ISSN 1799-2591
Theory and Practice in Language Studies, Vol. 15, No. 12, pp. 3995-4005, December 2025
DOI: https://doi.org/10.17507/tpls.1512.19

An Optimality-Theoretic Account of Superheavy Syllables in Urban Irbid Dialect

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***Abstract*—This study investigates the distribution of superheavy syllables in Urban Irbid dialect (UID), revealing their occurrence in both non-final and final word positions. We argue that word-final superheavy syllables are characterized by an extrametrical or weightless final consonant. This extrametricality is proposed as a mechanism to satisfy constraints against trimoraic syllables (*3µ) and final consonants bearing weight (*FINAL-µ-C), albeit at the cost of violating the Weight-to-Stress Principle (WBP). Drawing on Broselow's (1992) analysis, we suggest that the extrametrical final consonant can alternatively satisfy WBP by violating a constraint against non-syllabic segments (NSµ). Furthermore, the analysis highlights that the absence of final CVCC syllables in UID stems from a violation of the Sonority Sequencing Principle. Finally, the paper notes the non-occurrence of certain non-final CVCC and CVCCC syllable types within the system, suggesting further constraints on syllable structure beyond those discussed.**

***Index Terms*—Urban Irbid dialect, superheavy syllables, extrametricality, Weight-to-Stress Principle**

I. Introduction

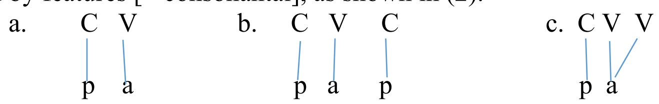
Previous works on Generative phonology have overlooked the role of syllables in the phonological theory to the extent that the term "syllable" was not mentioned in the index, as they claim that words are decomposed into sequences of vowels and consonants (Katamba, 1992; Spencer, 1996; Hannahs, 2011). Recent studies, however, have shown that syllables have become the locus of phonological theory, in which phonotactic constraints and distributional statements are best described in terms of syllables rather than words or morphemes (Hooper, 1972, 1975; Katamba, 1992; Spencer, 1996; Hannahs, 2011, Alsharif & Khasawneh, 2025). For example, in English, aspiration is sensitive to syllable structure, as in *[p^h]ea* and *re[p^h]eat*. That is, the voiceless stop [P] is aspirated when it occurs before any stressed vowel, whether it is word-initial or not (Hannahs, 2011). Another example is the case of emphasis in Cairene Arabic, wherein Broselow (1976) emphasized that the domain of emphasis (T, D, S, Z, L, R) is not the segment but the syllable, as illustrated in the following examples (1).

1. a. **FASL** / b. **FAS**. lu 'term, his term'
   b. **RAA**. gil / b. **RAG**. leen 'man, two men'

Obviously, in examples (a) and (b), when suffixes are cliticized to the word, they fail to share the emphasis with the preceding syllable since, as mentioned above, emphasis only spreads to all segments within the same syllable.

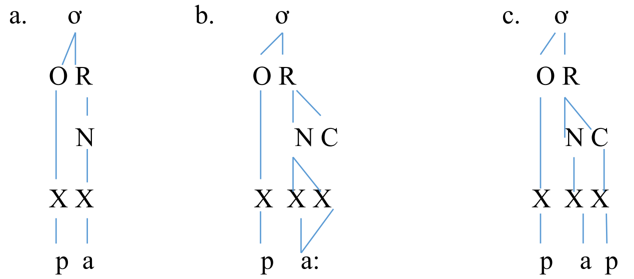
II. Previous Studies on Syllable Representation

Syllables have gained much attention in the last five decades, which has led to the emergence of a number of theories that are dedicated to accounting for the syllable structure in various languages and their dialects, such as the skeletal tier theory, X-slot theory, the templatic theory, and the moraic theory. For example, McCarthy (1979a) established the skeletal theory in which the skeleton is an empty frame into which units from the segmental tier are mapped, and the CV-tiers are designated by features [± consonantal], as shown in (2).

2.


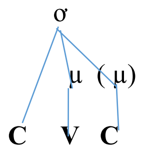
However, this theory was replaced by X-slots (Levin, 1985), which reflect the number of units on the segmental tier. Besides, the distinction between consonantal and vocalic features is rendered unspecified, so either consonants or vowels can be associated, as illustrated in (3).

3.



Subsequently, Hyman (2019) introduced the moraic theory, in which syllables are also categorized into two types: light and heavy. Accordingly, light syllables usually take the form of CV, which is considered to be one mora, while heavy ones are usually CVV or CVC. The long vowels or diphthongs in CVV weighed two moras, but the weight of a CVC syllable is language-specific, in which the coda C is sensitive to its position. This means that in some languages, including Arabic, if the coda C occurs in the absolute final position, it is weightless. However, it has one mora if it occurs word-internally, as represented in (4).

4. a.



Due to its inability to capture generalizations for the variations among languages and dialects, there was a need for a new grammatical representation to accommodate such variations. Accordingly, Itô (2018) proposed the template theory by which syllable structures are built around directional template matching.

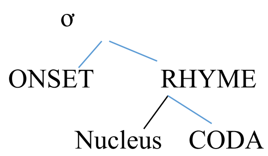
III. Arabic Syllable Structure

A. Basic Syllable Structure

Syllables consist of constituents that are hierarchically organized and represented in terms of branching tree diagrams. At the highest level, syllables are made up of onsets (the consonant or consonant at the beginning) and rimes (everything following the onset). Rime itself consists of a nucleus (the core of the syllable, usually a vowel) and a coda (the consonant or consonants at the end). The internal immediate syllable structure is schematized as in (5).

5.

a.



In Modern Standard Arabic (henceforth MSA) and other Arabic varieties, including Irbid Arabic (IA), a rural Jordanian Arabic sub-variety, it is widely acknowledged that syllables are divided into two categories: basic and derived syllables. Basic syllables are CV, CVC, and CVV, while derived ones are arguably CVCC, CVVC, and CVVCC (Broselow, 1979; McCarthy, 1979; Watson, 2002, 2007). It is argued that the latter syllable type does not appear phonetically, but it is analyzed as part of the underlying syllable inventory in many Arabic dialects. Consider the following examples (6), which show the syllable types (adapted from Abu Salim, 1982, p. 10):

6. a. CV **Ka**.tab ‘he wrote’
b. CVV **raa**.sal ‘he corresponded’
c. CVC **mad**.ra.se ‘school’
d. CVVC **šaaf** ‘he saw’
e. CVCC **? uxt** ‘sister’

It is clear from the examples mentioned above that Arabic does not allow a vowel-initial syllable. That is to say, onset is an obligatory constituent in Arabic syllable structure, while coda is optional, consisting of zero to two consonants at most. In addition, vowel length is phonemic, where short and long vowels are represented by nonbranching and branching nodes, respectively. However, although consonant clusters are highly restricted in distribution in Arabic, many Arabic dialects permit them to occur word-initially, only in phrase-initial position, as illustrated in the following examples (7) (adapted from Abu Salim, 1982, p. 13):

7. a. CCV **sta**.lam ‘to receive’
b. CCVV **ktaa**.bi ‘my book’
c. CCVC **sta?**.bal ‘to welcome’
d. CCVVC **blaad**.na ‘our countries’

e. CCVCC **mfakk** 'screw driver'

Diachronically, these words have consonant clusters that are derived by deleting vowels, consonants, or both in some environments. The Classical Arabic version of these words is presented in (8), which shows how deletion created these consonant clusters.

8. a. ?istalam
b. kitaabi
c. ?istaqbala
d. bilaaduna
e. mafakk

Of more importance here is the question of representation and markedness, which aroused considerable disagreement among Arab and Western linguists; accordingly, several proposals have been suggested with regard to the internal syllable structure in Arabic.

B. Superheavy Syllables

The term "superheavy" is traditionally used in Arabic to represent the syllable structures of CVVC and CVCC, as opposed to the heavy ones of CVV and CVC, respectively. Most Semitic studies discussed the role of these types of syllables in accentuation (Mitchell, 1960; Aoun, 1979; Bakalla, 1979; McCarthy, 2019, 1979). Interestingly, both heavy syllables behave similarly when they come into play with stress assignment. In other words, they become stressed when they occur in the penultimate position but unstressed in the absolute final position unless they are followed by a consonant, by which they become superheavy syllables, as shown in the following examples (9) and (10) (Selkirk, 1981, pp. 209-210).

9. a. kà.ta.bit 'she wrote'
b. kà.ta.bu 'they wrote'
10. a. ka.tàbt 'I, you (m.s) wrote'
b. ki.tàab 'a book'

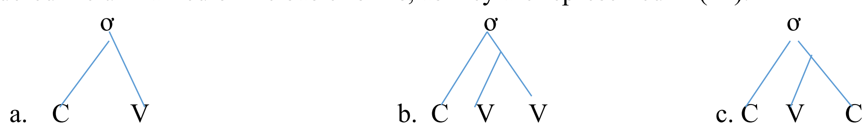
C. The Nonlinear Account of Superheavy Syllables

Several approaches have been proposed to represent CVVC and CVCC in the nonlinear framework of phonology, but two of them are particularly relevant to the phonological theory of Arabic: superheavy syllable analysis and degenerate syllable analysis. The former was suggested by McCarthy (2019, 1979) and Abu Salim (1982), while the latter was proposed by Aoun (1979) and Selkirk (1981).

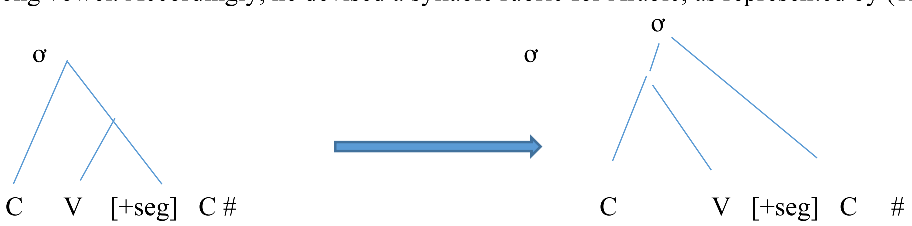
(a). Superheavy Syllable Analysis

1) McCarthy's Analysis (1979)

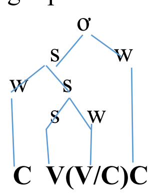
McCarthy (1979) exhibited that CV, CVC, and CVV are the most frequent syllables in Classical Arabic; therefore, they are considered the unmarked or the basic forms, as they are represented in (11).

11.


Moreover, he explained that there is no structural difference between CVC and CVV in terms of their internal structure, as both have branching rhymes. The former form, where the rhyme is divided into a nucleus and a coda, while the latter form constitutes a long vowel. Accordingly, he devised a syllable rubric for Arabic, as represented by (12).

12.


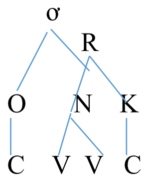
As for superheavy syllables (CVCC and CVVC), he claimed that they are distributionally restricted to phrase-final position in Classical Arabic and many Arabic dialects due to the deletion of morphological endings (i.e., mood and case) such as *ki.taab* (cf. ki.taab.bun 'book'). Accordingly, he proposed that the final consonant is Chomsky-adjoined to the preceding syllable, as shown in the following representation (13).

13.


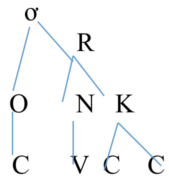
2) Abu Salim's Analysis (1982)

The validity of McCarthy's syllabification process of superheavy syllables has been questioned and undermined by Abu Salim. He offered an alternative proposal for syllabification in which the final consonant is to be sister-adjoin to the stranded consonant to the preceding node, so examples (14a) and (14b) can be shown by the following representation.

14. a



b.

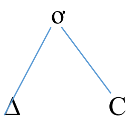


Abu Salim's analysis has been subject to heavy criticism in subsequent works. For example, Abu Mansour (1987) stated that the sister-adjoin analysis cannot be generalized to account for all varieties of Arabic. He added that Abu Salim formulated a template for Palestinian Arabic syllable structure in order to show the structural difference of the syllable types and to avoid deriving CVVCC phonetically; hence, it cannot be extended to account for the Meccan dialect.

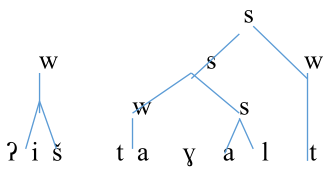
(b). The Degenerate Syllable Analysis

This analysis was developed by Aoun (1979) and Selkirk (1981). Aoun proposed an alternative approach to handle the superheavy syllables. He claimed that CVCC and CVVC are decomposed into two syllables: heavy and degenerate. However, according to Selkirk, CVCC is only analyzed as degenerate. The degenerate syllable is an extra consonant with an empty nucleus, as represented in (15) (Aoun, 1979).

15. a. degenerate coda



b.



'I worked'

The idea of such analysis is to provide the language of syllable types that is empty but structurally present. However, the degenerate syllable analysis shares McCarthy's analysis that both can create the same metrical structure and can account for the stress assignment of superheavy syllables.

IV. OT Analysis of Superheavy Syllables in MSA

As mentioned earlier, MSA consists of two-syllable structures in terms of weight: light and heavy. Heavy syllables are referred to as bimoraic since they bear two moras, while a light syllable, which bears one mora, is monomoraic. As for superheavy syllables, they are restricted to the final position, and they are disallowed word-internally. In the final-utterance position, the constraint *FINAL-Cμ is active, so the extra coda consonant in these kinds of structure is not assigned mora in order to retain conformity with the Bimoracity Constraint SYLLBIN, while superheavy syllables that occur word-internally are avoided by employing various strategies such as vowel shortening and epenthesis. In OT terms, *FINAL-Cμ is expressed as the violable constraint WBP and *3μ.

WBP: consonants in the coda position are moraic.

***FINAL-Cμ**: the final consonant is weightless.

SYLLBIN: syllable weight should not exceed two moras.

***3μ:** syllables are maximally bimoraic.

Moreover, we mentioned that CVC and CVV are equal in their weights, and this means the coda in CVC has a mora word internally. However, it is weightless when it occurs in the absolute final position because it violates the constraint *FINAL-Cμ. This indicates that the constraint WBP is active in MSA, and it violates the DEP-μ-C. This is illustrated in the following Tableau (16).

16. The following tableau illustrate how heavy and superheavy syllables are computed in OT.

μ CVC	NSμ	WBP	DEP-μ-C
μ μ a.→C V C			*
μ b. C V C	*!		
μ c. C V C		*!	

The ranking reveals that the three candidates equally violate one constraint. However, candidate (a) is optimal because it satisfies the high-ranked constraints in the Tableau NSμ and WBP, while candidate (b) and (c) are ruled out since they violate those two constraints, respectively.

Drawing on the data mentioned earlier, superheavy syllables in MSA occur only in the final position. The final consonant in CVVC and CVCC cannot be assigned mora due to the highly ranked constraint *3μ, which prevents trimoraic syllables from surfacing. Accordingly, MSA often avoids these kinds of syllables by employing two strategies: vowel shortening and epenthesis, as shown in the following Tableau (17).

17.

μ / CV: C/	*FINAL-Cμ	WBP	DEP-μ-C
μ a.→C V C		*	
μμ μ b. C V C	*!		*

MSA avoids CVCC and CVVC word-internally by employing three strategies: vowel shortening, Vowel epenthesis, and onset maximization.

V. OT Analysis of Superheavy Syllables in Urban Irbid Dialect

A. Introduction

Urban Irbid Dialect[1] (henceforth UID) is one of the sub-varieties (i.e., Ma'ani Arabic, Bani Hasan Arabic, Rural Arabic) spoken by city-dwellers in the north of Jordan. Several phonological differences are present between these sub-varieties. One of these differences lies in the structure of superheavy syllables *CVVC* and *CVCC*, which is the primary concern of the current study.

1) The distribution of basic syllable structure in UID

a. CA syllable
   1. **ka**.tab ‘he wrote’
   2. **na.sa** ‘he forgot’

b. CVV syllable
   1. ja**.saa.**fir ‘he travels’
   2. **faa.šil** ‘loser’

c. CVC syllable
   1.na.**ħil** ‘bees’
   2. **mad**.ra.sa ‘a school’

2) Restricted syllable types in UID

a. Complex onsets
   1. **kn**aa.fih ‘dessert’
   2. ktaab

b. Superheavy syllables
   1. CVVC → /daar/ ‘house’
   2. CVCC→ /šarħ/ ‘explanation by examples’

Possible syllable Types in UID

Light syllables	Heavy syllables	Superheavy syllables in final position	Superheavy syllable in non-final position
(C) CV	(C) CVC	(C) CVCC	CVVC.CV
	(C) CVV	(C) CVVC	CVCC.CV

An important point to note about the distribution of superheavy syllables in UID is that they occur freely word-internally and finally, as long as they do not violate the sonority profile.

B. Theoretical Background

Kiparsky (2003) suggested that Arabic dialects fall into three types: CV, VC, and C. The CV and C dialects allow the CC coda cluster to occur phrase-finally, while the VC dialects are also divided into two types. The first type allows the CC coda cluster to occur under the condition of sonority falling, while the other type prohibits the CC coda cluster from occurring in the final position. The following table exemplifies the treatment of the CC coda cluster in the three dialects (Kiprasky, 2003, p. 149).

CV dialects	C dialects	VC dialects Type (1)	VC dialects Type (2)
Allowed	Allowed	Falling SON only	Prohibited
1.katabt ‘I wrote’	Ktbət ‘I wrote’	Katabit ‘I wrote’	Katabit ‘I wrote’
2.?akl ‘food’		Kalb ‘dog’	Kalbi ‘dog’

As shown in the above table, both CV and C dialects allow CC coda clusters to occur without any restrictions. In the CV dialects, the first example *katabt* shows a sonority plateau /bt/, while the second one, *akl* represents a sonority rise. additionally, it can be noticed that in VC dialects of type (1), falling sonority is permitted, whereas in type (2), sonority plateau /bt/ is prohibited. UID obeys the Sonority Sequencing Principle (henceforth SSP) in a way that it is a member of the first type of VC dialects. In other words, UID allows a sonority profile for CC coda clusters where the first consonant is less sonorous than the other, as illustrated in the following examples (18a and b).

18 a. xalf ‘behind’
b. ħabil~*ħabl ‘rope’

Since complex coda clusters with a sonority falling are permitted, the constraint *COMP-COD is violated in JA.

Broselow (1992) examined many Arabic dialects (cf. Cairene, Iraqi, Sudanese, and Makkan) and deduced that almost all modern Arabic dialects are maximally bimoraic. In addition, she stated that superheavy syllables CVVC and CVVC are also bimoraic in which the final consonant is extrametrical. This is evident in the way these dialects avoid non-final trimoraic syllables, resulting from the concatenation of morphemes.

Watson (2007) proposed that the bimorality constraint is obligatory in most Arabic dialects, and trimoraic syllables are prohibited. Thus, the constraint *3μ was adopted in the analysis of UID data. Drawing on Broselow's (1992) analysis, the final consonant in superheavy syllables is extrametrical; therefore, the constraint *FINAL-C-μ is also inviolable and undominated in these dialects. Moreover, superheavy syllables might be affixed or concatenated to morphemes, and in this way, they become in a non-final position, which triggers the violation of the constraint *3μ. Previous studies have shown that Arabic dialects employ various strategies such as onset maximization, vowel epenthesis, vowel shortening, or metathesis to avoid superheavy syllables from occurring in a non-final position. Interestingly, UID tolerates the occurrence of superheavy syllables in non-final positions in some instances. However, it also inserts vowels in –CCC- coda clusters between the first and the second consonants in some cases or resyllabifies the third consonant to become the onset of a new syllable. That is to say, -CCC- coda cluster in JA triggers epenthesis to break up the cluster or utilize the resyllabification process, as represented in the following examples (19).

19. a. /bint-na/ [bini̇t-na] ‘our daughter’ (CCC→CCVC)
b. /gult-l-u/ [gul-tlu] ‘I told him’ (CCC→C.CC)

According to Broselow (1992), *CVVC* is either avoided or tolerated in the non-final position. For example, the Meccan dialect avoids this kind of syllable to conform to the bimoraicity constraint by triggering vowel epenthesis or utilizing vowel shortening. In contrast, the ID (Irbid dialect) tolerates CVVC to appear in non-final position, as is shown in the following examples (20).

20. a. Non-final CVVC is allowed (ID)
/xaal-na/ [xaal.na] ‘our uncle’
b. Non-final CVVC is avoided by epenthesis (MD)
/baab-na/ [baa.ba.na] ‘our door’

Broselow (1992) suggested an Adjuction-to-mora rule to account for the dialects that tolerate non-final CVVC. Under the Adjunction-to-Mora analysis, non-final CVVC can be moraic by associating a mora to the last VC in a CVVC syllable. In OT terms, the application of the adjunction-to-mora rule can be translated into the constraint NOSHAREDMORA (NSμ).

NOSHAREDMORA: Moras should be linked to single segments

According to Watson (2007), NOSHAREDMORA is ranked high in the dialects that permit non-final CVVC, while it is ranked low in the dialects that avoid non-final CVVC by epenthesis or vowel shortening. Given this, the constraint NOSHAREDMORA is inviolable in UID, where, in some cases, JA resorts to epenthesis or vowel shortening to repair ungrammatical sequences. In other words, JA usually avoids non-final trimoraic syllables either by epenthesis, vowel shortening, or CC shared mora or VC shared mora. Another constraint that is related to non-final CVVC is MAX-μ-V, which disallows the vowel shortening process by preventing surface forms with fewer moras than the input forms.

C. Constraint Interaction

Following Hayes’ (1989) analysis, codas are assigned moras by the constraint WBP. Other active constraints relevant to the discussion of superheavy syllables are the undominated constraints *3μ, which require superheavy syllables to be maximally bimoraic, the *FINAL-Cμ constraint, which also requires that the final consonant is moraless, and the faithfulness constraint DEP-μ-C. According to Watson (2007), NOSHAREDMORA is ranked high in the dialects that permit non-final CVVC, while it is ranked low in the dialects that avoid non-final CVVC by epenthesis or vowel shortening. Given this, the constraint NOSHAREDMORA is inviolable in JA; therefore, JA, in some cases, resorts to using epenthesis or vowel shortening to repair ungrammatical sequences. In other words, JA usually avoids non-final trimoraic syllables either by epenthesis, vowel shortening, or CC shared mora or VC shared mora. Another constraint that is related to non-final CVVC is MAX-μ-V, which disallows the vowel shortening process by preventing surface forms with fewer moras than the input forms. Regarding SSP, the constraint *COMP-COD, which requires codas to be simple, and *RISE-SON allows only coda clusters with a sonority fall.

1. Final CVVC and CVCC syllable structure

Accordingly, the possible ranking of constraints in ID is as follows:

*FINAL-μ-C, *3μ, NSμ, MAX-μ-V, *RISE-SON], DEP-V >>WBP, *COMP-COD >> DEP-μ-C

21. /ʤaar/ [ʤaar] 'neighbor'

μμ /ʤaar/	*FINAL-μ-C	*3μ	NSμ	MAX-μ-V	WBP	DEP-μ-C
μμμ a. /ʤaar/	*!	*			*	*
μμ b. /ʤaar/			*!			*
μ c. /ʤar/				*!	*	
μ d. /ʤar/	*!			*		*
μμ e. → /ʤaar/					*!	

The winning candidate in this Tableau (21) is (e), which satisfies the undominated constraints *FINAL-μ-C, *3μ, NSμ, MAX-μ-V. Its closest rival is (c). Vowel shortening in candidate (c) results in excluding it because it violates the constraint MAX-μ-V. Candidate (a) is ruled out by the constraints *FINAL-μ-C and *3μ since it has an extrametrical consonant that has a mora. Candidates (b) and (d) are ruled out of the game due to a fatal violation of the higher ranked *FINAL-μ-C and NSμ, respectively.

22. /šarħ/ [šarħ] 'explanation with examples'

μμ /šarħ/	*FINAL-μ-C	*3μ	NSμ	DEP-V	*COMP-COD	WBP	DEP-μ-C
μμ a.--> šarħ					*	*	
μμ b.šarħ			*!				*
μ c.šarħ					*	**!	
μ μ d.ša.riħ				*!			
μμμ e.šarħ	*!	*					*

According to Tableau (22), Candidate (a) wins over (c) since the latter incurs two violations in the constraint WBP. Candidate (b) is eliminated by the constraint that bans NOSHAREDMORA. Candidate (d) is ruled out by the undominated constraint DEP-V. Candidate (e) fails the competition immediately for violating the constraints *FINAL-μ-C and *3μ.

2. Avoiding Final CVCC syllable structure

The following Tableau shows that UID utilized epenthesis to avoid sonority rising in the coda cluster.

23. /ħabl/ [ħa.bil] 'rope'

μ μ /ħabl/	*FINAL-μ-C	*3μ	NSμ	*RISE-SON]σ	DEP-V	*COMP-COD	WBP	DEP-μ-C
μμ a.ħabl				*!				*
μμ b.ħabl			*!	*				*
μ c.ħabl				*!				
μ μμ d.ħa.bil	*!				*			*
μμμ e.ħabl	*!							
μ μ f.--> ħa.bil					*!		*	

Tableau (23) shows that final superheavy syllables are avoided through vowel epenthesis. The motivation behind the vowel epenthesis is the ban on sonority rising expressed through *RISE-SON]σ. Accordingly, candidate (f) wins the competition and emerges as the optimal output, as it violates DEP-V.

3. Non-Final CVVC and CVCC syllable structure

Accordingly, the possible ranking constraints for non-final CVVC and CVCC in UID are as follows: *COMP-ONS, *3μ, WBP, NSμ, DEP-V >> MAX-μ-V, *COMP-COD >> DEP-μ-C.

24. /suur-na/ [suur.na] 'our wall'

μ μ μ /suur-na/	*COMP-ONS	*3μ	MAX-μ-V	WBP	NSμ	DEP-μ-C
μμμ μ a. suur.na		*!				
μμ μ b.suu.rna	*!					
μμ μ c.suur.na					*!	
μμ μ d.sur.na			*!			
μμ μ e.suur.na				*!		

Tableau (24) shows that the optimal form is candidate (c), in which WBP occurs to avoid the trimoraic syllable word-internally. Candidates (a), (b), (d), and (e) violate the constraints *COMP-ONS, *3μ, MAX-μ-V, and WBP, respectively.

25. /šilthum/ [šilt.hum] 'I removed them'

μμ μ /šilt-hum/	*COMP-ONS	*3μ	MAX-μ-V	WBP	NSμ	DEP-V	*COMP-COD	DEP-μ-C
μμμ μ a. šilt-hum		*!					*	**
μμ μ b. šil.thum	*!							*
μμ μ c. šilt-hum					*!		*	*
μμ μ d. šilt.hum				*!		*!	*	*
μ μμ μ e.ši.lit.hum			*!					*
μ μ f. šilt-hum				**!			*	

In Tableau (25), candidate (c) surfaces as the optimal output, as it violates the constraint NSμ. Candidate (b) is immediately ruled out by the inviolable constraint *COMP-ONS. Candidates (a), (d), and (e) are eliminated for violating the inviolable constraints.

4. Avoiding Non-Final CVVC and CVCC syllable structure

UID employs two strategies to avoid non-final CVVC and CVCC. The first one is vowel shortening, which is used to prohibit CVVC from occurring word-internally in a non-final position. The other strategy is epenthesis, in which a vowel is inserted to disallow CVCC to occur in a non-final position. The following tableaux illustrate the two phonological processes.

26. /stašaarna/ [sta.šar.na] 'we asked for consultation'

μ μμ μ /sta.šaar-na/	*COMP-ONS	*3μ	NSμ	MAX-μ-V	*COMP-COD	DEP-μ-C
μ μμμ μ a.sta.šaar.na		*!			*	**
μ μμ μ b.sta.šaa.rna	*!					*
μ μμ μ c. sta.šaar.na			*!		*	*
μ μμ μ d. sta.šar.na				*!	*	*

Candidate (d) is selected as the optimal form in this Tableau (26). This non-final CVVC satisfies the bimoraicity constraint by utilizing the vowel-shortening repair strategy. The candidate (c) loses to (d) by violating the higher-ranked constraint NSμ. Candidates (a) and (b) are ruled out by violating the constraints *COMP-ONS and *3μ.

27. /bintna/ [bi.nit.na] 'our daughter'

μμ μ /bint-na/	*COMP-ONS	*3μ	NSμ	DEP-V	*COMP-COD	DEP-μ-C
μμμ μ a. bint.na		*!			*	**
μμ μ b. bin.tna	*!					*
μμ μ c. bint.na			*!		*	*
μ μμ μ d. bi.nit.na				*!		*

The optimal candidate is (d). It uses vowel epenthesis to avoid the potential trimoraic syllable. Its closest rival loses due to a fatal violation of NSμ. Candidates (a) and (b) are ruled out for violating *COMP-ONS and *3μ. MAX-μ-V is not mentioned in the Tableau as it is vacuously satisfied by the candidates.

VI. Conclusion

As can be noticed, superheavy syllables in UID can occur in the non-final position and the final position. When it occurs word-finally, the final consonant is extrametrical or weightless. This is because the extrametrical consonant satisfies the two constraints, *3μ and *FINAL-μ-C, while it violates the constraint WBP. Broselow's (1992) approach is used to handle the extrametrical consonant in the final position, where it violates the requirement of the constraint NSμ while satisfying the constraint WBP. Other superheavy cases demonstrate that UDI disallows final CVCC from occurring, as it violates the sonority rising constraint. On the other hand, some cases of non-final CVCC and CVCC fail to appear. Accordingly, this research triggers further research to account for the causes of this variation.

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