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Attitudinal Intonation of Arabic Interrogative Utterances among Sundanese Students at Islamic Boarding School

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***Abstract*:** This exploratory case study analyzes the Attitudinal Intonation of Arabic interrogative utterances produced by Sundanese students, using acoustic phonetic analysis to illustrate potential patterns of prosodic transfer. The aim is to describe the differences in pitch direction and duration in constructing Attitudinal Meaning across two types of interrogative utterances. Using a descriptive-evaluative design, speech data were extracted using Praat v.6.4.63 software and interpreted through Attitudinal Intonation Theory. The results show that in information-seeking utterances (WH-Questions), native Arabic speakers consistently use a falling tone to indicate assertiveness. Conversely, the students use a rising tone and exhibit final lengthening. This intonation shift may potentially alter the perceived attitudinal meaning from assertiveness toward hesitation or deference, according to Attitudinal Intonation Theory. However, in Yes/No Questions, a similarity in the rising tone pattern was found between the students and native speakers, allowing the politeness meaning to be conveyed accurately. This study highlights the potential importance of teaching intonation in communicative Arabic language learning, based on an exploratory case study of two students.

INTRODUCTION

Along with global developments, the orientation of Arabic language learning has undergone a significant shift. Arabic language learning, which previously focused more on mastering grammar and classical texts, now emphasizes the acquisition of communicative skills.[1] This shift aligns with the trend in other foreign language learning, where the ability to interact orally is considered a benchmark for successful language mastery.[2] In this context, Arabic language learners are required not only to be grammatically fluent but also

[1] M. Mardhiyah, Jaeni, and S. Salamah, "The Use of Arabic with a Communicative Approach: A Sociolinguistic Review," *Reslaj: Religion Education Social Laa Roiba Journal* 5 (2023), https://doi.org/10.47467/reslaj.v5i1.1378.

[2] Herlina Susanti, Miskalena, A. G. Marzuki, and A. Al Yakin, *Teknologi Era Society pada Dunia Pendidikan* (Akademi Pustaka, 2023).

capable of using the language appropriately according to the prevailing speech situations and cultures.[3]

This shift in the orientation of Arabic language learning is not just a global trend but also has a direct implication for the educational context in Indonesia. It encourages Islamic boarding schools (*pesantren*) in Indonesia to integrate language programs and bilingual environments to prepare students (*santri*) to face cross-cultural communication challenges,[4] both in traditional and modern *pesantren*.[5] Without a supportive language environment, Arabic learning often fails to achieve optimal results even though the methods and materials are well-developed.[6]

One of the Islamic boarding schools that integrates the language curriculum intensively is *Al-Basyariyyah* Islamic Boarding School (BIBS). BIBS adapts the Gontor curriculum, which emphasizes discipline, independence, and the habit of speaking foreign languages. In daily life, students are accustomed to speaking Arabic and English, thereby creating a conducive bilingual environment for developing communicative skills.[7] This condition is in line with the direction of the modern *pesantren* curriculum, which emphasizes strengthening language competence to face global challenges.[8] However, the use of Arabic among BIBS students cannot be separated from the influence of their regional languages, namely Sundanese. Consequently, a distinctive speaking style emerges, making the rhythm and intonation of the students' utterances different from those of native Arabic speakers.

This tendency was observed during preliminary observations conducted by a researcher in April 2026 at BIBS. While observing the students' Arabic conversation practice, the researcher found that although they were able to construct grammatically correct sentences, a distinctive Sundanese intonation was still very frequently heard. Instead of using a pitch contour that matches Modern Standard Arabic (MSA), students often use an undulating intonation that affects the Attitudinal Meaning of the utterance. The difference in contour between BIBS

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[3] Khaled Al Masaeed and Sarah McCombie, "L2 Arabic Pragmatics in the Classroom: Insights from Language Instructors' Beliefs and Practices," *System* 128 (2025), https://doi.org/10.1016/j.system.2024.103546.

[4] M. Ritonga, T. Nurdianto, and Rahmawati, "Strategies for Improving Arabic Language Ability through Language Environment: Phenomenology Studies in Islamic Boarding Schools," Journal of Language and Linguistic Studies 18, no. 1 (2022), https://doi.org/10.52462/jlls.198.

[5] S. Sanah, Odang, and Y. Lutfiyani, "Model Pengembangan Keterampilan Berbahasa Arab di Pesantren," *Ta'lim al-'Arabiyyah: Jurnal Pendidikan Bahasa Arab & Kebahasaaraban* 6, no. 2 (2022), https://doi.org/10.15575/jpba.v6i2.20164.

[6] W. Yul et al., "Unlocking the Secret to Arabic Fluency: Exploring the Critical Role of Language Environment in Maximizing Arabic-Speaking Outcomes," *Arabi: Journal of Arabic Studies* (2023), https://doi.org/10.24865/ajas.v8i1.584.

[7] F. A. Yoda and Y. Mardiansyah, "Campur Kode Bahasa Sunda ke dalam Bahasa Arab pada Percakapan Santri Pondok Pesantren Al-Basyariyyah Cigondewah Bandung (Kajian Sosiolinguistik)," *Hijai: Journal on Arabic Language and Literature* 3, no. 1 (2020), https://doi.org/10.15575/hijai.v3i1.5531.

[8] F. Pikri, "The Role of the Language Environment in Improving Arabic Learning Abilities," *International Journal of Science and Society* 4, no. 2 (2022), https://doi.org/10.54783/ijsoc.v4i2.478.

students as non-native speakers and native Arabic speakers has the potential to deviate from the original sociolinguistic standards.[9] This suggests that intonation may play an important role in the process of interaction meaning interference.[10] Therefore, the confusion of communicative functions resulting from these differences warrants a deep, comparative study between student and native Arabic intonation.

Intonation is fundamentally defined as the pitch variations generated by the vibration of the vocal folds throughout an utterance. This is often likened to a speech melody that gives color to each utterance and allows speakers to give emphasis to a specific part of the message conveyed. In acoustic phonetic studies, intonation is a representation of auditory variation in fundamental frequency (F0). This phenomenon is closely related to the rate of vocal cord vibration that determines the high and low pitch on each speech segment.[11] The intonation that forms the melody of an utterance does not stand alone but is a part of prosody.

Prosody is a suprasegmental aspect in linguistic studies that includes elements of intonation, stress, tempo, and duration. These elements do not work at the phoneme or word level, but on the whole utterance, so they play an important role in conveying emotional meaning, attitude, and the speaker's communicative intent.[12] Prosody functions not only as a regulator of speech rhythm and melody but also plays a role in marking information and social attitude meanwhile, intonation helps listeners understand the speaker's intention and attitude.[13] A rising tone is often associated with uncertainty, doubt, or politeness, while a falling tone shows certainty, assertiveness, or finality. Differences in stress and tempo also influence prosodic perception.[14]

Prosodic studies, especially regarding intonation and Attitudinal Intonation in *pesantren* Arabic learning, are still very limited. This can be seen in the following VOSviewer mapping:

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[9] N. A. Madzlan and C. T. Mahmud, "Perception of the Attitudinal Function of Intonation in Responding to Yes/No Questions: A Study of Non-Native English Language Teachers," *Studies in English Language and Education* 5, no. 2 (2018), https://doi.org/10.24815/siele.v5i2.10476.

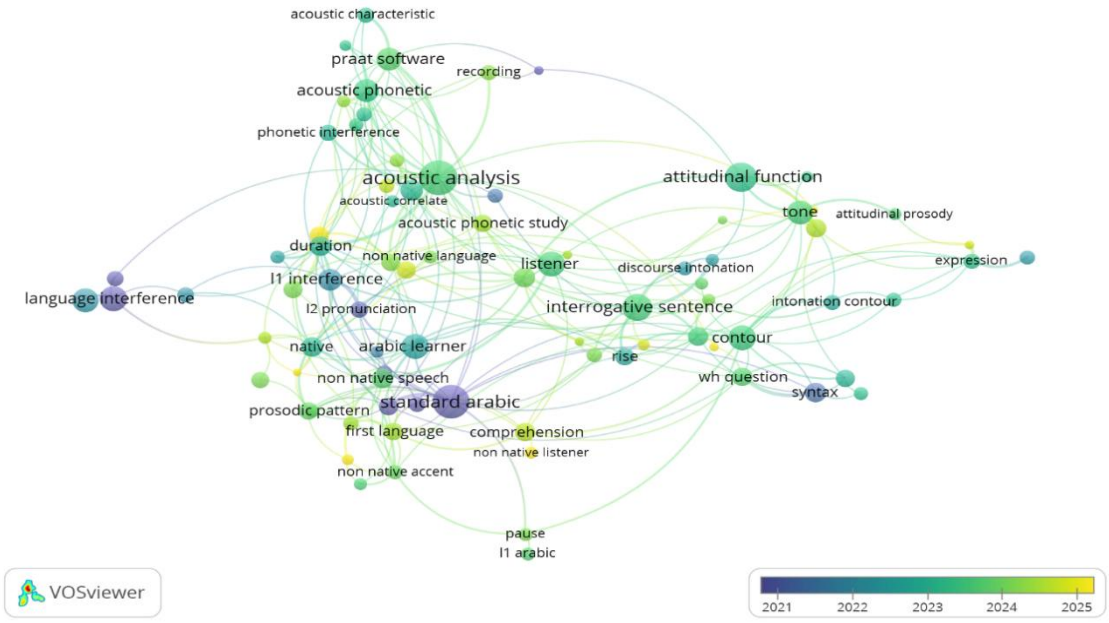
[10] Alan Wichmann, *Attitudinal Intonation and the Inferential Process* (London: Longman, 2000).

[11] Peter Ladefoged and Keith Johnson, *A Course in Phonetics*, 7th ed. (Stamford, CT: Cengage Learning, 2014).

[12] David Crystal, *Prosodic Systems and Intonation in English* (Cambridge: Cambridge University Press, 1969).

[13] Adrian Cruttenden, *Intonation* (Cambridge: Cambridge University Press, 1997); Carlos Gussenhoven, *The Phonology of Tone and Intonation* (Cambridge: Cambridge University Press, 2004).

[14] Ilse Lehiste, *Suprasegmentals* (Cambridge, MA: MIT Press, 1970).



Previous research has been dominated by grammatical, vocabulary, and teaching methods, ignoring suprasegmental aspects that are crucial for effective communication. [15] The difficulty of intonation for non-native speakers like Sundanese students is recognized as a global communication barrier.[16] Various previous studies have explored prosody and intonation in general. In the context of native Arabic speakers, Hellmuth highlighted the phenomenon of diglossic mixing in Arabic prosody, where native speakers often combine prosodic features between Modern Standard Arabic (MSA) and local dialects.[17] In the following year, Zarka introduced a configurational model of Egyptian Arabic intonation that emphasizes the role of pitch, duration, and intensity in shaping Attitudinal Meaning.[18] This model shifts the Autosegmental-Metrical (AM) theory, which focuses too much on pitch targets, toward a more functional and communicative approach, placing intonation as a means to express social and emotional meanings of speakers.

[15] M. R. Mubarak, N. A. Audnia, and B. Muhammad, "Enhancing Arabic Speaking Skills: A Societal Approach at an Indonesian Islamic Boarding School University-Implementation Challenges and Remedies," *Journal of Arabic Language Learning and Teaching (JALLT)* 1, no. 2 (2023), https://doi.org/10.23971/jallt.v1i2.148.

[16] S. Almelhes, "Enhancing Arabic Language Acquisition: Effective Strategies for Addressing Non-Native Learners' Challenges," *Education Sciences* 14 (2024), https://doi.org/10.3390/educsci14101116; N. Alrashoudi, H. Al-Khalifa, and Y. Alotaibi, "Improving Mispronunciation Detection and Diagnosis for Non-Native Learners of the Arabic Language," Discover Computing 28, no. 1 (2025), https://doi.org/10.1007/s10791-024-09489-8.

[17] S. Hellmuth, "Sentence Prosody and Register Variation in Arabic," *Languages* 7, no. 129 (2022), https://doi.org/10.3390/languages7020129.

[18] E. D. Zarka, "A Configurational Model of Egyptian Arabic Intonation," *Grazer Linguistische Studien* 94 (2023), https://doi.org/10.25364/04.49:2023.94.1.

While Zarka's configurational model advances the functional interpretation of Arabic intonation, it remains grounded in a general phonological description of pitch, duration, and intensity, without offering a systematic framework for classifying the specific attitudinal meanings, such as assertiveness, doubt, or politeness, that different pitch configurations convey to listeners. This is where Attitudinal Intonation Theory offers a distinct analytical advantage, rather than describing pitch behavior in purely configurational or ToBI-style tonal terms, it directly maps pitch patterns (Fall, Rise, Fall-Rise, Rise-Fall) onto a fixed inventory of attitudinal functions, making it more directly applicable to evaluating second-language learners' communicative competence.

The utilization of Praat software has also proven crucial for the objectivity of acoustic phonetic analysis,[19] dissecting interrogative intonation,[20] measuring melodic structures,[21] detecting segmental articulation deviations,[22] or mapping the acoustic profiles of interrogative utterances based on gender and Sundanese-Javanese ethnic variations.[23] However, these studies remain dominated by the segmental level and structural descriptions, while studies at the suprasegmental level, particularly regarding how intonation executes pragmatic functions to convey the speaker's Attitudinal Meaning, remain an unresolved challenge.

This gap is particularly evident in the *pesantren* context, because existing acoustic studies using Praat in Arabic learning settings have focused on segmental accuracy (e.g., articulation, mispronunciation detection) rather than on how suprasegmental patterns shape the pragmatic reception of a learner's speech. No prior study has combined Praat-based acoustic extraction with Attitudinal Intonation Theory to evaluate Sundanese learners' interrogative intonation specifically.

The limited literature in this domain is highly critical in a bilingual *pesantren* environment. Although Yoda and Mardiansyah have identified a high level of mother-tongue interference through the phenomenon of Sundanese code-mixing into the Arabic conversation of *Al-Basyariyyah* students, this sociolinguistic study

[19] M. E. Ahmed et al., "Acoustic Voice Analysis of Arabic-Speaking Dysphonic Adults Using Praat Software," The Egyptian Journal of Otolaryngology 40, no. 1 (2026), https://doi.org/10.1016/j.jvoice.2026.03.024.

[20] S. Utami et al., "Intonation of Interrogative Sentences in Learning Arabic for Mahārat al-Kalām," *Al-Ma'rifah: Jurnal Budaya, Bahasa, dan Sastra Arab* 20, no. 1 (2023), https://doi.org/10.21009/almakrifah.20.01.04.

[21] H. Rois, H. Yustanto, and A. H. Wibowo, "Struktur Melodi dalam Intonasi Bahasa Indonesia: Eksperimen pada Dimensi Gender," *Prosiding Seminar Nasional Linguistik dan Sastra (SEMANTIKS)* 4 (2022).

[22] H. Nurfitri, M. Z. Al Farisi, and N. Saleh, "Investigating the Articulation Disorder of the Arabic Phoneme /l/: A Case Study in Post-Ischemic Stroke Patient," *Language Literacy: Journal of Linguistics, Literature, and Language Teaching* 9, no. 2 (2025), https://doi.org/10.30743/ll.v1i1.12387.

[23] S. Mutmainnah, M. Z. Al Farisi, N. Saleh, and A. A. Langguly, "The Prosody of Arabic Interrogative Speech (An Acoustic Phonetic Study)," *IDEAS: Journal of Language Teaching and Learning, Linguistics and Literature* 12, no. 2 (2024), https://doi.org/10.24256/ideas.v12i2.6071.

has not touched upon prosodic interference or suprasegmental phonology.[24] This gap, between documented lexical interference and undocumented prosodic interference, is precisely what this study addresses. Using Attitudinal Intonation Theory to comprehensively dissect how intonation shift alters the attitudinal meaning of students' interrogative utterances, a dimension left unexamined by prior lexical-level analyses. This theory asserts that intonation does not merely function as a grammatical marker but as the main instrument carrying Attitudinal Meaning. Attitudinal Meaning is the meaning that appears from the way the speaker pronounces the utterance, not from its lexical or grammatical structure.[25]

Intonation pattern has a connection with Attitudinal Meaning. There are four main pitch patterns in this theory. First, Fall, which is associated with assertiveness, certainty, and authority of the speaker. Second, rise, which is associated with doubt, politeness, or uncertainty. Third, fall-rise, which indicates reservation, caution, or implicit contrast, and fourth, Rise-Fall, which expresses surprise, enthusiasm, or strong confirmation.[26] These four patterns form a distinctive prosodic structure. Each pitch pattern carries an Attitudinal Meaning that can be directly recognized acoustically, even without looking at the situational context directly.[27]

Based on this research gap, this study adopts an exploratory case study design to describe the differences in pitch movement of two Sundanese students at BIBS, relative to a native Arabic speaker reference norm. Given the limited number of subjects, the aim is not to generalize findings to the broader population of Sundanese Arabic learners, but to provide an in-depth, illustrative account of how local intonation contour interference may affect the delivery of Attitudinal Meaning in interrogative utterances, offering a foundation for future studies with larger samples. In doing so, this study contributes a novel application of Attitudinal Intonation Theory as distinct from configurational or ToBI-based approaches to the *pesantren* Arabic learning context, an environment where suprasegmental competence has so far been unexamined despite documented lexical-level interference.

METHOD

This study uses a qualitative method, employing an exploratory case study design through descriptive-evaluative acoustic phonetic analysis, focusing on two

[24] F. A. Yoda and Y. Mardiansyah, "Campur Kode Bahasa Sunda ke dalam Bahasa Arab pada Percakapan Santri Pondok Pesantren Al-Basyariyyah Cigondewah Bandung (Kajian Sosiolinguistik)," *Hijai: Journal on Arabic Language and Literature* 3, no. 1 (2020), https://doi.org/10.15575/hijai.v3i1.5531.

[25] J. D. O'Connor and G. F. Arnold, *Intonation of Colloquial English* (London: Longman Group Ltd., 1973).

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

[27] N. Hirci, "English Intonation Models: The Attitudinal Approach of O'Connor and Arnold, and Brazil's Communicative Approach," *Vestnik Filozofske Fakultete Univerze* (1999).

purposively selected subjects to allow an in-depth examination of individual prosodic behavior.[28] This design was selected because the study aims to evaluate the Attitudinal Intonation patterns of Arabic interrogative utterances produced by students based on the standard prosody of native Arabic speakers using MSA as a baseline reference norm. Acoustic phonetic analysis serves as an objective measurement instrument because the human ear is prone to errors or subjectivity when assessing intonation.[29]

The primary data in this study consist of oral utterances from two sources: voice recordings of Sundanese students as research subjects, and recordings of native Arabic speakers from the book *Al-'Arabiyyah Baina Yadayk* (ABY) volume 1 *waḥdah* 8, which serves as a benchmark for MSA prosody. The ABY book was chosen because it presents authentic communication situations that reflect native Arabic speech usage.[30] From this text, two interrogative sentences were chosen to map out pitch contour differences deeply, as displayed in Table 1.

Table 1. Interrogative Utterance Material of the research

No	Interrogative Utterance	Translation	Utterance Type
1	فِي أَيِّ مَرْحَلَةٍ تُدَرِّسِينَ؟ (*Fī ayyi marḥalatin tudarrisīn?*)	Which class do you teach?	WH-Question
2	هَلْ تُحِبِّينَ عَمَلَكِ؟ (*Hal tuḥibbīna 'amalaki?*)	Do you like your work?	Yes/No Question

Limiting the focus to two types of interrogative utterances is based on the prosodic systems that are linguistically opposed in MSA. First, WH-Questions, represented by the sentence *Fī ayyi marḥalatin tudarrisīn?* consistently end with a falling tone that expresses assertiveness and finality, because all information-seeking interrogative words (*Istifhām Taṣawwurī*) in MSA belong to the same intonation class, meaning they can be sufficiently represented by one sentence without needing to investigate each question word separately.[31] Second, Yes/No Questions, represented by the sentence *Hal tuḥibbīna 'amalaki?* end with a rising tone because confirmation questions (*Istifhām Taṣdīqī*) phonologically require a

[28] Hossein Nassaji, "Qualitative and Descriptive Research: Data Type Versus Data Analysis," *Language Teaching Research* 19, no. 2 (2015), https://doi.org/10.1177/1362168815572747; John W. Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, 4th ed. (Thousand Oaks, CA: SAGE Publications, 2014).

[29] Peter Ladefoged and Keith Johnson, *A Course in Phonetics*, 7th ed. (Stamford, CT: Cengage Learning, 2014).

[30] Ridha, "The Linguistic Differences Derived from the Arabic Dictionary 'Al-Muʿjam Al-ʿArabī Bayna Yadayk' to Enrich the Vocabulary of Beginners," *Proceeding of International Conference on Islamic Studies* (2025), https://proceedingincisst.arraayah.ac.id/

[31] M. E. Al-Ani, *Arabic Phonology: An Acoustical and Physiological Investigation* (The Hague: Mouton, 1970); S. Utami et al., "Intonation of Interrogative Sentences in Learning Arabic for Mahārat al-Kalām," *Al-Ma'rifah: Jurnal Budaya, Bahasa, dan Sastra Arab* 20, no. 1 (2023), https://doi.org/10.21009/almakrifah.20.01.04.

pitch Rise at the end of the sentence.[32] These two utterances represent both ends of the entire interrogative intonation spectrum in MSA and are empirically confirmed by the native speaker data in this study.

The determination of Sundanese student subjects was carried out through a purposive sampling technique.[33] The researcher involved Arabic language teachers as key informants. The subject profiles can be seen in Table 2.

Table 2. Criteria and Profile of Subjects

Subject Code	Subject Name	Region	Mother Tongue	Proficiency Level
MSS	Irzan (M)	Garut, West Java	Sundanese	Intermediate (Grade 6 TMI)
FSS	Devi (F)	Garut, West Java	Sundanese	Intermediate (Grade 6 TMI)

MSS = Male Sundanese Student Speaker
FSS = Female Sundanese Student Speaker

As this study involves only two student subjects, the findings are treated as case-specific illustrations of potential prosodic transfer rather than statistically generalizable patterns. This design choice allows for a deep, utterance-level acoustic analysis that would not be feasible with a larger sample, but readers should interpret the results as hypothesis-generating rather than confirmatory.

Data collection was carried out through recording. Two selected students dialogued and were recorded using a digital recording instrument based on a mobile device through the Easy Voice Recorder application. This instrument was chosen due to its ability to capture and export audio signals directly into a lossless format or Waveform Audio Format (.WAV). Audio was captured at a sampling rate of 44.1 kHz and 16-bit depth.

Recordings were conducted in a dedicated classroom isolated from student activity areas to minimize ambient noise at the source. No additional noise reduction or audio post-processing was applied to the recordings prior to analysis. Pitch extraction was performed using the autocorrelation method with a pitch floor of 75 Hz and a pitch ceiling of 300 Hz for male and 500 Hz for female, following standard settings recommended for the respective voice ranges.[34] Syllable boundaries were segmented manually based on visual inspection of the waveform and spectrogram, cross-checked against auditory judgment. Acoustic measurements and segmentations were manually verified through repeated

[32] M. A. Al-Zahrani, *The Intonation of Arabic: An Acoustic and Perceptual Study* (PhD diss., University of Edinburgh, 1988), 45; W. Zuraiq and M. Abu-Joudeh, "Synthesis of the Intonation of Neutrally Spoken Modern Standard Arabic Speech," *Signal Processing* 88, no. 12 (2008), https://doi.org/10.1016/j.sigpro.2008.03.013.

[33] Michael Quinn Patton, *Qualitative Research and Evaluation Methods*, 3rd ed. (Thousand Oaks, CA: SAGE Publications, 2002).

[34] Peter Ladefoged and Keith Johnson, *A Course in Phonetics*, 7th ed. (Stamford, CT: Cengage Learning, 2014).

visual inspection of the waveform and spectrogram by the researcher. The objective data extracted via Praat provided the primary basis for pitch contour classification, minimizing reliance on subjective auditory judgment. However, formal inter-rater reliability testing was not conducted, which is acknowledged as a methodological limitation for future research.

Data analysis was carried out through three sequential stages. First, each piece of interrogative utterance was imported into the Praat v.6.4.63 software to extract two main prosody parameters, namely pitch contour and temporal duration. The selection of these two parameters was based on their relevance to Attitudinal Meaning. Suprasegmental prosody includes intonation and duration as elements that together form the speaker's Attitudinal Meaning and significantly affect the listener's prosody perception.[35] Second, the acoustic extraction results were classified based on the direction of the final pitch contour movement, referring to the four pitch patterns in Attitudinal Intonation Theory Fall if the F0 line decreases on the final syllable of the sentence, Rise if the F0 line increases, Fall-Rise if the F0 line decreases then Rises, and Rise-Fall if the F0 line Rises then decreases. Third, the classification results of the intonation contours were interpreted using Attitudinal Intonation Theory.[36] This interpretation is not intended as an assessment of the subject's personal attitude, but rather as an identification of the Attitudinal Meaning contained in the students' interrogative utterances.

RESULT AND DISCUSSION

Based on the sound wave extraction using Praat software, significant differences in acoustic parameters were found between native Arabic speakers and the students. This difference includes not only the movement of F0 but also the temporal duration of each syllable. These differences are interpreted using Attitudinal Intonation Theory. This theory views prosody as a lexicon of attitudes, meaning that each intonation pattern has a strong connection with a specific Attitudinal Meaning that is widely agreed upon and understood by its speaker community.[37] Based on this framework, the Fall pattern is associated with assertiveness, certainty, and authority, while the Rise pattern is associated with doubt, politeness, or uncertainty.[38]

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[35] David Crystal, *Prosodic Systems and Intonation in English* (Cambridge: Cambridge University Press, 1969); Ilse Lehiste, *Suprasegmentals* (Cambridge, MA: MIT Press, 1970).

[36] J. D. O'Connor and G. F. Arnold, *Intonation of Colloquial English* (London: Longman Group Ltd., 1973).

[37] N. Hirci, "English Intonation Models: The Attitudinal Approach of O'Connor and Arnold, and Brazil's Communicative Approach," *Vestnik Filozofske Fakultete Univerze* (1999).

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

It should be noted that the attitudinal interpretations offered throughout this discussion are derived from acoustic pattern analysis interpreted through Attitudinal Intonation Theory, rather than from direct listener perception experiments; they should therefore be read as theoretically grounded interpretations rather than empirically confirmed perceptions.

The interrogative utterance *Fī ayyi marḥalatin tudarrisīn?* (Which class do you teach?) is a form of information-seeking question (*Istifhām Taṣawwurī*) which, in MSA prosody, requires a falling tone contour at the end of the sentence as a marker of assertiveness and finality.[39] The evaluation of the students' utterance production is conducted by referring to the native Arabic speaker (NAS) as an acoustic reference norm. The results of acoustic extraction using Praat are presented in Table 3.

Table 3. Acoustic Parameters and Stress Shifts in WH-Questions (single-utterance measurement per subject; F0 = mean across the utterance)

Subject	Average F0 (Hz)	Initial Duration (*fī*, seconds)	Medial Duration (*mar*, seconds)	Final Duration (*sin/na*, seconds)	Final Pitch Contour
NAS	122	0.36 seconds	0.30 seconds	0.23 seconds	Fall
MSS	128	0.17 seconds	0.16 seconds	0.28 seconds	Rise
FSS	201	0.21 seconds	0.13 seconds	0.35 seconds	Rise

Based on the duration extraction in Table 3, the NAS concentrates the longest duration at the beginning of the sentence on the syllable *fī* (0.36 seconds) and gives secondary emphasis in the middle of the sentence on the syllable *mar* (0.30 seconds). Lexically, this stress placement serves to emphasize the interrogative preposition and the core information sought, namely *marḥalah* (grade). At the final boundary of the utterance, the native speaker's duration actually shrinks to 0.23 seconds and ends with a Fall pitch contour. Under Attitudinal Intonation Theory, this configuration is associated with a nuance of assertiveness, certainty, and authority of the speaker in the context of searching for information.[40]

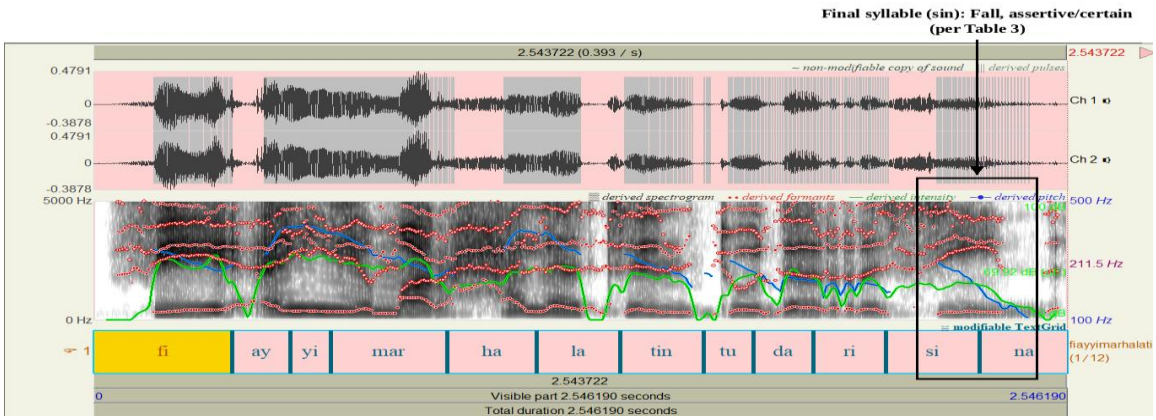

Figure 1. Spectrogram NAS

[39] W. Zuraiq and M. Abu-Joudeh, "Synthesis of the Intonation of Neutrally Spoken Modern Standard Arabic Speech," *Signal Processing* 88, no. 12 (2008), https://doi.org/10.1016/j.sigpro.2008.03.013.

[40] J. D. O'Connor and G. F. Arnold, *Intonation of Colloquial English* (London: Longman Group Ltd., 1973).

Visual evidence of this reference norm can be observed through the spectrogram in Figure 1, where the NAS concentrates the longest duration at the beginning of the sentence in the initial syllable boundary box *fī,* while the F0 line (blue line) at the end of the sentence is seen diving downward. This downward movement of the pitch line is in line with the model by Zarka, which states that the pitch shape produced by native speakers functions directly to express social and emotional meanings.[41] On the other hand, the student subjects (MSS and FSS) show different prosodic patterns that can be observed through their respective spectrogram profiles in Figure 2 and Figure 3.

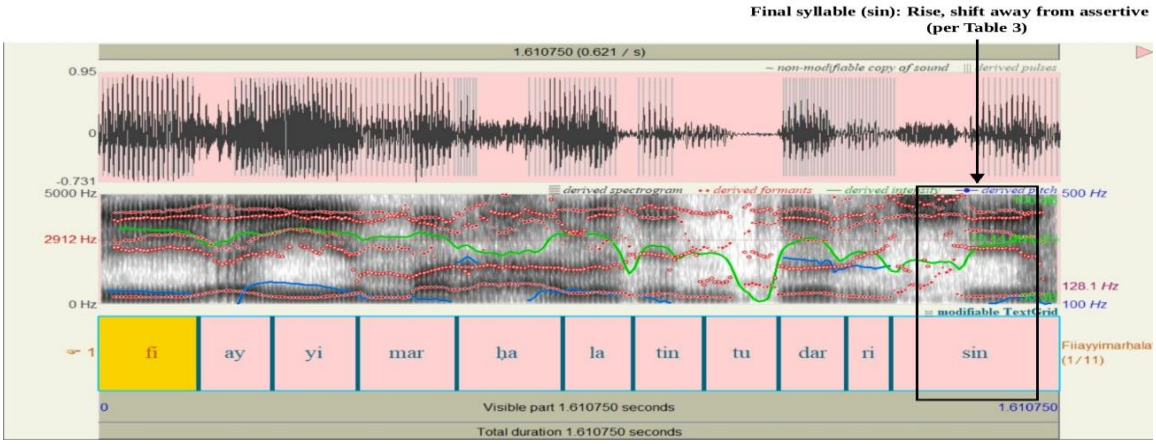

Figure 2. Spectrogram MSS

The spectrogram evaluation of MSS shows a clear pattern of stress displacement toward the end of the sentence. MSS distributes his shortest duration on the middle syllable *ri* (0.076 seconds) but instead unnaturally extends the duration on the last syllable *sīn* to 0.28 seconds. This final lengthening is more than three times the length of the previous syllable. The analysis results regarding this duration shift support the argument proposed by Irawan and Dinakaramani regarding negative prosodic transfer, where non-native speakers tend to transfer the rhythm of their mother tongue into the second language.[42] Furthermore, the blue F0 line inside the *sīn* box in Figure 2 does not dive downward like the native speaker's baseline. Instead, the line curves sharply upward, indicating that MSS replaces the expected Fall contour with a Rise contour that differs from the typical MSA contour.

[41] E. D. Zarka, "A Configurational Model of Egyptian Arabic Intonation," *Grazer Linguistische Studien* 94 (2023), https://doi.org/10.25364/04.49:2023.94.1.

[42] Yayan Irawan and Agustina Dinakaramani, *Prosodi: Fonetik & Fonologi Bahasa* (Bandung: Alfabeta, 2019).

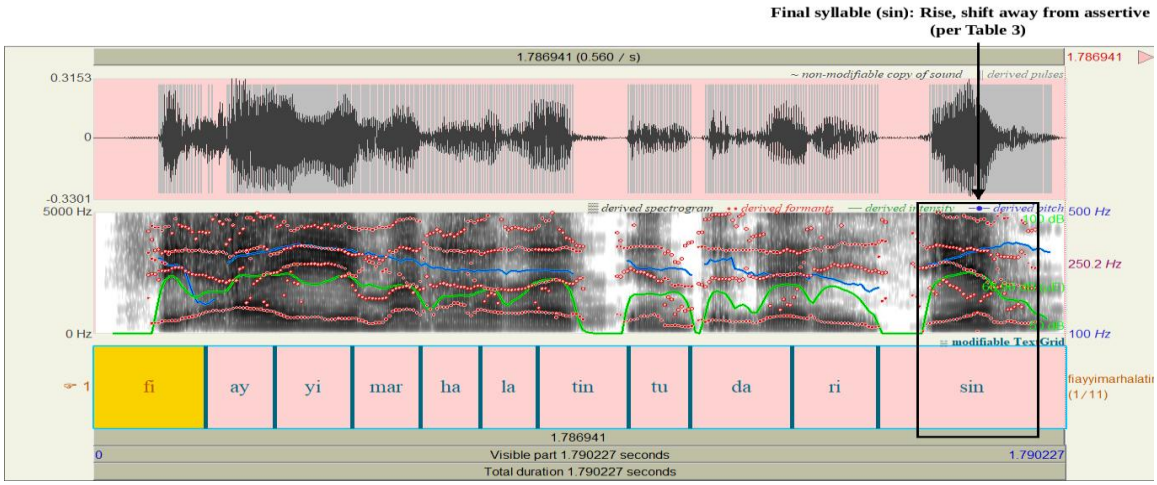

Figure 3. Spectrogram FSS

A highly contrastive difference can be observed when comparing the spectrograms of the NAS and the student subjects. In the spectrograms of MSS and FSS, the syllable box boundary for *fī* narrows, while the terminal syllable box boundary for *sīn* at the end of the sentence widens significantly, exceeding all other syllables. Additionally, the tip of the blue line inside the *sīn* box is seen bending sharply upward, representing a Rise pitch contour. This fits the characteristics of interrogative sentences in local Indonesian languages, which generally exhibit a rising final pitch contour.[43] Non-native speakers often carry over the duration rhythm of their mother tongue when speaking a second language.[44] This shared prosodic pattern across both subjects is consistent with the possibility that Sundanese prosodic habits interfere with Arabic WH-Question intonation, although a larger sample would be needed to confirm whether this pattern is systematic across the broader student population.

This kind of intonation difference may increase the possibility of pragmatic misunderstanding, as Mubarak et al. note that ignoring suprasegmental aspects (intonation) can contribute to communication difficulties.[45] This is also reinforced by Almelhes, who states that difficulty mastering native intonation is a major barrier for non-native learners when interacting globally.[46] This shared contour pattern across both subjects is also consistent with the mapping results of Mutmainnah et al. regarding the acoustic profile of Sundanese interrogative utterances, suggesting that the directional movement of the speech melody may be influenced by the speaker's regional language system, although this cannot be

[43] Yayan Irawan, *Fonetik Akustik* (Bandung: CV Angkasa, 2017).

[44] Yayan Irawan and Agustina Dinakaramani, *Prosodi: Fonetik & Fonologi Bahasa* (Bandung: Alfabeta, 2019).

[45] M. R. Mubarak, N. A. Audnia, and B. Muhammad, "Enhancing Arabic Speaking Skills: A Societal Approach at an Indonesian Islamic Boarding School University-Implementation Challenges and Remedies," *Journal of Arabic Language Learning and Teaching (JALLT)* 1, no. 2 (2023), https://doi.org/10.23971/jallt.v1i2.148.

[46] S. Almelhes, "Enhancing Arabic Language Acquisition: Effective Strategies for Addressing Non-Native Learners' Challenges," *Education Sciences* 14 (2024), https://doi.org/10.3390/educsci14101116.

confirmed as generalizable beyond the two participants examined here.[47] The students appear to transfer a tone-swinging habit at the end of utterances from their native language, which contradicts the standard Fall contour of MSA and, under Attitudinal Intonation Theory, is associated with a shift from assertiveness toward hesitation. This finding is in line with Yoda and Mardiansyah, who emphasize the high level of Sundanese language interference in Arabic-speaking practices at BIBS, while also extending these findings from the lexical domain to the suprasegmental domain. [48]

Unlike the WH-Question utterance, which experiences distortion, an interesting phenomenon is recorded in Yes/No Question interrogative utterances, such as the sentence *Hal tuḥibbīna ʻamalaki?* (Do you like your work?) The analysis of acoustic parameters on this sentence structure reveals a meeting point (convergence) of prosodic patterns between the native speaker and the students.

Table 4. Acoustic Parameters in Yes/No Questions (single-utterance measurement per subject; F0 = mean across the utterance)

Subject	Average F0 (Hz)	Final Pitch Contour	Total Duration (seconds)
NAS	207	Rise	1.77
MSS	118	Rise	1.61
FSS	221	Rise	1.58

Referring to Table 4, unlike the F0 pattern in the WH-Question utterance, the average F0 value in this Yes/No Question utterance consistently reflects a Rise pattern. The NAS produces a high F0 of 207 Hz as a direct consequence of the rising tone throughout the sentence that peaks at the end. FSS produces an F0 of 221 Hz, which is close to the native speaker's because both are female with aligned Rise patterns. MSS produces a lower F0 of 118 Hz solely due to biological gender factors, as the normal range for adult males is around 85-155 Hz; however, the direction of his pitch contour remains rising just like the native speaker.[49] Under Attitudinal Intonation Theory, this Rise in pitch is associated with shifting the turn of speech and subtly requesting agreement or an answer from the interlocutor. Visual evidence of this Rise tone pattern convergence in the Yes/No Question can be seen through the comparison of the frequency lines on the spectrogram of NAS (Figure 4), MSS (Figure 5), and FSS (Figure 6).

[47] S. Mutmainnah, M. Z. Al Farisi, N. Saleh, and A. A. Langguly, "The Prosody of Arabic Interrogative Speech (An Acoustic Phonetic Study)," *IDEAS: Journal of Language Teaching and Learning, Linguistics and Literature* 12, no. 2 (2024), https://doi.org/10.24256/ideas.v12i2.6071.

[48] F. A. Yoda and Y. Mardiansyah, "Campur Kode Bahasa Sunda ke dalam Bahasa Arab pada Percakapan Santri Pondok Pesantren Al-Basyariyyah Cigondewah Bandung (Kajian Sosiolinguistik)," *Hijai: Journal on Arabic Language and Literature* 3, no. 1 (2020), https://doi.org/10.15575/hijai.v3i1.5531.

[49] Peter Ladefoged and Keith Johnson, *A Course in Phonetics*, 7th ed. (Stamford, CT: Cengage Learning, 2014).

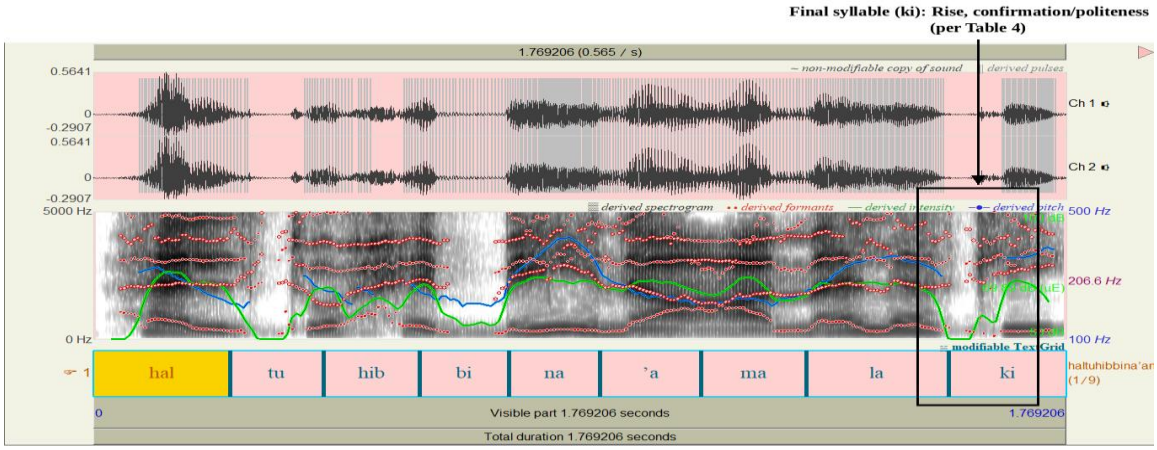

Figure 4. Spectrogram NAS

The NAS produces an utterance with a final pitch contour curving smoothly upward, showing a standard Rise pattern. This complies with standard MSA rules for confirmation questions, which require an increase in F0 at the end of the sentence, a pattern that is also consistent with interrogative prosody findings across various other world languages.[50]

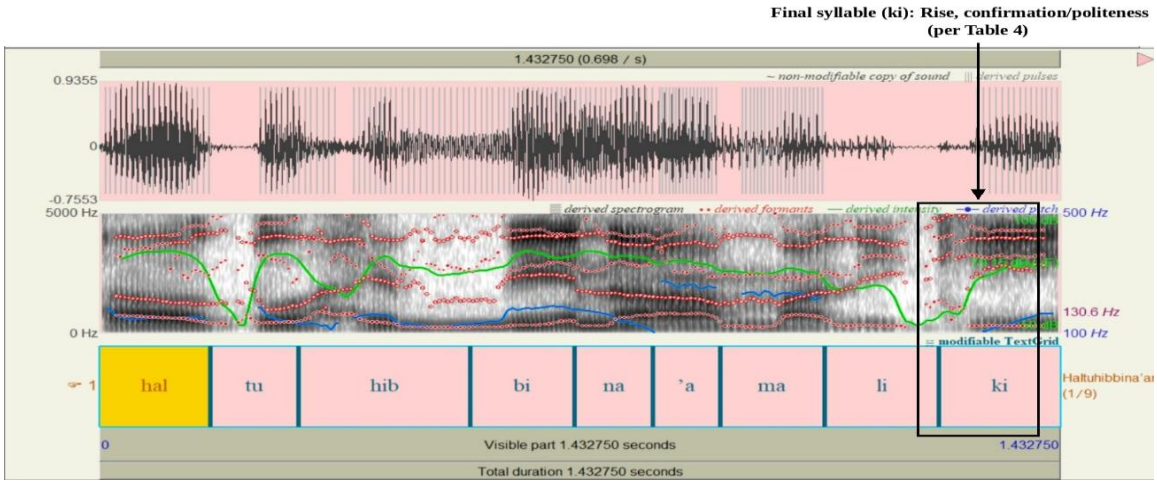

Figure 5. Spectrogram MSS

The spectrogram results in Figure 5 show the F0 line of the MSS on the last syllable *ki* curving consistently upward. Although MSS's voice is biologically lower (118 Hz) due to gender differences, the direction of the blue line appears to accurately follow the native speaker's Rise pattern.[51] This successfully formed pitch contour indicates an alignment in the students' utterances, where the stable closure duration data of the syllable *ḥib* (0.255 seconds) also complements the sound control study discussed by Nurfitri et al. regarding articulatory accuracy.[52]

[50] W. Zuraiq and M. Abu-Joudeh, "Synthesis of the Intonation of Neutrally Spoken Modern Standard Arabic Speech," *Signal Processing* 88, no. 12 (2008), https://doi.org/10.1016/j.sigpro.2008.03.013; Adrian Cruttenden, *Intonation* (Cambridge: Cambridge University Press, 1997).

[51] Peter Ladefoged and Keith Johnson, *A Course in Phonetics*, 7th ed. (Stamford, CT: Cengage Learning, 2014).

[52] H. Nurfitri, M. Z. Al Farisi, and N. Saleh, "Investigating the Articulation Disorder of the Arabic Phoneme /l/: A Case Study in Post-Ischemic Stroke Patient," *Language Literacy: Journal of Linguistics, Literature, and Language Teaching* 9, no. 2 (2025).

This condition may reflect positive prosodic transfer, where the pitch habits from the first language (Sundanese) coincidentally support pronunciation accuracy in the second language (Arabic). Alternative explanations should also be considered, however: the convergence could equally reflect a cross-linguistically common tendency for confirmation questions to end in a rising pitch, explicit classroom instruction on Arabic interrogative intonation, imitation of instructional recordings, or exposure to Modern Standard Arabic media, rather than Sundanese transfer alone. The present design cannot adjudicate between these possibilities.[53]

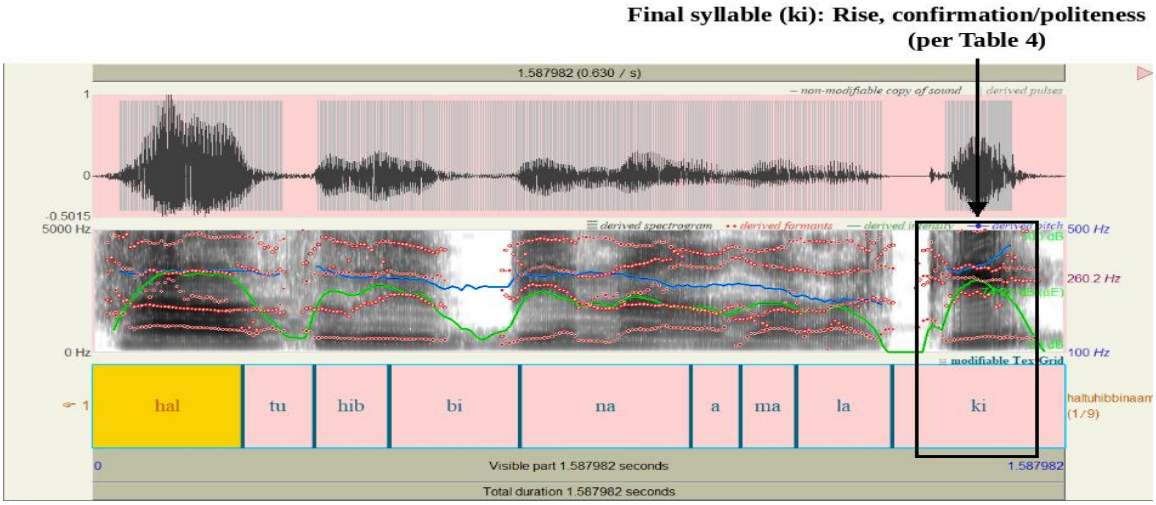

Figure 6. Spectrogram FSS

The visual display in Figure 6 shows the utterance results of FSS, who also successfully mimics the native speaker's curve pattern. Inside the terminal boundary box of the syllable *ki* in Figure 6, the blue pitch graph shoots upward, forming a good Rise contour with an average F0 value of 221 Hz. This close acoustic similarity between FSS and the NAS (207 Hz) is consistent with an alignment of speech melody across subjects that does not appear to disrupt the Attitudinal Meaning. This pattern is in line with the characteristics of interrogative sentence intonation described by Mutmainnah et al., suggesting that when the sentence pattern of the target language allows a rising pitch contour, the risk of meaning errors caused by regional-language influence may be reduced, at least for the two speakers examined here.[54]

The fact that both subjects consistently produce a pitch contour swinging upward on the final syllable *ki* marks a highly successful instance of prosodic convergence. Analysis using Attitudinal Intonation Theory suggests that little to no distortion of Attitudinal Meaning occurs in this confirmation utterance, at least for the two subjects examined. The convergence of the pitch direction between the

[53] Yayan Irawan and Agustina Dinakaramani, *Prosodi: Fonetik & Fonologi Bahasa* (Bandung: Alfabeta, 2019).

[54] S. Mutmainnah, M. Z. Al Farisi, N. Saleh, and A. A. Langguly, "The Prosody of Arabic Interrogative Speech (An Acoustic Phonetic Study)," *IDEAS: Journal of Language Teaching and Learning, Linguistics and Literature* 12, no. 2 (2024), https://doi.org/10.24256/ideas.v12i2.6071.

NAS and the student subjects (non-native Arabic speakers) produces an aligned interpretation of Attitudinal Meaning. Based on the acoustic convergence with the native speaker pattern, this confirmation question is interpreted, under the Attitudinal Intonation framework, as conveying an appropriate, polite, friendly, and warm nuance rather than one of dictating or interrogating.[55] When pitch height and duration are aligned with the native speaker pattern, this is interpreted as indicative of accurately conveyed sociolinguistic politeness.[56] Conversely, if the patterns clash as in the first case, a shift in Attitudinal Meaning occurs.[57] This tentatively suggests that local politeness values can be incorporated into Arabic when placed within a syntactic structure that inherently uses a Rise intonation, though confirmation would require a larger and more varied sample. The connection between the learners' cultural context and language adaptation is supported by the findings of Hidayah et al., which show that variations in Arabic expressions develop dynamically through the strength of linguistic stimuli and the active involvement of their users.[58]

These two phenomena together suggest that the interference of Sundanese prosody on the students' Arabic speech may vary depending on the syntactic structure of the utterance, a pattern that warrants further investigation with a larger sample. In utterances that inherently require a Fall pattern, namely the WH-Question, interference occurs because the Sundanese prosody system tends to end utterances with a rising tone, which contradicts the standard of MSA. Conversely, in utterances that require a Rise pattern, namely the Yes/No Question, interference actually results in convergence because the prosodic habits of the Sundanese language happen to align with the standard of the target language. Naturally, interrogative sentences that require confirmation do use a rising pitch structure at the end of the utterance.[59] In this condition, a positive prosodic transfer occurs, where the pitch habits from the first language coincidentally support pronunciation accuracy in the second language.

This finding tentatively extends the conclusion of Yoda and Mardiansyah from the lexical domain to the suprasegmental domain,[60] indicating that

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

[56] E. D. Zarka, "A Configurational Model of Egyptian Arabic Intonation," *Grazer Linguistische Studien* 94 (2023), https://doi.org/10.25364/04.49:2023.94.1.

[57] S. Mutmainnah, M. Z. Al Farisi, N. Saleh, and A. A. Langguly, "The Prosody of Arabic Interrogative Speech (An Acoustic Phonetic Study)," *IDEAS: Journal of Language Teaching and Learning, Linguistics and Literature* 12, no. 2 (2024), https://doi.org/10.24256/ideas.v12i2.6071.

[58] N. Hidayah, Y. L. Udin, I. Ichwani, Muslim, and S. Mustofa, "Linguistic Analysis of Arabic Expression Variations in Response Stimuli on the Arabiyahtalks Instagram Account," *ALSUNIYAT: Jurnal Penelitian Bahasa, Sastra, dan Budaya Arab* 8, no. 2 (2025): 448-462, https://doi.org/10.17509/alsuniyat.v8i2.82011.

[59] Yayan Irawan, *Fonetik Akustik* (Bandung: CV Angkasa, 2017).

[60] F. A. Yoda and Y. Mardiansyah, "Campur Kode Bahasa Sunda ke dalam Bahasa Arab pada Percakapan Santri Pondok Pesantren Al-Basyariyyah Cigondewah Bandung (Kajian Sosiolinguistik)," *Hijai: Journal on Arabic Language and Literature* 3, no. 1 (2020), https://doi.org/10.15575/hijai.v3i1.5531.

Sundanese language interference at BIBS may occur not only at the vocabulary and grammar level but also in the intonation system that carries Attitudinal Meaning. Failure to master the attitudinal function of intonation can potentially cause pragmatic miscommunication; the findings of this study illustrate this risk within the specific context of the two subjects examined, though further research involving listener perception is needed to empirically confirm this effect.[61]

CONCLUSION

This study suggests that mother-tongue interference in students' Arabic speech may affect not only the accuracy of letter pronunciation, but also their intonation and speech duration systems (suprasegmental phonology). Based on the acoustic phonetic analysis and Attitudinal Intonation Theory, two main phenomena were found.

First, in information-seeking interrogative utterances (WH-Questions), Sundanese students change the assertive Fall pitch contour into a Rise pattern, a shift that potentially alters the perceived Attitudinal Meaning toward a nuance of casual politeness or small talk. In this utterance, a shift in the point of emphasis (stress shift) also occurs, where Sundanese students shorten the duration of syllables at the beginning of the sentence and elongate them at the end of the utterance. A review of Attitudinal Intonation Theory indicates that the use of a rising pitch and this elongation of duration is consistent with a shift in perceived meaning from what should be authoritative and direct into an utterance with nuances of doubt or extra caution, though this interpretation is based on acoustic patterns alone and would benefit from perceptual validation. Second, a pattern similarity phenomenon (convergence) occurs in confirmation utterances (Yes/No Questions). In this sentence, the students' intonation habits accidentally coincide with Arabic standards (the Rise pattern), which, under Attitudinal Intonation Theory, is interpreted as producing an aligned and polite Attitudinal Meaning without apparent distortion, based on the acoustic patterns of the two subjects examined.

Overall, the findings of this case study point to a potential blind spot in Arabic language learning in *pesantren*, where a primary focus on lexical and grammatical appropriateness may leave the crucial role of intonation in pragmatic communication under-addressed. Therefore, these findings suggest a potential need for greater integration of suprasegmental instruction in the communicative Arabic curriculum, as a way to help reduce the risk of miscommunication in global interactions, a proposal that would benefit from further study involving actual classroom implementation and learner outcomes. In line with this need, this study

[61] N. A. Madzlan and C. T. Mahmud, "Perception of the Attitudinal Function of Intonation in Responding to Yes/No Questions: A Study of Non-Native English Language Teachers," *Studies in English Language and Education* 5, no. 2 (2018), https://doi.org/10.24815/siele.v5i2.10476.

offers a preliminary implication that Arabic language teachers in *pesantren* could consider utilizing speech analysis software such as Praat as a medium to evaluate students' pronunciation more objectively, and that developing specific instructional materials focusing on Attitudinal Intonation exercises may be a worthwhile direction for future pedagogical development. These remain proposed implications rather than empirically tested interventions, as this study did not evaluate classroom implementation, teacher perceptions, or learner improvement.

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