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Understanding the Phonotactics and Coda Clusters by Different Jordanian Speakers

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Abstract
This study aims to explore and tackle different phenomena of syllable structure and syllabification patterns in Jordanian Arabic (JA). The study compares and contrasts the permissible syllable structures in different Jordanian dialects. It also presents a comprehensive analysis of how speakers of different Jordanian dialects tackle the consonantal sequence in CVCC and the three moraic structures in CVVCC within the framework of the Optimality Theory. Data were collected from 15 females aged between 45 and 60 from the north, the south, and the middle of Jordan. These participants were asked to pronounce certain target words written on a sheet of paper in their daily dialects. Their productions of the words were recorded, transcribed, and analyzed within the framework of the Optimality Theory in Tableaux. The findings revealed that given CVCC, coda clusters are admissible in Ammani and Karaki but not in Ajluni Arabic. On the other hand, given CVVCC, in which the consonantal sequence in the coda position is geminate, Karaki speakers tend to preserve the geminate, and Ajluni speakers tend to degeminate the cluster. However, Ammani speakers tend to insert an epenthetic vowel to split the geminate. Since the study was limited to only two syllable structures from three Jordanian forms, further studies are recommended to investigate other syllable structures in such forms or even the same syllable structures in other Arabic dialects.

Keywords: phonological processes, Jordanian Arabic, coda clusters, phonotactics, constraints

Introduction

Phonotactics is that branch of phonology which regulates syllable structure, consonant clusters and vowel sequences through phonotactic constraints. Phonotactic constraints, in simple terms, refer to restrictions on sound sequences, and they are highly language-specific. It means that all phonemes are not allowed to combine in a particular language. Understanding the phonotactics of a particular language is a prerequisite to understand the formation of syllables in that language. Phonotactics is the phonological system or the

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number of rules that govern the distribution of sounds and the permissible combinations of sounds to construct a syllable in a language. Such phonological rules dictate how permissible syllable structures are formed by organizing and arranging individual sounds. Different languages have distinct phonotactic patterns, and different dialects of the same language have distinct phonotactic patterns. This phenomenon applies to the different Jordanian dialects under investigation in this study.

The Arabic language is a Semitic language that is the language of most of the Arabian Peninsula. It is also spoken in North Africa and the Middle East. There are numerous dialects of Spoken Arabic, one of which is Jordanian Arabic (JA), spoken by about 10 million Jordanians. Jordan's population is characterized as Bedouins (in the south) or sedentary villagers (in the north) and town dwellers (in the middle). Owing to this diversity, linguistic features are different in each population segment of Jordan. Like in any other dialects, phonological rules make the Jordanian dialects too differ; however, Jordanian Arabic has fixed syllable structures of both closed and open types.

It is a plain truth that grammar of different dialects is responsible for the emergence of different syllable structures like Consonant-Vowel-Consonant-Consonant (CVCC) and Consonant-Vowel-Vowel-Consonant-Consonant (CVVCC). In other words, phonotactic studies project different constraint hierarchies in target dialects from which such different productions of syllable structure and consonant-vowel clusters e.g., CVCC and CVVCC stem out. A large amount of research has been conducted on phonotactic patterns based on syllable structure and consonant-vowel clusters in different Arabic dialects in general and Jordanian dialects in specific (AbuAbbas, 2003; Alhoody & Aljutaily, 2022; Btoosh, 2006; Daana, 2018; Herin et al., 2021; Huneety et al., 2020; Jaber, 2017; Kiparsky, 2003; Watson, 2007a; Watson, 2007b; Zibin, 2019). These studies have focused on the permissible syllable structures and the permissible sequence of the elements of clusters, be they in the onset position or the coda position. One element lacking in these studies was the comparative approach, wherein phonotactics could compare and contrast target dialects in two different syllable structures and to study how people could handle particular coda cluster to avoid violating two markedness constraints. None of the previous studies compared how Jordanians resolve some non-permissible coda clusters in their dialects within the framework of Optimality Theory.

The current study investigated how phonotactics reacted with respect to target dialects in two particular syllable structures, within the framework of Optimality Theory, which is an established theory to study conflicting constraints in syllabus structures. The scope of this study was to compare and contrast the grammar of the different dialects responsible for the emergence of different syllable structures of the CVCC, and CVVCC in different dialects. In other words, this study projected different constraint hierarchies in target dialects from which different productions of CVCC and CVVCC stem out. The main objective of this study was to examine how Jordanians tackled CVCC, be it the cluster of a geminate or two different consonants. Concerning CVVCC, the article also summarized repair strategies (AbuAbbas, 2003) that the Jordanian speakers used to abstain from violating the***3µ** constraint, which entails: ***3µ** →no trimoraic syllables (Abu-Abbas, 2003)

Literature review

- ***Optimality Theory***

Several past studies have focused on phonotactic patterns regarding syllable structure and consonant clusters; however, very few have examined the phonotactic patterns within the framework of Optimality Theory (OT). The OT came into origin in 1990s as a new linguistics theory by Prince and Smolensky (2004) and expanded by McCarthy and Prince (1993) and Kager (1999). OT is mistakenly assumed to be a theory of phonology simply because it was first applied to phonology. However, it is believed to be an extension of Generative Grammar as it investigates universal principles, language typology, and language acquisition. OT differs from Generative Grammar since the latter views Universal Grammar (UG) as a set of rules with an inviolate linear order. Applying these rules in strict order results in a language's surface forms or output. In comparison, OT views UG as composed of three universal components, namely, (i) Generator **GEN** component, whose responsibility is to generate many rivals and possible outputs or candidates. (ii) Conflicting Violable Constraints **CON**, which is defined as the "structural requirement that may be either satisfied or violated by an output form" (Kager, 1999); and (iii) Evaluator **EVAL** component, which selects the optimal candidate that wins over the others and surfaces as the output.

It is interesting to note that the interaction of constraints within second component, **CON,** provides the criteria according to which the decision between the candidates is made. If the output meets those structural requirements, it satisfies a constraint. However, the constraint is violated if the output does not meet those requirements (Kager, 1999). OT assumes these conflicting constraints as of two types. The first type is Markedness or Structural constraint, which is universal, violable, and demands the output to be structurally unmarked and well-formed. It examines the output only and dispenses any marked or unpreferred structure. It can be stated negatively as well as positively as in the following two examples: e.g., (1) Syllables must not have codas; (2) Syllables must have onsets. The second type of constraint is the Faithfulness constraint, which is also considered universal. Faithfulness constraint requires a relative mapping between the input (underlying form) and the output (observed form) to ensure that the primary or lexical form is preserved in the output, regardless of the markedness of the input. An example of a Faithfulness constraint is: e.g., All segments in the input must be preserved in the output. The **EVAL** component, according to Kager (1999) demonstrate this relationship of OT components as follows:

Gen (input) → {$cand_1$, $cand_2$…$cand_n$}
EVAL {$cand_1$, $cand_2$…$cand_n$}→ output (Kager, 1999)

- ***Universality, Innateness & Ranking***

In the context of Optimality Theory, both types of constraints are considered universal, which may lead to the assumption that all languages are the same. However, difference in the grammar of languages results from different rankings of those constraints. This constraint ranking is language-specific. When structural constraints outrank faithfulness constraints, the language is structurally unmarked, but when faithfulness constraints outrank structural constraints, the language is marked. However, the conflict between these two types of constraints is more complex. Languages, in general, indeed prefer the unmarked structure to the marked structure. The question is, what determines the ranking of which type over the other? Kager (1999) stated, "A language may prioritize faithfulness over markedness with respect to some opposition, but reverse its priorities for another opposition".

OT also consists of faithfulness constraints that the speakers of the language prefer. The conflict between these two types of constraints in the process of domination gives precedence to the higher-ranked constraints over the lower ones. This conflict generates a massive number of candidates, amongst which optimal wins over the others by having the slightest violations of the highly ranked constraints in a set of constraints in a hierarchy. This ranking process is usually demonstrated in a tabular form which constraints are listed horizontally in a descending ranking from left to right, as shown in Table 1. The candidates are ordered vertically at random. The violation is demonstrated by '*', and the winning candidate is usually signalled by a pointing hand, but for technical reasons, by '→' in this study. If the violation is severe, it is marked by '*!'. This can be illustrated in Table 1:

Table 1. *List of constraints*

	Constraint1	Constraint2
→Candidate *a*		*
Candidate *b*	*!	

As can be inferred from the tableau, candidate *a* is the optimal candidate as it incurs a violation of a lower-ranked constraint than candidate *b,* whose violation is fatal.

- ***Jordanian Arabic and Optimality Theory framework***

Jordanian Arabic has three different geographical forms: the Bedouin dialect in the south, the Rural dialect in the north, and the Urban dialect in the middle (Zibin, 2019). The urban form is referred to as Ammani Arabic; Ajluni Arabic represents the north; and Karaki represents the south. Since Modern Standard Arabic and its dialects form a rich pool of target issues for researchers, especially when handling phonotactics, many studies have been carried out by Arabs and non-Arabs in phonology.

A plethora of researchers examined various dialects of Jordanian Arabic (JA). For instance, AbuAbbas (2003) evaluated different kinds of Jordanian Arabic common in northern Jordan- Ajluni Arabic within the framework of Optimality Theory. AbuAbbas (2003) and Huneety et al. (2020) elaborated on the permissible syllable structure in JA in general and Ajluni Arabic in particular. They stated that CV is a lighter syllable than CVC and CVV, which are considered heavy syllables. They further specified that the CVC syllable in Jordanian Arabic is light when in the word-final position; however, it is heavier elsewhere. However, CVVC, CVCC, and CVVCC are superheavy syllable structures. Moreover, CV, CVV, and CVC are unmarked clusters based on distribution. These three types are more commonly and frequently used than CVVC, CVCC, and CVVCC.

Btoosh (2006) evaluated Karaki Arabic in southern Jordan and analysed permissible syllable structures in Karaki Arabic within the framework of Optimality Theory. The study focused on onsets and the directionality of syllabification. Similarly, Al Huneety (2015) and Al Mashaqba (2015) stated that in JA, disyllables and trisyllables are common. However, only some monosyllables and quadrisyllables are used. Daana (2018) posited that Jordanian Arabic has fixed syllable structures: closed and open syllables and explained that the admissible syllable structures in most Jordanian varieties include CVVC as in **/ki:s/** 'bag', and CVV as in **/ma:**.ma/ 'mum', CVC such as **/mal**.ʕab/ 'playground', CCVCC, as in **/drobs/** 'candy', CCV as in **/nħa**.raʔ/ 'burnt', CCVC as in **/btil**.ʕab/ 'play', CCVVC as in **/ṣħu:n/** 'plates', and CVCC such as **/kalb/** 'dog'. Likewise, Jaber (2017) investigated the 'morpho-phonotactics' of Standard Arabic analyses within the framework of Optimality Theory and revealed that Standard Arabic does not allow consonant clusters in the onset position, so the language resorts to epenthesis. Watson (2007b) posited that most Arabic dialects are bimoraic. Typically, a syllable can only have a single mora. The study also stated that JA syllables are extremely bimoraic, suggesting they comprise not more than two moras abiding by the ***3μ** constraint.

Alhoody and Aljutaily (2022) investigated the weight of the superheavy syllables in Qasimi Arabic, one of the Saudi dialects. They discovered that both CVVC and CVCC can surface in any position of a word structure. Kiparsky (2003) has recognized many Arabic dialects, including some Jordanian forms, as VC dialects wherein no consonant cluster is allowed in the coda position, provided the consonants have falling sonority. Therefore, some forms of Arabic, including some Jordanian ones, allow this structure as long as it obeys the **SON** constraint, which entails:

SON → *In syllables, sonority adds in the peak and diminishes in the margins.*

However, other Arabic dialects, including other Jordanian ones, do not allow a CVCC structure even if it has a falling sonority. Speakers of such forms split this cluster by epenthesizing a vowel. Kiparsky (2003) suggested that some Jordanian Arabic resolve the CC geminate in CVVCC by adding a vowel to split the cluster or deleting one element of the geminate. This strategy is used to abide by the ***3μ** constraint.

Methodology

This research study adopted a qualitative research design, using a thematic content analysis approach. The sample of the study comprised 15 female participants aged between 45-60 years, out of which five spoke Karaki Arabic, five spoke Ajluni Arabic, and five spoke Ammani Arabic. The selection criterion were the specific particular dialect and their geographical distributions, which are north (Ajluni), south (Karaki), and middle (Ammani). The participants were selected according to the dialects they spoke. This was a noteworthy point of this study that data was collected from the native speakers of the dialects under study.

The instrument for data collection was an unstructured interview which took place in a café to make it less formal. All five participants were interviewed at the same time. The interview lasted for 60-75 minutes. The interview questions were related to informal and familiar issues to make them comfortable. At the end, each participant was given a paper with a list of the target words, and was asked to pronounce them in their native dialect: "How would you say these words?". These expressions were recorded after obtaining the participants' consent. These recordings were changed into transcripts for identifying categories, themes and content analysis for each target word.

Results and discussion

- ***Phonotactics and Codas Used in JA and OT***

— ***Non-Geminate Coda Cluster (CVCC)***

The complex set of codas is exhibited in four Jordanian dialects, which is contradictory to the universal *COD constraint considering OT:

*COD → *A Syllable must not comprise a coda.*

El-Badarin (1993) stated that coda clusters in JA are not commonly used. However, data collected for the purpose of this study revealed that a word such as /□alb/ 'heart' with a coda cluster of falling sonority has to be pronounced as /□alb/ in other forms of Jordanian Arabic, amongst which Ammani Arabic. By contrast, a word such as /ʔamer/ 'order' cannot be produced as /ʔamr/ in any of the dialects, not even Ammani Arabic. These kinds of JA do not allow coda clusters with increased sonority. This is congruent with Kiparsky's hypothesis (2003), which categorizes Syrian, Palestinian, and Jordanian dialects as VC-dialects that do not allow CC clusters word-finally but only if the consonants have falling sonority, as mentioned earlier. Thus, the sonority of the first consonant must have a greater sonority than the second consonant in word-final syllables of CVCC. In Ammani and Karaki dialects, coda clusters are exhibited when they follow the **SON** constraint (Daana, 2018; Btoosh, 2006). However, Ajluni Arabic does not permit coda clusters because the *COMPLEXcoda constraint over-ranks the SON constraint. *COMPLEXcoda constraint entails:

*COMPLEXcoda → *Coda must not comprise a consonant cluster.*

Table 2 presents the grammar responsible for avoiding the coda clusters in Ajluni Arabic.

Table 2. *Avoided Coda Clusters in Ajluni Arabic*

/⌦alb/	*COMPLEXcoda	SON	DEP-V-IO	*Coda
→/⌦alib/			*	*
/⌦alb/	*!			*

Where DEP-V-IO implies:

Every vowel in the output comprises a corresponding vowel in the input.

Therefore, in Ajluni Arabic, the grammar responsible for the production of CVCC where the last consonants do not geminate is:

*COMPEXcoda>>SON>> DEP-V-IO>> *CODA

On the other hand, the presence of syllables like CVCC in the Ammani and Karaki dialects show that in the grammar of these two dialects, the **DEP-V-IO** constraint outranks ***COMPLEXcoda**. These coda clusters are demonstrated in Table 3.

Table 3. *Coda Clusters in Ammani and Karaki Arabic*

/⌦alb/	**SON**	**DEP-V-IO**	***COMPLEXcoda**	***Coda**
/ ⌦alib/		*!		*
→/⌦alb/			*	*
/□amer/				
/□amr/	*!		*	*
→/ʔamer/		*		*

As Table 3 illustrates, the outranking of **SON** over **DEP-V-IO** and ***COMPLEXcoda** has allowed the speakers to keep the cluster in /⌦alb/ but to split it in /□amer/ in Ammani Arabic and Karali Arabic; hence, the second candidate surpasses the first as shown in the Table 3 above. Consequently, in Karaki and Ammani Arabic, the grammar that allows the production of the syllable structure CVCC in which the last two consonants abide by the **SON** constraint is:

SON>>DEP-V-IO>> *COMPEXCODA>> *CODA

— ***Geminate Coda Clusters (CVCC)***

Data analysis shows that all Arabic dialects under study allow geminates in the middle or the end of a word. The emergence of geminates in such dialects entails the low rank of ***GEM** constraint in their grammar, which prohibits geminate existence:

*GEM → *No geminates are allowed.*

Kenstowicz (1995) suggested IDENT-IO[GEM] to maintain the elements of a geminate. IDENT-IO[GEM], in the dialects mentioned above, outranks *GEM. This constraint asserts that the corresponding output of an input [gem] is also [gem]:

IDENT-IO [GEM] → A *corresponding output of an input [gem] will also be [gem].*

Table 4 exhibits the grammar that produces CVCC when the consonants in coda clusters are elements of a geminate in all Jordanian dialects.

Table 4. *Permissible Coda Clusters with Geminates (CVCC)*

/samm/	**IDENT-IO[GEM]**	**SON**	**DEP-V-IO**	***COMPLEX coda**	***GEM**	***CODA**
/sam/	*!					*
/samim/	*!		*			*
→/samm/		*		*	*	*

Deleting one segment of the cluster would violate the minimum weight of the syllable, which is considered a violation of the **W-MIN** constraint. Btoosh (2006) stated that this constraint preserves the minimum weight of the syllable.

W-MIN → At least two moras are in a prosodic word.

The rank of **W-MIN** is illustrated in Table 5, which prohibits the speakers of the Arabic dialects from deleting one segment of the geminate.

Table 5. *The Occurrence of CVCC wherein CC Comprise a Geminate*

/samm/	**IDENT-IO[GEM]**	**W- MIN**	**SON**	**DEP-V-IO**	***COMPLEXcoda**	***GEM**	***CODA**
/sam/	*!	*					*
/samim/	*!			*			*
→/samm/			*		*	*	*

Deleting an element of the geminate or inserting a short vowel to split it violates the highly ranked IDENT-IO [GEM]. Hence, the first and second candidates lose. Subsequently, the third candidate surpasses the others.

One can conclude that, in Ajluni Arabic, the grammar involved in producing CVCC, whether the last consonants are different or form a geminate, is:

IDENT-IO [GEM]>>W-MIN>> *COMPEXcoda>>SON>> DEP-V-IO>> *GEM>>*CODA

While, in Ammani and Karaki Arabic, the grammar which allows the occurrence of the syllable structure of CVCC, whether the cluster has a geminate or not, providing it follows **SON,** is:

IDENT-IO [GEM]>>W-MIN>>SON>>DEP-V-IO>>*COMPEXCODA>> *GEM>> CODA

— ***Syllables with three moras (CVVCC)***

Another controversial syllable structure is CVVCC. Noticeably, CVVCC in words such as /ma:rr/ 'passer-by' and /za: mm/ 'takes' has coda clusters with geminate preceded by a long vowel, which originates an issue with the bimoraic scenario as propounded by Broselow (1995). This structure violates the "no trimoraic syllable ***3µ**" constraint. However, data analysis reveals a possibility of syllables with three moras in certain syllable structures, which is consistent with Ratcliffe's conclusion (1998) that there are no more than two moras in Arabic syllables except for the CVVCC structure in which the consonants of the coda position form a geminate. By the same token, Abu-Abbas (2003) asserted that the coda cluster in CVVCC /za:mm/ 'takes' is limited to geminates. The fact that the findings of this current study, Ratcliffe (1998) and Abu-Abbas (2003) asserted the presence of CVVCC with a geminate in the coda position incurs a violation of the ***3µ** constraint. The productions of the Karaki ladies of CVVCC give further evidence to Btoosh's assertion (2006) that Karaki speakers prefer to produce CVVCC as is in various positions. Consequently, it shows that the production of CVVCC in such dialects without employing repair strategies stems from assigning ***3µ** a lower rank.

Table 6 delineates the position of the constraints responsible for the production of CVVCC in Karaki Arabic.

Table 6. *The Preservation of the Geminate Cluster in CVVCC by Karaki speakers*

/za:mm/	IDENT-IO[GEM]	*3 µ	W-MIN	SON	DEP-V-IO	*COMPLEXcoda	*GEM	*Coda
/ za:m/	*!							*
→/za:mm/		*		*	*		*	*
/za:mim/	*!					*		*

The winning candidate violates the low-ranked *3µ, whereas the other two do not obey the highly ranked IDENT-IO [GEM] constraint. Consequently, the grammar responsible for the preservation of the geminate in CVVCC in Karaki Arabic is:

IDENT-IO [GEM]>> *3 µ >>W-MIN>>SON>>DEP-V-IO>>*COMPEXCODA>> *GEM>> *CODA

On the other hand, CVVCC structure is resolved in two different ways in different dialects. Ajluni speakers, while attempting to respect the highly ranked ***3µ**, remove the second element of the geminate, as shown in Table 7.

Table 7. *Deleting one segment of the geminate as a repair strategy by Ajluni speakers*

/za:mm/	*3 µ	IDENT-IO[GEM]	W- MIN	*COMPLEXcoda	SON	DEP-V-IO	*GEM	*Coda
→/za:m/		*!						*
/za:mm/	*!			*	*		*	*
/za:mim/		*!				*		*

Table 7 illustrates the hierarchy of constraints responsible for the degeminating process. The fact that *3µ outranks IDENT-IO[GEM] results in deleting one element of the geminate. Therefore, the grammar responsible for the degemination of CC in CVVCC in Ajluni Arabic is:

*3 µ >>IDENT-IO [GEM]>>W-MIN>> *COMPEXcoda>>SON>> DEP-V-IO>> *GEM>>*CODA

Data from Ammani participants revealed that epenthesis is used to avoid the three moras in CVVCC in Ammani Arabic. In this dialect, the high rank of *3µ obliges its speakers to split the geminate clusters, changing CVVCC to CVV.CVC. From the perspective of OT, if a vowel is added between the different geminate elements, DEP-V-IO is not highly ranked. Consequently, this DEP-V-IO constraint is over-ranked by *3µ, resulting in the insertion of an epenthetic vowel to split the geminate. According to OT, the constraints hierarchy that allows breaking the geminate cluster in CVVCC, in Ammani Arabic, also portrays IDENT-IO [GEM] being outranked by *3µ. Table 8 demonstrates the grammar in Ammani Arabic that is responsible for dealing with CVVCC.

Table 8. *Repairing CVVCC in Ammani Arabic*

/za:mm/	***3 µ**	**IDENT-IO[GEM]**	**W- MIN**	**SON**	**DEP-V-IO**	***COMPLEX Coda**	***GEM**	***Coda**
→/za:m/		*						*
/za:mm/	*!			*		*	*	*
→/za:mim/		*			*			*

It can be concluded from Table 8 that two prime candidates can be the winners while only the third candidate should win. Another constraint is needed that should outrank **IDENT-IO[GEM]** to allow speakers of Ammani Arabic to split the geminate, namely, M**AX-IO.**

MAX-IO → Every segment of input has a corresponding output.

This constraint makes the first candidate lose to the third candidate. Table 9 shows the grammar responsible for fixing CVVCC wherein an epenthetic vowel splits the cluster formed by geminate.

Table 9. *Repairing CVVCC in Ammani Arabic*

/za:mm/	***3 µ**	**MAX- IO**	**IDENT-IO[GEM]**	**W-MIN**	**SON**	**DEP-V-IO**	***COMPLEXcoda**	***GEM**	***Coda**
/za:m/		*!	*						*
/za:mm/	*!				*		*	*	*
→/za:mim/			*			*			*

Table 9 shows that the first candidate violates **MAX-IO** and **IDENT-IO [GEM]**, which are highly ranked. The second incurs a violation of the highly ranked ***3µ**. In contrast, the third candidate violates the lower-ranked constraints. Hence, it wins over the rest.

Based on the above analysis, strategies used to abide by the two moraic syllables are splitting the cluster (in Ammani Arabic) or degemination (in Ajluni Arabic). Nonetheless, such a cluster is maintained by speakers of Karaki Arabic.

In summary, the grammar of Ammani Arabic, which derives CVCC and the repair of CVVCC, is represented in Table 10.

Table 10. *Admissible CVCC and repaired CVVCC in Ammani Arabic*

/kalb/	***3 µ**	**MAX-IO**	**IDENT-IO[GEM]**	**W-MIN**	**SON**	**DEP-V-IO**	***COMPLEX Coda**	***GEM**	***Coda**
→/⌦alb/							*		*
/⌦alib/						*!			*
/ʔamer/									
→/ʔamer/						*			*
/ʔamr/					*!		*		*
/samm/									
/sam/				*					*
/samim/			*!						*
→/samm/					*				*
/za:mm/									
/za:mm/	*!						*	*	*
/za:m/		*	*						*
→/za:mim/			*			*			*

The grammar hierarchy responsible for producing the two-syllable structures under investigation, CVCC, and CVVCC as CVV.CVC by Ammani speakers is presented below:

*3µ>>MAX-IO>>IDENT-IO[GEM]>>W-WIN>>SON>>DEP-V-IO>>*COMPLEXcoda>>*GEM>>*Coda

Conclusion, Limitations, and Recommendations

This study examined CVVCC and CVCC syllable constructions in multiple dialects of the JA. Given CVCC, it is apparent that coda clusters are admissible in Ammani and Karaki as long as the sonority of the elements in the cluster decreases. In Ajluni Arabic, the cluster is split even if the sonority of the elements of the cluster decreases. On the other hand, producing CVVCC violates the bimoracity nature of the Arabic syllable structure. Repair strategies have been given and explained within the Optimality Theory framework. Karaki speakers tend to preserve the geminate abiding by the highly ranked **IDENT-IO-[GEM],** which is ranked higher than ***3μ**. Ajluni speakers tend to degeminate the cluster by deleting one element abiding by the highly ranked***3μ** constraint. Ammani speakers tend to insert an epenthetic vowel to split the structure abiding by the highly ranked ***3μ.**

The study was also limited to two particular syllable structures: CVCC and CVVCC *per se*. Future investigations of differences in other syllable structures, not only between different Jordanian forms but also other Arabic forms, are strongly recommended. Such future investigations may shed light on how people of different forms of a language or different languages try to abide by the constraint hierarchies in their languages. The Optimality Theory tableaux digs up the strategies people unconsciously use to abide by the faithfulness constraints in their languages.

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