using Praat for EFL English Pronunciation Class: Defining the Errors of Question Tags Intonation," Language Circle: Journal of Language and Literature 16, no. 2 (2022): 332.

3) Flat or level intonation in either question type is considered non-target, as it fails to produce the required pitch direction and may sound monotonous, uncertain, or pragmatically ambiguous to native English listeners.

These canonical patterns form the phonological standard against which the pitch patterns of Rejang EFL students are evaluated in this study. It should be noted that while Wells (2006) acknowledges variation in real speech, the Rising/Falling distinction for Yes/No and WH-questions respectively, is described as the unmarked, default pattern in Standard British English, the primary reference norm for this study.

4. Fundamental Frequency (F0) and Acoustic Measurement

From an acoustic perspective, intonation is physically realized through variations in Fundamental Frequency (F0), which is the rate of vibration of the vocal folds and is perceived by listeners as pitch. The F0 value of a speech signal is measured in Hertz (Hz). When the F0 rises from the initial to the final syllable of an utterance, the pitch is perceived as Rising; when it falls, the pitch is perceived as Falling; and when there is minimal change, the pitch is perceived as Flat or level.

This study employs Praat software to extract F0 values at two measurement points for each utterance: the initial voiced syllable and the final voiced syllable. The direction of the pitch contour is determined by comparing these two F0 values. An utterance is classified as **Rising** when the final F0 is at least 10 Hz higher than the initial F0, **Falling** when the

final F0 is at least 10 Hz lower than the initial F0, and **Flat** when the difference is less than 10 Hz.

The ±10 Hz threshold was adopted as an operational criterion to distinguish meaningful pitch movements from minor fluctuations that may naturally occur because of individual voice variation or acoustic measurement noise. Rather than representing an absolute phonetic standard, this threshold was selected to ensure consistency and objectivity in classifying pitch contour direction across all utterances analyzed in this study. Furthermore, this classification procedure was reviewed and approved through the expert validation process before data collection, confirming its suitability for the present research.

Praat provides a reliable, objective, and reproducible platform for this type of acoustic measurement. As demonstrated by Larassati et al. (2022) in their study on question tag intonation errors among EFL learners, Praat enables the identification of subtle intonation errors that may not be detectable through auditory perception alone. Its widespread adoption in EFL phonological research across Indonesia, including Amaliah (2021), Ardini and Sunarya (2024), and the present study, establishes it as the methodological standard for acoustic intonation analysis in this context.

5. The Rejang Language and Its Intonation Characteristics

The Rejang language (bahasa Rejang) is spoken by approximately 400,000 people in the Bengkulu Province of Indonesia, primarily in the regencies of Rejang Lebong, Kepahiang, Lebong, and North Bengkulu. It belongs to the Austronesian language family, specifically the Malayo-

Polynesian branch, and is classified as forming its own distinct group within this family (Erikson, 2010). The language was historically written using the Aksara Kaganga script, which bears similarity to the Batak and Lampung scripts.

Based on an interview conducted with Mr. Dibul, the interview provided contextual and ethnolinguistic insights into the Rejang language. Therefore, the information obtained from the interview is used as supporting expert opinion rather than as primary empirical evidence. A local scholar and expert on the Rejang language and its history believes that variations in intonation exist among the major dialects of the Rejang language. According to his expert opinion, speakers from mountainous and interior areas generally tend to produce softer and more melodic speech, whereas speakers from market towns and lowland areas tend to exhibit relatively sharper and more assertive intonation patterns.[30] Since these observations are derived from expert knowledge rather than experimental phonetic research, they are presented in this study as contextual linguistic information rather than as established phonological facts.

Furthermore, Mr. Dibul suggested that Rejang-speaking learners may have a tendency to transfer the habitual intonation patterns of their first language when producing English questions. In his observation, this transfer often results in the use of Rising intonation in English WH-questions, where Standard English conventionally requires Falling intonation. This expert opinion serves as the initial rationale for the present study and forms the

[30] Mr. Dibul, Rejang language consultant, interviewed by the author, Curup, Bengkulu, June 12, 2026.

basis for the research hypothesis. The validity of this assumption is subsequently examined through acoustic analysis using Praat rather than being accepted as a predetermined fact.

6. Syntactic and Phonological Distinctions in Question Functions

As emphasized by Quirk et al. (1985) and further detailed in Betty Azar's (2002) grammatical framework, the same sentence structure can represent different pragmatic functions.[31] For instance, the modal verb *"Can"* may signify Ability (e.g., *"Can you speak Rejang?"*) or a Request (e.g., *"Can you help me with this assignment?"*). While they both fall under the Yes/No question cluster, their intonational realization can be subtly different. Wells (2006) and Roach (2000) explain that in a polite request, the speaker tends to use a wider pitch range (High Rise) compared to a factual question about ability.[32]

Furthermore, Quirk et al. (1985) distinguish between "Product" questions (Wh-questions) and "Choice" questions (Yes/No and Alternative questions).[33] Product questions expect a new linguistic item as a response, while Choice questions ask the listener to select between provided or implied alternatives. Phonologically, this study adopts Wells' (2006)

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[31] Betty Schrampfer Azar, *Understanding and Using English Grammar*, 3rd ed. (New York: Pearson Education, 2002), 143.

[32] J.C. Wells, *English Intonation: An Introduction* (Cambridge: Cambridge University Press, 2006), 40; Peter Roach, *English Phonetics and Phonology: A Practical Course*, 3rd ed. (Cambridge: Cambridge University Press, 2000), 151.

[33] Randolph Quirk et al. *A Comprehensive Grammar of the English Language* (London: Longman, 1985), 807.

categorization of "Tone Clusters," focusing on the Rising Cluster for choice-oriented inquiries and the Falling Cluster for product-oriented inquiries.[34]

This theoretical depth is essential to address the potential overlap in intonation accuracy among Rejangese students. By categorizing the Discourse Completion Task (DCT) scenarios into these clusters, the researcher can determine whether errors in intonation are consistent across all question types or specific to certain pragmatic functions, such as when a student uses a falling tone for a request where a rising tone is academically required.

7. Phonological Interference

Phonological interference, often referred to as linguistic interference or transfer, occurs when the sound system and habits of a speaker's first language (L1) are involuntarily applied to a second language (L2). According to the theory proposed by Weinreich (1957) and further discussed in the study by Suhery et al. (2024), this phenomenon is a common barrier in multilingual environments where the phonological rules of the mother tongue dominate the production of the target language.[35] This interference is not merely a matter of "mispronunciation" but is a systematic transfer of phonetic features—including vowels, consonants, and suprasegmental elements like intonation—from the native dialect to English. Sunanda et al. (2025) argue that this "negative transfer" is particularly strong when the L1

[34] J.C. Wells, English Intonation, 37.
[35] Uriel Weinreich, Languages in Contact: Findings and Problems (The Hague: Mouton, 1957), 14; See also Dedi Suhery et al., "Phonological Interference in the Pronunciation of Indonesian by Acehnese Speakers," Jurnal Serunai Bahasa Inggris 16, no. 1 (2024): 25.

has a distinct prosodic character that differs significantly from the stress-timed rhythm of English, leading to what is commonly perceived as a regional accent.[36]

Roach (2009) explains that intonation carries a grammatical function that helps listeners identify the sentence type. However, for second-language learners, this function is often disrupted by Phonological Interference. As proposed by Weinreich (1957), learners tend to transfer the prosodic habits of their mother tongue (L1) into the target language (L2).[37] In the context of Rejang speakers, the dialect's specific 'melodic' patterns, which often involve a forceful pitch rise in interrogative speech, are involuntarily applied to English questions. This results in a 'negative transfer' where students might produce a rising tone on a WH-question, even though the English standard requires a fall.

In the context of this study, the phonological interference is rooted in the unique characteristics of the Rejang dialect. The Rejang language possesses specific melodic patterns and syllable-timed prosody that are often fundamentally different from English intonation standards. While English relies on a contrastive use of rising and falling pitch to distinguish grammatical functions, the Rejang dialect tends to have its own habitual pitch movements which students may unconsciously carry over when speaking English.[38] This habituation makes it difficult for Rejang speakers

[36] Anisya Marsya Sunanda et al., "Pengaruh Dialek Banjar terhadap Pelafalan Bahasa Inggris," Jurnal Linguistik, Sastra, dan Pengajaran Bahasa (JLLLT) 5, no. 1 (2025): 49.

[37] Peter Roach, English Phonetics and Phonology: A Practical Course, 4th ed. (Cambridge: Cambridge University Press, 2009), 119.

[38] Senowarsito N. Ardini and Sunarya, "An Acoustic Study of Jonglish Community: Javanese-accented Speech," Forum for Linguistic Studies 6, no. 2 (2024): 1168.

to achieve the precise finality of an English falling tone in WH-questions or the sharp upward shift required for Yes/No questions. As a result, the "melodic" interference from the Rejang dialect often results in a deviation from standard English pitch contours, which this research seeks to measure quantitatively to identify the specific areas where the Rejang mother tongue most heavily impacts English intonation accuracy.[39]

8. Interlanguage and Phonological Transfer in Prosody

The concept of interlanguage, proposed by Selinker (1972), serves as the primary theoretical framework for understanding the linguistic systems of IAIN Curup students who are in the process of acquiring English. Interlanguage is not a “wrong” or flawed language system, but rather a unique and dynamic transitional linguistic system in which a systematic process of phonological transfer occurs from the students’ native language, Rejang, into the target language system. This concept emphasizes that students do not immediately adopt English phonetic rules perfectly; rather, they create a new system of rules based on the complex interaction between the structure of their native language and the rules of the English language they are learning.

Phonologically, interference occurs when the prosodic structure of the Rejang language, which, typologically, has rhythmic and tonal patterns that contrast sharply with those of English, is unconsciously applied to the structure of the target language. For example, the Rejang language has a distinct prosodic system for marking sentence focus, so students tend to

[39] Azah Al-Abd Abdullah Al-Tamimi, “Instrumental Analysis of Monophthongs of Hadrami Arabic” (Dissertation, Universiti Malaya, 2023), 10.

transfer this pattern when speaking English. This transfer is systematic; that is, intonation patterns considered “deviations” by native English speakers are actually adaptations of prosodic rules deemed “normal” and “natural” in the Rejang language.

Furthermore, phonological transfer theory states that the greater the typological distance between the native language and the target language, the greater the likelihood of prosodic interference. In the context of IAIN Curup students, the Rejang language, as their native language, operates under strong sociolinguistic mechanisms that shape their perception of what constitutes “natural” sounds. Therefore, this study does not interpret every intonation finding as a failure in learning, but rather as a manifestation of an active phonological system at work.

Using this interlanguage perspective, this study aims to map how IAIN Curup students negotiate meaning. A deep understanding of these transfer mechanisms is key to determining whether the intonation difficulties experienced by students stem from a lack of “competence” or are simply a matter of “phonological adaptation” from their local accents. Thus, the results of this analysis will provide a theoretical contribution to the development of pronunciation teaching strategies that are more sensitive to the linguistic backgrounds of students in the Curup region.

9. Acoustic Analysis using Praat

Acoustic analysis is an objective method used in phonological research to measure the physical properties of speech sounds, moving beyond the limitations of subjective auditory perception. In this study, the

accuracy of English intonation is measured through the analysis of Fundamental Frequency *(F0),* which represents the rate of vibration of the vocal folds and is perceived by listeners as pitch. As highlighted by Larassati et al. (2022) in their study on pronunciation errors, the use of acoustic tools is essential to provide precise data on pitch movement, especially when investigating how non-native speakers produce complex suprasegmental features. By focusing on *F0* variations, researchers can scientifically determine the direction of the pitch, whether it is rising or falling, and compare these contours against the standard phonological rules of English.

To measure these pitch movements objectively, this study employs Acoustic Phonetics. As explained by Ladefoged and Johnson (2015) in *A Course in Phonetics*, the perceived pitch of a voice is the psychological correlate of a physical property known as Fundamental Frequency *(F0)*. By using Praat software, the researcher can extract the *F0* values measured in Hertz (Hz) to visualize the pitch contour. This instrumental approach moves beyond subjective auditory perception, allowing the researcher to provide empirical and quantitative data on whether the students' pitch actually rises or falls according to phonological standards

The primary tool utilized for this acoustic measurement is Praat, a specialized software program designed for the analysis and reconstruction of acoustic speech signals. According to Amaliah (2021), Praat offers a highly reliable platform for EFL researchers to visualize speech through spectrograms and pitch contours, allowing for the identification of subtle errors that the human ear might overlook. In a quantitative framework, Praat

enables the researcher to extract numerical data from students' recordings, such as pitch height in Hertz (Hz) and the duration of specific syllables. By utilizing this software, the present study can provide an empirical evaluation of intonation accuracy among English Education students from the Rejang tribe. This data-driven approach ensures that the findings are based on objective evidence, allowing for a clear comparison between the students' performance in producing questions.

10. Discourse Completion Task (DCT)

The Discourse Completion Task (DCT) is a widely used elicitation instrument in applied linguistics research. According to Ogiermann (2018), the DCT presents participants with brief written scenarios and requires them to respond orally, producing target speech acts (in this case, English questions) in response to specific contextual situations. The primary advantage of the DCT in this study is its ability to elicit spontaneous question production without the reading effect of scripted tasks, while maintaining sufficient standardization for acoustic analysis.[40]

By requiring participants to formulate and produce their own questions in response to everyday academic situations, such as borrowing a book, checking assignment deadlines, or asking for a lecturer's location, the DCT captures more naturalistic prosodic features, including intonation patterns that may be influenced by the Rejang dialect. The situational contexts used in the DCT of this study are drawn directly from the

[40] Eva Ogiermann, "Discourse Completion Tasks," in Methods in Pragmatics (Berlin/New York: Mouton de Gruyter, 2018), 229.

participants' daily academic lives at IAIN Curup, maximizing ecological validity and the potential for authentic intonation production.[41]

The DCT is used alongside the Reading Aloud (RA) task to provide a dual-instrument triangulation of intonation production. While the RA task captures intonation under a controlled, scripted condition, where participants read pre-written questions aloud, the DCT captures intonation under a spontaneous, unscripted condition. The comparison between RA and DCT results allows this study to assess whether intonation accuracy is consistent across production modalities or is reduced under the cognitive demands of spontaneous speech.

B. Previous Studies

Several studies have provided the methodological and theoretical foundations for this research. The first is by Sunanda et al. (2025), who examined the influence of the Banjar dialect on English vowel pronunciation.[42] Their findings revealed significant phonological transfer in the segmental domain, specifically in vowel production, attributed to the limited vowel inventory of the Banjar dialect. While their study was qualitative and limited to two participants, it establishes the general phenomenon of regional dialect interference on English phonology in the Indonesian context. The present study extends this line of inquiry to the suprasegmental domain, specifically English questions intonation, and adopts a quantitative approach with 20 participants to achieve greater generalizability.

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[41] Y. A. Sari and Suhono, "Request and Politeness Strategies in the Javanese-Speaking Generation Z Community: A Pragmatic Study," Bulletin of Science Education 4, no. 2 (2024): 4.

[42] Anisya Marsya Sunanda et al., "Pengaruh Dialek Banjar terhadap Pelafalan Bahasa Inggris," Jurnal Linguistik, Sastra, dan Pengajaran Bahasa (JLLLT) 5, no. 1 (2025): 48.

The second is by Ardini and Sunarya (2024), who conducted an acoustic study of Javanese-accented English in the Jonglish community. Using Praat-based F0 analysis, they found a systematic tendency among Javanese English speakers to produce high, rising tones across all sentence types, regardless of grammatical function.[43] This study provides both a methodological parallel, the use of Praat for acoustic intonation analysis, and a comparative reference point. Whereas Ardini and Sunarya studied the Javanese dialect community, the present study investigates the Rejang dialect, allowing for a comparison of how different Indonesian regional languages produce distinct patterns of interference on English suprasegmentals.

The third is by Larassati et al. (2022), who used Praat software to define errors in question tag intonation among EFL learners.[44] Their findings showed that students frequently confused Rising and Falling tones in question tags, producing non-target intonation patterns that could lead to pragmatic miscommunication. This study reinforces the methodological validity of Praat-based intonation accuracy measurement in EFL contexts and establishes question intonation as a productive domain for acoustic phonological research. The present study expands Larassati et al.'s scope from question tags to a broader range of Yes/No and WH-questions.[45]

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[43] Senowarsito N. Ardini and Sunarya, "An Acoustic Study of Jonglish Community: Javanese-accented Speech," *Forum for Linguistic Studies* 6, no. 2 (2024): 1167.

[44] Adristi Larassati et al., "Using Praat for EFL English Pronunciation Class: Defining the Errors of Question Tags Intonation," *Language Circle: Journal of Language and Literature* 16, no. 2 (2022): 331.

[45] Azah Al-Abd Abdullah Al-Tamimi, "Instrumental Analysis of Monophthongs of Hadrami Arabic" (Dissertation, Universiti Malaya, 2023), 86.

The fourth is by Sari and Suhono (2024), who investigated request and politeness strategies among Javanese-speaking Generation Z students using a DCT approach. Their study demonstrated that the DCT effectively elicits pragmatically authentic oral data while maintaining sufficient standardization for systematic analysis. This confirms the methodological appropriateness of the DCT as a data collection instrument for the present study, particularly in capturing spontaneous English question production among Rejang-speaking students.

The fifth is by Amaliah (2021), who used Praat to analyze students' errors in pronouncing minimal pair words at IAIN Parepare.[46] While focused on segmental features, this study is significant because it establishes the precedent for Praat-based phonological research within the IAIN institutional context, the same institutional setting as the present study at IAIN Curup. It demonstrates that Praat is a feasible and appropriate tool for phonological accuracy research within Indonesian Islamic State University settings.

Collectively, these five studies establish the following gap that the present study addresses: while existing research has examined phonological interference in segmental features, Javanese-accented English prosody, and general EFL question tag intonation, no prior study has specifically quantified English question intonation accuracy among Rejang-speaking EFL students using acoustic Praat analysis. This study fills that specific gap.

[46] Fitra Amaliah, "Analysing Students' Error in Pronouncing Minimal Pair Words by Using Praat Application of English Program at IAIN Parepare" (Undergraduate Thesis, IAIN Parepare, 2021), 10.

C. Conceptual Framework

The conceptual framework of this study illustrates the systematic process of analyzing English questions intonation accuracy among Rejang EFL students at IAIN Curup. The framework is grounded in the theory of phonological interference and the English intonation norms established by Wells (2006) and Roach (2000). It comprises three phases: Input, Process, and Output, as described below.[47]

1. Input Phase.

The study begins with the selection of participants, who are English Education students at IAIN Curup from the Rejang tribe. These students are chosen because they possess the Rejang language as their mother tongue (L1), which serves as the primary source of potential phonological interference.

2. Process Phase.

Data are collected through two instruments:

a) Discourse Completion Task (DCT)

In the process phase, the students are given several social scenarios (DCT) to trigger spontaneous English questions. Participants are asked to respond orally to each specific situation to produce natural English questions (Yes/No and WH-questions) without reading a prepared script.

[47] Uriel Weinreich, *Languages in Contact: Findings and Problems* (The Hague: Mouton, 1957), 14.

b) Recording

Their oral production is recorded using a high-quality digital recorder to ensure clear sound waves for analysis.

c) Acoustic Analysis (Praat)

The recorded files are then analyzed using Praat software. This step involves measuring the Fundamental Frequency (*F0*) to visualize the pitch contours.[48] This objective measurement determines whether the pitch moves upward (rising) or downward (falling) at the end of each utterance.[49]

3. Output Phase

The output comprises two sets of findings that directly address the two research questions. For RQ 1, the output is a description of the specific pitch patterns (Rising, Flat, Falling distribution) produced across all 20 sentences and both tasks. For RQ 2, the output is a quantitative calculation of intonation accuracy percentages, defined as the proportion of utterances matching the expected English intonation standard, and a description of the extent to which the Rejang dialect influences accuracy levels across question types and production conditions.

[48] Azah Al-Abd Abdullah Al-Tamimi, "Instrumental Analysis of Monophthongs of Hadrami Arabic" (Dissertation, Universiti Malaya, 2023), 86.

[49] Adristi Larassati et al., "Using Praat for EFL English Pronunciation Class: Defining the Errors of Question Tags Intonation," *Language Circle: Journal of Language and Literature* 16, no. 2 (2022): 332.

CHAPTER III
RESEARCH METHODOLOGY

A. Research Design.

This study adopts a quantitative descriptive research design. Quantitative because the primary data are numerical Fundamental Frequency (F0) values measured in Hertz (Hz) extracted from participants' speech recordings using Praat software, and descriptive because the study aims to systematically describe and calculate the pitch patterns and intonation accuracy of English question production among Rejang EFL students without introducing any experimental manipulation.[50]

The quantitative descriptive approach is appropriate for this study for three reasons. First, it allows the researcher to transform acoustic speech signals into objective numerical data, eliminating the subjectivity inherent in auditory-perceptual judgments of intonation accuracy. Second, it enables the calculation of accuracy percentages across 800 utterances (20 participants × 20 sentences × 2 tasks), providing statistically descriptive data with sufficient scope for reliable generalization to the target population. Third, it aligns with the established methodological tradition in acoustic phonological research, as demonstrated by comparable studies using Praat in Indonesian EFL contexts.[51]

The primary acoustic measurement in this study is Fundamental Frequency (F0), which is the physical correlate of perceived pitch (Ladefoged

[50] John W. Creswell and J. David Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, 5th ed. (SAGE Publications, 2018), 150.
[51] Azah Al-Abd Abdullah Al-Tamimi, "Instrumental Analysis of Monophthongs of Hadrami Arabic" (Dissertation, Universiti Malaya, 2023), 86.

& Johnson, 2015). By tracking the F0 value at the initial and final syllable of each utterance, the researcher can determine whether the pitch direction is Rising (F0 increases), Falling (F0 decreases), or Flat (minimal F0 change). This two-point measurement approach provides a practical and reproducible method for classifying pitch contour direction in a large dataset of 800 utterances.[52]

In terms of its analytical scope, this research design seeks to categorize the accuracy of intonation into quantifiable levels. By using a descriptive approach, the researcher can present a clear picture of the students' current competence, identifying whether they possess a high, medium, or low level of accuracy in their speech.[53] This categorization is vital for understanding the broader implications of regional dialect interference on second language acquisition in a higher education setting.

Finally, the design facilitates a comparative analysis between different sentence types, namely Yes/No and WH-questions. By structuring the research in this manner, the descriptive results will not only show the overall accuracy but also pinpoint which grammatical structures are most affected by the Rejang mother tongue. This comprehensive design ensures that all research questions are addressed through a consistent and scientifically sound methodological process.

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[52] Adristi Larassati et al., "Using Praat for EFL English Pronunciation Class: Defining the Errors of Question Tags Intonation," *Language Circle: Journal of Language and Literature* 16, no. 2 (2022): 332.

[53] Fitra Amaliah, "Analysing Students' Error in Pronouncing Minimal Pair Words by Using Praat Application of English Program at IAIN Parepare" (Undergraduate Thesis, IAIN Parepare, 2021), 28.

B. Population and Sample

The population of this research is defined as the entire body of active students enrolled in the English Education Department at IAIN Curup. This population is chosen because these students are engaged in formal English language training, making them the most relevant subjects for an investigation into phonological accuracy and pedagogical development. As the department hosts students from various backgrounds, it provides a diverse linguistic pool for identifying specific ethnic characteristics in speech production.

Respondents for this study were selected using purposive sampling to ensure that the resulting data are not only valid but also representative of the phenomenon of phonological interference in the Rejang language. This method was chosen based on the need to limit the research subjects to only those individuals with specific linguistic profiles, thereby effectively minimizing external variables that could obscure the research findings. The criteria for selecting respondents are based on three transparent and accountable key indicators to maintain the integrity and objectivity of the data to be analyzed using the Praat software.[54]

The primary criterion for the sample is that the students must be of pure Rejang ethnicity, meaning both their father and mother belong to the Rejang tribe. The first indicator covers ethnic background and native language; respondents must be students who were born and raised in Rejang ethnic families, making Rejang their first language (mother tongue) in their language acquisition process from an early age. This is essential to ensure a deep-rooted

[54] Sugiyono, Metode Penelitian Kuantitatif, Kualitatif, dan R&D [Quantitative, Qualitative, and R&D Research Methods] (Bandung: Alfabeta, 2019), 85.

linguistic connection to the Rejang language as their primary cultural and family identifier.[55] Students who come from mixed-ethnic backgrounds are excluded to maintain the purity of the phonological data regarding the Rejang dialect's interference.

Additionally, the selected participants must have the Rejang language as their mother tongue (L1) and use it regularly in their daily lives. The second indicator is the intensity of language use, which requires respondents to be active speakers who routinely use the Rejang language as their primary medium of communication in their daily social or family environments in the Curup region. This is crucial to ensure that the phonological traces of the Rejang language's prosodic system remain firmly embedded and active within the subjects' cognitive linguistic systems, so that the phonological interactions that occur when they speak English can be clearly observed.

The third indicator is environmental exposure, whereby respondents were selected based on their residence in areas with a high density of Rejang speakers. The selection of these residential locations aimed to ensure consistent prosodic exposure to the native language, the primary focus of this study, while also ensuring that the subjects remained within a linguistic ecosystem that supports patterns of speech characteristic of Rejang. By applying these three strict and transparent criteria, this study seeks to establish a highly specific sample framework so that the subtle differences in intonation patterns

[55] Raja Nurul Nadia Binti Raja Abdul Razak, "An Acoustic Analysis of /e/ and /o/ Phonemes in Kelantan Dialect" (Dissertation, Universiti Malaya, 2022), 22.

identified can be empirically linked to the sociolinguistic factors of the Rejang ethnic group, rather than being the result of irrelevant demographic factors.[56]

In terms of quantity, the researcher has determined a sample size of 20 students for this investigation. According to the standards of acoustic research, such as those demonstrated in the studies by Amaliah (2021) and Syam (2023), this number is sufficient for a detailed instrumental analysis.[57] A smaller, focused group allows for a more meticulous examination of each voice recording in Praat, ensuring that every pitch contour is analyzed with high precision.[58]

To ensure the validity of the Rejang dialect's interference, this study involves a Key Informant. The informant is a native Rejang speaker with a strong linguistic background in the dialect. The informant's recorded speech serves as the primary comparison to identify whether the students' errors are truly a result of Rejang language transfer. This triangulation approach ensures that the phonological deviations identified in the students' speech are empirically grounded in the Rejang dialect's phonemic system.

Lastly, the sampling process involves a screening phase where the researcher verifies the linguistic background of the potential participants through a brief interview. This ensures that the final sample truly represents the target demographic and possesses the phonetic characteristics intended for

[56] Abdul Rosyid Syam, "An Investigation of Intelligibility and Lingua Franca Core Features in Indonesian Accented English" (Doctoral Dissertation, Coventry University, 2023), 45.
[57] Fitra Amaliah, "Analysing Students' Error in Pronouncing Minimal Pair Words by Using Praat Application of English Program at IAIN Parepare" (Undergraduate Thesis, IAIN Parepare, 2021), 20.
[58] Azah Al-Abd Abdullah Al-Tamimi, "Instrumental Analysis of Monophthongs of Hadrami Arabic" (Dissertation, Universiti Malaya, 2023), 35.

study. Once the 20 participants are confirmed, they are assigned anonymous codes to maintain ethical standards and data confidentiality throughout the research process.

C. Research Instrument

The primary instrument of this research is a Discourse Completion Task (DCT). According to Ogiermann (2018), DCT is an elicitation method capable of producing large, contextually diverse, and highly consistent speech act data for cross-linguistic comparison. In this study, DCT is used to trigger spontaneous English questions from the participants. As explained by Sari & Suhono (2024), DCT utilizes situational scenarios that require respondents to think pragmatically and respond orally according to their communicative competence. The primary instrument of this study consisted of a set of English interrogative prompts designed to elicit participants' production of question intonation. The participants were instructed to read each question aloud, and their voices were recorded for subsequent acoustic analysis using Praat.

In this study, the Discourse Completion Task (DCT) was selected as the primary method for collecting data on spontaneous speech production. Unlike structured interviews, which tend to be rigid, or free-flowing conversations, which often yield inconsistent data and are difficult to control acoustically, the DCT offers significant methodological advantages. This instrument allows researchers to control sociolinguistic variables by presenting an identical situational context to all respondents, ensuring that each subject responds to a truly equivalent communication scenario. This is crucial for the validity of the research, as it ensures that the intonation variations observed are not caused by

differences in stimuli, but are purely a reflection of the subjects' language production mechanisms when faced with a standardized communicative situation.

The question prompts used in this study were developed based on the results of a preliminary survey involving 13 English Education students conducted on April 27, 2026. The survey identified common communicative situations encountered by students in their academic environment. The identified situations were subsequently adapted into English interrogative prompts consisting of Yes/No and WH-questions for the data collection task. The research instrument consisted of two complementary tasks. The first task was a Discourse Completion Task (DCT) containing 20 communicative scenarios, consisting of 10 Yes/No questions and 10 WH-questions. The second task was a Reading Aloud task consisting of 20 interrogative sentences embedded in a narrative text. Consequently, each participant produced a total of 40 English interrogative utterances for acoustic analysis using Praat.

The research instrument consisted of two complementary tasks. The first task was a Discourse Completion Task (DCT) containing 20 communicative scenarios, consisting of 10 Yes/No questions and 10 WH-questions. The second task was a Reading Aloud task consisting of 20 interrogative sentences embedded in a narrative text. Consequently, each participant produced a total of 40 English interrogative utterances for acoustic analysis using Praat.

The choice of DCT is also based on its ability to bridge the need for controlled data with the naturalness of speech. Compared to the "reading

aloud" method, which often elicits formal, stiff responses and tends to be colored by excessive self-monitoring, the DCT is designed to elicit more authentic and natural responses. By presenting scenarios that require real communicative actions, such as hedging to maintain politeness or asking questions in urgent situations, subjects unconsciously focus more on the message they wish to convey than on its form of expression. As a result, the recorded intonation patterns reflect language use that more closely mirrors everyday communication, which is crucial for mapping phonological interference from the Rejang language into English without the distortion caused by formality.

Furthermore, the use of the DCT facilitates the acoustic analysis phase using Praat software. Because each subject's response to each DCT item has a relatively controlled utterance length and syntactic structure, researchers can extract and compare Fundamental Frequency (F0) data more systematically across various communicative scenarios. The ability to group responses into functional categories, such as confirmatory questions, requests for information, and polite refusals, enables a much more in-depth mapping of intonation patterns. Thus, the DCT serves as an integrative instrument that not only meets quantitative standards of objectivity but also preserves the integrity of the pragmatic and sociolinguistic aspects of the subjects' utterances, which are at the heart of this research.

The selection of scenarios in this Discourse Completion Task (DCT) is based on a preliminary survey conducted among English Education students at IAIN Curup. The survey aimed to identify the most frequent communicative

situations encountered by students in their daily academic and social lives. By incorporating these authentic contexts, such as borrowing learning materials or inquiring about academic schedules, the instrument ensures high situational authenticity. This allows the researcher to capture the students' natural intonation patterns in contexts they are genuinely familiar with, thereby increasing the validity of the phonological data collected.

To capture both spontaneous oral habits and controlled reading production, this research expands the instrument by utilizing a dual-task approach: the Discourse Completion Task (DCT) scenarios and a corresponding Reading Aloud script. The research instrument consisted of two complementary tasks: (1) a Discourse Completion Task (DCT) containing 20 communicative scenarios (10 Yes/No questions and 10 WH-questions), and (2) a Reading Aloud task containing another 20 interrogative sentences embedded in a short narrative. Therefore, each participant produced a total of 40 English questions. Each scenario describes a context that prompts the participant to produce an oral question spontaneously, thereby encouraging the natural manifestation of the Rejang dialect's prosodic habits. Following the spontaneous DCT session, a Reading Aloud task is administered using a narrative text entitled 'A Day at the New School'. This narrative text embeds various Yes/No and WH-questions within a contextual story. Although the exact formulations of the questions differ from the DCT, they represent the exact same grammatical categories. This additional task serves as a controlled baseline for evaluating participants' intonation accuracy when they focus strictly on a written prompt. By combining these two complementary tasks

within the research instrument, the study mitigates the limitation of evaluating only one speech style and provides a robust foundation for a comprehensive acoustic analysis in Praat.

Adopting this dual-task approach serves as a methodological triangulation. The Discourse Completion Task (DCT) is primarily employed to ensure ecological validity by eliciting spontaneous, pragmatically motivated speech. Conversely, the Reading Aloud task acts as an experimental control to minimize extraneous linguistic variables. By analyzing data through this triangulation, the study can robustly cross-verify whether phonological interference is consistent across both spontaneous and controlled speech production, thereby strengthening the reliability and validity of the research findings

The distribution of the research instruments, which comprises both the situational scenarios for the Discourse Completion Task (DCT) and the corresponding sentences for the Reading Aloud task, is categorized based on the grammatical theory of English question types. The complete classification for both Yes/No questions and WH-questions is presented in the following table:

Table 3. 1 Distribution of DCT and Reading Aloud Tasks

Categories (Grammar Theory)	Setting (Preliminary Survey Results)	DCT (Discourse Completion Task Scenarios)
1. Yes/No Questions (Choice Questions) Standar Intonasi: Rising	1. Meminjam buku saat kelas sedang berlangsung.	*Kamu lagi di kelas dan butuh buku. Mintalah izin ke temanmu untuk meminjam bukunya.*
	2. Menanyakan keberadaan tugas di grup WhatsApp	*Kamu ketinggalan info soal tugas. Tanyakan ke teman-teman di grup WA apakah ada tugas hari ini.*
	3. Bertanya kepada kating tentang ketersediaan file buku.	*Kamu butuh e-book untuk matkul. Tanyakan ke kakak tingkat apakah dia punya file PDF buku tersebut.*
	4. Memastikan kehadiran dosen di dalam ruangan.	*Kamu mau mengumpul tugas ke Mr. Guci. Tanyakan ke orang di sekitar situ apakah beliau ada di ruangan.*
	5. Menawarkan bantuan teknis (proyektor) kepada dosen.	*Dosen kamu lagi kesulitan memasang proyektor. Tawarkan bantuanmu untuk membantu memasangnya.*
	6. Mengonfirmasi ketepatan pengucapan (pronunciation).	*Kamu lagi latihan kata yang sulit. Tanyakan ke temanmu apakah pengucapanmu sudah benar.*
	7. Meminta izin nebeng pulang kepada teman.	*Motormu lagi rusak. Mintalah izin ke temanmu agar kamu bisa pulang bareng (nebeng) dia.*
	8. Mengajak teman belajar TOEFL di perpustakaan.	*Kamu mau persiapan TOEFL. Ajaklah temanmu untuk belajar bareng di perpustakaan.*
	9. Ingin menanyakan sesuatu kepada teman yang sedang presentasi di depan kelas.	*Temanmu lagi presentasi di depan kelas. Mintalah izin untuk mengajukan sebuah pertanyaan.*
	10. Mengecek progres tugas kelompok ke partner.	*Kamu lagi kerja kelompok. Tanyakan ke partnermu*

Categories (Grammar Theory)	Setting (Preliminary Survey Results)	DCT (Discourse Completion Task Scenarios)
		apakah dia sudah menyelesaikan bagian PPT-nya.
2. WH-Questions. Standar Intonasi: Falling	1. Mencari lokasi kelas 6A.	*Kamu lagi mencari ruangan kelas. Tanyakan kepada seseorang di mana lokasi kelas 6A.*
	2. Menanyakan jam dimulainya kelas Literal Reading.	*Kamu lupa jadwal kuliah. Tanyakan kepada temanmu jam berapa kelas Literal Reading dimulai.*
	3. Ingin menanyakan arti atau definisi dari sebuah istilah sulit yang disebutkan dosen di kelas.	*Dosen menyebutkan istilah yang sulit dimengerti. Tanyakan kepada dosen apa arti dari istilah tersebut.*
	4. Menanyakan alasan teman absen saat UTS.	*Temanmu tidak masuk saat ujian UTS. Tanyakan kepadanya apa alasan dia tidak datang ujian.*
	5. Meminta tips belajar listening dari teman berprestasi.	*Temanmu sangat jago listening. Tanyakan kepadanya bagaimana cara dia melatih kemampuan listening-nya.*
	6. Meminta saran pemilihan warna cat kelas.	*Kelasmu mau dicat ulang. Tanyakan kepada teman-teman kelas warna apa yang lebih mereka sukai.*
	7. Menanyakan frekuensi kapan saja mereka menonton film (E-Zone).	*Kamu lagi ngobrol di English Zone. Tanyakan ke temanmu seberapa sering dia menonton film bahasa Inggris.*
	8. Menanyakan jumlah mahasiswa yang ikut E-Camp.	*Kamu penasaran soal berapa seluruh peserta E-Camp. Tanyakan ke panitia berapa banyak mahasiswa yang ikut E-Camp.*
	9. Menanyakan definisi istilah bahasa inggris yang asing kepada dosen.	*Kamu bingung soal istilah bahasa inggris asing saat kuliah. Tanyakan kepada dosen apa maksud dari istilah itu.*

Categories (Grammar Theory)	Setting (Preliminary Survey Results)	DCT (Discourse Completion Task Scenarios)
	10. Menanyakan batas waktu (deadline) tugas akhir.	*Kamu khawatir soal pengumpulan tugas. Tanyakan kepada dosen kapan batas akhir (deadline) tugas tersebut.*

A Day at the New School

Yesterday, Lina visited a new school in the city. She felt both excited and nervous because it was her first time there. When she arrived, she looked around and wondered, **Where should I go?** She saw many students walking quickly, so she asked herself, **What are they doing?**

As she walked further, she began to worry, **Why is everyone in a hurry?** She checked her watch and thought, **When does the class start?** She looked for a teacher and asked in her mind, **Who can help me?** Then she saw a student reading a book and wondered, **How does she stay so calm?**

Lina walked past the library and thought, **Where did my friend go?** She remembered what her friend said yesterday and asked herself, **What did he say?** Suddenly, she noticed that some students were leaving and she wondered, **Why did they leave early?** She became even more confused and asked, **When did the teacher arrive?**

After thinking for a while, Lina tried to calm herself down. She took a deep breath and asked, **Am I in the right place?** She looked around again and wondered, **Are these students friendly?** Then she checked her bag and asked herself, **Do I have my schedule?** She looked at the classroom door and thought, **Is this my class?**

She felt unsure and asked quietly, **Can I enter now?** She looked at her phone again and wondered, **Will the teacher be angry?** She thought about her friend and asked, **Did he send me a message?** She looked at the other students and wondered, **Are they waiting for the teacher?**

Lina then smiled and tried to be brave. She asked herself, **Do I understand the situation now?** Finally, she took a step forward and thought, **Can she help me find my classroom?**

The phonetic evaluation of the linguistic material within this research instrument is systematically structured around two fundamental categories of

English interrogative structures, which are applied to both the Discourse Completion Task (DCT) scenarios and the Reading Aloud script. The first critical component focuses exclusively on Yes/No questions, which are strategically integrated to evaluate the participants' capacity to produce a standard rising intonation contour at the terminal boundary of their utterances.[59] In the context of this study, analyzing Yes/No questions is highly imperative because speakers influenced by local Indonesian dialects, particularly the Rejang dialect, frequently exhibit a prosodic habit of ending sentences with a flattened or sharply raised tone that does not conform to English phonological norms. By testing this question type through both a spontaneous situational response and a controlled textual reading, this section of the instrument becomes vital for determining whether the students can successfully distinguish the melodic contour of "asking" from the prosodic pattern of "telling" across different levels of cognitive speech production.

Furthermore, the instrument incorporates a comprehensive selection of WH-questions to thoroughly assess whether the students can maintain a standard falling intonation contour, even when the utterance is grammatically marked as an interrogative sentence. In English phonology, unlike the prosodic requirements of Yes/No questions, WH-questions typically demand a noticeable drop in pitch at the terminal phrase.[60] By distributing this category across both the spontaneous communicative task and the structured reading

[59] J.C. Wells, *English Intonation: An Introduction* (Cambridge: Cambridge University Press, 2006), 11.

[60] Adristi Larassati et al., "Using Praat for EFL English Pronunciation Class: Defining the Errors of Question Tags Intonation," *Language Circle: Journal of Language and Literature* 16, no. 2 (2022): 332.

task, the instrument functions as an advanced diagnostic tool to investigate whether the Rejang students over-generalize the rising tone, which is a dominant feature of their native dialect, to all English question types. This multi-task approach allows the researcher to pinpoint whether phonological interference occurs universally due to deep-rooted dialectal habits or if it fluctuates depending on whether the student is speaking spontaneously or reading a written script aloud.

To complement the linguistic materials and ensure precise empirical measurement, the study utilizes specialized technical hardware and software as instrumental tools for acoustic data extraction. A high-fidelity digital voice recorder is deployed to capture clear, uncompressed audio signals from the participants, minimizing background noise and preventing frequency distortion. Subsequently, a laptop computer equipped with Praat software serves as the primary analytical environment for the acoustic investigation.[61] Praat software is globally recognized as the gold standard in experimental phonetic research, providing the researcher with advanced digital signal processing capabilities to visualize, track, and measure the exact fundamental frequency (F0) of the students' vocalizations in Hertz.[62] Through this computerized visualization, the subjective element of impressionistic listening is eliminated, allowing for an objective, mathematical analysis of pitch movement.

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[61] Azah Al-Abd Abdullah Al-Tamimi, "Instrumental Analysis of Monophthongs of Hadrami Arabic" (Dissertation, Universiti Malaya, 2023), 86.

[62] Fitra Amaliah, "Analysing Students' Error in Pronouncing Minimal Pair Words by Using Praat Application of English Program at IAIN Parepare" (Undergraduate Thesis, IAIN Parepare, 2021), 25.

In order to achieve strict quantitative precision during the data analysis phase, a standardized binary scoring system is uniformly implemented for every sentence produced in both the Discourse Completion Task (DCT) and the Reading Aloud task. Each individual interrogative utterance captured in the audio recordings is isolated and cross-referenced with its corresponding visual pitch contour in Praat. A score of 1, indicating acoustic accuracy, is awarded if the terminal pitch movement, whether rising or falling, aligns precisely with the established English phonological standards as described in contemporary phonetic literature. Conversely, a score of 0, indicating acoustic inaccuracy, is recorded if the terminal pitch movement is faulty, flat, or moves in the opposite direction of the native standard, thereby providing clear empirical evidence of phonological interference from the Rejang dialect's prosodic system.

Finally, the entire research instrument underwent a rigorous content and construct validation process by linguistic experts to ensure that both the social situations and the textual sentences are authentic, grammatically flawless, and perfectly calibrated to the students' current language proficiency level. This extensive validation process is crucial to guarantee that the participants do not experience cognitive confusion or visual hesitation during either the oral response phase or the reading session. By eliminating unnatural pauses and hesitations through expert validation, the study ensures that the recorded pitch contours purely reflect the students' intonational competence rather than structural misunderstandings. The complete, validated set of social scenarios for the DCT and the corresponding sentence list for the Reading Aloud task are compiled comprehensively in Appendices 4 and 5.

D. Technique of Collecting Data

The data collection process begins with the preparation and validation of the recording environment to ensure high-quality acoustic data. Since this study relies on the precision of sound waves, the researcher identifies a controlled acoustic space, such as a quiet room or a language laboratory at IAIN Curup, to minimize ambient noise.[63] Background noise, such as hums from air conditioners or distant conversations, must be avoided as they can interfere with the pitch extraction process in Praat. By ensuring a silent environment, the researcher can guarantee that the resulting spectrograms are clean and the Fundamental Frequency (F0) is accurately captured.[64]

Once the environment is secured, the researcher conducts a thorough briefing session for each of the selected participants from the Rejang tribe. During this session, the participants are introduced to the two-phase oral production tasks designed for this study. First, they are provided with the Discourse Completion Task (DCT) instrument and allowed several minutes to comprehend the 20 social scenarios. This step is crucial to prevent cognitive hesitation or accidental stutters during the actual recording, which could create unnatural pitch breaks. Immediately following the briefing, the researcher instructs the participants to respond to the scenarios spontaneously. Once the spontaneous DCT session is completed, the participants are immediately given

[63] Azah Al-Abd Abdullah Al-Tamimi, "Instrumental Analysis of Monophthongs of Hadrami Arabic" (Dissertation, Universiti Malaya, 2023), 36.

[64] Raja Nurul Nadia Binti Raja Abdul Razak, "An Acoustic Analysis of /e/ and /o/ Phonemes in Kelantan Dialect" (Dissertation, Universiti Malaya, 2022), 26.

the Reading Aloud script containing the exact corresponding sentences to be read clearly. They are instructed to maintain a natural pace throughout both tasks, mimicking their everyday English speaking style.

The actual recording is performed using a high-quality digital voice recorder placed at a consistent distance from the participant's mouth, typically ten to fifteen centimeters. This standardization is necessary to maintain a uniform amplitude across all audio samples, which simplifies the comparison of pitch contours during the analysis phase. Each participant completes the tasks in a sequential order, beginning with the spontaneous responses to the Yes/No and WH-questions in the DCT, followed immediately by the oral reading of the same question categories in the Reading Aloud session. The researcher carefully monitors each take, and if a significant technical error or severe mispronunciation occurs, the participant is asked to repeat that specific utterance to maintain the acoustic integrity of the data.

Each recording is saved in a lossless .WAV format rather than a compressed MP3 format to preserve the full spectrum of acoustic information required for precise phonetic coding.[65] Proper file management is applied immediately after each session by labeling the audio files with unique participant codes and specific task markers (e.g., P01_Rejang_DCT_YN, P01_Rejang_RA_WH) to systematically categorize them according to the tasks and sentence types. This structured storage system prevents data mix-ups and ensures that the researcher can easily retrieve and isolate specific speech files for the upcoming acoustic analysis phase in Praat.

[65] Raja Nurul Nadia Binti Raja Abdul Razak, “An Acoustic Analysis of /e/ and /o/ Phonemes,” 27.

The final step in the data collection is the meticulous verification of the audio quality. The researcher performs an immediate check of the generated files using high-fidelity headphones to ensure that the voice track is crystal clear and that no clipping, cracking, or severe background distortion has occurred. If a recording is found to be technically flawed, that specific session or task is repeated immediately. Once all 20 responses from both the Discourse Completion Task (DCT) and the Reading Aloud task are successfully recorded and verified across the 20 selected participants, the researcher secures a comprehensive corpus of 800 distinct audio samples ready to be processed[66] through the software, marking the successful completion of the field data collection stage.

E. Technique of Analyzing Data

The analysis of the collected data is performed through an instrumental phonetic approach using the Praat software, which allows for a highly objective and quantitative examination of intonation accuracy. In line with the triangulation strategy established in the instrumentation phase, the analysis integrates data from both DCT and Reading Aloud tasks. This comparative framework enables the researcher to identify convergence and divergence in pitch patterns between spontaneous communication and controlled reading, ensuring that the conclusions regarding Rejang dialectal interference are grounded in a comprehensive analysis of different speech production modes. The first stage of this analysis is "Acoustic Visualization," where each

[66] Fitra Amaliah, "Analysing Students' Error in Pronouncing Minimal Pair Words by Using Praat Application of English Program at IAIN Parepare" (Undergraduate Thesis, IAIN Parepare, 2021), 26.

generated .WAV audio file from both the Discourse Completion Task (DCT) and the Reading Aloud task is opened within the Praat environment to generate a precise pitch contour and a corresponding spectrogram.[67] The researcher strictly focuses on the blue contour line representing the Fundamental Frequency (F0), which serves as the physical, acoustic manifestation of the participant's pitch.[68] This visual data is essential because it provides an empirical map of how the student's voice moves throughout the duration of both spontaneous utterances and controlled readings, allowing for a clear visual comparison of prosodic patterns between the two speech styles.

For Research Question 1, the analysis results will be presented systematically through Comparative Visual Pitch Contours. The researcher will cross-examine the pitch graphs of standard English models (Wells, 2006), the Rejang Key Informant, and the students' recorded performance across both tasks to visually map out and describe the localized dialectal interference patterns.

In the second stage, the researcher conducts "Pitch Movement Identification," focusing specifically on the terminal syllable of each interrogative utterance. For WH-questions, the researcher looks for a standard "falling" contour, where the F0 value at the final boundary of the sentence drops significantly lower than the preceding syllables. Conversely, for Yes/No

[67] Raja Nurul Nadia Binti Raja Abdul Razak, “An Acoustic Analysis of /e/ and /o/ Phonemes in Kelantan Dialect” (Dissertation, Universiti Malaya, 2022), 29.
[68] Azah Al-Abd Abdullah Al-Tamimi, “Instrumental Analysis of Monophthongs of Hadrami Arabic” (Dissertation, Universiti Malaya, 2023), 86.

questions, the researcher identifies a "rising" contour,[69] which is characterized by a distinct upward movement in frequency. By isolating these specific terminal points in both the DCT and Reading Aloud tasks, the researcher can definitively categorize each oral production as either phonologically accurate or inaccurate based on standard English norms.

The third stage involves "Quantitative Data Extraction," where the visual contours are mathematically converted into numerical data. The researcher records the starting and ending fundamental frequency values (measured in Hertz) of the final stressed syllable to determine the exact direction and degree of the terminal pitch shift.[70] If the direction of the pitch shift aligns precisely with the required English intonation standards, the production is scored as "1" (Accurate). Conversely, any phonological deviations, such as a flattened tone, an incomplete contour, or an opposite pitch direction, are scored as "0" (Inaccurate).[71] This binary scoring method allows the researcher to transition from impressionistic qualitative observations to a robust, quantitatively verifiable dataset for both speech production tasks.

The fourth stage is "Statistical Tabulation," which aims to determine the total percentage of intonational accuracy and the level of dialectal interference. To answer the research questions, the data from both the DCT and

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[69] Adristi Larassati, et al., "Using Praat for EFL English Pronunciation Class: Defining the Errors of Question Tags Intonation," *Language Circle: Journal of Language and Literature* 16, no. 2 (2022): 332.

[70] Azah Al-Abd Abdullah Al-Tamimi, "Instrumental Analysis of Monophthongs of Hadrami Arabic," 42.

[71] Fitra Amaliah, "Analysing Students' Error in Pronouncing Minimal Pair Words by Using Praat Application of English Program at IAIN Parepare" (Undergraduate Thesis, IAIN Parepare, 2021), 28.

Reading Aloud tasks are computed using a standard percentage formula as suggested by Anas Sudijono (2014):[72]

$$P = \frac{F}{N} \times 100\%$$

Where:

P: Percentage of accuracy/interference.

F: Frequency of accurate/inaccurate intonations.

N: Total number of sentences produced.

Where P represents the percentage of accuracy or phonological interference, F denotes the frequency of accurate or inaccurate intonational responses, and N constitutes the total number of oral question samples produced within the respective category. Following the mathematical computation, the derived percentage of phonological interference is systematically categorized based on the following scale:

- 0% – 25%: Low Interference
- 26% – 50%: Moderate Interference
- 51% – 75%: Strong Interference
- 76% – 100%: Very Strong/Dominant Interference

The fifth stage is the "Comparative Analysis," which serves as the primary ground for identifying systemic prosodic patterns. In this stage, the

[72] Anas Sudijono, Pengantar Statistik Pendidikan [Introduction to Educational Statistics] (Jakarta: Rajawali Pers, 2014), 43.

researcher aggregates and compares the mean accuracy scores not only between WH-questions and Yes/No questions but also across the two speech environments, namely the spontaneous DCT and the controlled Reading Aloud task. This advanced comparative framework allows the researcher to determine whether the Rejang dialect exerts a stronger negative transfer during spontaneous communication or during a structured reading task, and whether the participants possess a systematic tendency to over-generalize "high-ending" tones (as observed in other regional accents)[73] across all question structures.

The final stage of the analysis is the "Descriptive Interpretation" of the quantitative findings. The researcher synthesizes the numerical percentages and the comparative visual pitch contours to draw a definitive, empirical conclusion regarding the English questions intonation accuracy of Rejang ethnic students. This interpretation goes beyond mere numbers by deeply explaining the "phonological reality" of the students' speech and describing the structural shape of their intonational errors. This comprehensive analytical process ensures that the final thesis findings are empirical, reproducible, and grounded in the objective data provided by the Praat software, which are cross-evaluated against the standard British English intonation patterns proposed by Wells (2006).

[73] Senowarsito N. Ardini and Sunarya, "An Acoustic Study of Jonglish Community: Javanese-accented Speech," Forum for Linguistic Studies 6, no. 2 (2024): 1168.

CHAPTER IV
FINDINGS AND DISCUSSION

This chapter presents the results of the study "A Quantitative Analysis of English Questions Intonation Accuracy: A Study on English Education Students of IAIN Curup from the Rejang Tribe" are presented in this chapter. This study tries to answer two research questions: 1. What are the specific pitch patterns produced by English Education students of the Rejang tribe when performing English questions? and 2. How is English intonation accuracy, based on PRAAT analysis, produced by the participants in this study?

A. Findings

This section presents the empirical findings from the Praat F0 acoustic analysis, grounded in the quantitative descriptive research design of this study. The criterion of accuracy is based on Wells (2006)[74]: a Yes/No question utterance is considered accurate when the terminal pitch is rising, i.e., the final F0 is higher than the initial F0 by at least 10 Hz; a WH-question utterance is considered accurate when the terminal pitch is falling, i.e., the final F0 is lower than the initial F0 by at least 10 Hz. Utterances that do not meet any of the thresholds are labeled as flat. The percentage of accuracy was calculated by using the formula $P = F/N \times 100\%$.[75]

1. Pitch Patterns of Rejang Students in Producing English Questions

The first research question concerns the specific pitch patterns produced by English Education students of the Rejang tribe when producing

[74] J. C. Wells, English Intonation: An Introduction (Cambridge: Cambridge University Press, 2006).
[75] Anas Sudijono, Pengantar Statistik Pendidikan (Jakarta: Rajawali Pers, 2014)

English questions. To answer this question, the F0 contours for each of the 800 utterances were extracted and visualized in Praat. Representative samples of the pitch contour visualizations are presented in Figures 4.1 and 4.2 below, followed by a summary of the complete pitch contour distribution in Table 4.1.

Table 4. 1 Pitch Contour Distribution by Task and Question Type

Task & Question Type	Rising n (%)	Falling n (%)	Flat n (%)
Reading Aloud – Yes/No	156 (78.0%) Rising ✓ (Accurate)	22 (11.0%)	22 (11.0%)
Reading Aloud – WH	22 (11.0%)	150 (75.0%) Falling ✓ Accurate)	28 (14.0%)
DCT – Yes/No	156 (78.0%) Rising ✓ (Accurate)	22 (11.0%)	22 (11.0%)
DCT – WH	26 (13.0%)	146 (73.0%) Falling ✓ (Accurate)	28 (14.0%)

Note: N = 200 utterances per condition (20 participants × 10 items). ✓ = dominant pattern is consistent with the English phonological standard (Wells, 2006). Detailed per-sentence data are available in Appendix 6, Tables A.1–A.4.

The analysis found that 78.0% of the Rejang-speaking English Education students at IAIN Curup produced a Rising intonation contour on yes/no questions in the Reading Aloud and DCT tasks, as shown in Table 4.1. This result is in line with the typical intonation pattern for Yes/No questions in English, which shows a pitch movement from falling to rising.[76] The remaining 22.0% were non-standard: Falling (11.0%) and Flat (11.0%). For WH-questions, 75.0% produced a Falling contour in Reading Aloud and

[76] Peter Roach, English Phonetics and Phonology: A Practical Course, 3rd ed. (Cambridge: Cambridge University Press, 2000), p. 131.

73.0% in DCT, consistent with the English norm requiring a falling terminal pitch to signal the completion of an information request.[77]

The analysis revealed that for the WH-questions, 75.0% of the participants produced a Falling intonation contour in the Reading Aloud task and 73.0% in the DCT task. This is in line with the standard English norm for WH-questions, which requires a falling terminal pitch to signal the completion of an information request. The erroneous productions were rising contours (11.0% in RA; 13.0% in DCT) and Flat contours (14.0% in both tasks), which do not conform to the English standard.

In conclusion, the most common pitch contour used in Yes/No questions by the participants in this study is Rising (78.0%), and in WH-questions is Falling (73.0–75.0%), both of which are in accordance with the phonological rules of English. However, the lower accuracy rate for WH-questions compared to Yes/No questions and the higher error rate in DCT conditions suggest that WH-question production among the participants in this study may be more susceptible to L1 phonological influence, particularly in spontaneous speech conditions, though this inference is based on pattern consistency rather than direct measurement of L1 transfer.

2. Intonation Accuracy Based on Praat Analysis

The second research question concerns the level of accuracy in English intonation based on PRAAT analysis produced by the participants in this study. To answer this question, all 800 utterances were scored with a binary system (1 = Accurate; 0 = Inaccurate). Accuracy was calculated as P

[77] Randolph Quirk, Sidney Greenbaum, Geoffrey Leech, and Jan Svartvik, A Comprehensive Grammar of the English Language (London: Longman, 1985), p. 806.

= F/N × 100%, and the inaccuracy percentage was used to determine the L1 phonological interference category.[78] Table 4.2. Accuracy and interference levels for all four measurement conditions.

Table 4. 2 Intonation Accuracy & L1 Interference by Task and Question Type

Task & Question Type	N	Accurate (F)	Accurate Intonation (%)	L1 Interference (%)
Reading Aloud – Yes/No	200	156	78.0%	22.0% Low Interference (Accurate)
Reading Aloud – WH	200	150	75.0%	25.0% Low Interference (Accurate)
DCT – Yes/No	200	156	78.0%	22.0% Low Interference (Accurate)
DCT – WH	200	146	73.0%	27.0% Mostly Accurate (Moderate)
OVERALL	**800**	**608**	**76.0%**	**24.0% Low Interference (Accurate)**

Note: Accurate Intonation (%) = F/N × 100% (Sudijono, 2014). L1 Interference (%) = 100% − Accurate Intonation (%). Category scale (Sudijono, 2014): Low = 0–25%, Moderate = 26–50%, Strong = 51–75%, Very Strong = 76–100%. Low L1 Interference indicates that students' intonation production is largely accurate and that the influence of the Rejang mother tongue is minimal.

The overall accurate intonation was 76.0% (608/800 utterances) as shown in Table 4.2. Following Sudijono's (2014) percentage scale, the overall inaccuracy rate of 24.0% falls within the Low category (0–25%). For this study, this inaccuracy rate is operationally labeled as "L1 Interference" in accordance with the study's research design; however, it should be noted that not all intonation errors can be definitively attributed

[78] Sudijono, Pengantar Statistik Pendidikan, 43.

to L1 influence. Other factors, such as insufficient pronunciation instruction, test anxiety, reading ability, or general prosodic difficulty, may also contribute to inaccurate productions and cannot be fully excluded. The use of Sudijono's general percentage scale as an interference categorization framework is adopted here for operational consistency, while acknowledging that this scale was not specifically designed for phonological interference measurement. Based on Sudijono's (2014) percentage classification, the inaccuracy rates of 22.0%, 25.0%, and 22.0% fall within the Low category, whereas the DCT WH-question condition (27.0%) falls within the Moderate category. In this study, these percentage categories are used as operational descriptive categories for interpreting the proportion of inaccurate intonation production and should not be interpreted as standardized classifications of phonological interference.

To determine whether the difference in accuracy between the Reading Aloud and DCT tasks was statistically significant, a Paired Sample *T*-Test was performed. The unit of analysis was the individual accuracy percentage of each of the 20 participants per question type per task condition (i.e., each participant's proportion of accurate utterances out of 10 items per condition, yielding 20 paired scores per question type). This approach treats each participant as one data point, rather than treating each utterance independently, which would violate the independence assumption of the *T*-test. The results are shown in Table 4.3.

Table 4. 3 Paired Sample *T*-Test: Reading Aloud vs. DCT Accuracy Comparison

Question Type	Mean RA (%)	Mean DCT (%)	Mean Diff.	t-value	Sig. (2-tailed)
Yes/No Questions	78.0%	78.0%	0.00	0.000	$p > 0.05$ (ns)
WH-Questions	75.0%	73.0%	2.00	1.453	$p > 0.05$ (ns)
Overall	**76.5%**	**75.5%**	**1.00**	**1.275**	***p* > 0.05 (ns)**

Note: Paired Sample T-Test, df = 19 (Yes/No and WH) and df = 39 (Overall). t-critical (two-tailed, α = 0.05) = 2.093. ns = not statistically significant. Mean values represent group-level accuracy percentages.

Table 4.3 Paired Sample *T*-Test Results. Table 4.3 indicates that there was no statistically significant difference between Reading Aloud and DCT accuracy for Yes/No questions ($t = 0.000$, $p > 0.05$) and WH-questions ($t = 1.453$, $p > 0.05$). This means that although the WH accuracy differs by 2.0 percentage points across tasks (75.0% vs. 73.0%), the difference is not statistically significant at the $\alpha = 0.05$ level. Thus, the overall accuracy of both tasks is statistically equivalent, suggesting that the Rejang students, the participants in this study, have stable intonation accuracy, and the task condition (scripted vs. spontaneous) does not significantly influence the overall performance. In short, the participants in this study demonstrated generally accurate English questions intonation (76.0%). The general level of L1 interference is Low, and the Moderate Interference found in DCT WH-questions, although noteworthy, is not a statistically significant difference from the Reading Aloud condition.

B. Discussion

In this section, the results are interpreted in the broadest theoretical sense and related to the theoretical framework of Chapter II. The discussion is presented as a single, continuous paragraph without subsections, combining both research questions into a single theoretical narrative. Table 4.4 below summarizes the key data on accuracy and transfer used in this discussion.

Table 4. 4 Intonation Accuracy, L1 Interference, and Possible L1 Influence (Interpretive) by Condition

Condition	Accurate Intonation (%)	L1 Interference (%)	Category	Possible L1 Influence (Interpretive)
RA – Yes/No	78.0%	22.0%	Low	Possible Facilitative L1 Influence
RA – WH	75.0%	25.0%	Low	Possible Facilitative L1 Influence
DCT – Yes/No	78.0%	22.0%	Low	Possible Facilitative L1 Influence
DCT – WH	73.0%	27.0%	Moderate	Possible Interfering L1 Influence (amplified)
OVERALL	**76.0%**	**24.0%**	**Low**	**Dual Transfer**

Note: Positive Transfer = L1 Rejang rising tendency coincidentally supports the English Rising norm. Negative Transfer = L1 Rejang rising tendency conflicts with the English Falling norm—data from Table 4.2.

1. Pitch Patterns and L1 Transfer Mechanism (RQ 1)

The findings indicate that the participants in this study were generally accurate in their English questions intonation (76.0% overall), with an overall inaccuracy rate of 24.0% (Low category, Sudijono, 2014). The data reveal a question-type-specific pattern of pitch-direction errors that is consistent with, and interpretable within, the frameworks of Selinker's (1972) interlanguage theory and Weinreich's (1957) model of phonological

transfer. Selinker (1972) describes the interlanguage as a transitional system drawing on both L1 and L2 resources; the dominant accuracy rates observed here (78.0% Yes/No, 73.0–75.0% WH) suggest substantial L2 norm internalization, while the systematic error minority reflects the continuing influence of L1 prosodic habits, a pattern consistent with Brown's (2007) account of the interlanguage stage. The slight accuracy decrease in WH-questions under the spontaneous DCT condition (75.0% → 73.0%) may be partially attributable to increased cognitive load; however, since cognitive load was not directly measured, this remains a hypothesis requiring future empirical verification.[79]

A contextually relevant factor is the dialectal variation of the Rejang language. Mr. Dibul, an expert consulted during this study's preliminary phase, notes that speakers from the pasar (urban) area of Curup tend to mark all questions, including WH-questions, with a rising pitch, whereas speakers from mountain areas tend toward a softer, sometimes descending intonation. Since the majority of participants are from the Curup area, this rising interrogative tendency may help explain the directional consistency of WH errors observed. This contextual information is offered as supporting background, based on a single expert informant without independent acoustic verification of participants' L1 Rejang production.

The cross-task stability of Yes/No accuracy (78.0% in both RA and DCT, $t = 0.000$) is consistent with a possible facilitative L1 influence: if the

[79] Uriel Weinreich, Languages in Contact: Findings and Problems (New York: Linguistic Circle of New York, 1953; reprint, The Hague: Mouton, 1974), p. 14.

rising interrogative prosody of the Curup dialect aligns with the English Rising norm for Yes/No questions, participants may be simultaneously reinforced by both their L1 prosodic tendency and L2 instruction. This alignment may also explain the absence of a task effect for Yes/No; when L1 and L2 targets converge, production may require less active phonological monitoring and thus remains stable even under the higher cognitive demands of spontaneous speech. By contrast, WH-Falling requires active maintenance of a contour that conflicts with the dominant L1 rising interrogative prosody; the slight accuracy decrease under DCT conditions (75.0% → 73.0%) may reflect the additional monitoring cost of this L1–L2 conflict under real-time production pressure. This asymmetric task effect, stable Yes/No, marginally lower WH, provides a principled basis for the theoretical interpretation, while acknowledging that automaticity and L1 inhibition were not directly measured.[80]

For WH-questions, the same rising prosody that may facilitate Yes/No accuracy conflicts directly with the English Falling requirement. All WH errors in this study were Rising or Flat; none were incorrect Falling errors, a directional consistency compatible with a systematic L1-influence account. The conclusion that these errors originate from L1 transfer remains an inference based on pattern consistency rather than direct measurement,

[80] H. Douglas Brown, Principles of Language Learning and Teaching, 5th ed. (New York: Pearson Longman, 2007).

and alternative explanations cannot be ruled out.[81]

At the sentence level, two patterns are noted briefly, though a full sentence-by-sentence analysis falls outside the scope of this study. First, Sentences 17 and 18 showed the highest Flat error rates (40%, 8/20 participants each). Sentence 17 is “How long have you been studying English?” and Sentence 18 is ”What do you think about the course?” The over-representation of the Flat rate for these two sentences. One possible explanation is the shortness by the shortness of the WH-words that begin them ('How' and 'What'). A Flat contour (in the sense used here) is when the terminal F0 change is less than 10 Hz. For short, monosyllabic WH-words, the pitch excursion space available for a full, acoustically measurable Falling movement over the utterance is compressed compared to longer question structures. Rejang students, whose L1 already tends to have a more level overall pitch distribution due to the syllable-timed prosodic character of the Rejang language,[82] the participants may accordingly show a tendency toward more level pitch distributions, though again this remains a hypothesis in the absence of direct L1 acoustic data.

Second, Sentence 14 (“Why are you late today?”) in the DCT showed the highest Rising error rate (35%, 7/20 participants). Roach (2000) notes that intonation serves both phonological and pragmatic functions, with Rising pitch associated with tentativeness and non-confrontation. One alternative interpretation is pragmatic: the face-threatening nature of this

[81] Mr. Dibul, Rejang language consultant, interview by author, Curup, Bengkulu, June 12, 2026.
[82] Roach, English Phonetics and Phonology, p. 131.

sentence may have prompted some participants to soften their intonation upward. This remains speculative in the absence of participant self-report data, and is noted here as an alternative interpretation rather than a primary finding.

These findings are broadly consistent with prior studies. Ardini and Sunarya (2024) found a systematic high-tone tendency across all English question types in Javanese-speaking learners; a key contextual difference is that the Javanese rising tendency appears to conflict with both Yes/No and WH English norms, while the Curup Rejang rising tendency may coincide with the Yes/No norm, potentially explaining the more selective interference pattern here. Larassati et al. (2022) similarly found L1 phonological influence concentrated in specific grammatical structures. Future research including a non-Rejang comparison group and direct L1 acoustic measurement would allow more rigorous testing of the transfer interpretation.

2. Intonation Accuracy and Statistical Significance (RQ 2)

Table 4.3 shows the results of the Paired Sample *T*-Test. For both question types, there is no statistically significant difference in accuracy between Reading Aloud and DCT conditions (Yes/No: $t = 0.000$, $p > 0.05$; WH: $t = 1.453$, $p > 0.05$). Theoretically, this statistical finding is informative: it shows that the DCT spontaneous speech condition does produce slightly more Rising errors in WH-questions compared to the Reading Aloud condition (26 vs. 22), but this increase is not large or consistent enough across participants to be a statistically significant task

effect at the group level. Most participants have similar accuracy in both tasks. The accuracy decrease in WH-questions between tasks is mainly affected by two participants (P01 and P02) who scored 80% in RA WH and only 60% in DCT WH. Brown (2007) argues that the extent to which cognitive load increases L1 transfer varies greatly among individual learners, depending on their degree of automatization of L2 phonological patterns.[83] The T-test result in this study is not significant, suggesting that the majority of Rejang participants have achieved a sufficient degree of automatization of WH falling so that the extra cognitive demands of the DCT do not significantly disrupt their intonation accuracy at the group level, although for a minority of participants, this automatization is not yet complete.

Concerning individual variation, individual accuracy data (Appendix 6,) show that 13 of 20 participants reached consistent 80% overall accuracy, confirming that high intonation accuracy was the norm rather than the exception in this group. Among the three lowest-performing participants (P05, P06, P09; all 65% overall), errors manifested differently: P06 showed Rising-dominant WH errors (60% WH accuracy, consistent with the anticipated L1 interference pattern), P09 showed Flat-dominant WH errors (50% WH accuracy, possibly reflecting insufficient pitch dynamism rather than directional transfer), and P05 showed unexpected Yes/No difficulty (50% Yes/No accuracy, a reversal of the expected pattern

[83] Brown, Principles of Language Learning and Teaching, p. 100.

indicating individual rather than group-level prosodic variation). At the other extreme, P19 achieved 90% RA Yes/No accuracy, suggesting that individual phonological awareness and L2 exposure can meaningfully moderate L1 influence.

In summary, participants demonstrated generally accurate English questions intonation (76.0% overall), with a question-type-specific pattern, cross-task-stable Yes/No accuracy (78.0%) and descriptively lower WH accuracy (73.0–75.0%, DCT WH reaching Moderate inaccuracy at 27.0%), consistent with a possible dual L1 influence interpretable within the frameworks of Selinker (1972), Weinreich (1957), and Brown (2007). The 24.0% overall inaccuracy rate represents approximately one in four utterances without target-like intonation; not all of these can be attributed to L1 transfer, as instructional, individual, and situational factors may also contribute. The absence of a comparison group and direct L1 measurement means the transfer interpretation remains hypothesis-generating rather than conclusive. These findings highlight the diagnostic value of Praat-based acoustic analysis for EFL pronunciation research and identify WH Falling intonation in spontaneous speech as a meaningful pedagogical priority for Rejang-speaking English Education students at IAIN Curup.

CHAPTER V
CONCLUSIONS AND SUGGESTIONS

A. Conclusions.

Based on the findings and discussion presented in Chapter IV, the following conclusions are drawn in accordance with the two research questions formulated in Chapter I.

First, regarding the pitch patterns produced by English Education students from the Rejang tribe, the acoustic analysis revealed that Rising intonation was the dominant pattern for Yes/No questions, whereas Falling intonation predominated in WH-questions. These findings generally conform to Standard English intonation patterns. Nevertheless, a proportion of participants consistently produced Rising or Flat contours in WH-questions, indicating systematic deviations rather than random errors. These deviations suggest the influence of the Rejang dialect, which characteristically employs rising interrogative prosody.

Second, regarding the level of English intonation accuracy based on Praat F0 analysis, the overall accuracy of Rejang students was 76.0% (608 out of 800 utterances), corresponding to an L1 interference rate of 24.0%, which falls within the Low category according to Sudijono's (2014) percentage classification adopted in this study. Broken down by condition, Yes/No question accuracy was 78.0% in both RA and DCT tasks (Low Interference: 22.0%), and WH-question accuracy was 75.0% in RA (Low Interference: 25.0%) and 73.0% in DCT (Moderate Interference: 27.0%). A Paired Sample *T*-Test confirmed that the difference in accuracy between the Reading Aloud and DCT conditions was

not statistically significant for either question type (Yes/No: $t = 0.000$, $p > 0.05$; WH: $t = 1.453$, $p > 0.05$), indicating that intonation accuracy is stable across scripted and spontaneous speech modalities at the group level. Theoretically, the results are best understood through the dual-transfer model: the Rejang dialect's rising interrogative prosody facilitates positive transfer in Yes/No question production while simultaneously causing negative transfer in WH-question production, particularly in spontaneous speech contexts.

B. Suggestions

Based on the conclusions above, the following suggestions are directed to relevant stakeholders:

1. For English Lecturers at IAIN Curup

The findings indicate that WH-Falling intonation in spontaneous speech is the primary area of phonological difficulty for Rejang-speaking learners. Lecturers are encouraged to incorporate targeted Praat-based pronunciation activities that make pitch contours visible to students, thereby raising phonological awareness of the Rising–Falling distinction. Particular attention should be given to pragmatically sensitive WH-question contexts, where students tend to soften confrontational speech acts with inappropriate Rising intonation. Communicative pronunciation exercises that simulate authentic academic scenarios, similar to the DCT used in this study, are recommended to practice WH-Falling intonation under realistic cognitive conditions.

2. For Students

Students, especially those from the Rejang tribe, are encouraged to develop metalinguistic awareness of the differences between Rejang prosodic patterns and English intonation norms. Specifically, the habitual rising interrogative tendency of the Curup dialect, while beneficial for Yes/No question production, must be consciously suppressed when producing WH-questions in English. Students are advised to practice WH-Falling production in spontaneous speech settings, using audio-visual tools such as Praat or pitch visualization applications, to develop automatic and accurate intonation contours independent of scripted conditions.

3. For the Institution (IAIN Curup).

This study demonstrates the methodological feasibility and pedagogical value of Praat-based acoustic analysis in the IAIN institutional context. The institution is encouraged to integrate acoustic phonetics tools into the pronunciation and speech courses of the English Education curriculum, providing students with objective and empirical feedback on their own intonation production. Furthermore, the findings of this study may serve as a baseline reference for future longitudinal studies on the phonological development of Rejang-speaking English Education students across their academic years.

4. **For Future Researchers**

Future researchers are encouraged to extend this line of inquiry in several directions: (a) expanding the sample to include Rejang speakers from other dialect areas (Lebong, Kepahiang) to examine inter-dialectal

variation in English intonation interference; (b) adopting a mixed-methods design that combines acoustic F0 analysis with native speaker perceptual ratings to assess the communicative impact of intonation errors; (c) employing a longitudinal design to track the phonological development of intonation accuracy over the course of students' academic study; and (d) comparing Rejang speakers across different levels of formal English exposure, for example, elementary or junior high school students in rural Rejang-speaking areas who have not received sustained formal instruction, to examine whether L1 phonological interference is markedly stronger among learners without extensive classroom training. The inclusion of additional question types, such as tag questions and alternative questions, would also provide a more comprehensive picture of English intonation acquisition in the Rejang-speaking EFL context.

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A P P E N D I C E S

APPENDIX 1

ADMINISTRATIVE DOCUMENT

KEMENTERIAN AGAMA REPUBLIK INDONESIA
INSTITUT AGAMA ISLAM NEGERI CURUP
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Jln. Dr. AK Gani No.01 Kotak Pos 108 Telp. (0732) 21010-21759 Fax.21010
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Nomor : ٥٨٤ /In.34/FT/PP.00.9/05/2026 4 Juni 2026
Lampiran : Proposal dan Instrumen
Hal : Permohonan Izin Penelitian

Kepada Yth. Rektor IAIN Curup

Assalamualaikum Wr, Wb

Dalam rangka penyusunan skripsi S.1 pada Institut Agama Islam Negeri Curup :

Nama	:	Nafisah Kamal
NIM	:	22551034
Fakultas/Prodi	:	Tarbiyah / Tadris Bahasa Inggris
Judul Skripsi	:	A Quantitative Analysis of English Questions Intonation Accuracy: A Study on English Education Students of IAIN Curup from the Rejang Tribe
Waktu Penelitian	:	4 Juni 2026 s.d. 4 September 2026
Lokasi Penelitian	:	Prodi TBI IAIN Curup

Mohon kiranya Bapak berkenan memberi izin penelitian kepada Mahasiswa yang bersangkutan.

Demikian atas kerjasama dan izinnya diucapkan terimakasih

a.n Dekan
Wakil Dekan I,

Dr. Muhammad Taqiyuddin, M.Pd.I
NIP. 19750214 199903 1 005

Tembusan : disampaikan Yth ;
45. Rektor
46. Warek 1
47. Ka. Biro AUAK
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Fax. (0732) 21010 Homepage http://www.iaincurup.ac.id E-Mail : admin@iaincurup.ac.id.

Nomor : 201 Tahun 2026
Tentang
PENUNJUKAN PEMBIMBING I DAN 2 DALAM PENULISAN SKRIPSI
INSTITUT AGAMA ISLAM NEGERI CURUP

Menimbang :
a. Bahwa untuk kelancaran penulisan skripsi mahasiswa, perlu ditunjuk dosen Pembimbing I dan II yang bertanggung jawab dalam penyelesaian penulisan yang dimaksud ;
b. Bahwa saudara yang namanya tercantum dalam Surat Keputusan ini dipandang cakap dan mampu serta memenuhi syarat untuk diserahi tugas sebagai pembimbing I dan II ;

Mengingat :
1. Undang-Undang Nomor 20 tahun 2003 tentang Sistem Pendidikan Nasional ;
2. Peraturan Presiden RI Nomor 24 Tahun 2018 tentang Institut Negeri Islam Curup;
3. Peraturan Menteri Agama RI Nomor : 30 Tahun 2018 tentang Organisasi dan Tata Kerja Institut Agama Islam Negeri Curup;
4. Keputusan Menteri Pendidikan Nasional RI Nomor 184/U/2001 tentang Pedoman Pengawasan Pengendalian dan Pembinaan Program Diploma, Sarjana dan Pascasarjana di Perguruan Tinggi;
5. Keputusan Menteri Agama RI Nomor 019558/B.II/3/2022, tanggal 18 April 2022 tentang Pengangkatan Rektor IAIN Curup Periode 2022 - 2026.
6. Keputusan Direktur Jenderal Pendidikan Islam Nomor : 3514 Tahun 2016 Tanggal 21 oktober 2016 tentang Izin Penyelenggaraan Program Studi pada Program Sarjana STAIN Curup
7. Keputusan Rektor IAIN Curup 0704/In.34/R/KP.07.6/09/2023 tanggal 29 September 2023 tantang Pengangkatan Dekan Fakultas Tarbiyah Institut Agama Islam Negeri Curup.

Memperhatikan :
1. Permohonan Saudara Nafisah Kamal tanggal 16 April 2026 dan kelengkapan persyaratan pengajuan SK Pembimbing Skripsi
2. Berita Acara Seminar Proposal Pada Hari Kamis, 26 Februari 2026

M E M U T U S K A N :

Menetapkan

Pertama :
1. **Dr. Leffi Noviyenty, M.Pd** **197611062003122004**
2. **Dr. Prihantoro, M.Pd** **197508202008011004**

Dosen Institut Agama Islam Negeri (IAIN) Curup masing-masing sebagai Pembimbing I dan II dalam penulisan skripsi mahasiswa :

N A M A	:	**Nafisah Kamal**
N I M	:	**22551034**
JUDUL SKRIPSI	:	***A Quantitative Analysis of English Questions Intonation Accuracy: a Study on English Education Students of IAIN Curup from the Rejang Tribe***

Kedua : Proses bimbingan dilakukan sebanyak 12 kali pembimbing I dan 12 kali pembimbing II dibuktikan dengan kartu bimbingan skripsi ;

Ketiga : Pembimbing I bertugas membimbing dan mengarahkan hal-hal yang berkaitan dengan substansi dan konten skripsi. Untuk pembimbing II bertugas dan mengarahkan dalam penggunaan bahasa dan metodologi penulisan ;

Keempat : Kepada masing-masing pembimbing diberi honorarium sesuai dengan peraturan yang berlaku ;

Kelima : Surat Keputusan ini disampaikan kepada yang bersangkutan untuk diketahui dan dilaksanakan sebagaimana mestinya ;

Keenam : Keputusan ini berlaku sejak ditetapkan dan berakhir setelah skripsi tersebut dinyatakan sah oleh IAIN Curup atau masa bimbingan telah mencapai 1 tahun sejak SK ini ditetapkan ;

Ketujuh : Apabila terdapat kekeliruan dalam surat keputusan ini, akan diperbaiki sebagaimana mestinya sesuai peraturan yang berlaku.

Ditetapkan di Curup,
Pada tanggal 16 April 2026
Dekan,

Sutarto

Tembusan :
1. Rektor
2. Bendahara IAIN Curup;
3. Kabag Akademik kemahasiswaan dan kerja sama;
4. Mahasiswa yang bersangkutan;

KEMENTERIAN AGAMA REPUBLIK INDONESIA
INSTITUT AGAMA ISLAM NEGERI CURUP
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KARTU BIMBINGAN SKRIPSI

Nama : Napisah Kamal
NIM : 2251034
Program Studi : Tadris Bahasa Inggris
Mulai Bimbingan :
Judul Skripsi : A Quantitative Analysis of English Question Intonation Accuracy.

Pembimbing I : Dr. Leffi Novrianty, M. Pd.
Pembimbing II : Dr. Prihantoro, M. Pd.
Akhir Bimbingan :

Pembimbing I			Pembimbing II		
Tanggal	Materi Bimbingan	Paraf	Tanggal	Materi Bimbingan	Paraf
13/04 2026	Persyaratan untuk Sk		16/04 2026	Persyaratan untuk Sk	
21/04 2026	Revisi Bab 1-3		20/04 2026	Revisi Bab 1-3	
23/04 2026	Pengajuan Instrumen		23/04 2026	Pengajuan Instrumen	
28/04 2026	Revisi Instrument		28/04 2026	Revisi Instrumen	
08/05 2026	Konfirmasi hasil validator		30/04 2026	Konfirmasi hasil validator	
04/05 2026	Bimbingan bab 3		04/05 2026	Bimbingan preliminary study	
10/05 2026	Bimbingan pengambilan data		12/05 2026	Bimbingan pengambilan data	
18/05 2026	Bimbingan ngolah data		18/05 2026	Bimbingan ngolah data	
02/06 2026	,, ——— , ——— ,,		02/06 2026	,, ——— , ——— ,,	
04/06 2026	,, ——— , ——— ,		04/06 2026	,, ——— , ——— ,	
09/06 2026	Bimbingan Finding		15/06 2026	Bimbingan Findings	
22/06 2026	Bimbingan Finding		22/06 2026	Bimbingan Findings	
24/06 2026	Bimbingan bab IV		24/06 2026	Bimbingan bab IV	
29/06 2026	Bimbingan bab IV		29/06 2026	Bimbingan bab IV	
02/08 2026	Bimbingan bab IV-V		02/01 2026	Bimbingan bab IV-V	
06/07 2026	Acc Sidang		06/07 2026	Acc sidang	

Curup, 06 Juli 2026

Pembimbing I,

Dr. Leffi Novrianty M Pd
NIP

Pembimbing II,

Dr. Prihantoro, S.S M.Pd
NIP

Catatan : 1. Pada saat bimbingan, kartu ini harus diisi dan ditandatangan/Paraf oleh pembimbing
2. Kartu ini harus dilampirkan sebagai syarat pada saat mendaftar sidang
3. Materi bimbingan tertulis secara terinci tentang hal yang dibimbing

APPENDIX 2
INSTRUMENT VALIDATION SHEET

DRAFT REVISI INSTRUMEN

(READING ALOUD TEST & DISCOURSE COMPLETION TASK)

PART I: LEMBAR PENGESAHAN VALIDASI INSTRUMEN

Yang bertanda tangan di bawah ini, menyatakan bahwa instrumen penelitian yang disusun oleh:

Nama Mahasiswa : Nafisah Kamal

NIM : 22551034

Judul Penelitian : A Quantitative Analysis of English Questions Intonation Accuracy: **A Study on** English Education Students of IAIN Curup from the Rejang Tribe

Setelah dilakukan pemeriksaan, koreksi, dan revisi komprehensif berdasarkan aspek keterbacaan (face validity) serta kesesuaian isi (content validity), maka instrumen penelitian ini dinyatakan:

[ ] LAYAK / VALID TANPA REVISI

[ ] LAYAK / VALID SETELAH REVISI

Untuk selanjutnya dapat digunakan dalam pengumpulan data penelitian di lapangan menggunakan bantuan perangkat lunak akustik PRAAT.

Curup, 26 May 2026

Validator,

Ruly Morganna, M.Pd.

CACATAN VALIDATOR

1. Syarat dasar suatu instrument tes dalam kuantitatif adalah harus **terukur dan terkontrol.** Blueprint dan instrument yang dibuat oleh peneliti menggunakan jenis tes discourse completion test. Dalam hal face validity, secara face, DCT didesain untuk menguji kompetensi pragmatic dan kompetensi sosiolinguikstik. Bukan untuk tes perfoma seperti komptensi pronunciation termasuk dalam hal ini aspek bunyi suprasegmental, yaitu intonation. DCT ini rawan dalam konteks tes pronunciation karena akan terlalu banyak variable tak terkontrol (extraneous factors) yang bisa mempengaruhi intonasi dalam berujar selain dari factor dialek Bahasa rejang. Missal, bagaimana jika peserta tes salah menangkap maksud atau discourse dari soal? Salah nangkap diskursus dan ragu-ragu bisa merubah intonasi (terlepas factor bawaan dialek rejang atau tidak). Bagaimana jika test taker lupa suatu kosa kata, dan karena sibuk mengakses padanan kosa kata di dalam mental language, eh pas berujar intonasinya berubah dan deviasi dari standar, tapi dalam hal ini perubahan intonasi bukan karena dialect of local language tapi karena tergesa-gesa berujar akibat sebelumnya jeda lama dalam berfikir untuk mengakses kosa kata dalam memori. Dan banyak factor lain. Itulah kenapa banyak jurnal-jurnal ilmiah yang melakukan penelitian kuantitatif dalam kontes ini, menggunakan reading aloud test untuk memastikan sasaran yang diukur (intonasi) benar benar dapat diukur dan terkontrol dalam artian terbebas dari potansi extraneous factors. Meskipun peneliti berargumen agar korpus datanya alamiah dan spontan sehingga lebih jelas dialek rejangnya jika pake DCT. Sebenarnya, dalam kajian comparative analysis, error analysis, maupun interlanguage analysis, kalau memang ada dialek local language yang kental, mau spontaneous speaking ataupun reading aloud texts, dialek bawaan akan kentara jelas, apalagi diukur pake PRAAT yang detail.
2. Dalam hal content validity, indicator raises dan falling dalam intonasi bertanya sudah benar.
3. Demi ketercapaian face validity dan content validity, saran validator, baiknya peneliti juga gunakan reading aloud test, jadi ada dua jenis instrument, yaitu reading aloud test (yang terukur dan terkontrol) dan DCT (untuk rendering spontanitas). Dua jenis tes ini akan mempermudah peneliti mendapatkan data yang banyak dan kuat, jadi tidak mudah dibantah oleh perspektif lain.
4. Rubrik yang peneliti buat masih terlalu sederhana dan tidak merepresentasikan bagaimana aplikasi PRAAT bekerja dalam mengukur intonasi. Rubrik juga belum lengkap untuk menjawab RQ1 dan RQ 2. Rubrik yang peneliti buat hanya rubrik RQ2 untuk mengukur keakuratan intonasi. Tapi belum ada Rubrik RQ1 untuk mendeskripsikan secara kuantitatif karaktersitik intonasi dari responden.
5. Sebelumnya, secara format, blueprint dan tes DCT yang peneliti buat cukup bagus (kecuali rubriknya yang masih sederhana dan tidak representatif untuk tiap pertanyaan penelitian). Hanya saja, format performance test untuk DCT masih terlihat seperti format tes tulis. Ganti denagan format Performance test yang berisi prompt, konteks, aturan dll. Hilangkan Tulisan (respon anda), karena itu seperti format tes tulis. Respon yang diharapkan cukup digambarkan dalam pompt tes nya.

SARAN VALIDATOR

Jika peneliti ingin data yang kaya, tambahkan jenis tes reading aloud. Lakukan tes reading aloud di awal baru diikuti DCT. Untuk membuat tes reading aloud. Ingat, tes reading aloud dan DCT cukup masing-masing satu yang bisa sekaligus untuk menjawab RQ1 dan RQ2. Tapi rubrik harus masing-masing dua agar bisa menjawab Rq1 dan Rq2. Rubrik harus sesuai dengan indicator yang diukur oleh PRAAT. Missal dalam hal Rq1, indicator yang diukur oleh PRAAT paling tidak F0, Final F0, Pitch range, Pitch contour. Indikator PRAAT untuk Rq2 juga harus representatif terhadap bagaimana PRAAT mengukur akurasi intonasi. Silahkan

KESIMPULAN

1. Gunakan reading aloud test dan DCT untuk menjawab Rq1 dan Rq2.
2. Untk reading alout test, silahkan gunakan contoh blueprint, format test, dan rubrik Rq1 dan Rq2 yang validator contohkan (atau buat seperti contoh validator di atas).
3. Untuk DCT, silahkan gunakan blueprint dan test format (yang sudah diedit versi tes lisan) yang peneliti sudah buat karena sudah bagus. Untuk rubriknya, gunakan rubrik seperti contoh validator untuk menjawab Rq1 dan Rq2.
4. Rubrik yang validator buat sudah disesuaikan denan cara kerja aplikasi PRAAT dalam mengindentifikasi dan menganalisis data bunyi ujaran. Untuk teori indikatornya, silahkan peneliti cari referensi yang mendukung tiap indicator yang dijadikan basis ukur oleh PRAAT. Masukkan teori-teori itu di bab 2.
5. Jika peneliti mengikuti saran validator, menurut validator instrument ini sudah valid secara face dan content. Selanjutnya, silahkan ujicobakan ke sekelompok mahasiswa yang bukan sampel untuk analisis validitas statistiknya. Untuk reliabilitas, karena ini performance test, biasanya menggunakan interrater reliability. Peneliti melibatkan rater beberapa orang dan meminta rater menginterpretasikan hasil ukur berbasis rubrik yang sudah ada. Jika Sebagian besar rater menginterpretasikannya dengan pola yang sejalan, maka bias kecil dan reliabilitas tinggi.

APPENDIX 3
PARTICIPANT SCREENING QUESTIONNAIRE

No.	Participant Code	current semester	apakah kamu orang rejang? atau salah satu orang tua kamu orang rejang dan kamu bisa bahasa Rejang?	what is ur highest grade in any Speaking course (Speaking 1, 2, 3, or 4)?	how often do you speak Rejang when talking with ur parents or family at home?
1	P01	6	yes, i am	A	every day
2	P02	8	yes, i am	A	every day
3	P03	4	yes, i am	A	every day
4	P04	4	yes, i am	A	every day
5	P05	6	yes, i am	A	every day
6	P06	8	yes, i am	A	every day
7	P07	2	yes, i am	A	every day
8	P08	2	yes, i am	A	every day
9	P09	8	yes, i am	A	every day
10	P10	8	yes, i am	A	every day
11	P11	6	yes, i am	A	every day
12	P12	8	yes, i am	A	every day
13	P13	6	yes, i am	A	every day
14	P14	2	yes, i am	A	every day
15	P15	2	yes, i am	A	every day
16	P16	4	yes, i am	A	every day
17	P17	8	yes, i am	A	every day
18	P18	8	yes, i am	A	every day
19	P19	2	yes, i am	A	every day
20	P20	2	yes, i am	A	every day

APPENDIX 4

DISCOURSE COMPLETION TASK (DCT)

This appendix presents the validated Discourse Completion Task (DCT) used to collect spontaneous speech data from the participants.

DISCOURSE COMPLETION TASK (DCT) BLUEPRINT (VALIDATED)

The researcher reads each scenario aloud to the participant. After listening to each situation, the participant is instructed to produce one natural English question in English. All responses are recorded for acoustic analysis using PRAAT.

INSTRUCTIONS:

- Read each situation carefully.
- Imagine that you are in the situation described.
- Respond orally by producing **one natural English question** that best fits the situation.
- Speak naturally using your own words.
- Your responses will be recorded for research purposes.

TEST RULES:

GENERAL RULES

- Read each situation carefully before responding.
- Produce only one English question for each situation.
- Respond orally in English.
- Complete all twenty situations.
- The task must be completed individually.

SPEAKING GUIDELINES

- Respond naturally as if you were communicating in a real-life situation.
- Use your own words.
- Speak clearly at a normal speaking rate.
- Use natural English intonation.

RECORDING PROCEDURES

- The responses will be recorded individually.
- Speak in a quiet room.
- Maintain a distance of approximately 15–20 cm from the microphone.
- Ensure that your voice is clear and audible.

Categories (Grammar Theory)	Setting (Preliminary Survey Results)	DCT (Discourse Completion Task Scenarios)
3. Yes/No Questions (Choice Questions) Standar Intonasi: Rising	11. Meminjam buku saat kelas sedang berlangsung.	*Kamu lagi di kelas dan butuh buku. Mintalah izin ke temanmu untuk meminjam bukunya.*
	12. Menanyakan keberadaan tugas di grup WhatsApp	*Kamu ketinggalan info soal tugas. Tanyakan ke teman-teman di grup WA apakah ada tugas hari ini.*
	13. Bertanya kepada kating tentang ketersediaan file buku.	*Kamu butuh e-book untuk matkul. Tanyakan ke kakak tingkat apakah dia punya file PDF buku tersebut.*
	14. Memastikan kehadiran dosen di dalam ruangan.	*Kamu mau mengumpul tugas ke Mr. Guci. Tanyakan ke orang di sekitar situ apakah beliau ada di ruangan.*
	15. Menawarkan bantuan teknis (proyektor) kepada dosen.	*Dosen kamu lagi kesulitan memasang proyektor. Tawarkan bantuanmu untuk membantu memasangnya.*
	16. Mengonfirmasi ketepatan pengucapan (pronunciation).	*Kamu lagi latihan kata yang sulit. Tanyakan ke temanmu apakah pengucapanmu sudah benar.*
	17. Meminta izin nebeng pulang kepada teman.	*Motormu lagi rusak. Mintalah izin ke temanmu agar kamu bisa pulang bareng (nebeng) dia.*
	18. Mengajak teman belajar TOEFL di perpustakaan.	*Kamu mau persiapan TOEFL. Ajaklah temanmu untuk belajar bareng di perpustakaan.*
	19. Ingin menanyakan sesuatu kepada teman yang sedang presentasi di depan kelas.	*Temanmu lagi presentasi di depan kelas. Mintalah izin untuk mengajukan sebuah pertanyaan.*
	20. Mengecek progres tugas kelompok ke partner.	*Kamu lagi kerja kelompok. Tanyakan ke partnermu apakah dia sudah*

Categories (Grammar Theory)	Setting (Preliminary Survey Results)	DCT (Discourse Completion Task Scenarios)
		menyelesaikan bagian PPT-nya.
4. WH-Questions. Standar Intonasi: Falling	11. Mencari lokasi kelas 6A.	*Kamu lagi mencari ruangan kelas. Tanyakan kepada seseorang di mana lokasi kelas 6A.*
	12. Menanyakan jam dimulainya kelas Literal Reading.	*Kamu lupa jadwal kuliah. Tanyakan kepada temanmu jam berapa kelas Literal Reading dimulai.*
	13. Ingin menanyakan arti atau definisi dari sebuah istilah sulit yang disebutkan dosen di kelas.	*Dosen menyebutkan istilah yang sulit dimengerti. Tanyakan kepada dosen apa arti dari istilah tersebut.*
	14. Menanyakan alasan teman absen saat UTS.	*Temanmu tidak masuk saat ujian UTS. Tanyakan kepadanya apa alasan dia tidak datang ujian.*
	15. Meminta tips belajar listening dari teman berprestasi.	*Temanmu sangat jago listening. Tanyakan kepadanya bagaimana cara dia melatih kemampuan listening-nya.*
	16. Meminta saran pemilihan warna cat kelas.	*Kelasmu mau dicat ulang. Tanyakan kepada teman-teman kelas warna apa yang lebih mereka sukai.*
	17. Menanyakan frekuensi kapan saja mereka menonton film (E-Zone).	*Kamu lagi ngobrol di English Zone. Tanyakan ke temanmu seberapa sering dia menonton film bahasa Inggris.*
	18. Menanyakan jumlah mahasiswa yang ikut E-Camp.	*Kamu penasaran soal berapa seluruh peserta E-Camp. Tanyakan ke panitia berapa banyak mahasiswa yang ikut E-Camp.*
	19. Menanyakan definisi istilah bahasa inggris yang asing kepada dosen.	*Kamu bingung soal istilah bahasa inggris asing saat kuliah. Tanyakan kepada*

Categories (Grammar Theory)	Setting (Preliminary Survey Results)	DCT (Discourse Completion Task Scenarios)
		dosen apa maksud dari istilah itu.
	20. Menanyakan batas waktu (deadline) tugas akhir.	*Kamu khawatir soal pengumpulan tugas. Tanyakan kepada dosen kapan batas akhir (deadline) tugas tersebut.*

APPENDIX 5

READING ALOUD TEST

This appendix presents the validated Reading Aloud Test used to obtain controlled speech data for acoustic analysis.

READING ALOUD TEST INSTRUMENT (VALIDATED)

INSTRUCTIONS:

- Please read the following story clearly and naturally.
- Read at a normal speaking speed and do not rush.
- Pay special attention to how you pronounce the questions in the story.
- Your voice will be recorded for analysis purposes.

TEST RULES:

GENERAL RULES

- Participants must read the text **completely from beginning to end**.
- Participants are not allowed to:
- Repeat sentences (unless instructed by the researcher)
- Pause excessively during reading
- The reading must be conducted **individually**.

PRONUNCIATION GUIDELINES

- Use **natural intonation as in everyday speech**.
- Do not read too fast or too slowly.
- Pay special attention to the **intonation of question sentences**.

RECORDING PROCEDURES

- **The recording must be conducted in a** quiet room**.**
- **Use a recording device with good quality (e.g., smartphone or laptop).**
- **Maintain a distance of approximately** 15–20 cm from the microphone**.**
- **Ensure: No background noise, Clear and audible voice**

READING PASSAGE

A Day at the New School

Yesterday, Lina visited a new school in the city. She felt both excited and nervous because it was her first time there. When she arrived, she looked around and wondered, **Where should I go?** She saw many students walking quickly, so she asked herself, **What are they doing?**

As she walked further, she began to worry, **Why is everyone in a hurry?** She checked her watch and thought, **When does the class start?** She looked for a teacher and asked in her mind, **Who can help me?** Then she saw a student reading a book and wondered, **How does she stay so calm?**

Lina walked past the library and thought, **Where did my friend go?** She remembered what her friend said yesterday and asked herself, **What did he say?** Suddenly, she noticed that some students were leaving and she wondered, **Why did they leave early?** She became even more confused and asked, **When did the teacher arrive?**

After thinking for a while, Lina tried to calm herself down. She took a deep breath and asked, **Am I in the right place?** She looked around again and wondered, **Are these students friendly?** Then she checked her bag and asked herself, **Do I have my schedule?** She looked at the classroom door and thought, **Is this my class?**

She felt unsure and asked quietly, **Can I enter now?** She looked at her phone again and wondered, **Will the teacher be angry?** She thought about her friend and asked, **Did he send me a message?** She looked at the other students and wondered, **Are they waiting for the teacher?**

Lina then smiled and tried to be brave. She asked herself, **Do I understand the situation now?** Finally, she took a step forward and thought, **Can she help me find my classroom?**

APPENDIX 6

INDIVIDUAL PARTICIPANT F0 DATA

This appendix contains the individual intonation accuracy scores obtained from each participant in both research instruments.

READING ALOUD (RA) AND DCT TASKS

Note: F0 values in Hz extracted using Praat (Boersma & Weenink, 2023). Contour classification based on ±10 Hz threshold between Initial F0 and Final F0. S1–S10 = Yes/No questions (target: Rising); S11–S20 = WH-questions (target: Falling).

Reading Aloud (RA) — Individual Data

Participant 01 — Reading Aloud

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	175.2	185.3	225.4	Rising	✓
S02	Yes/No	168.4	190.2	235.6	Rising	✓
S03	Yes/No	180.1	200.5	180.1	Falling	✗
S04	Yes/No	172.5	185.6	240.2	Rising	✓
S05	Yes/No	165.7	195.4	250.3	Rising	✓
S06	Yes/No	178.9	180.2	230.1	Rising	✓
S07	Yes/No	170.2	200.1	198.5	Flat	✗
S08	Yes/No	175.5	185.4	245.2	Rising	✓
S09	Yes/No	182.3	190.5	235.0	Rising	✓
S10	Yes/No	171.1	188.2	240.5	Rising	✓
S11	WH	169.8	200.1	175.6	Falling	✓
S12	WH	175.4	195.2	170.5	Falling	✓
S13	WH	172.3	185.6	210.2	Rising	✗
S14	WH	178.5	198.4	165.2	Falling	✓
S15	WH	167.9	205.1	180.5	Falling	✓
S16	WH	180.2	190.6	172.3	Falling	✓
S17	WH	173.5	185.2	168.9	Falling	✓

S18	WH	176.8	192.1	195.5	Flat	✗
S19	WH	170.5	200.5	175.2	Falling	✓
S20	WH	175.1	195.6	178.4	Falling	✓

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 02 — Reading Aloud

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	180.5	195.2	175.6	Falling	✗
S02	Yes/No	175.6	188.5	230.1	Rising	✓
S03	Yes/No	172.1	192.1	245.6	Rising	✓
S04	Yes/No	185.4	200.5	250.2	Rising	✓
S05	Yes/No	178.2	185.6	220.5	Rising	✓
S06	Yes/No	170.5	190.2	242.1	Rising	✓
S07	Yes/No	182.5	195.6	252.1	Rising	✓
S08	Yes/No	175.2	182.5	235.6	Rising	✓
S09	Yes/No	179.8	195.2	196.5	Flat	✗
S10	Yes/No	173.2	190.5	245.8	Rising	✓
S11	WH	175.6	195.2	170.5	Falling	✓
S12	WH	180.2	188.5	210.5	Rising	✗
S13	WH	172.5	200.1	175.6	Falling	✓
S14	WH	178.2	192.5	172.1	Falling	✓
S15	WH	175.5	195.6	178.5	Falling	✓
S16	WH	170.8	190.2	172.6	Falling	✓
S17	WH	180.5	200.5	202.1	Flat	✗

S18	WH	175.2	188.5	170.2	Falling	✓
S19	WH	172.1	192.1	175.6	Falling	✓
S20	WH	178.6	200.5	178.5	Falling	✓

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 03 — Reading Aloud

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	111.5	116.3	139.7	Rising	✓
S02	Yes/No	97.8	122.9	104.4	Falling	✗
S03	Yes/No	117.8	133.8	167.3	Rising	✓
S04	Yes/No	97.2	104.6	136.0	Rising	✓
S05	Yes/No	104.0	111.8	144.1	Rising	✓
S06	Yes/No	121.2	106.6	134.4	Rising	✓
S07	Yes/No	104.2	112.4	111.9	Flat	✗
S08	Yes/No	121.3	105.1	121.3	Rising	✓
S09	Yes/No	96.6	116.2	137.9	Rising	✓
S10	Yes/No	112.1	113.6	134.1	Rising	✓
S11	WH	110.8	113.8	90.6	Falling	✓
S12	WH	102.2	114.7	93.9	Falling	✓
S13	WH	101.4	103.0	124.9	Rising	✗
S14	WH	107.0	115.5	93.1	Falling	✓
S15	WH	101.3	130.6	111.4	Falling	✓
S16	WH	110.1	103.3	85.5	Falling	✓
S17	WH	122.9	117.8	91.1	Falling	✓

S18	WH	97.4	102.8	104.9	Flat	✗
S19	WH	115.7	127.5	93.9	Falling	✓
S20	WH	104.8	111.5	93.2	Falling	✓

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 04 — Reading Aloud

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	242.1	248.5	303.2	Rising	✓
S02	Yes/No	248.5	242.1	310.2	Rising	✓
S03	Yes/No	234.1	250.2	294.1	Rising	✓
S04	Yes/No	250.2	245.1	312.4	Rising	✓
S05	Yes/No	244.1	258.4	308.4	Rising	✓
S06	Yes/No	230.1	254.1	318.4	Rising	✓
S07	Yes/No	243.2	260.2	300.1	Rising	✓
S08	Yes/No	218.4	254.1	142.1	Falling	✗
S09	Yes/No	223.1	238.4	288.4	Rising	✓
S10	Yes/No	262.1	312.4	308.4	Flat	✗
S11	WH	254.1	302.1	304.1	Flat	✗
S12	WH	244.1	272.1	254.1	Falling	✓
S13	WH	230.1	254.1	232.1	Falling	✓
S14	WH	264.1	254.1	302.1	Rising	✗
S15	WH	248.5	248.5	262.1	Rising	✗
S16	WH	244.1	292.1	258.4	Falling	✓
S17	WH	248.5	272.1	296.4	Rising	✗

S18	WH	232.1	254.1	238.4	Falling	✓
S19	WH	228.4	238.4	222.1	Falling	✓
S20	WH	264.1	248.5	223.1	Falling	✓

Accuracy: 14/20 (70%) | ✓ = Correct ✗ = Incorrect

Participant 05 — Reading Aloud

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	200.6	207.2	249.7	Rising	✓
S02	Yes/No	250.2	239.8	199.3	Falling	✗
S03	Yes/No	263.7	261.1	301.5	Rising	✓
S04	Yes/No	267.9	237.0	190.5	Falling	✗
S05	Yes/No	212.2	222.1	254.6	Rising	✓
S06	Yes/No	225.6	222.5	184.8	Falling	✗
S07	Yes/No	241.3	228.2	260.1	Rising	✓
S08	Yes/No	213.1	230.1	266.4	Rising	✓
S09	Yes/No	226.0	248.7	250.9	Flat	✗
S10	Yes/No	217.1	199.8	201.4	Flat	✗
S11	WH	227.4	251.1	201.5	Falling	✓
S12	WH	224.6	241.9	202.0	Falling	✓
S13	WH	229.8	200.0	153.7	Falling	✓
S14	WH	221.0	225.2	187.2	Falling	✓
S15	WH	241.0	237.4	182.6	Falling	✓
S16	WH	221.3	243.2	202.7	Falling	✓
S17	WH	227.6	220.7	195.5	Falling	✓

S18	WH	225.6	243.9	184.1	Falling	✓
S19	WH	221.5	226.3	262.7	Rising	✗
S20	WH	205.1	226.5	228.9	Flat	✗

Accuracy: 13/20 (65%) | ✓ = Correct ✗ = Incorrect

Participant 06 — Reading Aloud

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	232.5	205.0	246.5	Rising	✓
S02	Yes/No	268.4	251.0	291.8	Rising	✓
S03	Yes/No	241.3	235.6	198.1	Falling	✗
S04	Yes/No	222.9	225.3	266.0	Rising	✓
S05	Yes/No	251.9	238.6	241.1	Flat	✗
S06	Yes/No	235.2	230.6	284.1	Rising	✓
S07	Yes/No	258.8	249.1	295.7	Rising	✓
S08	Yes/No	215.4	227.6	181.0	Falling	✗
S09	Yes/No	215.8	245.6	270.9	Rising	✓
S10	Yes/No	217.9	210.6	259.5	Rising	✓
S11	WH	220.3	236.1	231.4	Flat	✗
S12	WH	216.7	204.6	234.7	Rising	✗
S13	WH	253.2	237.3	197.7	Falling	✓
S14	WH	244.2	246.7	189.3	Falling	✓
S15	WH	254.4	229.3	203.8	Falling	✓
S16	WH	222.0	230.9	227.9	Flat	✗
S17	WH	233.5	223.8	225.6	Flat	✗

S18	WH	214.8	208.6	154.6	Falling	✓
S19	WH	208.3	215.3	159.3	Falling	✓
S20	WH	234.0	233.9	190.6	Falling	✓

Accuracy: 13/20 (65%) | ✓ = Correct ✗ = Incorrect

Participant 07 — Reading Aloud

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	228.6	232.2	260.9	Rising	✓
S02	Yes/No	241.2	238.3	297.1	Rising	✓
S03	Yes/No	233.0	215.9	246.6	Rising	✓
S04	Yes/No	222.8	252.4	256.3	Flat	✗
S05	Yes/No	207.4	217.1	258.4	Rising	✓
S06	Yes/No	228.6	233.6	264.4	Rising	✓
S07	Yes/No	253.5	245.3	196.0	Falling	✗
S08	Yes/No	225.0	213.1	245.6	Rising	✓
S09	Yes/No	208.1	192.5	224.2	Rising	✓
S10	Yes/No	209.6	230.8	274.8	Rising	✓
S11	WH	227.3	229.6	172.0	Falling	✓
S12	WH	234.7	222.7	188.9	Falling	✓
S13	WH	232.0	237.0	188.4	Falling	✓
S14	WH	242.0	245.2	186.1	Falling	✓
S15	WH	264.0	240.9	245.6	Flat	✗
S16	WH	215.9	198.5	138.6	Falling	✓
S17	WH	247.4	246.8	200.9	Falling	✓

S18	WH	266.0	255.7	289.0	Rising	✗
S19	WH	257.8	232.9	199.2	Falling	✓
S20	WH	235.5	244.7	275.1	Rising	✗

Accuracy: 15/20 (75%) | ✓ = Correct ✗ = Incorrect

Participant 08 — Reading Aloud

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	112.5	121.7	103.6	Falling	✗
S02	Yes/No	94.6	106.8	139.5	Rising	✓
S03	Yes/No	93.4	115.4	140.7	Rising	✓
S04	Yes/No	102.3	124.6	147.2	Rising	✓
S05	Yes/No	109.1	99.8	121.4	Rising	✓
S06	Yes/No	115.0	101.4	136.7	Rising	✓
S07	Yes/No	115.9	119.5	144.5	Rising	✓
S08	Yes/No	90.9	103.7	131.6	Rising	✓
S09	Yes/No	111.1	105.7	107.0	Flat	✗
S10	Yes/No	87.7	102.2	132.5	Rising	✓
S11	WH	111.4	100.9	81.3	Falling	✓
S12	WH	115.3	101.8	118.9	Rising	✗
S13	WH	104.0	109.9	89.0	Falling	✓
S14	WH	117.7	123.5	92.0	Falling	✓
S15	WH	116.8	122.9	104.2	Falling	✓
S16	WH	104.9	111.4	93.1	Falling	✓
S17	WH	104.1	128.8	129.2	Flat	✗

S18	WH	113.3	101.8	83.1	Falling	✓
S19	WH	97.4	114.6	94.2	Falling	✓
S20	WH	99.4	117.3	91.0	Falling	✓

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 09 — Reading Aloud

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	246.5	242.7	244.0	Flat	✗
S02	Yes/No	253.5	219.6	271.9	Rising	✓
S03	Yes/No	217.8	210.6	257.8	Rising	✓
S04	Yes/No	227.6	226.5	256.2	Rising	✓
S05	Yes/No	232.0	221.2	182.8	Falling	✗
S06	Yes/No	241.6	242.0	276.4	Rising	✓
S07	Yes/No	236.1	240.4	269.4	Rising	✓
S08	Yes/No	199.2	228.9	261.5	Rising	✓
S09	Yes/No	238.8	237.8	270.7	Rising	✓
S10	Yes/No	222.5	240.4	277.2	Rising	✓
S11	WH	232.2	232.3	232.0	Flat	✗
S12	WH	220.6	213.3	212.3	Flat	✗
S13	WH	237.0	253.2	207.0	Falling	✓
S14	WH	228.6	203.6	144.6	Falling	✓
S15	WH	254.2	234.6	196.8	Falling	✓
S16	WH	248.7	262.1	267.0	Flat	✗
S17	WH	242.0	231.3	236.2	Flat	✗

S18	WH	235.0	261.4	260.6	Flat	✗
S19	WH	242.6	250.0	205.4	Falling	✓
S20	WH	238.8	247.5	191.8	Falling	✓

Accuracy: 13/20 (65%) | ✓ = Correct ✗ = Incorrect

Participant 10 — Reading Aloud

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	196.3	225.3	277.5	Rising	✓
S02	Yes/No	205.0	214.2	241.5	Rising	✓
S03	Yes/No	206.6	237.3	209.6	Falling	✗
S04	Yes/No	229.9	240.7	281.9	Rising	✓
S05	Yes/No	227.3	209.4	206.7	Flat	✗
S06	Yes/No	212.1	205.3	245.6	Rising	✓
S07	Yes/No	211.7	218.5	271.8	Rising	✓
S08	Yes/No	207.9	219.5	273.7	Rising	✓
S09	Yes/No	233.5	217.0	214.8	Flat	✗
S10	Yes/No	196.5	207.1	240.5	Rising	✓
S11	WH	231.3	224.6	229.5	Flat	✗
S12	WH	204.7	214.5	244.1	Rising	✗
S13	WH	209.7	226.4	198.7	Falling	✓
S14	WH	228.4	206.6	163.9	Falling	✓
S15	WH	222.1	214.1	169.7	Falling	✓
S16	WH	202.0	242.5	238.9	Flat	✗
S17	WH	208.6	240.1	237.7	Flat	✗

S18	WH	221.4	226.2	193.9	Falling	✓
S19	WH	198.7	230.3	195.1	Falling	✓
S20	WH	209.0	240.5	192.1	Falling	✓

Accuracy: 13/20 (65%) | ✓= Correct ✗= Incorrect

Participant 11 — Reading Aloud

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	215.9	231.2	272.6	Rising	✓
S02	Yes/No	224.4	216.3	191.5	Falling	✗
S03	Yes/No	211.6	216.4	264.7	Rising	✓
S04	Yes/No	205.3	207.2	234.9	Rising	✓
S05	Yes/No	214.1	232.0	263.5	Rising	✓
S06	Yes/No	199.9	222.6	221.6	Flat	✗
S07	Yes/No	212.7	209.0	248.6	Rising	✓
S08	Yes/No	212.2	225.0	261.1	Rising	✓
S09	Yes/No	228.5	230.6	265.0	Rising	✓
S10	Yes/No	216.6	212.9	261.5	Rising	✓
S11	WH	216.0	205.7	168.0	Falling	✓
S12	WH	227.3	216.5	170.5	Falling	✓
S13	WH	216.9	218.0	172.5	Falling	✓
S14	WH	204.2	216.7	232.2	Rising	✗
S15	WH	205.9	216.6	177.8	Falling	✓
S16	WH	193.4	234.0	189.7	Falling	✓
S17	WH	197.4	214.0	213.1	Flat	✗
S18	WH	207.3	238.4	209.0	Falling	✓
S19	WH	203.3	226.0	180.7	Falling	✓
S20	WH	204.8	219.1	189.7	Falling	✓

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 12 — Reading Aloud

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	201.0	241.7	295.5	Rising	✓
S02	Yes/No	214.9	234.4	214.8	Falling	✗
S03	Yes/No	231.6	205.5	242.7	Rising	✓
S04	Yes/No	226.9	210.7	260.8	Rising	✓
S05	Yes/No	214.1	232.2	270.1	Rising	✓
S06	Yes/No	203.3	238.7	241.8	Flat	✗
S07	Yes/No	207.5	203.1	228.2	Rising	✓
S08	Yes/No	204.9	218.4	244.6	Rising	✓
S09	Yes/No	211.8	210.2	258.0	Rising	✓
S10	Yes/No	218.5	238.2	278.7	Rising	✓
S11	WH	201.3	215.7	183.4	Falling	✓
S12	WH	227.0	209.0	175.8	Falling	✓
S13	WH	227.8	220.8	170.1	Falling	✓
S14	WH	222.2	219.6	246.9	Rising	✗
S15	WH	225.9	221.1	173.5	Falling	✓
S16	WH	215.9	213.9	177.3	Falling	✓
S17	WH	226.9	221.5	219.0	Flat	✗
S18	WH	229.2	212.6	162.2	Falling	✓
S19	WH	213.6	223.2	184.3	Falling	✓
S20	WH	213.0	241.6	189.0	Falling	✓

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 13 — Reading Aloud

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	215.5	229.6	205.2	Falling	✗
S02	Yes/No	211.7	206.1	238.8	Rising	✓
S03	Yes/No	207.5	233.2	265.6	Rising	✓
S04	Yes/No	192.6	212.2	241.0	Rising	✓
S05	Yes/No	209.9	233.6	267.9	Rising	✓
S06	Yes/No	211.9	208.1	242.8	Rising	✓
S07	Yes/No	199.3	210.7	208.9	Flat	✗
S08	Yes/No	225.5	216.6	256.0	Rising	✓
S09	Yes/No	217.3	206.8	256.5	Rising	✓
S10	Yes/No	197.3	218.7	243.7	Rising	✓
S11	WH	221.1	217.6	192.3	Falling	✓
S12	WH	207.0	207.6	175.2	Falling	✓
S13	WH	207.6	217.3	245.2	Rising	✗
S14	WH	227.3	220.8	178.5	Falling	✓
S15	WH	212.9	233.2	206.1	Falling	✓
S16	WH	215.3	207.5	155.6	Falling	✓
S17	WH	225.7	237.0	186.0	Falling	✓
S18	WH	210.1	224.2	222.5	Flat	✗
S19	WH	211.0	237.7	203.2	Falling	✓
S20	WH	221.3	225.9	181.2	Falling	✓

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 14 — Reading Aloud

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	192.0	236.1	211.2	Falling	✗
S02	Yes/No	209.9	213.8	267.0	Rising	✓
S03	Yes/No	199.5	230.4	283.5	Rising	✓
S04	Yes/No	226.5	232.0	277.1	Rising	✓
S05	Yes/No	196.1	212.3	253.1	Rising	✓
S06	Yes/No	216.0	212.8	247.8	Rising	✓
S07	Yes/No	224.4	210.7	207.3	Flat	✗
S08	Yes/No	193.4	235.4	264.1	Rising	✓
S09	Yes/No	199.3	238.7	263.9	Rising	✓
S10	Yes/No	199.9	239.0	273.8	Rising	✓
S11	WH	204.5	217.6	183.9	Falling	✓
S12	WH	201.2	214.1	159.8	Falling	✓
S13	WH	224.8	232.0	265.2	Rising	✗
S14	WH	213.1	234.9	185.5	Falling	✓
S15	WH	199.1	201.0	149.4	Falling	✓
S16	WH	193.7	235.7	196.7	Falling	✓
S17	WH	220.2	235.3	190.0	Falling	✓
S18	WH	213.4	211.5	213.6	Flat	✗
S19	WH	219.9	208.6	176.4	Falling	✓
S20	WH	209.0	224.3	191.3	Falling	✓

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 15 — Reading Aloud

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	110.5	101.8	123.2	Rising	✓
S02	Yes/No	94.2	115.3	102.7	Falling	✗
S03	Yes/No	97.8	97.8	121.5	Rising	✓
S04	Yes/No	101.5	111.7	140.8	Rising	✓
S05	Yes/No	98.1	103.4	124.5	Rising	✓
S06	Yes/No	111.8	98.1	118.6	Rising	✓
S07	Yes/No	83.7	116.5	148.2	Rising	✓
S08	Yes/No	92.4	100.8	101.2	Flat	✗
S09	Yes/No	92.7	95.7	125.1	Rising	✓
S10	Yes/No	83.5	98.6	129.1	Rising	✓
S11	WH	85.9	96.8	71.3	Falling	✓
S12	WH	91.9	116.0	100.5	Falling	✓
S13	WH	111.4	98.4	63.7	Falling	✓
S14	WH	95.4	111.2	134.2	Rising	✗
S15	WH	110.3	120.8	98.4	Falling	✓
S16	WH	94.6	98.9	68.5	Falling	✓
S17	WH	91.6	109.3	85.4	Falling	✓
S18	WH	98.4	104.4	83.4	Falling	✓
S19	WH	93.3	119.2	119.8	Flat	✗
S20	WH	89.6	116.8	99.7	Falling	✓

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 16 — Reading Aloud

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	204.8	229.7	277.2	Rising	✓
S02	Yes/No	228.4	213.0	258.4	Rising	✓
S03	Yes/No	213.7	236.2	214.9	Falling	✗
S04	Yes/No	219.1	209.6	261.5	Rising	✓
S05	Yes/No	231.8	236.7	287.4	Rising	✓
S06	Yes/No	197.2	238.8	278.2	Rising	✓
S07	Yes/No	201.5	220.1	251.3	Rising	✓
S08	Yes/No	216.0	216.9	215.5	Flat	✗
S09	Yes/No	208.8	229.5	262.9	Rising	✓
S10	Yes/No	197.5	227.4	252.4	Rising	✓
S11	WH	193.4	229.7	190.6	Falling	✓
S12	WH	204.6	215.8	187.0	Falling	✓
S13	WH	207.9	240.2	199.9	Falling	✓
S14	WH	224.5	228.7	193.1	Falling	✓
S15	WH	231.3	214.9	239.4	Rising	✗
S16	WH	230.6	222.2	187.4	Falling	✓
S17	WH	226.7	224.9	173.0	Falling	✓
S18	WH	228.3	227.8	230.7	Flat	✗
S19	WH	226.3	202.4	168.1	Falling	✓
S20	WH	218.2	202.4	172.3	Falling	✓

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 17 — Reading Aloud

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	196.0	227.0	270.3	Rising	✓
S02	Yes/No	225.2	210.2	248.9	Rising	✓
S03	Yes/No	217.6	227.0	256.5	Rising	✓
S04	Yes/No	221.1	206.4	190.1	Falling	✗
S05	Yes/No	210.9	220.1	253.1	Rising	✓
S06	Yes/No	225.9	218.9	265.2	Rising	✓
S07	Yes/No	226.5	214.7	255.1	Rising	✓
S08	Yes/No	218.1	205.9	207.7	Flat	✗
S09	Yes/No	212.4	202.4	236.7	Rising	✓
S10	Yes/No	212.7	227.9	274.4	Rising	✓
S11	WH	227.6	203.5	168.0	Falling	✓
S12	WH	203.8	212.5	170.7	Falling	✓
S13	WH	224.7	225.4	255.3	Rising	✗
S14	WH	197.7	209.4	159.3	Falling	✓
S15	WH	204.9	216.4	178.9	Falling	✓
S16	WH	201.3	211.3	159.4	Falling	✓
S17	WH	197.1	201.0	173.2	Falling	✓
S18	WH	209.1	235.8	236.9	Flat	✗
S19	WH	191.9	218.6	166.2	Falling	✓
S20	WH	214.3	205.2	156.2	Falling	✓

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 18 — Reading Aloud

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	231.1	237.5	290.8	Rising	✓
S02	Yes/No	206.9	231.6	279.1	Rising	✓
S03	Yes/No	221.3	231.1	256.5	Rising	✓
S04	Yes/No	220.8	210.4	249.9	Rising	✓
S05	Yes/No	221.1	217.7	201.2	Falling	✗
S06	Yes/No	222.7	229.5	267.1	Rising	✓
S07	Yes/No	225.2	235.0	282.6	Rising	✓
S08	Yes/No	217.8	229.2	270.5	Rising	✓
S09	Yes/No	218.0	219.1	221.5	Flat	✗
S10	Yes/No	231.3	223.0	249.4	Rising	✓
S11	WH	213.4	243.1	191.9	Falling	✓
S12	WH	223.0	226.7	189.1	Falling	✓
S13	WH	212.2	243.0	190.0	Falling	✓
S14	WH	211.8	221.0	187.4	Falling	✓
S15	WH	213.9	219.2	190.0	Falling	✓
S16	WH	218.9	231.3	260.2	Rising	✗
S17	WH	211.9	230.8	180.8	Falling	✓
S18	WH	223.1	241.3	207.3	Falling	✓
S19	WH	206.3	244.8	216.7	Falling	✓
S20	WH	235.9	206.3	207.4	Flat	✗

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 19 — Reading Aloud

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	105.2	115.6	145.2	Rising	✓
S02	Yes/No	98.5	110.2	150.5	Rising	✓
S03	Yes/No	102.1	118.5	135.2	Rising	✓
S04	Yes/No	95.6	105.4	155.6	Rising	✓
S05	Yes/No	108.5	112.1	140.5	Rising	✓
S06	Yes/No	92.1	108.5	152.1	Rising	✓
S07	Yes/No	100.2	115.6	140.2	Rising	✓
S08	Yes/No	98.6	110.5	158.5	Rising	✓
S09	Yes/No	105.4	120.2	120.5	Flat	✗
S10	Yes/No	99.5	105.4	150.2	Rising	✓
S11	WH	102.1	125.6	98.5	Falling	✓
S12	WH	95.6	115.2	92.1	Falling	✓
S13	WH	98.5	105.4	88.5	Falling	✓
S14	WH	105.2	120.5	125.2	Rising	✗
S15	WH	92.1	115.6	90.5	Falling	✓
S16	WH	102.5	110.5	92.1	Falling	✓
S17	WH	98.5	125.2	95.6	Falling	✓
S18	WH	95.2	118.5	115.6	Flat	✗
S19	WH	100.5	112.1	95.4	Falling	✓
S20	WH	98.5	120.5	98.5	Falling	✓

Accuracy: 17/20 (85%) | ✓ = Correct ✗ = Incorrect

Participant 20 — Reading Aloud

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	203.0	243.7	295.5	Rising	✓
S02	Yes/No	216.9	236.4	265.4	Rising	✓
S03	Yes/No	233.6	207.5	183.7	Falling	✗
S04	Yes/No	228.9	212.7	260.8	Rising	✓
S05	Yes/No	216.1	234.2	270.1	Rising	✓
S06	Yes/No	205.3	240.7	286.9	Rising	✓
S07	Yes/No	209.5	205.1	228.2	Rising	✓
S08	Yes/No	206.9	220.4	216.1	Flat	✗
S09	Yes/No	213.8	212.2	258.0	Rising	✓
S10	Yes/No	220.5	240.2	278.7	Rising	✓
S11	WH	203.3	217.7	187.4	Falling	✓
S12	WH	229.0	211.0	179.8	Falling	✓
S13	WH	229.8	222.8	174.1	Falling	✓
S14	WH	224.2	221.6	181.2	Falling	✓
S15	WH	227.9	223.1	177.5	Falling	✓
S16	WH	217.9	215.9	181.3	Falling	✓
S17	WH	228.9	223.5	221.0	Flat	✗
S18	WH	231.2	214.6	166.2	Falling	✓
S19	WH	215.6	225.2	250.2	Rising	✗
S20	WH	215.0	243.6	193.0	Falling	✓

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

DCT — Individual Data

Participant 01 — DCT

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S05	Yes/No	241.1	265.3	311.9	Rising	✓
S06	Yes/No	231.3	263.2	324.5	Rising	✓
S07	Yes/No	244.7	273.6	306.4	Rising	✓
S08	Yes/No	214.9	261.2	132.4	Falling	✗
S09	Yes/No	220.5	242.9	291.0	Rising	✓
S10	Yes/No	267.8	320.7	313.0	Flat	✗
S12	WH	244.9	278.6	264.7	Falling	✓
S13	WH	232.2	258.6	239.8	Falling	✓
S14	WH	264.9	260.4	309.9	Rising	✗
S15	WH	247.2	253.7	264.3	Rising	✗
S16	WH	247.4	296.2	271.3	Falling	✓
S17	WH	247.3	275.8	299.7	Rising	✗
S18	WH	233.6	260.4	243.7	Falling	✓
S19	WH	230.8	240.6	226.5	Falling	✓
S20	WH	266.7	250.2	226.1	Falling	✓

Accuracy: 10/20 (50%) | ✓ = Correct ✗ = Incorrect

Participant 02 — DCT

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	235.4	240.3	295.4	Rising	✓
S02	Yes/No	241.2	235.6	302.1	Rising	✓

S03	Yes/No	228.9	245.1	288.7	Rising	✓
S04	Yes/No	244.1	238.9	305.6	Rising	✓
S05	Yes/No	239.6	250.4	301.2	Rising	✓
S06	Yes/No	225.1	248.5	310.4	Rising	✓
S07	Yes/No	238.7	255.4	293.1	Rising	✓
S08	Yes/No	210.2	248.5	135.4	Falling	✗
S09	Yes/No	218.4	230.1	280.4	Rising	✓
S10	Yes/No	255.6	305.4	301.2	Flat	✗
S11	WH	249.1	295.4	298.6	Flat	✗
S12	WH	238.4	265.4	248.5	Falling	✓
S13	WH	225.1	248.5	225.4	Falling	✓
S14	WH	258.4	248.5	295.4	Rising	✗
S15	WH	240.2	242.1	255.4	Rising	✗
S16	WH	238.9	285.4	250.4	Falling	✓
S17	WH	255.4	289.9	309.2	Rising	✗
S18	WH	226.4	248.5	230.1	Falling	✓
S19	WH	222.1	232.4	215.4	Falling	✓
S20	WH	258.4	242.1	216.4	Falling	✓

Accuracy: 14/20 (70%) | ✓ = Correct ✗ = Incorrect

Participant 03 — DCT

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	100.0	134.5	153.7	Rising	✓
S02	Yes/No	94.8	102.6	128.5	Rising	✓
S03	Yes/No	93.1	115.0	104.3	Falling	✗
S04	Yes/No	110.1	131.6	164.7	Rising	✓
S05	Yes/No	105.2	100.8	125.7	Rising	✓
S06	Yes/No	124.6	122.9	155.6	Rising	✓
S07	Yes/No	102.1	125.1	150.1	Rising	✓
S08	Yes/No	91.9	109.1	139.1	Rising	✓
S09	Yes/No	118.5	111.4	110.1	Flat	✗
S10	Yes/No	124.8	102.1	120.3	Rising	✓
S11	WH	108.1	125.1	109.9	Falling	✓
S12	WH	110.2	106.6	91.4	Falling	✓
S13	WH	103.8	121.7	101.4	Falling	✓
S14	WH	120.3	100.8	85.1	Falling	✓
S15	WH	106.6	116.5	96.6	Falling	✓
S16	WH	118.8	119.5	133.6	Rising	✗
S17	WH	115.3	100.5	83.1	Falling	✓
S18	WH	107.5	127.3	96.6	Falling	✓
S19	WH	90.7	132.8	131.7	Flat	✗
S20	WH	103.0	111.4	93.3	Falling	✓

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 04 — DCT

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	240.2	245.1	301.2	Rising	✓
S02	Yes/No	246.1	240.2	308.4	Rising	✓
S03	Yes/No	232.4	248.5	292.1	Rising	✓
S04	Yes/No	248.5	242.1	310.2	Rising	✓
S05	Yes/No	242.1	255.4	305.4	Rising	✓
S06	Yes/No	228.4	252.1	315.2	Rising	✓
S07	Yes/No	241.2	258.4	298.1	Rising	✓
S08	Yes/No	215.2	252.1	140.2	Falling	✗
S09	Yes/No	221.4	235.1	285.4	Rising	✓
S10	Yes/No	260.2	310.2	305.4	Flat	✗
S11	WH	252.1	300.2	302.1	Flat	✗
S12	WH	242.1	270.1	252.1	Falling	✓
S13	WH	228.4	252.1	230.1	Falling	✓
S14	WH	262.1	252.1	300.2	Rising	✗
S15	WH	245.1	245.1	260.2	Rising	✗
S16	WH	242.1	290.1	255.4	Falling	✓
S17	WH	245.1	270.1	294.1	Rising	✗
S18	WH	230.1	252.1	235.1	Falling	✓
S19	WH	225.4	236.4	220.4	Falling	✓
S20	WH	262.1	246.1	221.4	Falling	✓

Accuracy: 14/20 (70%) | ✓ = Correct ✗ = Incorrect

Participant 05 — DCT

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	200.6	207.2	249.7	Rising	✓
S02	Yes/No	250.2	239.8	199.3	Falling	✗
S03	Yes/No	263.7	261.1	301.5	Rising	✓
S04	Yes/No	267.9	237.0	190.5	Falling	✗
S05	Yes/No	212.2	222.1	254.6	Rising	✓
S06	Yes/No	225.6	222.5	184.8	Falling	✗
S07	Yes/No	241.3	228.2	260.1	Rising	✓
S08	Yes/No	213.1	230.1	266.4	Rising	✓
S09	Yes/No	226.0	248.7	250.9	Flat	✗
S10	Yes/No	217.1	199.8	201.4	Flat	✗
S11	WH	227.4	251.1	201.5	Falling	✓
S12	WH	224.6	241.9	202.0	Falling	✓
S13	WH	229.8	200.0	153.7	Falling	✓
S14	WH	221.0	225.2	187.2	Falling	✓
S15	WH	241.0	237.4	182.6	Falling	✓
S16	WH	221.3	243.2	202.7	Falling	✓
S17	WH	227.6	220.7	195.5	Falling	✓
S18	WH	225.6	243.9	184.1	Falling	✓
S19	WH	221.5	226.3	262.7	Rising	✗
S20	WH	205.1	226.5	228.9	Flat	✗

Accuracy: 13/20 (65%) | ✓ = Correct ✗ = Incorrect

Participant 06 — DCT

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	232.5	205.0	246.5	Rising	✓
S02	Yes/No	268.4	251.0	291.8	Rising	✓
S03	Yes/No	241.3	235.6	198.1	Falling	✗
S04	Yes/No	222.9	225.3	266.0	Rising	✓
S05	Yes/No	251.9	238.6	241.1	Flat	✗
S06	Yes/No	235.2	230.6	284.1	Rising	✓
S07	Yes/No	262.6	294,1	335.9	Rising	✓
S08	Yes/No	215.4	227.6	181.0	Falling	✗
S09	Yes/No	215.8	245.6	270.9	Rising	✓
S10	Yes/No	217.9	210.6	259.5	Rising	✓
S11	WH	220.3	236.1	231.4	Flat	✗
S12	WH	216.7	204.6	234.7	Rising	✗
S13	WH	253.2	237.3	197.7	Falling	✓
S14	WH	244.2	246.7	189.3	Falling	✓
S15	WH	254.4	229.3	203.8	Falling	✓
S16	WH	222.0	230.9	227.9	Flat	✗
S17	WH	233.5	223.8	225.6	Flat	✗
S18	WH	214.8	208.6	154.6	Falling	✓
S19	WH	208.3	215.3	159.3	Falling	✓
S20	WH	234.0	233.9	190.6	Falling	✓

Accuracy: 13/20 (65%) | ✓ = Correct ✗ = Incorrect

Participant 07 — DCT

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	228.6	232.2	260.9	Rising	✓
S02	Yes/No	241.2	238.3	297.1	Rising	✓
S03	Yes/No	233.0	215.9	246.6	Rising	✓
S04	Yes/No	222.8	252.4	256.3	Flat	✗
S05	Yes/No	207.4	217.1	258.4	Rising	✓
S06	Yes/No	228.6	233.6	264.4	Rising	✓
S07	Yes/No	253.5	245.3	196.0	Falling	✗
S08	Yes/No	225.0	213.1	245.6	Rising	✓
S09	Yes/No	208.1	192.5	224.2	Rising	✓
S10	Yes/No	209.6	230.8	274.8	Rising	✓
S11	WH	227.3	229.6	172.0	Falling	✓
S12	WH	234.7	222.7	188.9	Falling	✓
S13	WH	232.0	237.0	188.4	Falling	✓
S14	WH	242.0	245.2	186.1	Falling	✓
S15	WH	264.0	240.9	245.6	Flat	✗
S16	WH	215.9	198.5	138.6	Falling	✓
S17	WH	247.4	246.8	200.9	Falling	✓
S18	WH	266.0	255.7	289.0	Rising	✗
S19	WH	257.8	232.9	199.2	Falling	✓
S20	WH	235.5	244.7	275.1	Rising	✗

Accuracy: 15/20 (75%) | ✓ = Correct ✗ = Incorrect

Participant 08 — DCT

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	107.6	119.5	138.8	Rising	✓
S02	Yes/No	90.1	101.3	133.1	Rising	✓
S03	Yes/No	111.0	128.2	161.4	Rising	✓
S04	Yes/No	101.4	108.9	136.0	Rising	✓
S05	Yes/No	100.8	117.8	103.6	Falling	✗
S06	Yes/No	90.7	104.9	138.2	Rising	✓
S07	Yes/No	92.4	114.7	150.8	Rising	✓
S08	Yes/No	103.8	122.9	123.6	Flat	✗
S09	Yes/No	108.5	117.0	154.3	Rising	✓
S10	Yes/No	114.0	104.1	141.0	Rising	✓
S11	WH	96.5	127.2	100.4	Falling	✓
S12	WH	96.0	126.9	106.6	Falling	✓
S13	WH	99.4	117.8	94.6	Falling	✓
S14	WH	110.1	104.9	103.1	Flat	✗
S15	WH	111.4	102.3	82.5	Falling	✓
S16	WH	121.2	120.4	88.0	Falling	✓
S17	WH	120.7	105.1	85.9	Falling	✓
S18	WH	96.9	131.0	111.6	Falling	✓
S19	WH	111.6	130.6	97.4	Falling	✓
S20	WH	100.9	112.5	124.4	Rising	✗

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 09 — DCT

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	246.5	242.7	244.0	Flat	✗
S02	Yes/No	253.5	219.6	271.9	Rising	✓
S03	Yes/No	217.8	210.6	257.8	Rising	✓
S04	Yes/No	227.6	226.5	256.2	Rising	✓
S05	Yes/No	232.0	221.2	182.8	Falling	✗
S06	Yes/No	241.6	242.0	276.4	Rising	✓
S07	Yes/No	236.1	240.4	269.4	Rising	✓
S08	Yes/No	199.2	228.9	261.5	Rising	✓
S09	Yes/No	238.8	237.8	270.7	Rising	✓
S10	Yes/No	222.5	240.4	277.2	Rising	✓
S11	WH	232.2	232.3	232.0	Flat	✗
S12	WH	220.6	213.3	212.3	Flat	✗
S13	WH	237.0	253.2	207.0	Falling	✓
S14	WH	228.6	203.6	144.6	Falling	✓
S15	WH	254.2	234.6	196.8	Falling	✓
S16	WH	248.7	262.1	267.0	Flat	✗
S17	WH	242.0	231.3	236.2	Flat	✗
S18	WH	235.0	261.4	260.6	Flat	✗
S19	WH	242.6	250.0	205.4	Falling	✓
S20	WH	238.8	247.5	191.8	Falling	✓

Accuracy: 13/20 (65%) | ✓ = Correct ✗ = Incorrect

Participant 10 — DCT

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	215.0	233.9	258.6	Rising	✓
S02	Yes/No	206.2	234.0	275.2	Rising	✓
S03	Yes/No	200.8	218.5	244.0	Rising	✓
S04	Yes/No	207.3	227.3	256.0	Rising	✓
S05	Yes/No	224.5	224.7	195.6	Falling	✗
S06	Yes/No	231.4	233.7	255.1	Rising	✓
S07	Yes/No	224.3	248.0	297.0	Rising	✓
S08	Yes/No	232.3	237.4	236.8	Flat	✗
S09	Yes/No	204.9	246.4	274.2	Rising	✓
S10	Yes/No	226.5	231.9	257.4	Rising	✓
S11	WH	238.8	245.8	207.9	Falling	✓
S12	WH	236.9	211.8	238.3	Rising	✗
S13	WH	215.5	224.3	195.9	Falling	✓
S14	WH	221.7	213.0	163.4	Falling	✓
S15	WH	230.9	242.6	201.4	Falling	✓
S16	WH	229.2	224.3	220.5	Flat	✗
S17	WH	234.5	212.5	210.6	Flat	✗
S18	WH	213.0	245.5	245.2	Flat	✗
S19	WH	204.8	232.5	189.4	Falling	✓
S20	WH	219.8	211.0	187.8	Falling	✓

Accuracy: 14/20 (70%) | ✓ = Correct ✗ = Incorrect

Participant 11 — DCT

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	218.7	214.9	257.5	Rising	✓
S02	Yes/No	231.4	236.9	264.6	Rising	✓
S03	Yes/No	220.2	239.4	290.4	Rising	✓
S04	Yes/No	207.3	237.2	216.7	Falling	✗
S05	Yes/No	225.4	213.5	241.1	Rising	✓
S06	Yes/No	237.8	237.4	275.7	Rising	✓
S07	Yes/No	234.5	222.3	226.8	Flat	✗
S08	Yes/No	211.7	229.5	279.2	Rising	✓
S09	Yes/No	201.9	243.6	270.4	Rising	✓
S10	Yes/No	209.0	236.1	272.7	Rising	✓
S11	WH	225.2	217.0	177.7	Falling	✓
S12	WH	202.8	210.1	182.8	Falling	✓
S13	WH	215.7	227.1	251.3	Rising	✗
S14	WH	223.5	210.0	168.9	Falling	✓
S15	WH	230.5	225.0	183.3	Falling	✓
S16	WH	206.4	237.9	213.1	Falling	✓
S17	WH	229.4	227.9	176.6	Falling	✓
S18	WH	206.1	209.9	213.9	Flat	✗
S19	WH	201.2	223.1	200.7	Falling	✓
S20	WH	231.7	236.4	194.1	Falling	✓

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 12 — DCT

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	202.6	240.4	283.8	Rising	✓
S02	Yes/No	203.6	217.1	246.2	Rising	✓
S03	Yes/No	225.6	236.0	260.9	Rising	✓
S04	Yes/No	233.3	218.9	188.2	Falling	✗
S05	Yes/No	226.0	224.2	251.4	Rising	✓
S06	Yes/No	212.6	228.2	266.4	Rising	✓
S07	Yes/No	208.0	211.2	207.1	Flat	✗
S08	Yes/No	212.0	209.5	240.2	Rising	✓
S09	Yes/No	210.1	246.5	289.6	Rising	✓
S10	Yes/No	226.3	220.0	270.3	Rising	✓
S11	WH	201.8	236.5	211.9	Falling	✓
S12	WH	234.6	234.6	190.4	Falling	✓
S13	WH	231.0	238.0	260.5	Rising	✗
S14	WH	217.6	225.8	182.9	Falling	✓
S15	WH	200.8	227.9	203.5	Falling	✓
S16	WH	224.7	212.3	184.4	Falling	✓
S17	WH	213.6	227.2	195.2	Falling	✓
S18	WH	202.3	239.4	234.5	Flat	✗
S19	WH	229.2	226.4	192.9	Falling	✓
S20	WH	218.1	242.8	207.1	Falling	✓

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 13 — DCT

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	208.5	226.2	267.7	Rising	✓
S02	Yes/No	213.0	235.1	276.6	Rising	✓
S03	Yes/No	210.0	205.4	177.1	Falling	✗
S04	Yes/No	203.7	236.0	285.1	Rising	✓
S05	Yes/No	231.2	220.7	261.9	Rising	✓
S06	Yes/No	227.6	214.7	259.3	Rising	✓
S07	Yes/No	198.4	233.3	254.6	Rising	✓
S08	Yes/No	212.9	241.1	243.0	Flat	✗
S09	Yes/No	227.2	218.3	245.0	Rising	✓
S10	Yes/No	213.5	240.1	283.5	Rising	✓
S11	WH	201.2	235.2	186.8	Falling	✓
S12	WH	216.2	216.7	180.5	Falling	✓
S13	WH	219.3	213.0	166.5	Falling	✓
S14	WH	232.2	239.1	273.9	Rising	✗
S15	WH	214.4	242.7	206.2	Falling	✓
S16	WH	231.5	236.7	190.6	Falling	✓
S17	WH	220.2	241.5	204.0	Falling	✓
S18	WH	205.4	216.6	188.7	Falling	✓
S19	WH	231.5	226.4	230.6	Flat	✗
S20	WH	207.5	208.7	163.5	Falling	✓

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 14 — DCT

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	224.2	208.7	250.4	Rising	✓
S02	Yes/No	204.1	222.9	264.9	Rising	✓
S03	Yes/No	198.3	208.4	179.5	Falling	✗
S04	Yes/No	214.3	228.8	255.1	Rising	✓
S05	Yes/No	195.6	232.7	263.4	Rising	✓
S06	Yes/No	199.5	228.8	255.4	Rising	✓
S07	Yes/No	204.5	228.1	274.9	Rising	✓
S08	Yes/No	199.2	232.9	231.6	Flat	✗
S09	Yes/No	199.1	205.3	227.0	Rising	✓
S10	Yes/No	229.0	209.1	258.9	Rising	✓
S11	WH	216.7	212.6	191.9	Falling	✓
S12	WH	219.2	240.5	207.3	Falling	✓
S13	WH	202.7	208.2	172.5	Falling	✓
S14	WH	203.2	243.7	263.0	Rising	✗
S15	WH	200.9	219.1	181.1	Falling	✓
S16	WH	222.2	223.5	198.8	Falling	✓
S17	WH	231.6	225.7	176.1	Falling	✓
S18	WH	232.8	241.0	194.1	Falling	✓
S19	WH	199.1	205.9	204.4	Flat	✗
S20	WH	220.3	217.5	191.6	Falling	✓

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 15 — DCT

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	108.1	119.0	145.5	Rising	✓
S02	Yes/No	108.1	108.4	133.9	Rising	✓
S03	Yes/No	103.2	107.6	127.2	Rising	✓
S04	Yes/No	113.6	122.5	149.3	Rising	✓
S05	Yes/No	112.1	122.4	111.9	Falling	✗
S06	Yes/No	108.5	113.2	129.6	Rising	✓
S07	Yes/No	103.5	112.4	147.1	Rising	✓
S08	Yes/No	100.7	114.6	129.8	Rising	✓
S09	Yes/No	114.2	121.3	118.5	Flat	✗
S10	Yes/No	102.0	123.9	151.6	Rising	✓
S11	WH	87.1	99.7	84.2	Falling	✓
S12	WH	93.1	119.5	87.8	Falling	✓
S13	WH	114.8	114.2	95.1	Falling	✓
S14	WH	104.5	124.8	101.2	Falling	✓
S15	WH	97.8	106.0	117.6	Rising	✗
S16	WH	86.5	116.9	86.2	Falling	✓
S17	WH	112.0	120.3	88.5	Falling	✓
S18	WH	90.4	111.4	111.6	Flat	✗
S19	WH	88.3	120.0	93.8	Falling	✓
S20	WH	93.4	109.3	75.9	Falling	✓

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 16 — DCT

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	235.6	211.8	240.6	Rising	✓
S02	Yes/No	222.6	236.6	264.9	Rising	✓
S03	Yes/No	219.4	232.9	273.8	Rising	✓
S04	Yes/No	232.3	229.8	257.7	Rising	✓
S05	Yes/No	220.8	235.4	284.6	Rising	✓
S06	Yes/No	208.7	238.0	217.3	Falling	✗
S07	Yes/No	228.3	229.2	267.6	Rising	✓
S08	Yes/No	202.0	231.5	260.2	Rising	✓
S09	Yes/No	236.4	218.6	223.2	Flat	✗
S10	Yes/No	213.2	241.9	273.5	Rising	✓
S11	WH	218.5	231.5	204.0	Falling	✓
S12	WH	232.7	226.1	184.8	Falling	✓
S13	WH	213.3	238.3	269.7	Rising	✗
S14	WH	237.5	222.0	198.4	Falling	✓
S15	WH	205.7	215.3	168.0	Falling	✓
S16	WH	210.4	230.2	199.7	Falling	✓
S17	WH	214.0	228.3	227.7	Flat	✗
S18	WH	225.2	237.6	212.7	Falling	✓
S19	WH	199.9	228.5	204.3	Falling	✓
S20	WH	210.5	228.9	191.2	Falling	✓

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 17 — DCT

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	221.3	237.8	264.6	Rising	✓
S02	Yes/No	201.3	229.1	270.1	Rising	✓
S03	Yes/No	202.9	235.5	214.1	Falling	✗
S04	Yes/No	204.5	238.1	259.7	Rising	✓
S05	Yes/No	228.6	210.5	237.1	Rising	✓
S06	Yes/No	234.9	239.0	259.6	Rising	✓
S07	Yes/No	202.6	224.2	264.6	Rising	✓
S08	Yes/No	205.0	212.8	260.2	Rising	✓
S09	Yes/No	228.9	208.8	209.7	Flat	✗
S10	Yes/No	223.7	238.8	281.2	Rising	✓
S11	WH	198.1	215.7	166.5	Falling	✓
S12	WH	198.8	227.6	191.3	Falling	✓
S13	WH	229.1	238.5	197.0	Falling	✓
S14	WH	196.0	231.0	250.5	Rising	✗
S15	WH	228.5	235.3	187.5	Falling	✓
S16	WH	208.1	207.7	178.7	Falling	✓
S17	WH	200.7	235.2	209.7	Falling	✓
S18	WH	226.0	220.7	172.8	Falling	✓
S19	WH	232.9	216.6	216.3	Flat	✗
S20	WH	203.8	221.9	175.8	Falling	✓

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 18 — DCT

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	213.0	218.2	199.6	Falling	✗
S02	Yes/No	198.3	230.5	273.6	Rising	✓
S03	Yes/No	206.9	211.6	259.8	Rising	✓
S04	Yes/No	211.4	213.6	245.7	Rising	✓
S05	Yes/No	217.1	218.7	270.3	Rising	✓
S06	Yes/No	220.4	213.1	248.2	Rising	✓
S07	Yes/No	192.8	211.4	259.8	Rising	✓
S08	Yes/No	228.5	228.7	230.0	Flat	✗
S09	Yes/No	203.6	202.5	252.2	Rising	✓
S10	Yes/No	217.9	236.5	265.9	Rising	✓
S11	WH	206.8	206.2	160.1	Falling	✓
S12	WH	194.1	239.6	258.9	Rising	✗
S13	WH	229.7	206.1	159.3	Falling	✓
S14	WH	197.9	234.2	182.5	Falling	✓
S15	WH	230.7	237.2	200.3	Falling	✓
S16	WH	220.8	226.5	175.4	Falling	✓
S17	WH	227.7	224.9	198.1	Falling	✓
S18	WH	211.8	236.6	209.1	Falling	✓
S19	WH	204.4	212.4	217.4	Flat	✗
S20	WH	204.8	202.2	152.0	Falling	✓

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 19 — DCT

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	95.2	110.5	135.2	Rising	✓
S02	Yes/No	102.1	105.4	140.1	Rising	✓
S03	Yes/No	90.5	115.2	112.5	Flat	✗
S04	Yes/No	98.4	102.1	150.5	Rising	✓
S05	Yes/No	105.2	115.6	138.2	Rising	✓
S06	Yes/No	92.1	108.5	145.6	Rising	✓
S07	Yes/No	100.5	112.1	135.4	Rising	✓
S08	Yes/No	94.6	105.4	142.1	Rising	✓
S09	Yes/No	102.3	120.5	118.5	Flat	✗
S10	Yes/No	98.5	102.1	148.5	Rising	✓
S11	WH	105.4	125.6	95.4	Falling	✓
S12	WH	92.5	115.2	90.5	Falling	✓
S13	WH	98.6	105.4	85.6	Falling	✓
S14	WH	102.1	120.5	122.1	Rising	✗
S15	WH	95.4	115.6	92.1	Falling	✓
S16	WH	108.2	110.5	88.5	Falling	✓
S17	WH	99.5	125.2	95.4	Falling	✓
S18	WH	92.1	118.5	115.2	Flat	✗
S19	WH	105.6	112.1	90.5	Falling	✓
S20	WH	96.5	120.5	98.4	Falling	✓

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

Participant 20 — DCT

S	Type	F0 Mean (Hz)	Initial F0 (Hz)	Final F0 (Hz)	Contour	Result
S01	Yes/No	195.6	233.4	279.8	Rising	✓
S02	Yes/No	196.6	210.1	242.2	Rising	✓
S03	Yes/No	218.6	229.0	256.9	Rising	✓
S04	Yes/No	226.3	211.9	181.2	Falling	✗
S05	Yes/No	219.0	217.2	247.4	Rising	✓
S06	Yes/No	205.6	221.2	262.4	Rising	✓
S07	Yes/No	201.0	204.2	232.0	Rising	✓
S08	Yes/No	205.0	202.5	236.2	Rising	✓
S09	Yes/No	203.1	239.5	285.6	Rising	✓
S10	Yes/No	219.3	213.0	217.4	Flat	✗
S11	WH	194.8	229.5	246.2	Rising	✗
S12	WH	227.6	227.6	180.4	Falling	✓
S13	WH	224.0	231.0	194.8	Falling	✓
S14	WH	210.6	218.8	172.9	Falling	✓
S15	WH	193.8	220.9	193.5	Falling	✓
S16	WH	217.7	205.3	174.4	Falling	✓
S17	WH	206.6	220.2	185.2	Falling	✓
S18	WH	195.3	232.4	207.0	Falling	✓
S19	WH	222.2	219.4	182.9	Falling	✓
S20	WH	211.1	235.8	235.4	Flat	✗

Accuracy: 16/20 (80%) | ✓ = Correct ✗ = Incorrect

APPENDIX 7

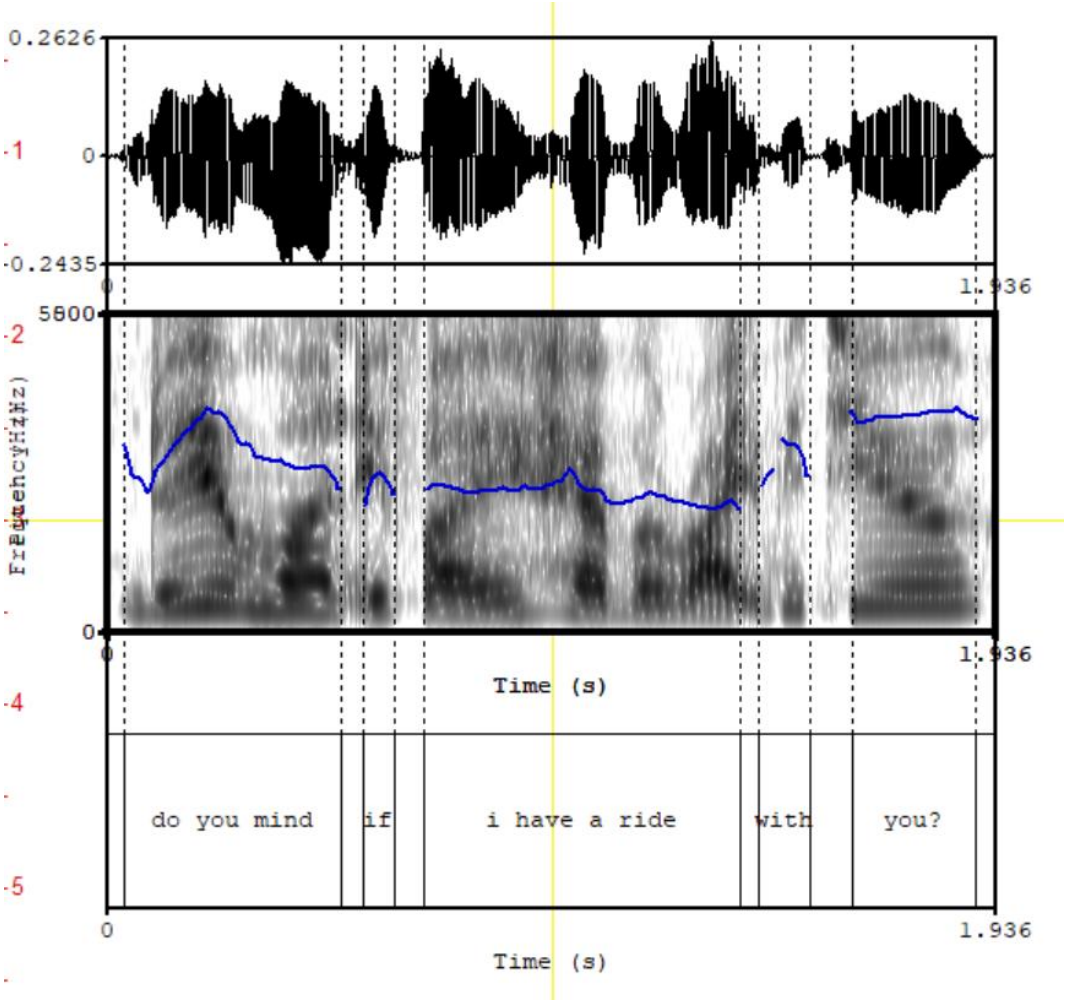
SAMPLE OF PRAAT ANALYSIS

This appendix provides sample screenshots of PRAAT analyses illustrating the acoustic measurement of participants' intonation.

Participant : **P-06**

Question Type : **Yes/No Question**

Utterance : ***"Do you mind if I have a ride with you?"***



Feature	Observation
Initial F0	294.1 Hz
Final F0	335.9 Hz
F0 Maximum	352.5 Hz

Feature	Observation
F0 Minimum	**192.7 Hz**
Pitch Range	**159.8 Hz**
Pitch Contour	**Rising**
Expected Contour	**Rising**
Classification	**Accurate**

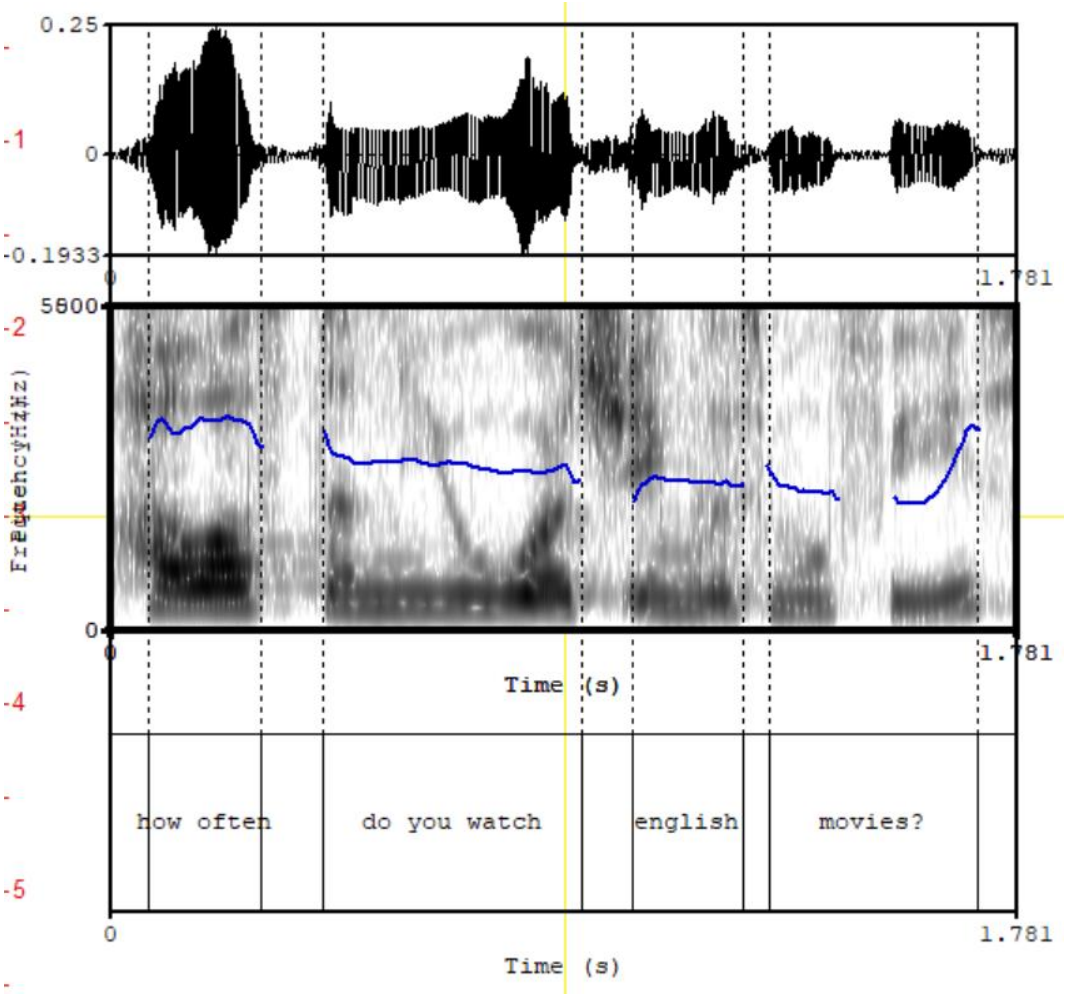
Interpretation

The pitch contour demonstrates a rising movement toward the end of the utterance, indicating that the participant produced the expected intonation pattern for a Yes/No question. Based on the PRAAT analysis, this response was classified as **accurate**.

Participant : **P-02**

Question Type : **WH-Question**

Utterance : **"*How often do you watch English movies?*"**



Feature	Observation
Initial F0	289.9 Hz
Final F0	310 Hz
F0 Maximum	330.3 Hz

Feature	Observation
F0 Minimum	**195.2 Hz**
Pitch Range	**135.1 Hz**
Pitch Contour	**Rising**
Expected Contour	**Falling**
Classification	**Inaccurate**

Interpretation

The pitch contour rises at the end of the utterance, whereas WH-questions in Standard English are expected to end with a falling intonation. Therefore, this utterance was classified as **inaccurate**.

ABOUT THE AUTHOR

Nafisah Kamal was born in Curup on June 18, 2004. She is the third of four daughters, born to a loving and devoted family headed by Mr. Kamaluddin and Mrs. Ummi Athiyah. Raised in a warm, nurturing environment enriched by strong religious values, kindness, and grace, she has grown to deeply cherish the importance of faith and compassion in every step of her life.

Her academic journey began at SDN 01 Curup Kota, followed by SMPN 01 Curup Kota, and later, she completed her high school years at the Rubath Al Muhibbien Islamic Boarding School in Kenten, Palembang. Although she has a deep-seated passion for the arts, particularly dancing, she chose to pursue her higher education in the English Language Education study program at IAIN Curup. Outside the classroom, she finds joy and inspiration in listening to English music and immersing herself in English cinema, which has significantly shaped her love for the language.

During her undergraduate years, the author balanced her academic rigor with practical experience, including her Community Service Program (KKN) in Air Bening and her teaching practicum (PPL) at SMP IT RR. Her research focus reflects her linguistic interests, leading her to complete this thesis entitled: **"A Quantitative Analysis of English Questions Intonation Accuracy (A Study on English Education Students of IAIN Curup from the Rejang Tribe)."**

The author is deeply grateful to her beloved parents for their endless prayers and sacrifices, which have been her greatest strength. She also extends her heartfelt appreciation to her thesis supervisors, whose invaluable guidance, patience, and wisdom have been instrumental in the completion of this study. Living by her personal motto, *"Radiate softly, work silently, and let your journey be your most beautiful masterpiece,"* she remains dedicated to her passion for education. She sincerely hopes that this work will contribute meaningfully to the field of English education and inspire others to continue learning with heart and purpose.