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Syllable Structure Variation between Two Iraqi Arabic Dialects: A Comparative Optimality-Theoretic Investigation

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ABSTRACT

This study is an Optimality-Theoretic comparison of two major dialects of Iraqi Arabic: Baghdadi Gilit Arabic (BGD) and Basri Arabic (BAS), focusing on syllable structure variation. The data were collected from 20 native speakers (10 for each dialect), representing both rural and urban backgrounds, as participants in recorded naturalistic conversations and in targeted elicitation tasks. The analysis examined a large set of more than 200 phonological tokens in the framework of Optimality Theory (OT), in particular, the ranking of the constraints for dealing with complex onsets, the resolution of triconsonantal clusters, and the Gahawa Syndrome. Key findings reveal that complex onsets are allowed in both dialects, but that they have different strategies for resolving the triconsonantal clusters and different characteristics in the occurrence and phonological conditioning of the Gahawa Syndrome.

Keywords: Optimality Theory, Iraqi Arabic Gilit dialects, BGD Arabic, BAS Arabic, Gahawa Syndrome

التباين في بنية المقطع الصوتي بين اللهجات العراقية العربية دراسة مقارنة في إطار نظرية الأمثلية

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المستخلص

تقارن هذه الدراسة الفروق في بنية المقطع الصوتي بين لهجتين رئيسيتين من العربية العراقية، هما: العربية البغدادية والعربية البصرية في إطار نظرية الأمثلية (OT) (Optimality Theory) تنتمي كلتا اللهجتين إلى مجموعة اللهجات الجليّة في العربية الرافدينية، حيث تمتلكان مخزوناً متقارباً جداً من أنماط المقاطع الصوتية، إلا أنهما تختلفان في بعض السلوكيات الفونولوجية، ولا سيما في معالجة التراكيب الصامتية المتجاورة (Consonant Clusters) واستخدام الإقحام الصوتي (Epenthesis). حيث تهدف الدراسة إلى تفسير هذه الاختلافات اللهجية من خلال تحليل القيود الفونولوجية الكونية وترتيبها وفق منظور نظرية الأمثلية. حيث تركز بصورة خاصة على مدى تقبل كل لهجة للباديات المقطعية المعقدة (Complex Onsets)، والاستراتيجيات المتبعة في معالجة التراكيب الصامتية الثلاثية (Triconsonantal Clusters)، فضلاً عن التحقق من وجود أو غياب ما يُعرف بـ (متلازمة الكهوهة Gahawa Syndrome) حيث تعرف بانها سمة فونولوجية مميزة لبعض اللهجات المتأثرة باللهجات البدوية. الكلمات المفتاحية: نظرية الأمثلية، العربية العراقية الجليّة، العربية البغدادية (BGD)، العربية البصرية (BAS)، متلازمة الكهوهة (Gahawa Syndrome).

1. Introduction

The Arabic language family is rich in diversity and abundance; and there are various dialects of Iraqi Arabic with various phonological characteristics. There are several of these dialects in which /q/ is actually realized as /g/ (such as gilit in the central and southern regions of Iraq; literally a feature of the Gilit dialects is its form of the verb "to say", which is qultu, as opposed to I said). This study focuses on two important Gilit varieties: Basri Arabic variety of the south, with Bedouin influence and Baghdadi Gilit Arabic variety of the city center. While the two dialects share similarities in structure, they exhibit some interesting differences in terms of their syllable structure and phonotactic processes, such as consonant clusters and epenthesis of vowels (Alshawhi, 2020; Albuarabi & Park, 2023).

After Prince and Smolensky (1993), and more recently in studies (Al-Momani, 2023) the framework used for analyzing phonological variation is Optimality Theory (OT) which proposes that the surface forms are the optimal outputs of a set of universal, violable and ranked constraints. It will help us make a systematic comparison of the different constraint rankings in BGD and BAS and their observed phonology. The main aim of this investigation is to identify the constraint hierarchies present in the syllable structure of BGD and BAS, as well as to explain them, which will enable us to explain the principles of the phonological divergence of the two.

Both dialects follow the same linguistic tradition as Gilit Arabic, but there exist linguistic differences between them with respect to the phonological features of the Arabic syllables. Although Iqzar (2025) concentrated on glottalization in Arabic dialects, the study did not state syllable structure variation or constraint interface within the structure of Optimality Theory. Thus,

examining syllable patterns across Iraqi Arabic dialects from an Optimality-Theoretic viewpoint remains an underexplored extent of research. The understanding of these differences is crucial not only for the scope of a general Arabic Dialects phonological mapping in Iraqi Arabic, but also the importance of their role in the general theoretical knowledge about phonological variation.

Therefore, the study aims to answer the following research questions:

1. What is the difference between the two Arabic dialects (Bagdadi and Basri) in terms of the inventories of their syllable structure and their tolerance for complex onsets and codas?
2. How do each of these dialects solve the triconsonantal consonant clusters?
3. What does this tell us about the differing constraint rankings in Optimality Theory?

In addition, the study purpose is to state the purposes of the study based on the research questions:

1. Examine the solution to the resolution of the triconsonantal consonant clusters in both dialects, and provide OT constraint rankings to explain the differences observed.
2. Examine the nature of the 'Gahawa Syndrome' in Basrai Arabic and its lack in Baghdadi Arabic and propose relevant Optimality-Theoretic constraints and their hierarchy.
3. Present a comparative Optimality-Theoretic model that gives a systematic account of the phonological differences in the structure of the syllables of the two varieties of Arabic (Baghdadi and Basri) and which contributes to the field of Arabic phonology and Optimality Theory.

2. Fundamentals of Arabic Syllable Structure

The internal structure of Arabic syllables is well documented, researchers have identified a set of basic Arabic syllable types that are common in most varieties (CV, CVV, and CVC) (Broselow 2019). Broselow (2019) notes that while MSA and some of the urban dialects (such as Cairene) disallow complex onsets in the initial position of a word, many of the Gilit dialects of Iraqi Arabic and Bedouin-influenced varieties permit word-initial consonant clusters (CCV-). It is treated as a difference in ranking of the markedness constraint COMPLEX-ONSET related to faithfulness constraints MAX-IO, etc. (Al-Momani 2023).

2.1 Optimality Theory and Dialectal Variation

The work of Prince and Smolensky (1993) has introduced an efficient approach to the problem of dialectal divergence, namely Optimality Theory, which is based on the principle of hierarchical ranking of universal constraints. In the Arabic language, OT has been applied to the explanation of phenomena such as vowel epenthesis, deletion, and stress assignment. Phonological differences between dialects (e.g., the Baghdadi Gilit and the Moslawi Qeltu) have been shown in recent research (Al-Momani 2023, Alabid et al. 2024) to be not only different rules, but also different prioritizations of constraints such as HARMONY, PARSIMONY, and DEP-IO. Alabid et al. (2024) mention in particular that BGD shows a higher frequency of deletion and assimilation; this is due to the high level of markedness constraints that reflects BGD's Bedouin-influenced history.

2.2 Phonological Outlines of Iraqi Arabic

In the Arabic language of Iraq the dialect into which the language was classified is divided into two main groups: the Gilit and the Qeltu (Blanc, 1964). The fine-grained differences within the

group Gilit have been the subject of recent research, including the differences between urban and rural/southern varieties. Khalaf (2026) offers a new analysis of the Baghdadi Arabic and details its urbanizing nature, which frequently makes for more simplified phonotactic patterns when compared with more conservative Arabic dialects. On the other hand, research on the dialects of the south of Iraq (such as the research conducted by Alshawi 2020, Al-Basri 2021) highlights the preservation of Bedouin elements. Al-Basri (2021) applies a moraic approach to examine syllable weight in Basri Arabic, as a basis for understanding the treatment of complex clusters in southern dialects as compared to central dialects.

2.3 Consonant Clusters and the Gahawa Syndrome

Two of the most important markers of dialectal variation in the area are the resolution of the triconsonantal clusters (CCC) and the presence of the 'Gahawa Syndrome'. Albuarabi and Park (2023) examined complex onsets in the Southern Iraqi and Najdi Arabic varieties, and they concluded that although complex onsets are permitted in both varieties of Arabic, the constraints and processing strategies are distinct. This is especially important in the Gahawa Syndrome where /a/ vowel is inserted after guttural consonants. This phenomenon is discussed in detail by Procházka (2026), who observes that it is a characteristic of Bedouin-type dialects, serving to meet certain markedness requirements on guttural-coda sequences. The occurrence of the syndrome is observed in the other southern dialects but not in Baghdadi, meaning that it is a major phonological change towards the urban norms (Salman, 2021).

Table 1: Comparative Phonological Features of Baghdadi and Basri Arabic
(Alabid et al., 2024, p. 239; Khalaf, 2026, p. 1134)

Feature	Baghdadi (BGD)	Basri(BAS)
Initial CC clusters	Permitted (e.g., /ktaab/)(كِتَاب)	Permitted (e.g., /ktaab/)(كِتَاب)
CCC Resolution	CvCC (e.g., [ki.tab.it.la])	Variable/Harmony-based
Gahawa Syndrome	Absent (e.g., [gah.wa])(قَهْوَة)	Active (e.g., [ga.ha.wa])(قَهْوَة)
Epenthesis Position	Between C1 and C2	Variable/Gahawa-driven
Epenthetic Vowel	/i/ (typically)	/a/ (in Gahawa contexts)

Both Arabic dialects, Baghdadi and Basri, are Gilit Arabic in which there are several common phonological features. They usually have syllables that are CV, CVV, CVC, CVVC and CVCC. One of the most significant differences between Qeltu dialects (such as Moslawi) and the Gilit dialect is that the latter permits initial consonant clusters (CCV-) which are not allowed in Qeltu dialects. For example, the word /ktaab/ 'book' is pronounced with an onset of k, either as a CC

cluster in BGD, or as a single consonant in BAS, indicating that constraints against complex onsets are ranked low (Broselow, 2019)

The similarities do not extend to their strategies for solving phonotactic violations particularly for complex consonant sequences, however, as BGD and BAS do not solve violations alike. It is important to note that these differences play a significant role in the description of their unique phonological profiles and are key to an Optimality-Theoretic analysis (Al Motairi, 2021; Al-Basri, 2025).

3. Methodology

The research in this paper is of a comparative, qualitative and descriptive type, in order to examine the phonological differences between the two dialectal varieties, namely, Baghdadi Gilit Arabic (BGD) and Basri Arabic (BAS) in terms of their phonological variations in the structure of their syllables. The methodology aims to systematically identify, describe and analyze the constraint hierarchies that regulate these variations in the context of Optimality Theory (OT).

3.1 Research Design

This research uses comparative synchronic design which is based on the contemporary phonological system of BGD and BAS. The aim of the study is to identify some variables that contribute to the phonological divergence between two dialects within the same linguistic branch (Gilit) as a way of isolating some specific variables, including urbanization and Bedouin influence. The design process is divided into three main steps:

1. **Descriptive Mapping:** Syllable inventories and phonotactic patterns in both dialects.
2. **Compare and contrast:** Identify specific differences, especially in the way clusters are resolved and the Gahawa Syndrome.
3. **Theoretical forming:** Construction and testing of constraint rankings to capture superficial forms observed.

3.2 Data Collection and Description

The evidence for this study came from a combination of primary and secondary sources, so that each dialect had an objectively complete phonological outline. The speech samples were collected from primary data which included recorded naturalistic conversations and elicitation tasks with native speakers of BGD (Central of Baghdad city) and BAS (Basra city and surrounding rural areas). The primary data was collected from 20 native speakers (10 from Baghdad city center and 10 from various districts in Basra, including both urban and rural areas to ensure a representative sample). All participants were native speakers who had lived in their respective cities for most of their lives., who were asked to provide the target lexical items containing complex onsets, triconsonant clusters and guttural-coda sequences. Moreover, the secondary data has been used extensively from existing dialectal corpora and previous linguistic descriptions such as Alshawi (2020), Al-Basri (2021) and Alabid et al. (2024). The sources were used to find valid examples of dialect-specific phonological processes. The data is described as follows: The dataset comprises more than 200 tokens of each dialect, which have been transcribed in IPA. The tokens were chosen

to encompass a variety of different morphological contexts, such as nouns, verbs, and suffixed forms, to reflect the morphology-phonology relationship

3.3 Analytical Framework: Optimality Theory (OT)

In contrast to rule-based phonology, OT assumes that surface forms (outputs) are derived from interaction between universal, unviolated constraints. There are three main components to the framework:

- **GEN (Generator):** Computes a list of possible candidates for the output of a function given its input.
- **CON (Constraints):** Universal constraints; Markedness (simple structures) and Faithfulness (similarity to the input).
- **EVAL (Evaluator):** Chooses the "optimal" candidate according to a hierarchy of constraints imposed by the evaluator, depending on the dialect.

In this study, the analysis is focused on the interaction between markedness constraints (such as CCC, COMPLEX-ONSET, GUTTURAL-CLUSTER (GAHAWA)), and faithfulness constraints (such as DEP-IO (prohibiting insertion), and (MAX-IO prohibiting deletion). OT Tableaux visualize the rankings while showing how different rankings give rise to different outputs of BGD and BAS in a step-by-step manner.

4. Comparative Analysis

4.1 Complex Onsets

Unlike many Arabic dialects, which often do not allow complex onsets, both BGD and BAS allow such structures. The markedness constraint that is attached to complex onsets (*COMPLEX-ONSET) is ranked relatively low in the two dialects, thus enabling the dominance of faithfulness constraints (such as `MAX-IO`, which forbids the omission of parts from the input). The common feature has been the basis for their being considered as the Gilit dialects.

4.2 Triconsonantal Cluster Resolution and Epenthesis

The resolution of triconsonantal consonant clusters (CCC) is an interesting difference between BGD and BAS. The CCC sequences are usually not allowed in either dialect, causing an epenthetic vowel to occur and separate the CCC cluster. However, the exact sound and position of this epenthetic vowel may be different.

Epenthesis is usually found in the CCDV sequences of CCC clusters in Baghdadi Arabic. The underlying form /kitab-t-l-a/ 'I wrote to him' appears in [ki.tab.it.la] where an /i/ is inserted to separate the /tbl/ cluster. The pattern indicates that the markedness constraint against CCC clusters (*CCC) is more favored than the faithfulness constraint (DEP-IO) (which favors the deletion of the epenthetic vowel).

In addition to using epenthesis to break up CCC clusters, Basri Arabic may also show different patterns, depending either on which of the consonants is involved or on the morphology. This difference suggests that there are nuances in the ordering of `DEP-IO` compared to other markedness constraints, or that there is an additional, dialect-specific, constraint that is not part of the theory. General observations of Southern Iraqi Arabic indicate that the decision of which epenthetic vowel and its position to use may be more varied. Besides, it may be subject to vowel

harmony rules found in Bedouin dialects. Although detailed examples of Basri epenthesis in CCC contexts are less documented in comparative studies.

4.3 The Gahawa Syndrome

The 'Gahawa Syndrome' (or Ghawa Syndrome) is a well-known phonological process in many Bedouin and Gulf Arabic dialects. The Gahawa Syndrome is the addition of an /a/ vowel between a guttural consonant (such as /ħ/, /ʕ/, /h/, /x/, /ʁ/) and the following consonant, especially when the guttural is in a coda position. This is a common phenomenon for many Bedouin and Gulf Arabic dialects.

The Gahawa Syndrome is in Basri Arabic. The word /gahwa/ 'coffee' for example is sometimes realized as [ga.ha.wa]; the word /baħr/ 'sea' is sometimes realized as [ba.ħar]. This suggests that a markedness constraint which targets guttural-consonant clusters, which we can call 'GUTTURAL-CLUSTER' or 'GAHAWA', is very high in rank in Basri and thus plays a role in forcing the vowel insertion even if it is at the expense of 'DEP-IO'.

Urban variants, such as Baghdadi Arabic, on the other hand, are unlikely to show the Gahawa Syndrome. The pronunciation of the word /gahwa/ is normally [gah.wa] with no epenthetic /a/. In this distinction, a basic difference in the phonotactic priorities of the two dialects can be identified.

4.4.1 Optimality-Theoretic Modeling

The following simplified constraint rankings for BGD and BAS: The rankings provide a demonstration of the significant differences in optimal outputs that can be achieved as a result of the different weighting of universal constraints.

Figure 1: BGD Arabic Ranking

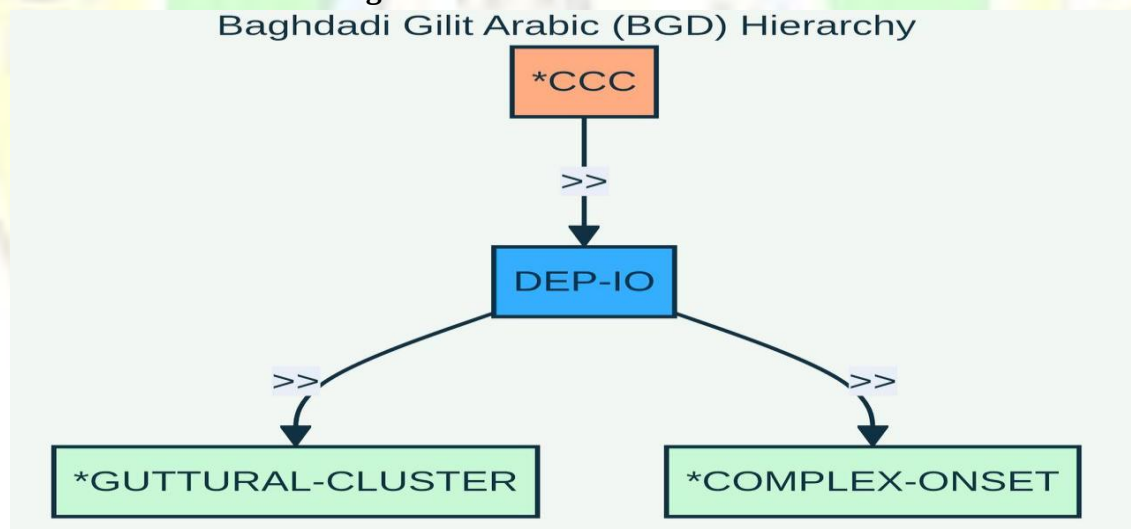
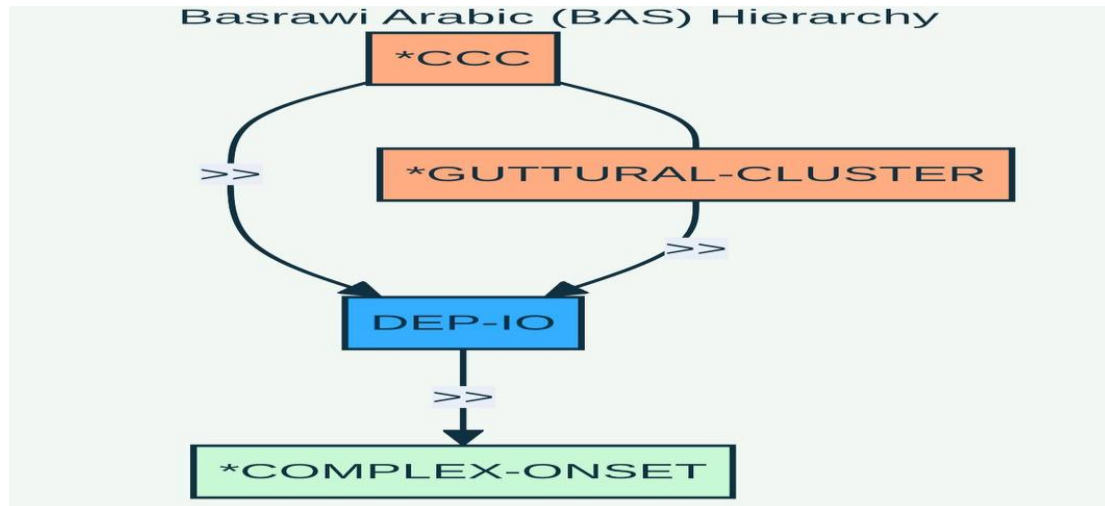


Figure 2: BAS Arabic Ranking



4.4.2 Constraint Explanations

- Consonant clusters consisting of three consonants are treated as follows:
- `\*COMPLEX-ONSET`: Complex onsets (such as CCV-) are penalized.
- `\*GUTTURAL-CLUSTER`: guttural + another consonant clusters.
- `DEP-IO`: (Dependence Input-Output) Penalties for segments being inserted (epenthesis).
- `MAX-IO`: (Maximality Input-Output) Penalizes for removing segments.

4.4.3 Baghdadi Arabic (BGD) Constraint Ranking

In BGD, the main reason for epenthesis is to split an illicit CCC cluster, where complex onsets are allowed and the Gahawa Syndrome is inhibited. The results are presented in the following partial ranking:

`CCC` >> `DEP-IO` >> `GUTTURAL-CLUSTER`, `\*COMPLEX-ONSET`

The following sequence of letters is referred to as a cluster, or guttural cluster. The cluster, or guttural cluster, of the following sequence of letters is called such.

Tableau 1: BGD Epenthesis for CCC

Input:	`*CCC`	`DEP-IO`	`*GUTTURAL-CLUSTER`	`*COMPLEX-ONSET`
/kitab-t-l-a/				
a.	*!			
[ki.tab.it.la]				
b.	*!			
[ki.tab.tla]				

Tableau 2: BGD and Gahawa Syndrome

Input: /gahwa/ (قهوة)	`DEP-IO`	`*GUTTURAL-CLUSTER`
a. [gah.wa]	*	
b. [ga.ha.wa]	*!	

4.4.4 BAS Arabic Constraint Ranking

Like BGD, the clusters are resolved through epenthesis in BAS and the complex onsets are allowed. The difference, however, is that the Gahawa Syndrome is active, which makes the constraint on guttural-consonant clusters have a higher rank.

`CCC`, `GUTTURAL-CLUSTER` >> `DEP-IO` >> `\*COMPLEX-ONSET`

This ranking reflects the high preferences for both triconsonantal and guttural-consonant clusters (even if a vowel is inserted) to avoid such clusters. However, complex onsets are still approved.

Tableau 3: BAS and Gahawa Syndrome

Input: /gahwa/ (قهوة)	`*GUTTURAL-CLUSTER`	`DEP-IO`
a. [gah.wa]	*!	
b. [ga.ha.wa]	*	

5. Discussion

The results of the analysis obtained from the comparative Optimality-Theoretic (OT) analysis of the variations of the syllable structure in Baghdadi Gilit Arabic (BGD) and Basri Arabic (BAS) are presented in this section. The results show the systematic nature of the different constraint rankings within the OT framework to account for the observed phonological differences between these two dialects of Iraqi Arabic.

5.1. Structure of the Syllables and Complex Onsets

The basic syllable forms of BGD and BAS are the same: CV, CVV, CVC, CVVC and CVCC. This low ranking makes faithfulness constraints like MAX-IO (that disallow deletion of the segments) dominate and thus preserve complex onsets in the underlying structure.

5.2 Triconsonantal Cluster Resolution

One of the salient differences seen among the resolution of triconsonantal consonant clusters (CCC) is where the CCC sequences are not allowed and these sequences are solved by epenthesis of vowels in both dialects. However, the exact position and quality of the epenthetic vowel vary and so do the relative strength of the constraints.

5.2.1 Baghdadi Arabic (BGD)

Epenthesis is common in BGD; it happens between the first and second consonants of a CCC cluster in order to produce a CvCC structure. Similarly, the underlying sequence /CCC/ of /kitab-t-l-a/ ('I wrote to him') is pronounced as [ki.tab.it.la] with an epenthetic /i/ in between. High ranking of the CCC constraint, which is more significant than DEP-IO (penalizing vowel insertion) causes this type of pattern. The sonority sequencing maxims also apply to epenthetic vowels, as do the other sonority sequencing principles.

5.2.2 Basri Arabic (BAS)

Basri Arabic also handles CCC clusters through epenthesis, with the epenthetic vowel's quality and place being more variable, depending on vowel harmony or the phonetic context, especially in Bedouin-influenced forms. The interaction of other constraints, especially those pertaining to guttural consonants, results in a more complex epenthesis strategy than BGD, although CCC remains highly ranked. The difference in the order of ranked markedness constraints suggests that the influence of other markedness constraints, such as vowel harmony or a separate dialect-specific constraint, might also cause a slight difference in sub-ranking of DEP-IO.

5.3 The Gahawa Syndrome

The most important difference between BGD and BAS is that they differ in their handling of guttural-consonant clusters, which is seen as the 'Gahawa Syndrome' in Basri Arabic and is absent in Baghdadi Arabic.

5.3.1 Baghdadi Arabic (BGD)

Baghdadi Arabic is an urban dialect, and does not reflect the Gahawa Syndrome. The guttural-consonant clusters remain; for instance, the word for 'coffee' is /gahwa/ and is pronounced [gah.wa]. This situation is due to the constraint ranking, that is, DEP-IO (avoid vowel insertion) is a stronger constraint than GUTTURAL-CLUSTER (penalizing guttural/consonant clusters). It is interesting to note that in BGD the avoidance of guttural clusters takes precedence over the avoidance of vowel insertion, which is a typical city phonotactic simplification.

5.3.2 Basri Arabic (BAS)

In Arabic, the Gahawa Syndrome is at exertion in Basri Arabic. The mixture of vowels and consonants is comprehended as [ga.ha.wa] with epenthetic /a/ added after the guttural. This resources high rank for the constraint *GUTTURAL-CLUSTER* that is specified a higher rank than the constraint DEP-IO. In BAS, the guttural-consonant cluster avoidance is so strong that it causes a vowel to be inserted, even if this disrupts DEP-IO. This phonotactic preference is common in Bedouin as well as more conservative rural dialects.

5.4. Comparative Constraint Rankings

The different phonological properties of BGD and BAS are recorded in an optimality-theoretic constraint ranking. Below is a summary of these comparative rankings: The following table shows the comparative constraint rankings of the Baghdadi and Basri Arabic systems. It presents comparative constraint rankings of the Baghdadi and Basri Arabic systems.

Table 3: Comparative Constraint Rankings in Baghdadi and Basri Arabic

Constraint	Baghdadi Arabic (BGD) Ranking	Basri Arabic (BAS) Ranking
<u>*CCC</u>	High-ranked	High-ranked

<u>*GUTTURAL-CLUSTER</u> <u>DEP-IO</u>	Low-ranked (dominated by <u>DEP-IO</u>) Intermediate	High-ranked (dominates <u>DEP-IO</u>) Intermediate
<u>*COMPLEX-ONSET</u>	Low-ranked	Low-ranked
Overall Hierarchy	<u>*CCC</u> >> <u>DEP-IO</u> >> <u>*GUTTURAL-CLUSTER</u> , <u>*COMPLEX-ONSET</u>	<u>*CCC</u> , <u>*GUTTURAL-CLUSTER</u> >> <u>DEP-IO</u> >> <u>*COMPLEX-ONSET</u>

6. Conclusion

In this comparative Optimality-Theoretic study, the variation in the structure of the syllables of the Baghdadi and Basri dialects of Arabic has been carried out. It has been shown that complex onsets, triconsonantal clusters and the Gahawa Syndrome may usefully be explained on a systematic basis by different constraint rankings in the OT framework. The Gahawa Syndrome is present in the dialect type of Basri, whereas it is absent in the dialect type of Baghdadi, particularly, as it is clear from the previous discussions that dialect-specific constraint hierarchies influence on the surface phonological forms of the dialects. This study helps to deepen the understanding of Iraqi Arabic phonology and strengthen the importance of Optimality Theory in analyzing Dialectal variation.

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Appendix A: Participant Demographic Information

This Appendix presents detailed demographic data for the 20 native speakers who were involved in the study. The participants were chosen to represent a representative sample of the two subgroups of the Baghdadi Gilit (BGD) and Basri (BAS) dialects.

ID	Dialect	Gender	Age	Education	Background
BGD-01	Baghdadi	Male	24	Undergraduate	Baghdad Center
BGD-02	Baghdadi	Female	22	Undergraduate	Karkh District

BGD-03	Baghdadi	Male	35	Master's	Rusafa District
BGD-04	Baghdadi	Female	42	PhD	Mansour District
BGD-05	Baghdadi	Male	58	Secondary	Adhamiya District
BGD-06	Baghdadi	Female	31	Bachelor's	Karada District
BGD-07	Baghdadi	Male	45	Bachelor's	Baghdad Center
BGD-08	Baghdadi	Female	27	Bachelor's	Yarmouk District
BGD-09	Baghdadi	Male	52	Diploma	Sadr City
BGD-10	Baghdadi	Female	39	Bachelor's	Zayouna District
BAS-01	Basrawi	Male	21	Undergraduate	Basra Center
BAS-02	Basrawi	Female	25	Bachelor's	Zubair (Urban)
BAS-03	Basrawi	Male	48	Secondary	Abu Al-Khaseeb (Rural)
BAS-04	Basrawi	Female	33	Master's	Basra Center
BAS-05	Basrawi	Male	60	Primary	Qurna (Rural)
BAS-06	Basrawi	Female	29	Bachelor's	Ashar District
BAS-07	Basrawi	Male	37	Bachelor's	Basra Center
BAS-08	Basrawi	Female	44	Secondary	Faw (Rural)
BAS-09	Basrawi	Male	55	Secondary	Zubair (Urban)
BAS-10	Basrawi	Female	26	Bachelor's	Basra Center

Notes on Selection:

- Native speakers of each of their respective dialects, all lived in their cities for 20 years or more.
- The respondents are all speakers of their own dialect, and have been living in their own cities for a minimum of 20 years.
- Basri participants are urban and rural representatives to ensure representation of the entire distribution of the Gahawa Syndrome.
- The participants from the Basri are both urban and rural, so as to capture the whole distribution of the Gahawa Syndrome.
- All participants received an ID in order to preserve their anonymity and informed consent was obtained.
- All participants were given an ID for anonymity and informed consent was obtained.

