A Phono-Pragmatic Study of Gemination in the Glorious Quran with Reference to English

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Abstract

Gemination involves articulating a consonant twice due to muscle tension. This study analyzes gemination in the Qur'an concerning English, focusing on its pragmatic functions and phonological distinctions. While well-documented in Arabic, its interpretive implications in the Qur'an are underexplored. Using qualitative analysis and a Context Model, which is a theoretical framework initially proposed by van Dijk in 2008 and further developed in 2009, forms the foundation of this study. The problem of this study revolves around analyzing selected Ayahs to determine how the dual roles of phonology and pragmatics contribute to the understanding of gemination in the Glorious Qur'an. It examines how gemination affects interpretation, analyzing acoustic features with Pratt software to investigate the phonological features that differentiate between geminated and

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ungeminated lexical items, showing gemination contributes to distinctions in meaning. More importantly, it explores how gemination influences the interpretation of specific Ayahs. The study examines how gemination shapes meaning, emphasis, and theological nuances, hypothesizing it as a rhetorical device that enhances understanding and interpretation. Combining classical tafsīr analysis with acoustic phonetics, it finds gemination is not just phonological but a deliberate communication device that amplifies meaning and auditory impact.

Keywords: gemination, phonology, pragmatics, Quranic discourse

دراسة صوتية-تداولية للتشديد في القرآن الكريم مع الاشارة الى اللغة الانكليزية

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المستخلص

التضعيف (التشديد) يعني نطق الحرف الساكن مرتين نتيجة للتوتر العضلي في أعضاء النطق. تتناول هذه الدراسة ظاهرة التضعيف في القرآن الكريم من منظور صوتي-تداولي، مع الإشارة اليها في اللغة الإنجليزية. وتهدف إلى استكشاف الظاهرة اللغوية للتضعيف (التشديد) في القرآن الكريم، مع التركيز على وظائفها التداولية والفروقات الصوتية المرتبطة بها.

ورغم أن التضعيف يُعد سمة صوتية موثَّقة في اللغة العربية، إلا أن أبعاده التداولية والتفسيرية في سياق القرآن الكريم لم تُبحث بشكل كافٍ.

من خلال اعتماد منهج نوعي ونموذج تداولي سياقي، تسعى هذه الدراسة إلى دراسة تأثير التضعيف في تفسير (تفسير) الآيات المختارة. ولتحقيق ذلك، تقوم الدراسة بتحليل صوتي للمصطلحات المشددة وغير المشددة في الآيات المختارة باستخدام برنامج Praat ، لتحديد الخصائص الصوتية مثل المدة، و علو الصوت (pitch) و مستوى الشدة (intensity level).

كما تبحث الدراسة في الوظائف التداولية للتضعيف، وكيف يسهم في تشكيل المعنى، والتوكيد البلاغي، والدلالات العقائدية داخل آيات القرآن الكريم. وتفترض الدراسة أن التضعيف في القرآن الكريم يُستخدم كأداة بلاغية تُعزز المعنى. وتفترض الدراسة أن التضعيف في القرآن لا يُستخدم فقط كأداة بلاغية لتعزيز المعنى المقصود، بل يتجاوز ذلك ليؤثر أيضًا في التفسير، موجِّهًا فهم المتلقي وسياق التأويل..

من خلال الدمج بين التحليل النصي للتفسير القرآني والتحليل الصوتي باستخدام علم الصوتيات الحاسوبي، تخلص الدراسة إلى أن التضعيف ليس مجرد سمة صوتية، بل أداة تواصل مقصودة. فهو يُعزز التأثير السمعي وعمق المعنى في آنٍ واحد.

الكلمات المفتاحية: التشديد، علم الاصوات، علم التداول، التفسير القراني

1. Introduction

Gemination means articulating a consonant twice due to the muscle tension in the organs of speech. This study conducts a phono-pragmatic study of gemination in the Glorious Qur'an with reference to English. It aims to investigate the linguistic phenomenon of gemination (Tashdiid) in the Glorious Qur'an with a focus on its pragmatic functions and the phonological distinctions. While gemination is a well-documented phonetic feature in Arabic, its pragmatic and interpretive implications in the context of the Glorious Qur'an remain underexplored.

Utilizing a qualitative method and context model, this study aims to examine the pragmatic function of gemination and how it influences the interpretation (tafsīr) of the selected ayahs. To achieve this, the Pratt software is used to identify their acoustic features, including duration, pitch, and intensity. It examines the pragmatic functions of gemination, how it shapes the meaning, rhetorical emphasis, and theological nuances within the Qur'an Ayahs.

This study hypothesizes that, in the Glorious Qur'an, gemination is a rhetorical device that enhances meaning. Additionally, it hypothesizes that gemination not only affects the intended meaning but also influences the interpretation, thereby guiding the listener's comprehension and interpretive framework

The combination of the textual analysis of classical tafsīr literature and acoustic phonetics to bridge linguistic form and function, this study finds that gemination is not merely a phonological feature but a deliberate communication device. It enhances both the auditory impact and the depth of meaning.

2. Gemination

A geminate is a consonant that remains in closure for a measurable amount of time longer than a singleton or shorter consonant. It is often described as a lengthening of the articulatory stance and two similar articulation sequences. "Consonants can be long, or geminate when the closure or obstruction is held momentarily before release," (Robins,1964:80). The Oxford English Dictionary, 1933, Vol. 4, P. 98, defines the noun "gemination" as "the doubling of a letter in the orthography," and the lexical definition of "geminate" as "a doubled consonant."
The definition of geminate in linguistics is "a sequence of identical segments of a sound in a single morpheme.": A sequence of identical sound segments that occur within a single morpheme.
 Robins (ibid) states that consonants may be lengthy or geminate when the closure or blockage is retained for a brief period before release. However, several academics

distinguished between germination and long consonants, stating that germination is articulated across two syllables. "Double consonants" lends credence to this conclusion as Abercrombie (1967:82) states that "double consonants must be distinguished from long consonants. A double consonant lasts two syllables, while a long consonant lasts one." In English, double consonants appear at word junctions,

> 1- e.g., book-case. /ˈbʊk.keɪs/

Catford (1977:298) defines geminate as maintaining occlusion longer for production. Mortimer (1977:2) argues that if we accept this, English geminate sequences cannot be considered true geminates, occurring only at word boundaries or in words like

> 2- 'unknown.' /ʌnˈnəʊn/

which comprises two morphemes. He (ibid) asserts that the terms "double consonant" and "geminate consonant" are equivalent, using phrases like

> 3- "nice-cider" /naɪs ˈsaɪ.dər/ and
> 4- "black coffee." /blæk ˈkɒfi/

Hall (1964:99) defines long consonants as geminate when involving a two-consonant cluster of one followed by itself. Jones (1967:116) considers all intervocalic long consonants as double, as precise speech can separate them by diminishing force. He prefers double consonants over long ones. Cantineau (1960:214) distinguishes long from geminate consonants, describing geminates as prolonged and usually doubly transcribed. Lehiste et al (1973:131) present two views on whether there is a phonetic difference; one claims geminates have two phases, while the other denies it.

Gemination, which implies doubling the consonant without an intervening vowel, is the term often used to describe the lengthening of Arabic consonants, according to El-Saaran (1951:158). Cowell uses the phrases "double" and "long" (1964:23–24). They appear at the end of words without contrast to short ones, although they can also occur word-medially between vowels,

> 5- as in /hatta/ 'until'.

As stated by Mitchell (1956:8), "doubled consonants" should be used instead of "geminate." Geminate consonants, often found at the end of words like

> 6- /muhimm/ 'important,'

must be spoken roughly twice as long as a single one. In this instance, geminate consonants are characterized by increased muscle tension in the articulatory organs.

3. Definition of Geminating

The origin root of the term gemination is the Latin word 'Gemini,' which means 'twinning'. It means elongating of consonants in speech. According to Trubetzkoy (1969:161), gemination is a process that needs more muscle tension in the organs of the

articulators,' and the geminated consonants are more long and strongly articulated than the plain or non-geminated consonants. This practice of doubling up of consonants is observed in many languages, and geminated consonants are distinct because of the length of their duration and intensity.

Nasr (1960:210) highlights that in spoken Arabic, consonant length is phonemic, meaning it serves a distinctive function. He argues that geminate consonants require comparatively more time to produce than non-geminate ones, treating length as a segmental rather than a supra-segmental feature. Later, Nasr (1963:23) notes that in English, gemination is phonetic rather than phonemic, as the length of a consonant is determined by its phonetic environment and does not affect word meaning.

Crystal (2003:206) describes gemination as a series of neighboring, identical sound segments within a single morpheme. He distinguishes true geminates from fake or seeming geminates, which arise from morphological concatenation of identical segments. Crystal also emphasizes that transcriptional differences, such as [mm] (geminate) versus [m:] (long consonant), imply that geminate sequences cannot be equated with long consonants. Additionally, epenthetic vowels cannot break up these lengthy segments.

Watson (2002:233) observes that geminate consonants are a notable characteristic of Arabic, appearing in both medial and final positions. She discusses two contrasting perspectives on representing geminate consonants: the prosodic length analysis, which views a geminate as a single consonant phoneme linked to two C-slots, and the moraic weight representation, which associates a geminate with a single consonant connected to a mora. The latter has gained considerable support among linguists.

Khattab (2007:155) provides a variant definition, stating that a geminate is a consonant held in closure for a noticeably longer duration than a short or singleton consonant. Delattre (1971:132) explains gemination as a process of consonant re-articulation, where the first consonant occupies a syllable coda and the second begins the subsequent syllable. He contrasts geminates, which have two phases in their articulation, with long consonants, which are single segments with two temporal slots, as illustrated in figures (1-a) and (1-b) by Ahmed & Sameer (2016:3).

x x	x x
f f	f
Figure(1-a)Representation of geminates	Figure(1-b)Representation of long consonants

4. Gemination in Arabic

Gemination, also known as "tashdi:d" in Arabic, is the act of articulating or repeating a consonant letter twice, or phonetically doubling it. Germination is described by Van Ess (1938:5) as a unique orthography sign [ّ], indicating a double consonant when it is positioned over a consonant. Arabic displays a diacritical picture called shadda ('strengthening') in place of writing the letters twice. The Arab linguist Sibawayh rejected the realization of two identical articulations in favor of the gemination of two identical phonemes, resulting in a single articulatory action due to tiredness during consecutive realizations.

According to El-Saaran (1951:162), geminate consonants were regarded by the ancient Arab grammarians as two brief segments: "still" (saakin) and "moving" (mutaharik). Geminate consonants should be treated phonetically as two distinct sounds rather than a single, lengthy sound. According to Arab grammarians, a geminate consonant can be identified by its syllabic structure, as Cantineau (1960:214) describes it. There is still a going forward after that. A geminate cannot thus exist in the first position. Because it is insignificant to compare single and geminate consonants in this place, he concludes that geminate consonants that occur in the last position of words are non-distinctive in Arabic. Additionally, the last geminate in Arabic is described as tenseness of articulation compared to   a   non–geminate.
In Arabic, the phonological phenomenon of gemination carries emphatic function, as intensity or iterativeness, or non-emphatic function; causative. The ratio of geminate to non-geminate phoneme duration varies across languages, with Arabic having a higher ratio. The primary auditory and perceptual cue for gemination is the lengthy closure produced by intervocalic geminate plosives (Lodhi, 2004:6).

The gemination process is quite significant in Arabic; compare the following sentences

7- /haddara eddarsa/ *(حضَّر الدرس)* (he prepared the lesson),

8- /hadara eddarsa/ *(حضرالدرس)* (he attended the lesson)

The two sentences give a distinct meaning.

Furthermore, there is a phoneme [q] gemination between the words

9- /naqaba/ *(نقب)* (to dig) and

10- /naqqaba/ *(نقَّب)* (to seek).

Benhallam (1980:141) classifies geminates into two categories based on surface and deep structure: "underlying geminates" can be divided according to morphological or phonological principles, while "derived geminates" can be divided according to phonological rules. In conclusion, gemination in Arabic is a complex aspect that influences both the phonetic structure of words and their meanings.

5. Typology of Gemination

There are different types of geminates in Arabic; geminates are essentially underlyingly motivated, meaning that a singleton-geminate alternation might evoke a meaning shift. Gemination that is formed by assimilation or morphological lengthening, or that is base-generated (lexical), is considered a true geminate. Put differently, if and only if one of the following is true, a language is supposed to contain true geminates: They either (i) display morphemes internally, (ii) contrast phonemically with singletons, (iii) are produced by complete assimilation, or (iv) indicate morphological exponence (Noamane, 2020: 44).

1. Lexical Gemination

Lexical geminates, often known as "true" geminates, indicate a phonemic difference; that is, they form minimum pairs with their singleton counterparts, as in the Japanese words kona *"powder"* and *konr* "such."(Hedia, 2019:5).

Geminate appropriate functions to differentiate one word from another are guaranteed by Ghlib (1984:41). It serves as the basis for drawing a comparison between geminated consonants and their single cognates. Geminate proper is always a fundamental component of the word's internal structure. Verbs and nouns can exhibit the distinction between geminate and non-geminate in medial position. For example:

11- /kásar/ 'he broke' b. [kássar/ 'he smashed''

12- /bát!al/ 'hero' d. /bát!t!al/ 'he quit' (something)

13- /"hamá:m/ 'pigeons' f. /"hammá:m/ 'bathroom

14- /#ámal/ 'hope' h. /#amáll/ 'more/most boring'

15- /dárasa/ ('he studied') and /dárrasa/ ('he taught')

16- /sáfaq/ ('clap') and /sáffaq/ ('applauded').

In these cases, the meanings are related but different from what Matthews (1997:141). Certain Arabic words with medial geminates lack matching counterparts with medial single consonants. For instance:

17- /takallama/ "he talked,"

18- /rassam/ "painter," and

19- /dʒazzaar/ "butcher,"

According to Nasr (1960:210), consonant length in spoken Arabic is phonemic.He views length as a segmental characteristic as opposed to a superasegmental one. According to

him, the distinction between geminate and non-geminate consonants is that the former requires comparatively more time to generate than the latter. According to Erwin (1969:20), the relative length is what distinguishes a geminate consonant from a non-geminate one. He goes on to say that the distinction between a short and a long vowel is comparable to that between a single and a geminate consonant. According to Erwin (1969:20), the usage of geminate is unique in Arabic, making the difference between a single consonant and its geminate counterpart as significant as the difference between [b] and [p] in English.

2. Morphological gemination

Gemination in classical Arabic is considered a process that alters the structure of words, focusing on attachment, generation, substitution, and syllabic order. Attachment is an addition that adds one or two letters to a word's structure to give it a particular meaning. Also, gemination may use as a process to generate new forms involving using one form instead of another, such as

20- فعل /fala /to /faʿala/ فعّل as in نجح / najaha/ (he succeed) to نجّح /najjaha/ (he make someone succeed or to ensure success)

21-فاعل /faːʕil/ to /fiʕaːl/ فعّال as in كاذب /kadhib/ (lair) to كذّاب /kadhdha/ (someone who lies frequently)

Gemination, the doubling of consonants in Arabic, is a crucial morphological technique that creates new forms from existing roots. It serves as a linguistic tool for substitution or alternation, utilizing one form of a word in place of another depending on the context or intended meaning. Geminated forms are preferred in Arabic speech for their ease of pronunciation and stronger emphasis, which can significantly impact the meaning of words. This differentiation in pronunciation impacts the expressiveness and clarity of spoken Arabic, making it a fundamental aspect of its linguistic framework. Gemination also changes the syllabic order of words, leading to a change in grammatical function. Emphasis in Arabic can be defined in terms of diversity, quantity, and intensity, often indicating a sense of increase. (Awada, 2019: 7-10)

Lodhi (2004: 7) also notes that Arabic gemination serves both non-emphatic functions, such as causality, and emphatic functions like intensity and iterativeness, this includes terms related to professions or occupations, as well as concepts of plurality and repetition.

Similarly, Matthews (1997) observes that gemination can enhance nouns and adjectives, particularly when indicating repetitive actions, occupations, and dispositions., e.g.,

22- "rabbi" "رَبّي"'my Lord',

23- " hamma:m" "حمّام"'bathroom',

3. Gemination as a result of assimilation

Assimilation in Arabic is a process known as "idgham" and is crucial for reciting verses from the Glorious Quran. Old Arab grammarians have studied this phenomenon, as it requires careful production of Arabic sounds. Knowledgeable reciters of the Quran intentionally extend and make sounds noticeable to prevent assimilation. When assimilating a consonant, the pausal indication "sukuun" is removed. Arabic consonants are divided into solar and lunar groups, with "ʃams" starting with a solar consonant and "qamar" starting with a lunar consonant.

 The Arabic definite article is attached to the noun without changing its accent. For example, the l-sound of the article is assimilated to the succeeding consonant, which is then geminated in pronunciation when it limits a noun starting with a solar consonant. This can be illustrated in the following examples

$$24- [\int] \quad /\int arq/ \quad east \qquad /?\int\int arq/ \quad the\ east$$

$$25- [n] \quad /nuur/ \quad light \qquad /?annuur/ \quad the\ light$$

$$26- [l] \quad /lawn/ \quad colour \qquad /?allawn/ \quad the\ colour$$

On the other hand, when followed by a lunar consonant, the l-sound of the definite article should not be assimilated into that consonant. Both the L-sound of the article and the subsequent lunar consonant must be pronounced in full. The previously mentioned examples are monosyllable words pronounced with their pausal forms. These examples are :

27- [b] in /bahe/ (sea) without article, it becomes /?albahr/ (the sea) with the article,

28- [k] in /kalb/ (dog) without article becomes /?alkalb/ with the article,

29- [q] in /qayd/ (chain) without article becomes /?alqayd/ (the chain),

Arabic speech has a higher number of geminate consonants than the text may suggest. Examples include the definite article's l-sound assimilation to solar consonant sounds and phonetic assimilations between words' final consonants and initial consonants. These assimilations create two consonants that are already somewhat related to be identical, occurring when adjacent words have a close syntactic relationship. For instance:

30- /min man/   to   /mim man/   'From whom'

31- /?an laa/   to   /?al laa/   'Lest, so that not'

32- /man qaːl /   to   /maq qaːl/   'Who says'

All of the above instances clearly demonstrate regressive assimilation, where the last consonant of the preceding word is assimilated to the initial consonant of the subsequent

word. There is progressive assimilation in Arabic as well, albeit it happens less frequently Ghalib(1984: 33-37) .

6. Methodology

This study combines both the Praat nalysis to distinguish between the geminated and ungeminated terms. The Context model is used to analyze the meaning of the selected terms within the context of the Ayah.

1.   **Praat**

Praat is a free software application developed by Paul Boersma and David Weenink at the University of Amsterdam for speech sound analysis and synthesis. It is widely used in phonetics research and for reconstructing and analyzing acoustic speech signals. Praat offers various tools for in-depth acoustic analysis, including waveform visualization, spectrograms, pitch tracking, formant analysis, and measurement of intensity (Styler, 2023:12).

The application also has editing capabilities, allowing users to import pre-existing sound files or record sounds directly into Pratt, and to enhance specific frequency bands to reduce noise or separate sounds. Text Grid annotations are also available, allowing users to add linguistic annotations to audio recordings. Pratt is widely used in various fields, such as linguistics, communication disorders, and language teaching. It is used to examine phonetic characteristics, evaluate the quality of a patient's voice and speech, and provide visual feedback on speech sounds for pronunciation instruction (Lieshout, 2003:17). As mentioned by Ibrahim (2019: 47) there are three physical properties of linguistic sounds are determined by three main descriptive dimensions that give the sound its character and material form. They are intensity refers to "the energy inherent in the sound", pitch, which is a feature by which the ear distinguishes sounds in terms of sharpness and thickness, and duration refers to the specific time taken to articulate a linguistic sound. In this study, Praat is used to analyze both geminated and un-geminated words in the Qur'an, examining and contrasting these terms according to pitch, intensity, and spectrogram properties variations.

2. Context model

The traditional view in linguistics and social sciences suggests that language variation and discourse are directly influenced by social factors, such as age, gender, or ethnicity. However, recent research indicates that social factors are mediated by participants' "definitions of the situation," which explain why similar social situations can lead to varying discourse production and comprehension among different participants. The concept of relative context explains various interactions between society, situations, and discourse (van Dijk, 2010: 2). Context Models in episodic memory can be used to convey subjective definitions of

communication contexts. These models comprise a basic schema of culturally variable categories, such as a spatiotemporal setting, participants and their identities and roles, ongoing social action, goals, and current knowledge, that language users use to interpret and represent the communicative situation. Context models should be relatively straightforward and apply across various situations, as language users find it mentally challenging to handle a Context Model with numerous categories. To effectively manage everyday discourse, language users must keep the Context Model in working memory alongside other grammatical and discursive details, such as clause structure, the current proposition, and the ongoing topic. Context models are dynamic and adjust to earlier passages in the text or conversation, as well as to situational shifts, including changes in participant knowledge, identities, and aims, as well as alterations in relationships between participants. They are constantly being reinterpreted and modified to accommodate evolving circumstances, as recipients' knowledge is continually updated through discourse and its potential inferences. Context models define appropriateness and explain how language users modify their discourse to fit the social and communicative context of the moment.

A pragmatics theory is built upon the Concept of Context Models, which play a crucial role in both global and local control of discourse attributes within a strategic theory of discourse production.

During an interaction, context models are not created and modified from the ground up; they could have been somewhat prepared beforehand, particularly for institutional discourse, where participants already know the context, participants, action, aim, and background information of the participants (van Dijk, 2010: 5).

This model is adapted in this study to highlight the role of context in interpreting and explaining the meaning of the selected words according to the Ayahs' context.

a. Context vs. co-text

Yule (1996a: 129) distinguishes two types of context: linguistic and physical. Linguistic context, or co-text, includes words surrounding a term, forming the 'verbal environment' (Halliday, 1999:3) and relating to linguistic relations like collocations and lexical or morpho-syntactic ties. Finch (2000: 212) notes this context includes sounds and words that influence meaning, such as in 'The Flight of the Bumble Bee,' where understanding requires knowledge of 'bumble bee.' Linguistic context comes from the linguistic environment. Physical context, as Yule (1996: 21) states, affects interpretation but is more complex, involving situation factors beyond words. Mey (1993: 38) says linguistic elements are analyzed in isolation, while physical context considers real-world use. Many linguists distinguish between micro-context, the immediate setting, and macro-context, the broader environment shaped by geographic, social, and cultural factors (Finch, ibid: 213).

b. The Role of Context Models in Text and Discourse Processing

The new context model schema integrates ongoing discourse into the context model, reflecting actions in progress and forming an integral part of the communicative event. This separation between text and context is analytical, as completed discourse is distinct from its context. In spoken dialogue, prior exchanges influence current speech and actions, highlighting a link between Text Representation in past theories and the current context model. However, personal knowledge in event models should be conceptually distinguished from autobiographical memories in context models, as knowledge can arise from sources beyond discourse (Van Dijk, 1999:132). Context plays a crucial role in text processing by eliminating ambiguity, indicating referents, and detecting conversational implicature. Ambiguity refers to words, phrases, sentences, or groups of sentences with multiple interpretations or meanings. Lexical ambiguity arises from homonymy and polysemy, while structural ambiguity results from grammatical interpretation. Context helps clarify the precise meaning of sentences and helps distinguish between sources beyond discourse (Song, 2010:877). Indicating referents is essential for understanding pronouns, auxiliary verbs, and adverbial phrases. Without context, it is challenging to discern the subjects of conversation due to the abundance of auxiliary and modal verbs used throughout the dialogue. (ibid) Conversational implicature, as defined by Grice, refers to what a speaker implies beyond their literal words, guided by the Cooperative Principle and its four maxims: Quantity, Quality, Relation, and Manner. Understanding these implicatures requires acknowledging the specific contexts in which dialogues occur (ibid:878).

7. Data analysis

Text 1

{ وَالَّذِينَ يُؤْمِنُونَ بِمَآ أُنزِلَ إِلَيْكَ وَمَآ أُنزِلَ مِن قَبْلِكَ وَبِٱلْآخِرَةِ هُمْ يُوقِنُونَ } البقرة – 4

Translation:

"And those who believe in what was revealed to you, and in what was revealed before you, and are certain of the Hereafter." Al- Baqara – 4(Itani, 2012: 1).

Transcription:

The transcription of the ungeminated verb (أُنزِلَ) is /anzala / (descend, send down)

Explanation

This Ayah describes the attributes of believers (those who have faith in the Glorious Quran and the Sunnah revealed to Muhammad (peace be upon him), as well as the Taurat (Torah) and the Injeel (Gospel) that were sent down before him. They believe with certainty in the Hereafter, which includes concepts such as resurrection, the recompense for their good and bad deeds, and the existence of Paradise and Hell.). (Al-Hilali & Khan, 1996:2)
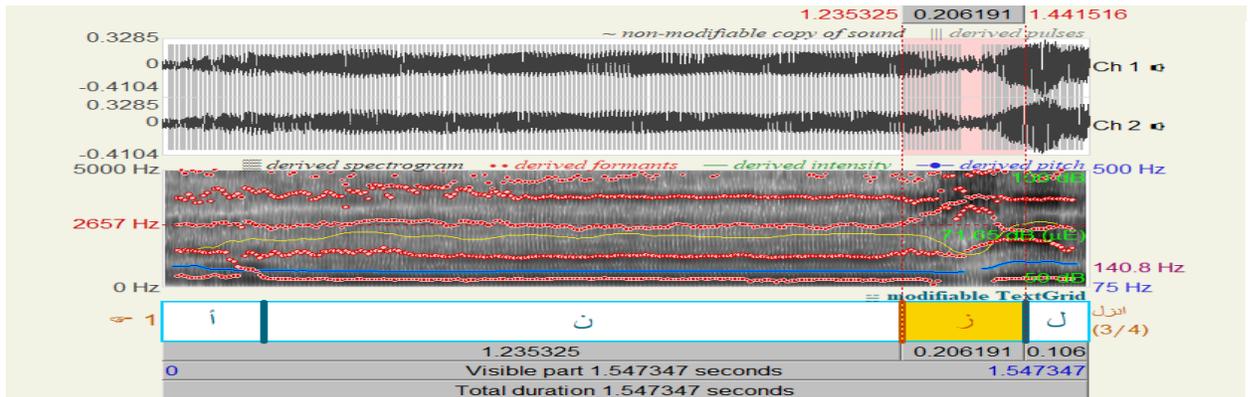
Praat analysis

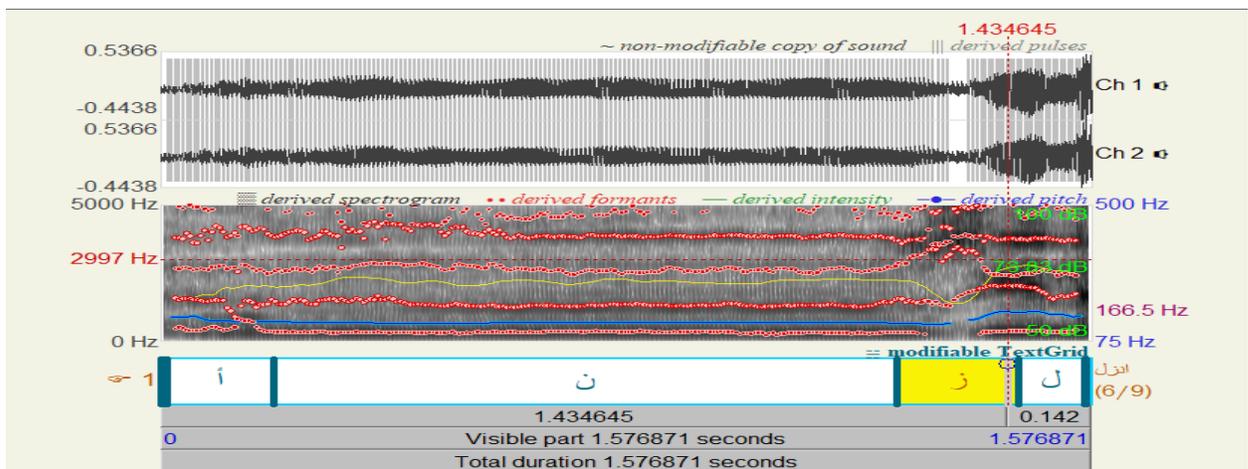
Figure 1: أَنزَلَ/ʔanzala/ duration

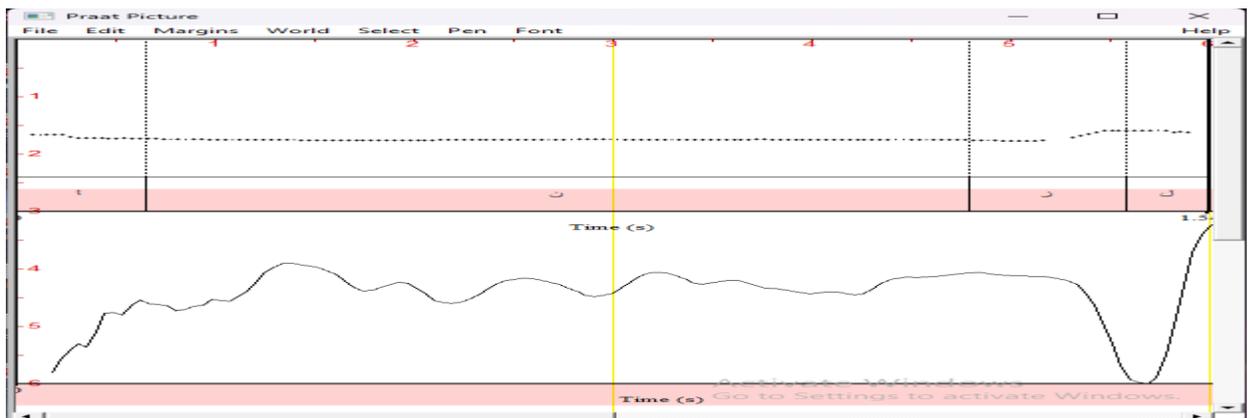
Figure 2: أَنزَلَ/ʔanzala/pitch and intensity analysis

Figure 3: drawing of pitch and intensity

A spectrogram, a visual aid for representing sound properties, is shown in Figures 1and 2. The amplitude and frequency components of a sound wave during a given time period are depicted in this spectrogram. Frequency is indicated on the vertical axis (Y-axis) and time on the horizontal axis (X-axis) in the spectrogram. The black lines represent the frequency, which can vary from 0 to 5000 Hertz (Hz), this number indicates the number of complete cycles of air pressure fluctuations each second. This format is especially useful for studying complicated signals with several frequency elements since it efficiently records changes in frequency components.

The spectrogram's shading represents amplitude, which indicates how loud the sound is. The darker the lines, the higher the amplitude components; in contrast, lower amplitudes are represented by lighter grayscale tones which eventually can turn to white, representing silence (Ladefoged & Johnson, 2015:191).

Shortly, the spectrogram displays a three-dimensional view, with time on the horizontal axis, frequency on the vertical axis, and amplitude represented by shading.

Furthermore, the formants in the spectrogram are indicated by red dots. Formants are essentially classified into three primary types. First, the lowest one, F_0. This one is crucial to distinguish vowel sounds. Second, F_2, the second formant, represents the vowels' decreasing pitch [i, I, e, oe]. The character of these vowels is further differentiated by the third formant (F_3) (ibid:188).The spectrogram has two lines; on one hand, the green line on the spectrogram indicates intensity, which ranges from 50 to 100 decibels (dB) and represents the quantity of acoustic energy in a sound (ibid: 307). On the other hand, the blue line that ranges from 75 to 500 Hertz (Hz) is used to represent pitch, which is the aural quality of a sound (ibid: 309).

several significant conclusions may be drawn from the examination of the acoustic characteristics of the word "أَنزَلَ" /ʔanzala/ Figure 1 shows that the word lasts for 1.547 seconds in total. In particular, 0.206 seconds was recorded as the closure duration for the consonant sound /ز/. Additionally, Figure 2 states that by the end of the section, the ungeminated /z/'s intensity level was 77.25 dB, and its maximum recorded pitch was 166.5 Hz. All that has been mentioned before offers important information reflecting the phonetic properties of the /z/ sound.

Discussion

In standard Arabic, the verb form IV (أفعل) (four-letter ungeminated verb) suggests causative and declarative action. The root of this verb is form I (نزل)(فعل) . In this Ayah, the phrase "بِمَا أُنزِلَ إِلَيْكَ" (what has been revealed to you), the ungeminated verb "أُنزِلَ" / ʔanzala/ refers to the Glorious Qur'an. It means the entirety of the Qur'an, not just the portion that had been revealed at the time of their belief, because believing in all of it is obligatory. Even though some of it was yet to be revealed, the use of the past tense emphasizes what

already exists over what has not yet come to pass, and because some of it had already been revealed, while the rest was anticipated to be revealed. (Al-Nasafi, 2005:42)

The context shift implies a complete action, with this ungeminated verb focusing on the fact that the revelation has been sent down rather than on the process.

It concerns the state of belief in the revealed messages as whole entities. In this context, the emphasis is on believing in the totality of revelation (in both past and present) as a static, established truth. The ungeminated verb also emphasises the universality of revelation to generalize the act of revelation across time and prophets. It unifies all divine messages under a single semantic framework.

Text 2

{ تَبَارَكَ ٱلَّذِي نَزَّلَ ٱلْفُرْقَانَ عَلَىٰ عَبْدِهِ لِيَكُونَ لِلْعَٰلَمِينَ نَذِيرًا } الفرقان – 1

Translation:

"Blessed is He who sent down the Criterion upon His servant, to be a warning to human ity." Al-Furqan- 1 (Itani, 2012: 133)

Transcription:

The transcription of the geminated word نَزَّلَ in this Ayah is نَزَّلَ /nazzala/ (to bring down, to cause to descend)

Explanation

(This Ayah begins by praising Allah, who is both blessed and exalted. Blessed be He who sent down the criterion to His servant (Muhammad, peace be upon him), so that he may warn all of mankind and jinn. The Furqan (Quran) serves to define right and wrong, illuminating the path toward truth. This verse emphasizes the Quran's role as a definitive guide for all human beings.) (Al-Hilali & Khan, 1996:214)
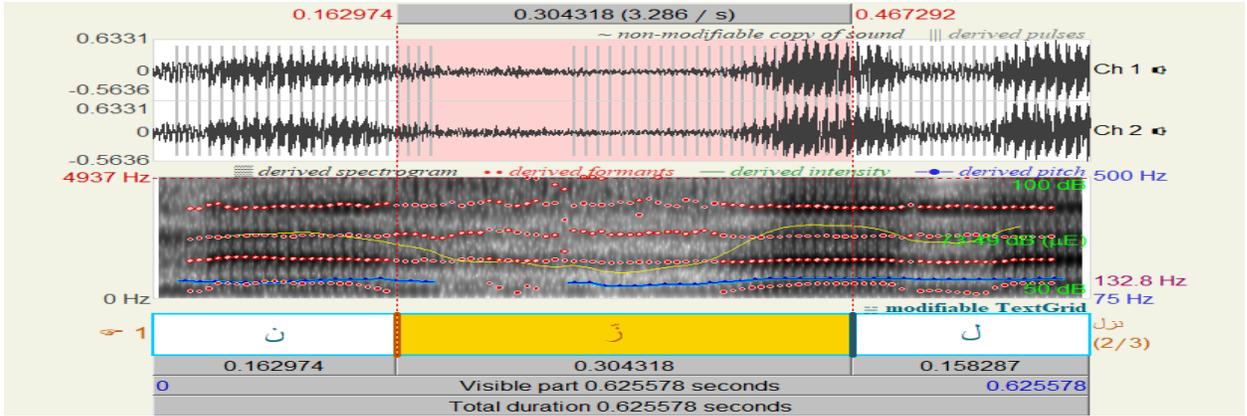
Pratt analysis
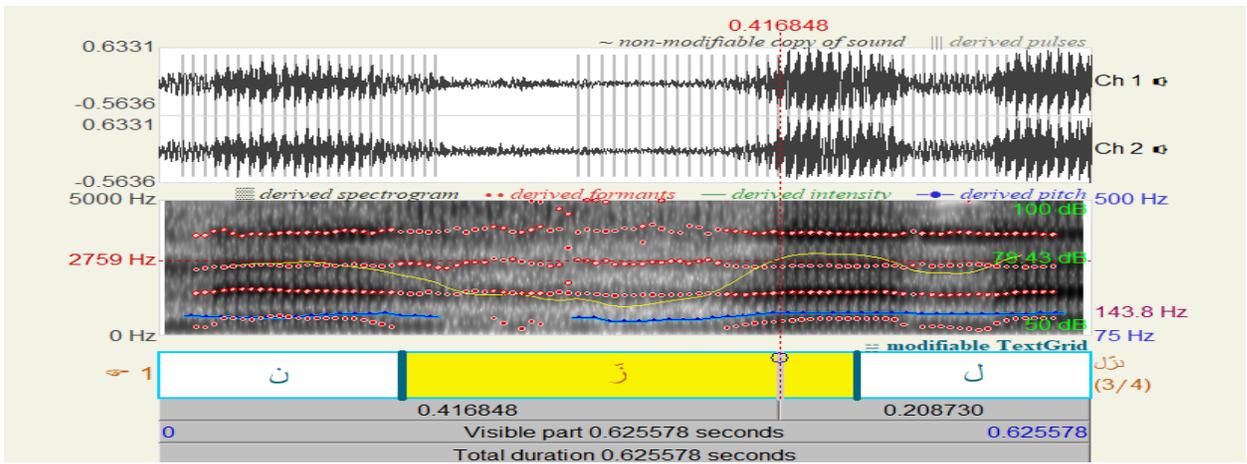
Figure 4: نَزَّلَ /nazzala/ duration

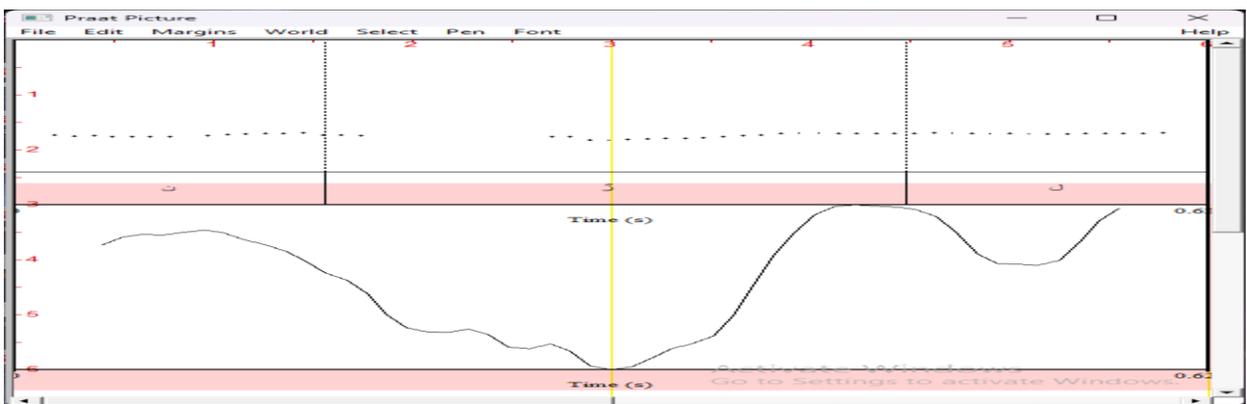Figure 5: نَزَّلَ /nazzala/ pitch and intensity analysis

Figure 6: drawing of pitch and intensity

The examination of the word "نَزَّلَ" /nazzala/ presented in figures 4,5, and 6 provides a certain acoustic characteristic of this geminated verb.

In Figure 4, the duration of pronunciation shows that the whole word lasts about 0.625 seconds; however, in the meantime, the geminated consonant/ زّ/ (z) has a duration of 0.304 seconds. Compared to the ungeminated one, showing a clear contrast with the ungeminated segment.

Considering the pitch and intensity analysis, Figure 5 indicates that this segment has a measure of 80.15 dB. Reflecting a stronger pronunciation. And it has a pitch of 143.8 Hz. All these features that relatively affect pronunciation are clarified by these sonic attributes

Discussion

The verb form II (فعّل)(three-letter geminated verb) in standard Arabic is associated eith intensity, repetition, and causation. The root of this verb is form I (فعل)نزل . The selection of this particular form of verb "نَزَّلَ" /nazzala/ meaning to bring down or descend gradually, this meaning is also used in Ayah:

﴿ وَقُرْءَانًا فَرَقْنَٰهُ لِتَقْرَأَهُ عَلَى ٱلنَّاسِ عَلَىٰ مُكْثٍ وَنَزَّلْنَٰهُ تَنزِيلًا ﴾الاسراء – 106

"This is a Qur'an that We have revealed over stages so that you may recite it to people at a slower pace, and We have sent it down in a successive manner. " Israel – 106 (Al-Nasafi, 2005:524).

In this Quranic context, this example represents an unexpected language and contextual decision. This verb is meant to reflect Allah's wisdom and kindness in aiding the Prophet's mission; more particularly, it reflects the manner in which the Glorious Quran was revealed to the Prophet Muhammad for the benefit of mankind and the Jinn. The Quran was revealed to the Prophet Muhammad (peace be upon him) gradually rather than all at once. As a contrast to a single complete act.
Furthermore, step-by-step revelation is indicated by the geminated verb "نَزَّلَ" /nazzala/.
More importantly, the divine intentionality is reflected in the context of this Ayah, emphasizing the act of revelation itself. The way the Quran was unveiled over 23 years allowed the message to unfold in stages for better understanding and memorization application.

The use of the middle geminated verb in this context also aligns with the celebratory tone (تبارك), which emphsises the glorification of Allah's act of bestowing the Quran.

Conclusion

Accompanying gemination, which has the function of repetition to emphasise the divine uniqueness in the Qur'an's revelation, the variations in pitch and intensity of نَزَّلَ/nazzala/ and أُنزِلَ/ʔanzala/ lead to meaning differences, despite Arabic not being a tonal language.

First, there are phonological differences between the two words, نَزَّلَ being geminated, leading to longer duration and higher intensity, while أُنزلَ has a simpler structure, resulting in lower intensity.

Second, the pitch and intensity differ due to the morphological differences between Form II (a three-letter verb) and Form VI (a four-letter verb).

The phonological differences between the two words represented by gemination, in addition to the morphological differences represented by the structure of the two words, lead to the meaning differences

Despite Arabic lacking tonal distinctions, there are certain differences between these two forms, revealing that pitch and intensity can differ due to factors such as emphasis, word stress, and sentence intonation. Clearly showing that even with non-phonemic contrast, meaning that these changes do not alter the lexical meaning in Arabic, such distinctions can still arise due to phonological and morphological influences and differences.

These examples illustrate the concept of similarities in the Quranic expression. Some people, especially non-Arabic speakers, may tend to think that such words have the same meaning; however, they have different meanings. This reflects the miraculous nature of the Qur'an in its precise selection of expressions and terminology, highlighting the depth and richness of the Arabic language (Zakir & Mari, 2024:39)

Table 1: The key contrast between نَزَّلَ /nazzala/ and أُنزلَ /ʔanzala/

Features	نَزَّلَ /nazzala/	أُنزلَ /ʔanzala/
Aspect	Form II	Form IV
Agency	The glorious Allah as the gradual revealer of Quran	The glorious Allah as the source of revelation
Type of action	Gradual, progressive action	Complete action
Meaning	Emphasizes the gradual revelation of the Quran to reflect the divine intention	The focus is on the content of what was revealed to establish the truth
The focus	Step-by-step revelation	Belief in revelation
Gemination's function	Repetition to emphasise the divine uniqueness in the Qur'an's revelation	Ungeminated verb
The pitch	143.8 Hz	166.5 Hz
The intensity	80.15 dB	77.25 dB
Duration	0.304 s	0.206 s

8. Conclusion

In Arabic, gemination or the process of lengthening the consonants, i.e., stretching a sound rather than articulating it twice, is called "tashdiid". Any Arabic consonant may occur geminate, especially in word-medial position, and in Arabic writing, when the letter is geminated, it is written only once, and a relatively small sign like [ّ], it is called "shadda".

1. To study the linguistic phenomenon of gemination, this study employed a dual method. Praat's analysis and contextual analysis, when integrated, allow for a systematic investigation of both the phonetic characteristics of gemination and its pragmatic functions within the Quranic text.
2. In the Glorious Quran, gemination at the level of nouns, verbs, or particles, whether lexical or morphological, enriches meaning as a rhetorical device indicating divine identity, deliberate action, emphasis, theological reinforcement, or emotional impact.
3. The use of geminated forms, which significantly impact meaning, depends on context, influencing interpretation and comprehension in oral recitation and written form, ensuring the intended meaning is perceived.
4. Gemination holds linguistic significance: phonetically, it emphasizes sounds; morphologically, it alters verb forms and noun structures; lexically, it distinguishes meanings. Overall, it enhances precision, rhetorical force, and depth, ensuring clarity of meaning.
5. Although geminated segments are pronounced longer with higher pitch and intensity, it is noted that some geminated sounds have lighter pitch or intensity than ungeminated ones, showing variation.

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