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Non-Assimilatoy Processes in Algerian Arabic as Spoken in Mostaganem: An Autosegmental Phonology Perspective

Master's Degree in Linguistics

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Dedication

This study is wholeheartedly dedicated to my dearest parents especially my mother who has been the source of motivation, joy, and inspiration. To my beloved brother who has always been there for me. I also dedicate this paper to my friends Sarah Saadi and Belakhal Hayat, who stood by my side on and off water; thus, I sincerely thank them for their help, support, encouragement, and for pushing me further than I thought I could go.

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My gratitude also goes to the members of the examination board who accepted to examine the study at hand.

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Abstract

The present disserttion revolves around the non-assimilatory processes in the Algerian Arabic as spoken in Mostaganem. These non-assimilatory processes include addition, deletion, metathesis, compensatory lengthening, and major class change. The approach adopted in this study is Goldsmith's autosegmental phonology. Thus, the aim of this work remains in knowing whether the model is able to account for the non-assimilatory processes in Mostaganemian Arabic (MA). In the process of conducting the experiments, a qualitative method has been adopted. Thus, a corpus of the speech of thirty native speakers of MA was recorded and transcribed. After completing the transcription part, the phonological processes were extracted and analyzed using autosegmental phonology framework. The outcome of this study was that non-linear phonology succeeded in accounting and explaining MA's non-assimilatory processes.

Keywords: Phonological processes, non-assimilatory processes, MA, autosegmental phonology.

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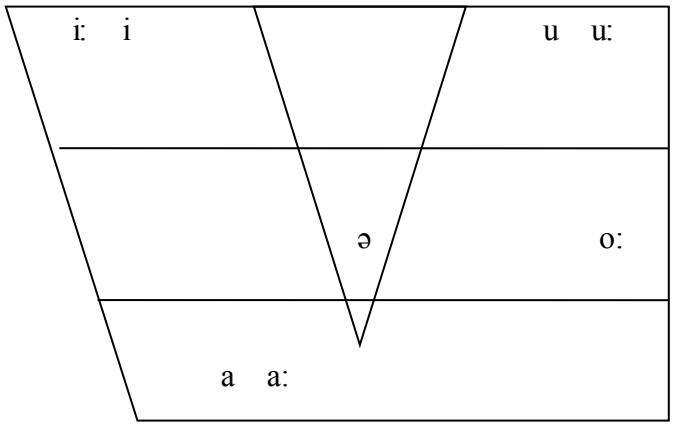
The IPA Symbols of MA Consonants

	Labial	Dental	Alveolar	Palatal	Velar	Uvular	Pharyngeal	Glottal	Emphatic alveolar
Nasal	M		n						
Stop	p b		t d		k g	q		ʔ	ṭ ḍ
Fricative	F	θ ð	s z	ʃ		x ɣ	ħ ʕ	H	Ṣ
Affricate				ʧ ʤ					
Trill			r						
Approximant			l	j	w				

The IPA Symbols of MA Vowels



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General Introduction

In linguistics, the term 'grammar' refers to the naturally-developing structural properties of syntax and morphosyntax of a language. The term 'generative', on the other hand, refers to generating infinite well-formed sentences from a finite set of grammar. Wasow (2003). Generative grammar is the general theory of language. It was introduced by Chomsky in the 1950's, as it is also known as *transformational grammar*. Proponents of generative grammar believed that it was the first truly scientific account of language and the first to be called a theory. Some tenets shared by the majority of generative grammarians stated by Wasow (2003) include that grammar should be descriptive, based on competence, fully explicit, maximally general, as it should make universal claims.

A subfield of generative grammar is called 'generative phonology'. According to Kentstowicz and Kissberth (1979), it aims at knowing the nature of language together with its inherent and accidental properties. The generative school of phonology was founded by Chomsky and Halle in the late 1950's. Their landmark *Sound Pattern of English (SPE)* in 1968 was the first systematic exposition of generative phonology. According to McCarthy (2003) the theory requires explicit formulation of the rules that relate the abstract representations of the lexicon to the surface representations of actual pronunciation which what provides the generative sense to the theory. It describes all the sound systems and rules of any language.

Sounds of language are governed by rules and every speaker's knowledge of language consists of rules of grammar, including phonological rules. Goldsmith (1995) defines this concept as mappings between two various levels of sound representations, the abstract level and the

surface level. Hayes (2009) describes them as 'generalizations' about the various ways a sound can be produced in different environments. Thus, the phonological rules explain the way the underlying representations of sounds in mind are shifted and transferred to the actual articulated sound.

The research in hand aims at applying Goldsmith's approach of autosegmental phonology on the Algerian Arabic dialect that is spoken in Mostaganem, 'Mostaganemian Arabic' (MA). Hence, it is an attempt to extract the phonological phenomena, more specifically non-assimilatory processes, included in MA. Consequently, the following research questions have been proposed:

1- What are the non-assimilatory processes found in MA??

2- Is autosegmental phonology able to provide a complete analysis of the non-assimilatory processes of MA

Thus, the potential hypotheses of the above questions are:

1- The non-assimilatory processes include addition, deletion, and Metathesis.

2- Yes, it is able to provide an analysis of the non-assimilatory processes presented in MA.

The significance of this work is to apply the non-linear phonology to the non-assimilatory processes that occur in MA and to see if this model is able to stand on its own in explaining these phonological phenomena.

This work is divided into three chapters; the first two are theoretical, and the last one is practical. The first chapter provides fundamentals on phonology as well as explaining the various phonological processes including assimilatory processes and the non-assimilatory processes.

The second chapter introduces Goldsmith's theory of autosegmental phonology and describes the non-linear phonology, its principles, components and research contributions in myriad studies.

The third chapter is divided into two parts. First, it presents a brief description of Mostaganem's origins, history and its dialect's properties and features. Second, the chapter provides the methodology mentioning the tools used for the data collection and analysis and explains the process data analysis. The chapter ends with discussion of the findings while comparing the results with the hypotheses.

CHAPTER ONE: THE PHONOLOGICAL PROCESSES

Introduction

The field of language study is divided into several branches, each branch focuses on a specific aspect of human language. Phonology, for example, deals with sounds systems. This chapter attempts to provide some fundamentals of phonology. It starts with giving backgrounds on this branch. Then, it moves to explain the various phonological processes.

1. Backgrounds On Phonology

Phonology and phonetics are two branches of linguistics concerned with the scientific study of sounds. According to Lass (1984) phonology deals with the function, behavior, and organization of sounds as 'linguistic items', unlike phonetics which provides a 'neutral' study of sounds as phenomena in the physical world. Odden (2005) claims that phonology is the scientific study of language structure that is regarded as a one of the core fields in the composition of linguistics. The speech sounds that phonology deals with are symbolic sounds and fictitious units named phonemes. Gleason and Jones define the phoneme as a label of a group of sounds that share the same primary articulatory features. It has a function of creating meaning difference. Each phonetic realization is called an allophone, however, unlike phonemes the exchange of allophones does not make a meaning difference. Thus, they are in a complementary distribution. To distinguish between phonemes' properties and to understand the structure of sounds systems, phonology imposed theories of universal set of distinctive features. This latter was introduced by Chomsky and Halle in 'The Sound Pattern of English (SPE)' in 1968.

2. Phonological Processes

Phonological processes are categorized **as** syllable structure processes which describe the sound changes affecting the structure of the syllable, substitution processes describe those sound changes in which one sound class is replaced by another, or assimilatory processes describe changes in which a sound becomes similar to, or is influenced by, a neighboring sound of an utterance. (Sutomo, 2012)

According to Maduagwu (2016), Schane (1973) defines the phonological processes as the changes that are brought to neighboring segments when morphemes are combined to form words. Thus, segments and morphemes are juxtaposed when they appear in the same environment. Maduagwu (nd) adds that phonological processes may be assimilatory or non-assimilatory.

Spencer (1996, p.47) believes that "…any phonological process has three aspects to it: a set of sounds which undergo the process; a set of sounds produced by the process; a set of situations in which the process applies."

In order to explain this phenomenon, Spencer (1996, p.46-47) gave an example about fricative devoicing presented in "five past" /faɪvpɑːst/ that becomes [faɪfpɑːst]. Under this situation, the voiced fricative /v/ is devoiced when followed by a voiceless consonant, as a result /v/ is realized as /f/. This means that the contrast between these two phonemes has been neutralized; thus, the process is called neutralization process. In other words, a process of assimilation has taken place. The devoiced assimilation can be represented as following as Spencer provided:

voiced fricative → voiceless / —— voiceless

As an interpretation to this rule given by Spencer (1996, p.47), the voiced fricative becomes a voiceless sound when it appears in the environment indicated by the slash. The bar after the slash as he called the focus bar; signifies the position of the phoneme undergoing the process. According to this rule, it happens immediately before a voiceless sound.

2.1. Assimilatory processes

The term assimilation is often defined as a process of changing one sound or some of its properties under the influence of another sound which occurs near to it, as Pavlik (2009) mentioned, it is described as an adjustment of speech sounds to their environment. According to Hyman (1952) assimilation refers to whole adaptive changes of a segment in a chain of segments by an adjacent segment. Driven (2004) stated that it is a process where one phoneme causes a neighboring sound to be similar to it. Ramelan (1994) asserted that assimilation is the process of changing one phoneme into another phoneme as the result of putting morphemes together. Ramelan (1994) added that assimilation is complete when the assimilated phoneme is completely changed into the neighboring sound that affects the change, and it is considered to be partial when the change is not complete, but only partial.

The notion of assimilation contains the assimilee which assimilates or transfers some features to another segment, the assimilator, and the assimilant the segment that results from the assimilation. To illustrate, in the phrase 'ten cups' [tɛŋkeps],the segment [n] is the assimilee, the segment [k] is the assimilator, whereas the segment [ŋ] is the assimilant. (Pavlik, 2009)

There are two directions of assimilation. Regressive or anticipatory assimilation occurs when a sound changes to be similar with a following one. Garn-Nunn and Lynn (2004) define it as "the change in phoneme characteristics due to influence of a sound occurring later on the word"

(p.111). Furthermore, the progressive or the preservative assimilation takes place when the features of a phoneme are modified by the features of the preceding one (Forel & Puskás, 2005). Thus, a sound changes to be similar with a preceding one.

2.1.1. Consonant to Consonant Assimilation

A consonant phoneme features are changed to some extent to be similar to a neighboring consonant phoneme. It groups voice, place, and manner assimilations.

A. Voice Assimilation

Having different voicing values in a consonant cluster, in English, creates a remarkable difficulty in pronunciation. According to Forston (2005) (cited by Aatawneh & Shehdeh, 2015) in a cluster of two consonants differing in voicing, the second consonant has to agree in voicing with the preceding one. There are two forms of this assimilation. First, assimilation of voice across morpheme boundaries, it is presented in noun plural, possessive, and singular present tense that agree in voicing with the preceding obstruent consonant. For example, bag + s → [bag**z**] and pencil + s → [ˊpens**l**z]. Second, assimilation of voice across word boundaries, according to Knight (2003) (cited by Aatawneh et all, 2015) this assimilation occurs only in regressive direction and happens when the voiced word final consonant is followed by a voiceless word initial consonant to become voiceless as the following, and never the vise versa. For example, /v/ becomes /f/ similar in voicing to /t/ in 'have to' /hæv tə/→/hæf tə/.

Samokhina (2010), in her dissertation based on regressive voicing assimilation in Russian, found out several voice assimilation in Russian, such as /podsestʲ/→[potsestʲ] 'to sit down next', /lodka/→[lotka] 'boat'.

B. Place of Assimilation

The changes here happen at the level of place of articulation. Taking the word [ɪ**n**-plɪsɪt]→[ɪ**m**plɪsɪt] 'implisit', the /n/ is an alveolar and /p/ is a bilabial to ease the articulation /n/ changes to a bilabial consonant /m/ to be similar with /p/ at the level of place of articulation.

C. Manner of Assimilation

On the other side, the process whereby a consonant phoneme acquires the manner feature of an adjacent consonant phoneme is called manner assimilation. As an example, taking the word [ɪ**n**-lɪgəl]→[ɪ**l**lɪgəl] 'illigle', the stop nasal /n/ becomes lateral /l/ to be similar to the neighboring /l/.

Kim (2004) spotted out the manner of assimilation process in Korean, such in: /pap.mas/→[pam.mar] 'appetite', /kuk.mu/→[kuŋ.mul] 'broth', /cac.na.mu/→[can.na.mu] 'pine tree'.

2.1.2. Vowel Harmony

Second class is vowel to vowel assimilation also called harmony, more specifically vowel harmony. Spencer (1996) stated an example of this type that occurs in Hungarian language, where a suffix is added to form nouns. This suffix has two allomorphs, /o:/ is a front vowel, and /ø:/ is a back vowel. He illustrated the following examples :

a. [te:rke:prø:l] 'map'
   [føldrø:l] 'land'
   [yjrø:l] 'business'
   [si:nrø:l] 'colour'
b. [la:ɲro:l] 'girl'

[u:rro:l] ‘gentleman’

[fogro:l] ‘tooth’

(Spencer, 1996, p.58)

Therefore, the front vowel allomorph /o:/ occurs after stems that include a front vowels like in group (b). On the other hand, the back vowel allomorph /ø:/ occurs after stems with back vowels, as mentioned in group (a). To conclude with, the suffix vowel changes from back to front under the influence of the stem.

According to Spencer (1996), this phenomenon may target consonants also, specifically in children’s language. For example, saying [gɔg] instead of ‘dog’ and [keɪk] instead of ‘take’. This case is called ‘velar harmony’, where a coronal consonant at the begging of the word harmonizes with a velar consonant at the end.

2.1.3. Consonant to Vowel Assimilation

A vowel phoneme acquires features to be similar to an adjacent vowel.

A. Palatalisation

Palatalisation (frontning) takes place when the palatal characteristics of the assimilator are transferred to the assimilee (Pavlik, 2009). It occurs when a velar consonant is followed by a front vowel, as a result, the articulation of the consonant is influenced, as it is released with a slight anticipatory fronting of the tongue. This fronting is indicated by [$^{+}$] or [^{j}] up the consonant . For example, [ku:l]→[k^{+}u:l] ‘cool’, [kæt]→[k^{+}æt] ‘give’, [gɪv]→[g^{+}ɪv]. Palatalisation is not limited to velar consonants only, but also occurs in connected speech, when the alveolar consonant at the end of the first word meets with the palatoalveolar of the following word. Thus, the alveolar

consonant gets palatalized as in [hɪzʃu:z]→[hɪʒʃu:z] 'his shoes', [mɪsju:]→[mɪʃju:] 'miss you', [heɪts ju:]→[heɪtʃju:] 'hates you'.

Some examples of palatalization in Ikaram, an endangered dialect of Akpes language spoken in Akoko North West Local Government Area of Ondo State in Nigeria, proposed by Maduagwu (nd) : /idìàN/→[idʲìàN] 'two', /bíì/→[bʲíì] 'ask', /èfionù/→[èfʲionù] 'beard', /díE/→[dʲíE] 'few'

B. Labialization

Labialization (rounding) occurs when the lip-rounding of the assimilator is transferred to the assimilee (Pavlik, 2009) i.e when a consonant is followed by a round vowel, this consonant is produced with rounded lips. Abdurahim (1993, p.22) defines it as "a process by which vowels with [+round] feature influence or superimpose their properties on a preceding consonant". This rounding is expressed by the IPA symbol [ʷ]. To illustrate, [tu:]→[tʷu:] 'two', [sku:l]→[skʷu:l] 'school', [pu:l]→[pʷu:l] 'pool'. Some labialization examples illustrated by Maduguawu () in Ìkáràm:

a. /tΣum/→[tΣʷum] 'break'

b. /àsùg/→[àsʷùg] 'ear'

c. /òkùkù/→[òkʷùkw ù] 'cloud'

2.1.4. Vowel to Consonant Assimilation

Where by a vowel acquires consonant features to be similar with a neighboring consonant.

A. Nasalization

Alemayehu (1991) distinguishes between a nasal sound which is produced with air escaping from the nasal cavities only with a complete closure of the oral cavity, and the nasalized sound that is produced with air passing through both of nasal and oral cavities. Nasalization of vowels occurs when the vowel immediately precedes or follows a nasal consonant /m, n, ŋ/. The subscript (~) above the vowel indicates its nasalization. For example, [ten]→[tẽn] 'ten', [reɪn]→[reĩn] 'rain'. Umuchu, a dialect of Igbo, attests consonant nasalization as mentioned by Okorji (1999), such in /vó/→[ṽó] 'hatch', /só/→[s̃ó] 'cut', /ré/→[r̃é] 'burn'.

B. Vowel shortening

Is a process where a vowel is shortened if followed by a voiceless consonant. For instance, [bɑːθ]→[bɑˑθ] 'bath', [kiːp]→[kiˑp] 'keep'.

Ghorbanpour (2017) made a phonological analysis concerning vowel shortening in Persian, some examples to be extracted from his study include: /sændʊg/→[sæn.doɢ] 'box', /jæɢlɑvi/→ [jæɢ.læ.vi] 'dish, pan', /mɑh/→[mæh] 'moon'.

2.2. Non-assimilatory Processes

This group includes insertion, deletion, coalescence, and metathesis. According to Schane (1973) the non-assimilatory processes include all the processes that do not include a feature change in order to agree with an adjacent segment.

Additional processes influence the pronunciation of groups of phonemes instead of the articulation of individual segments, namely insertions (epenthesis), deletions (truncation), and coalescence. These processes are grouped under the non-assimilatory category. It takes place to

make two sounds distinguishable, to ease production and perception; when a phoneme changes to be less similar to a neighboring sound.

2.2.1. Insertion

An illustration for epenthesis, stated by Spencer (1996, p.63), is mentioned in Koryak. This paleosiberian language that is spoken in Kamachatka imposes a condition in syllable structure, that is to have the form CVC. Thus, in situations like CCVC and CVCCCVC, a vowel is needed to be inserted between consonants in order to break up the illegal cluster. In the following examples, it is noticeable that a schwa is inserted epenthetically between consonants. The schwa is added only when needed, in the absence of other vowels, to keep the Koryak restrictions and to make clusters of consonants pronounceable.

[təmək]	'kill'
[pəŋlok]	'ask'
[wəwwən]	'stone'
[jəlləjəl]	'branch'
[ʔənnəŋəjtəgəjŋən]	'catch' (of fish)
[Pəlˊhəlˊhəgəjŋən]	'river flow'

(Spencer, 1996, p.63)

Daly and Martin (1972,p.2) present myriad examples of different languages with this process, such as, [tem-lo-m]→[templum] (Latin 'temple'), [anr-os]→[andros] (Greek 'man'), and [we-anna]→[weʔanna] (Zuñi 'to become sick- (he) will')

Concerning English, some existing epenthesis revolves around inserting ‘ linking r’ in connecting speech. /r/ will be added between two vowels to ease pronunciation. This can be illustrated in [dræmə-ænd]→[dræmə**r**ænd] and [bɔ:-ɪz]→[bɔ:**r**ɪz].

2.2.2. Deletion

Another strategy to deal with such clusters is to delete some consonants. Deletion takes place when a segment is elided in a given context, to simplify certain types of ‘difficult consonant cluster’. To understand better this phenomenon, the following example is illustrated. Spencer explains that in Koryak, when /t/ and /d/ emerge in the middle of a cluster they get deleted. For certain words dropping theses segments is obligatory.

a.	mest-o	‘place’
	mest + nij	‘local’
	[mesnij]	
b.	zvjozd-i	‘stars’
	zvjozd + nij	‘stellar’
	[zvjoznij]	

(Spencer, 1996, p.65)

In connecting speech French language, when /t/ is followed by a vowel it is kept as in /pətitõfõ/, but when it is followed by a consonant /t/ is dropped like in /pətigaʁsõ/ instead of /pəti**t**gaʁsõ /.

There are three types of deletion depending on the deleted segment’s position.

A. Aphaeresis

It "is initial deletion: as in English I am → I'm" (Lass, 1984, p.187). This process is also found in historical change, for example, the drop of initial /k/ before /n/ in English knife and knight.

B. Syncope

It revolves around vowel loss in the middle of the word. This occurs in comparisons between American and British forms of certain words, such as in /sɛkrɪtɛri/ vs /sɛkrɪtrɪ/ 'secretry', /dɪkʃənɛri/ vs /dɪkʃn̩rɪ/ 'dictionary', as mentioned by (Lass, 1984, p.187).

C. Apocope

It occurs when a phoneme is deleted in the final position. Some examples that are present in British English as the final /g/ deletion, as in words ending in /ŋg/ then the final /g/ is elided /sɪŋ/ instead of /sɪŋg/ for 'sing'. Moreover, /r/ deletion at the end of words like in /fɑ:/ instead of /fɑ:r/ for 'far'. In connected speech, apocope results in the deletion of /t/ when it is followed by a word starting with a consonant, such as in [læst^{h}aɪm] 'last time'.

2.2.3. Coalescence

Another process that is related to deletion is coalescence. It takes place when two consonants or vowels are fused to give rise to a singleton segments. According to Spencer (1996, p.66-67) coalescence of segments is "when two distinct sounds blend together to produce a single sound which which is an amalgam of the two original sounds." Spencer illustrates the following example from Serbo-Croat, contain words with prefix ending with same consonant that the word's stem starts with. These examples justify the importance of coalescence in simplifying word's pronunciation.

a.	lomiti	'break'
	odlomiti	'break off'
b.	umirati	'die'
	odumirati	'die out'
c.	derati	'tear'
	oderati	'tear off'
d.	trcati	'run'
	otrcati	'run away'

(Spencer, 1996, p.66)

In this example, when the prefix 'ot' is added to stem starting with /d/ or /t/, it gets fused and simplified resulting in /d/ or /t/.

This phenomenon is also frequent with vowels, bending a diphthong to a singular vowel. For instance, 'mais' or 'cause' in French are pronounced as /mɛ/ and /koz/.

2.2.4. Compensatory Lengthening

According to Hayes (1989) (cited by Neruis, 2013, p. 114) this process is defined as "a segment that is triggered by the deletion or shortening of a nearby segment". Thus, a deletion of a sound causes the duration's lengthening of the adjacent short vowel which compensates the loss of duration that is ascribed to the omission of the neighboring segment. Compensatory lengthening is traceable in Dagara, in the derivation of word classes, where the final segment gets deleted while using the nominal suffix 'lu'. Hence, the adjacent short vowel's duration gets lengthened, such as /zìɛ̀/ 'red'+ /lʊ/ → [zi:lʊ] 'redness'

2.2.5. Metathesis

Another process that can be detected in connected speech is metathesis. "This refers to the ordering of segments." (Spencer, 1996, p.68). It usually occurs as speech error, especially in child phonology. For example, saying /aks/ for 'ask' and /aminal/ for 'animal'. Another example can be found in Old English, " the words bird, frost, and horse in Old English were pronounced /brid, forst, hros/" (Wright and Wright, 1928, p.111) (cited by Spencer, 1996, p. 68).

Hume (2001) claims that metathesis is a process where two segments switch position with one another under certain conditions. She stated an example in Austronesian language Leti the word [kunis]→[kunsi] 'key'.

2.2.6. Major class change

According to Benyoucef (2018, p.8) this process occurs when 'a sound changes its major class membership from vowel to consonant or vice versa'. This phenomenon is spotted in French, as she added, when an unstressed vowel changes to a glide if followed by an else stressed vowel, viz. /tˈu/ 'you kill'→ [twˈe] 'to kill' (Schane, 1973).

Conclusion

Phonology is one of the core fields that compose the discipline of linguistics. It affords an explanation and an analyzation of sound systems and how they function through various theories and studies. Both of phonological rules and phonological processes contribute in describing the phonological changes that occur in different environments.

CHAPTER TWO: AN OVERVIEW ON AUTOSEGMENTAL PHONOLOGY

Introduction

The 1970's have witnessed a radical change in the nature of research into phonological theories. Thus, various theoretical frameworks emerged, for instance, nonlinear phonology that was developed as an alternative to the SPE model. Under the realm of nonlinear phonology, two major theoretical movements are identified, metrical and autosegmental phonology. This chapter attempts to shed light on the autosegmental phonology and its fundamental principles. Then, it will pitch into the contribution of this theory in previous studies.

1. Autosegmental phonology

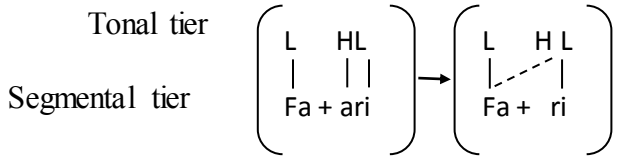
It is an approach of generative phonologythat was introduced by Goldsmith in his dissertation at the Massachusetts Institute of Technology (MIT), in 1976, that bears the same name. His main concern was the "evaded segmental classification" (Goldsmith, 1976, P.6) (cited by Clarck, Yallop and Fletcher 2007, P.413). It dealt with tonal phenomena of Bantu and other tonal languages as well as stress and intonation in English. Nevertheless, Goldsmith's work was elaborated to capture what is beyond tonal analysis, such as nasal features, vowel harmony, and more.

The chief tenet of autosegmental phonology is the ability of segments to be sliced into smaller units, hence, they can be manipulated by the phonological operations, for instance spreading or deletion (de Weijer, 2006).

This theory acknowledges that different classes of features can appear on various levels, viz. tiers. Each level is independent from the other: one bearing a banch of arranged segments that can be vowels and consonants, tones, or stress, while the other level includes CV slots. According to

McCarthy (1983) tones, for example,are coordinated with different articulatory gestures through the mechanism of association between the various autosegmental tiers.

What makes the autosegmental phonology distinct from the precursor model 'linear phonology' lies on the order and the independence of the phonological representations on different tiers. Thus, what happens at one level does not influence the other levels. Katamba (1989) compared this insight with the multi-storied building, with syllables as the structural pillars and beams. In this building various events occur at different levels, viz. the tonal level, the stress level and more, without affecting another level. The elements on different tires are linked by the association lines. An example provided by Katamba (1989, p.198) presents the process of deletion in Margi:



1.1. Autosegmental Phonology Notation

The notation system used in writing rules from Katamba (1989, p.197).

a. T — Vowel linked to a tone
   |
   V

b. (T) Free (floating) tone not linked to a vowel

c. (V) Free vowel slot

d. T — Established a link between tone and vowel
   ⋮
   V

e. T — Delink the tone from the vowel
   ≠
   V

1.2. Well –Formedness Condition (WFC)

The constraints that govern the linking of segments on different tiers. Goldsmith (1972, p.48) stated two conditions:

1. All vowels are associated with at least one tone; all tones are associated with at least one vowel.
2. Association lines do not cross.

The WFC is a universal constraint, it functions "as a statement of the unmarked, neutral, normal state of affairs" (Katamba, 1989, p.203). In other words, it does not adjust the phonological representations; rather, it changes these representations by addition or deletion of tiers. Katamba (1993) added that the role of this constraint is to make sure that the restrictions of the incorporations of segments are not violated.

In certain circumstances the WFC can facesome limitations during tone mapping. In order to cope with these situations, additional principles were introduced to WFC by Clements and Ford (1979) and Clements and Goldsmith (1984) stated by Katamba (1989, p.205):

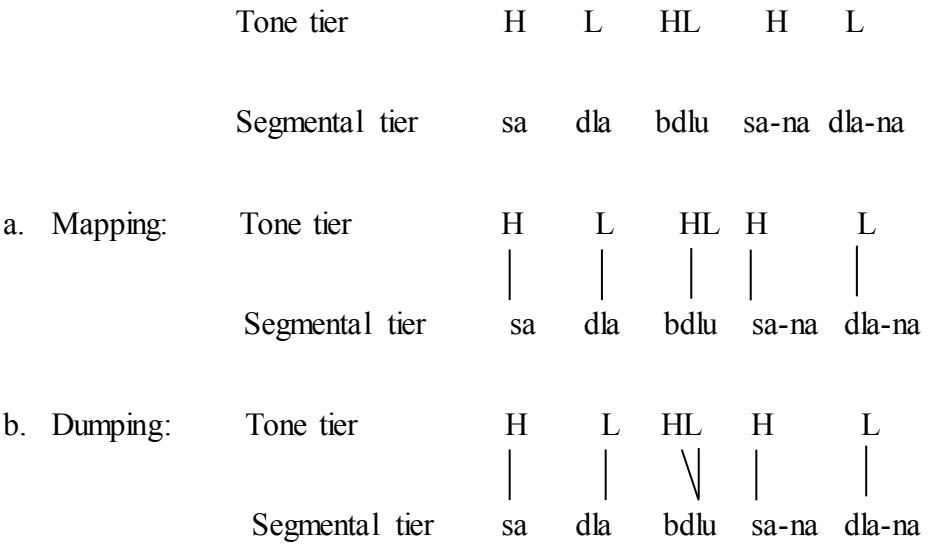
1. Associate free tones to free ton-bearing units going from left to right.
2. The association of free (unassociated) segments takes precedence over that of already linked (associated) segments; furthermore, (a) gives precedence to segments linked to unaccented elements, if there are any; (b) give precedence to segments on the left.
3. Add the minimal number of association lines required to undo the violation of the WFC.

1.3. The General Principles of Association

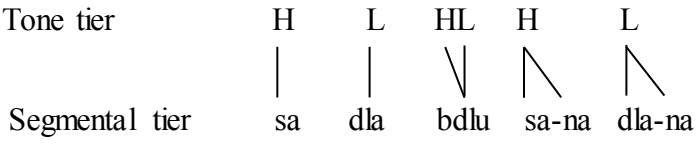
These conventions indicate the relationship between tones and tones bearers as they are applied to any autosegmentalized feature as well as the segmental tier units that are connected to, as outlined by Durand (1990, p.249) as following:

a. Mapping: Associate vowels with tones in a one-to-one fashion left to right until we run out of tones or vowels.
b. Dumping: If after applying (mapping) some tones are still free (that is, unassociated) link them to the last vowel to the right.
c. Spreading: If after applying (mapping) some vowels are still free link them to the last tone on the right.
d. Association lines are not allowed to cross.

Nerius (2013, p.16) illustrated data on Margi, a Northern Nigerian language, taken from Oyebade (1998, p.129) that demonstrates the principles of association:



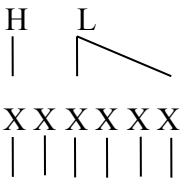
c. Spreading:



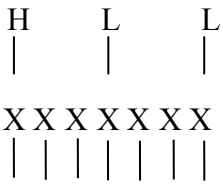
1.4. The Obligatory Contour Principle

This principle allows stuctures like H, L, HL, LH, and LHL and disallows adjacent identical tones like HH and HLHLLH. Thus, these identical tones are fused into a lone tone before getting 'mapped onto' their corresponding vowels. Nerius (2013) assumes that words containing more than one low vowel have to take one-to-many mapping instead of one-to-one mapping. Furthermore, this principle can be applied to other segments on else tiers. Neruis (2013, p.18) provided an explanation exemplified inthe word /nábáglɛ/ 'hunter', as follows:

a. Tone tier



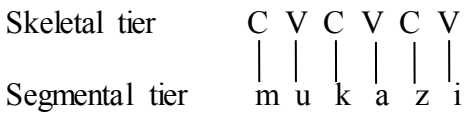
b.



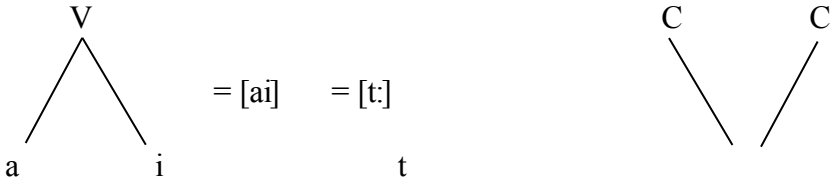
1.5. The Skeletal Tier

It is also called the CV-tier. It plays a fundamental role in organizing the phonological structure, as it is the mediator that anchors the elements in the different tiers. It is the core of the phonological structure. It aims at organizing the elements in the different tiers by being the coordinator. Segments can be linked to it in distinct ways. Moreover, a segment that does not take a position in the skeletal tier cannot be phonologically realized. The CV-tier can relate to several tiers "on one-to-one, one-to-many, or many-to-one basis" (Nerius, 2013, p. 15). A vowel is

associated with a V-slot and a consonant with a C-slot. As stated by Katamba (1993, p.160) in Luganda word /mukazi/ ‘woman’:



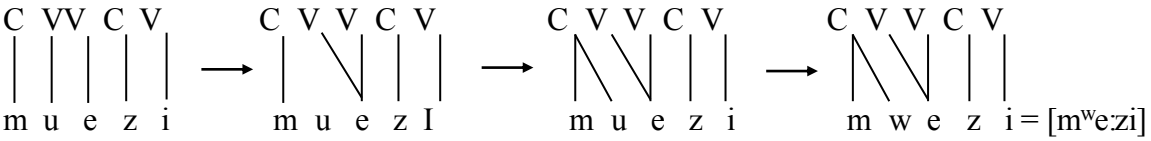
Furthermore, a diphthong can be represented “as two vowel qualities filling the position of a single vowel … lengthened orgeminate consonant can be represented as a single segment spreading over two C positions” (Clark et all, 2007, p.415), as shown below:



2. Studies that Applied Autosegmental Approach

2.1. Cmpensatory Lengthening

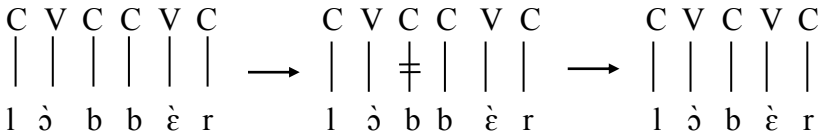
In Luganda, based on a work of Clements (Clarck et al, 2007), some nouns in the singular form take the prefix /mu-/ and /ba-/ in the plural, such in /mukazi/ ‘woman’ becomes /bakazi/ ‘women’ and /mulimi/ ‘cultivator’ becomes /balimi/‘cultivators’. However, in someforms it differs, for instance in /mweezi/ ‘sweeper’ becomes /beezi/ ‘sweepers’and /mwaana/ ‘child’ becomes /baana/ ‘children’. This latter is explained as following:



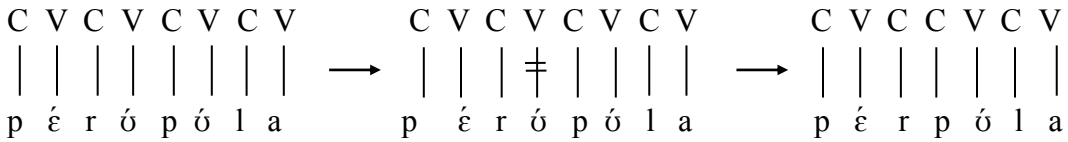
The regular form of both nouns is /muezi/ and /baezi/, their suffixes /mw/ and /b/ are always followed by a long vowel. However, vowels like /ue/ and /ae/ are not allowed in Luganda's rules. Thus, the first vowel dissociates and the second vowel associates with the 'vacated' V slot. In this situation the vowel combines to two V positions will be released as a long vowel like in [be:zi].On the other hand, if the dissociated vowel is long, then it will be combined to the preceding consonant as 'secondary labialization' like in [m^{w}e:zi], or else it will not be realized phonetically.

2.2. Deletion

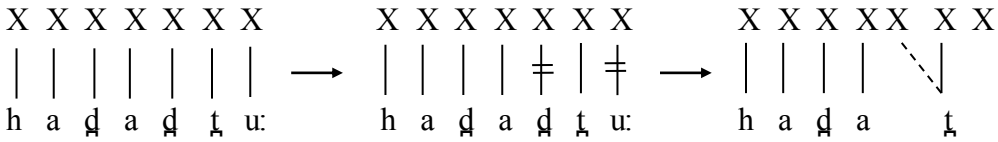
In Dagara, as noted by Nerius (2013), a consonant is elided when the onset consonant of the second word is same as the coda consonant of the initial word. For instance, /lɔ̀b/ 'throw'+/bɛ̀r/ 'leave'→[lɔ̀bɛ̀r] 'throw away'. The autosegmental representation of this latter is illustrated as (Nerius, 2013):



Furthermore, the vowel deletion in Dagara takes place when two stems are put together to form a new word; thus, the final vowel in CV or CVV syllable gets elided before it compounds to another stem (Nerius, 2013). For example, /pɛ́rɔ́/ 'sheep'+ /pɔ̀la/ 'white'→[pɛ́rpɔ̀la] 'white sheep', this example is presented as follows:



Another deletion case in Yemeni Tihami Dialect called 'the coda deletion' takes place when the coda [d̪] of the penultimate syllable is deleted without causing any lengthening at the level of the nucleus of the syllable, such in /had̪ad̪+t̪u:/→[had̪at̪] and it is presented as follows (Al-Suaibi, 2010):



2.3. The Autosegmental Representation of Vowel Harmony

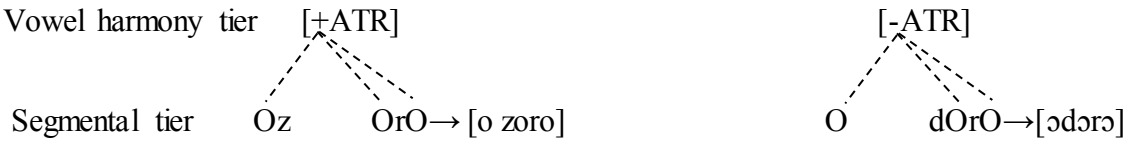
Katamba (1989) stated that vowels of a language are classified as either front or back, high or low, rounded or unrounded. However, Welmeres (1973) reported that in Igbo in Nigeria, vowels can be whether [-ATR], viz. [i, e, u, o] as in /zòrò/ 'he did' or [+ATR], viz. [I, a, ʊ, ɔ] like in /dɔ̀rɔ̀/. When vowel harmony occurs, the harmonizing phonological features, [back], [round], [high], and [ATR], get extracted from the segmental tier and function as properties of individual segments; by spreading to all vowels along the word. Set of principles were proposed by Katamba (1989, p.212) that describe the way vowel harmony occurs in the framework of autosegmental phonology:

a. Identify the set of harmonising features which are suprasegmentalised and placed on a separate tier.
b. Identify the class of elements (vowels) which bear the harmonising feature;

c. Identify the set (possibly empty) of OPAQUE SEGMENTS. Opaque segments are vowels which ought to obey the vowel harmony rules but fail to do so because they are specified in the lexicon for the harmonising feature and are therefore exempt from vowel harmony rules which fill in the blanks for harmonising feature during a derivation;

d. mutatis mutandis, harmonising features are associated with vowels in accordance with the requirements of th WFC.

Furthermore, katamba (1989) illustrated an example in Igbo, where the above principles are used:



2.4. The Autosegmental Representation of Nasalisation

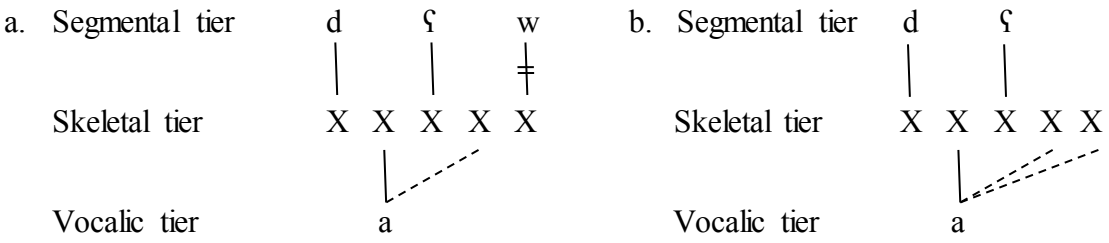
In some languages the feature [+nasal] gets extracted from the segmental tier and placed in the suprasegmental one (Katamba, 1989). This case can be presented in Desano, a Colombian language of the Amazon basin, which contains morphemes that are all oral, for instance /wai/ 'fish' or all nasal as in /wãĩ/. Hence, nasality targets only the voice segments which have both oral and nasalised versions, for example /v, g, w/ and /ṽ, ŋ, w̃/. the Desano case is represented as following by Katamba (1989):

2.5. Syncope and Compensatory Lengthening in Arabic

These two processes take place in 'Al-ʔiʕlaal phenomenon'. In the syncope process, the semi vowels /w/ and /y/ get deleted when appearing at the end of the word. In the following example illustrated byAltakhaineh (2016, p.03) in the word /daʕaw/ 'prayed', the /w/ gets delinked and deleted; thus, the unattached X slot gets linked with the vowel /a/. This latter results in the spreading of the vowel /a/ to make up for the loss of the consonant creating what is called the compensatory lengthening process:

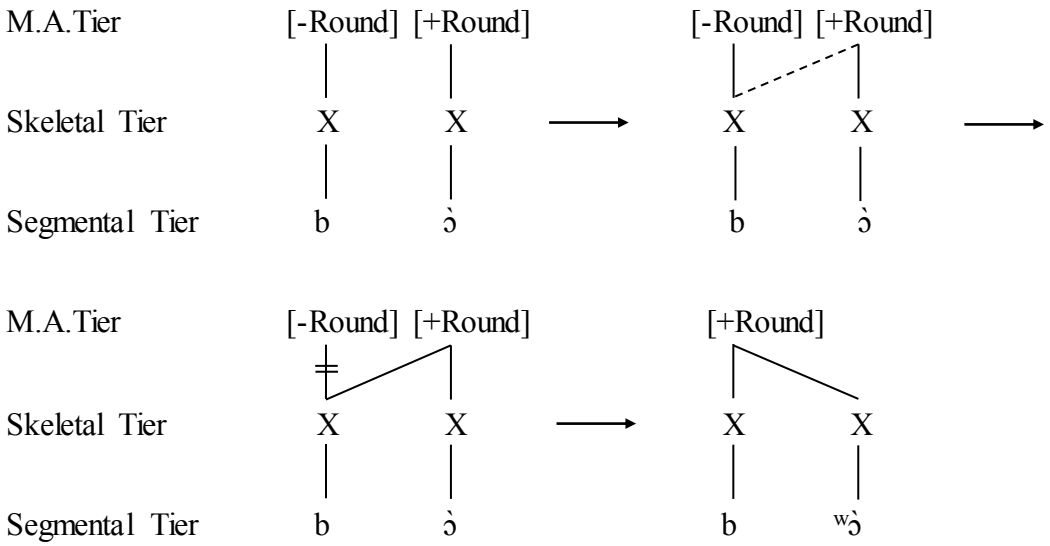
(a) describes the syncope of /w/ representing the word /daʕaw/ 'prayed'.

(b) describes the compensatory lengthening of /a/ representing the word [daʕaː] 'prayed'.



2.6. Consonant Labialization

In Dagara, underlying labialized consonants do not exist. However, during the process,consonants that are followed by a rounded vowel are produced with a rounding lip. Such in /bɔ̀/→[bʷɔ̀], an autosegmental representation of this process was provided by Nerius (2013, p.102-103):



Conclusion

Autosegmental phonology has been presented by Goldsmith as an alternative model to fill up the gaps that linear phonology ceased to accomplish. Furthermore, the salient principles and conditions made it capable to elucidate the analysis of various phonological phenomena, such as deletion and addition. Thus, the following chapter's concern remains in the application of this model in accounting MA's phonological processes.

CHAPTER THREE: METHODOLOGY, RESULTS AND DISCUSSION

Introduction

So far, the first chapter described the phonological processes, and the second chapter shed light on the notion of autosegmental phonology along with its applications in myriad languages. This chapter aims at acquainting the context of the study, namely Mostaganem spoken Arabic and describes the research methodology, presents data analysis and the findings.

1. Mostaganem's History and Origins

Mostaganem is a seashore city, in the Mediterranean Sea, located in the northwestern of Algeria. It is situated in the Gulf of Arzew in the Mediterranean Sea and is bordered by Al-Dahra mountains in the east and Al-Macta river in the West (Belhmissi, 1982, p.14) (cited by Benyoucef, 2018, p.107). It's surface measures 2269 km^2 with a coastline of 124 km^2 .

Leo Africanus (1986) believes that this city's constructions date back to early ages due to Africans. Nevertheless, other historians assume that the Phoenicians were the first who put their feet on this place, as they named its port 'Murustaga', Yakhtar (2013), later Mostaganem was succeeded and reconstructed by the Romans under the name 'Carteannae'. According to Shaw (1962) cited by Belhamissi (1982) the Romans settled in Mostaganem during 127 AD. The strategic location and the rich agriculture of Mostaganem charmed myriad tribes and civilizations to settle in it, such as the 'Mahals' tribe , who came from Beni Rached's fort, where a bridge was built and named after it during the Almoravid's ruling called' Bordj al Mahal'.

From the Phoenicians epoch till the French colonization, Mostaganem has noticed various appellations viz. 'Misk Elghanaim' 'sheep abundance', 'Marsa Ranem' 'loot harbour', 'Machhta

Elghanem' 'Ghanem winter station', and more. However, Mostaganem's origins cannot be fully determined due to several events, settlements, and inhabitants that this historical place has witnessed.

2. Properties of Mostaganemian Arabic (MA)

Algerian Arabic spoken in Mostaganem differs in its properties from the ones used in the surrounding or else cities of Algeria. Indeed, Mostaganemian Arabic varies slightly from one township to another; however, they share specific processes including the phonological merits.

2.1. The Phonetic Realization of /q/

As cited by Chachou (2009), Ctineau (1940) describes such realization as 'hesitant'. Thus, sometimes the phoneme /q/ is realized as the allophone [g], such in [gla] 'he roasted' or elswhere as the allophone [q] viz. [qdar] 'respect'. Hence, [q] and [g] are in complementary distribution. Such a realization took place as a consequence of the rural migration to the city.

2.2. Pronunciation of /θ/, /ð/, and /đ/

According to Chachou (2009) , the phonemes /ð, θ, đ/ are exchanged by the phonemes /t, d/ in MA; therefore, the Arabic words /jaðrub/ 'he hits' and /θalaθa/ 'three' are pronounced as /jadrub/ and /tlata/.

2.3. Long vowels (Compensatory Lengthening)

Chachou (2009) claims that in certain words in MA, the diphthtong /aj/ is replaced by [i:]. For example: /xajṭ/ → [xi:ṭ], /bajd/ → [bi:d], /ħajṭ/ →[ħi:ṭ], /zajt/ → [zi:t]

2.4. MA's Syllable Structure

The distinct types of syllables that MA includes are mentioned by Benyoucef (2017-2018, p.124) as follow:

Syllable structure	Example	Gloss
CV	dʒa	‘he came’
	ma	‘water’
CCV	ʃra	‘he bought ’
	kla	‘he ate’
CVC	ʃak	‘he deflated’
CVCC	lamm	‘he gathered’
	ʃadd	‘he held’
CVVC	so:g	‘auction’
	fu:g	‘above’
CCVC	dxal	‘he came in’
	ʃrab	‘he drunk’

2.5. MA’s Accent

It is divided into Rural MA, that is spoken in rural areas as in Achaacha and Urban MA, that is used in the city and its surroundings like Mezeghra. However, another accent mentioned by Chachou (2009) as ‘citadine’ the City MA, used by the pure Mostaganemians ‘sedentary’, unlike the Urban one that is used by speakers who migrated to the city from rural areas and spent at least three generations in the city.

Chachou (2009) and Catineau (1982) pointed out that the pronunciation of the phonemes /θ, ð, đ, iː, g/, that are replaced by /t, d, aj/ in Urban MA, remains preserved in Rural MA. They added that the plural form of the quadrilateral nouns that end with a long syllable, change in pronunciation from City MA to Urban Ma viz. the singular noun /maftaħ/ 'a key' takes the plural form /mfataħ/ in City MA whilst it takes the plural form /mfatiħ/ in Urban MA.

3. Population and Sampling

The sample was drawn from a population of MA native speakers who live in Mostaganem. These speakers of MA are from distinct townships including the urban areas along with the rural areas namely Achaacha, Khadra, Busqui, and Bouguirat.

This study includes thirty MA native speakers, ten male participants and twenty female participants, aging from thirteen to eighty years old with the ability of comprehension and the clarity of articulation. The participants were mostly the researcher's family members and friends that she contacted, together with other MA speakers outside her acquaintances.

4. Data Collection

This paper attempts to analyze MA's speech examine its phonological phenomena by applying Goldsmith's model of autosegmental phonology. I have chosen MA as a case study because I am a part of this speech community and this allows me to have access to and recognize speakers of MA and know more about the phonological process of this accent.

Given Covid-19 conditions, data were gathered following two methods. (1) recordings of direct interactions with MA speakers. (2) recordings of MA speakers through phone calls. In order not to influence the quality of data, the aim of the research was not revealed to candidates.

Speech recordings lasted from five minutes to twenty minutes. A smart phone's voice recorder application was used.

5. Procedures

Once the recording session part was finished, the recordings were listened to multiple times. Each recorded speech was transcribed by the researcher using IPA symbols of MA. These transcriptions were analyzed in order to extract the non- assimilatory processes contained in MA's speech. These procedures required about four months to be completed.

Then, non-assimilatory processes were classified into different types namely metathesis, deletion, compensatory lengthening, epenthesis, and major class change. Each type was analyzed based on autosegmental phonology following a set of stages. First step included distinguishing the underlying representations from the surface representations. Next, an embodiment of the framework was established according to the type of the process, respecting the model's constraints.

6. Data Analysis: Autosegmental Account of Non-Assimilatory Processes in MA

This part aims at listing and analyzing the findings using Goldsmith's theory of autosegmental phonology.

6.1. Metathesis

There are two types of metathesis in MA. One type is spotted when the feminine past suffix of the singular third person /at/ or the third person plural suffix /u:/ are added to a verb. Hence, the middle phonemes of the root of the word interchange their position. The other type takes place while transforming a present simple verb to a causative verb. Thus, the second and

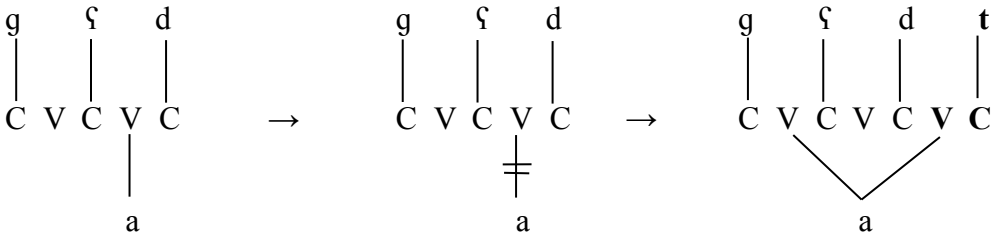
third segments exchange their places. This phenomenon occurs with the third-person singular pronouns ‘he and she’ only. Metahesis types are illustrated in the table below:

Table 3.1.Metathesis in MA

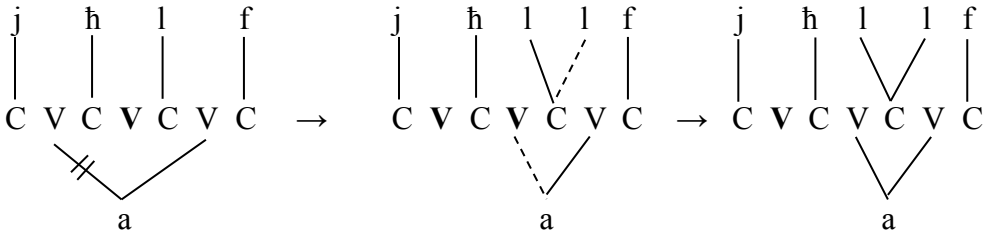
Type	Underlying representation	Surface representation	Gloss
1	gʕad	**gaʕdat**	‘s/he stayed’
	ktab	**katbat**	‘s/he wrote’
	ṭlaʕ	**ʈalʕat**	‘s/he went up’
	xzar	**xazrat**	‘s/he stared’
	ṣbar	**ṣabrat**	‘s/he was patient’
	smaħ	**samħu:**	‘he/they forgave’
	slak	**salku:**	‘he/they survived’
	xradʒ	**xardʒu:**	‘he/they went out’
	ʕraf	**ʕarfu:**	‘he/they knew’
	lsaq	**lasqu:**	‘he/they stuck’
2	Jaħlaf	**Jħal′af**	‘he causes to swear’
	jaʃrab	**jʃar′ab**	‘he causes to drink ’
	jakdab	**jkad′ab**	‘he causes to lie’
	jamʃi	**jmaʃ′i**	‘he causes to walk’
	jaqrar	**jqar′i**	‘he causes to learn’
	taxdam	**txad′am**	‘she causes to work’
	tansa	**tnas′i**	‘she causes to forget’
	taħfad	**tħaf′ad**	‘she causes to learn by heart’
	taskut	**tsak′at**	‘she causes to quite ’

talʕab	**tlaʕ′ab**	‘she causes to play’

For example, the word /gʕad/ changes to /gaʕdat/ in the feminine. Thus, /a/ of /gʕad/ disassociates from its V slot, which remains as a free V slot, and gets linked to a different free V slot. Thus the outcome gets realized as /gaʕd-at/.



The second type of metathesis can be presented as follow:



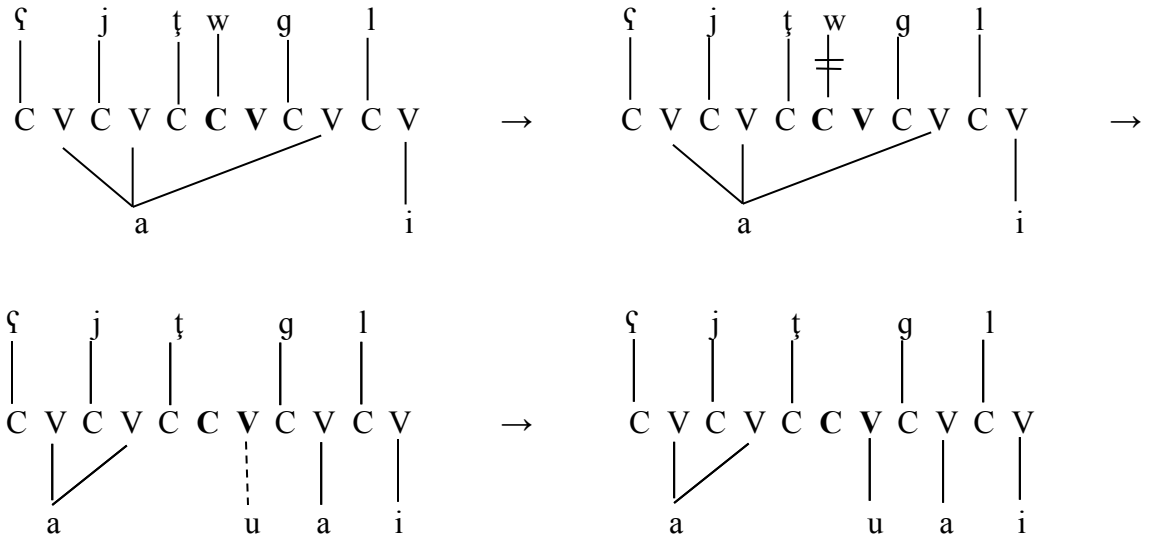
6.2. Major class change

Major class change is manifested in MA in the presence of the conjunction/w/ ‘and’. Thus, glide /w/ changes to the vowel/u/ in some circumstances in order to break consonant cluster. In other conditions /w/ is kept to separate vowels, when a conjunction takes place between two words; the first word ends with a vowel and the second word starts with a vowel. These conditions are illustrated in the following table:

Table3.1. Major class change in MA

Type	Underlying representation	Surface representation	Gloss
	ʕajaṭ w gali	ʕajaṭ **u** gali	'he called me and said
	ti taɣasli w dik tqaraʕ	ti taɣasli **u** dik tqaraʕ	'you wash and she waits'
1	rgatt w nott	rgatt **u** nott	'I slept and woke up'
	raħ w xalahum	raħ **u** xalahum	'he went and left them'
	ʃwijaman w ʃwijaman	ʃwijaman **u** ʃwijaman	'little bit from here and there'
	əl-maqarun wəlħam	əl-maqarun **wə**lħam	'macrons and meat'
	zawdʒa w atalta	zawdʒa **wa**talta	'the second and the third'
2	trabi w aṭajab	trabi **wa**ṭajab	'she raises and cooks'
	lmakla w argad	lmakla **wa**rgad	'food and sleeping'
	ketbi wər-raslili	ketbi wər-raslili	'write it and send me it'

As it is represented below /w/ gets unattached from its C slot which becomes a free C slot. Furthermore, /u/ gets associated with a floating V slot, in order to produce the equivalent realization:



6.3. Deletion

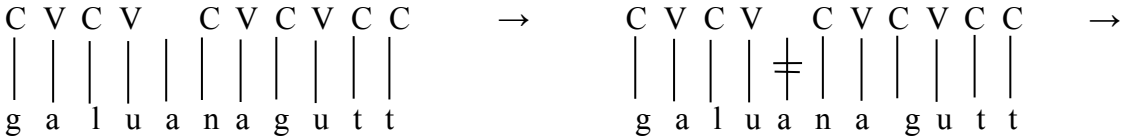
Data showed that there are two types of deletion in MA. First type occurs because vowel sequence is disallowed in MA. Therefore, a syncope deletion takes place in order to avoid this situation. When the first word ends with a vowel and the second one starts with a vowel, the second vowel is deleted. The second type occurs when the infinite article /əl/ is attached to a non-coronal segment. Therefore, the /ə/ of the infinite article gets elided. These phenomena is shown in the table below:

Table 3.1.Deletion in MA

Type	Underlying representation	Surface representation	Gloss
1	la ani nqalad fih	la **ni** nqalad fih	‘ no, I am imitating him’
	fəlxazna əl-kbira	fəlxazna**lkbira**	‘ in the large cabnet’
	huma galu ana gutt	huma galu **na** gutt	‘they said, not me’
	mʕa əl-ħidʒr	mʕa **lħidʒr**	‘with quarantine’
	taqanʕi əl-ʕaql əl-baţini	taqanʕi**lʕaql** əl-baţini	‘to convince the unconscious mind’
	gulili əţ-ţariqa latəʃorbi əl-ma	gulili**ţţariqa** latəʃorbi **lma**	‘ tell me how and do you drink water’
	raki mrabja əb-bgar	raki mrabja**bbgar**	‘you are raising cows’
	jaklu əl-maqarun wijzidu əl-ħlib	jaklu**lmaqarun** wijzidu**lħlib**	‘they eat macrons and drink milk too ’
	tafi əd-daw	tafi **ddaw**	‘switch off the lights’
2	əl-ʔard	ʔlard	‘floor’
	əl-ma	lma	‘water’

əl-faʤr	lfaʤr	‘dawn’
əl-ħi:t	lħi:t	‘wall’
əl-xawf	lxawf	‘fear’
əl-baraħ	lbaraħ	‘yesterday’
əl-bab	lbab	‘door’
əl-qarʕa	lqarʕa	‘bottle’
əl-mard	lmard	‘sickness’
əl-kas	lkas	‘glass’
əl-gasʕa	lgasʕa	‘bowl’

In the following autosegmental representation of deletion in MA, the vowel /a/ gets delinked and elided.



6.4. Compensatory lengthening

Findings also indicated that MA speech consists of a phenomenon called compensatory lengthening that remains in replacing the diphthong /aj/ by the monophthong [i:] in some words, such in:

Table 3.1.Compensatory lengthening in MA

Underlying form	Surface form	Gloss
bajd	biːd	'eggs'
ħajţ	ħiːţ	'wall'
xajţ	xiːţ	'thread'
zajt	ziːt	'oil'

The /a/ of /aj/ gets elided while /j/ gets replaced by /i/. The vowel /i/ compensates the deleted /a/; thus, it is lengthened. The following representation offers and elucidation of this case:

6.5. Epenthesis

Addition is manifested in MA in order to get rid of disallowed consonant cluster. For example when prefixes such as /t, j,n/ are added to di- consonantal clusters words, they come up with a complex cluster containing a tri-consonantal clusters. Therefore, /ə/ is inserted between first and second consonants in order to break the tri-consonantal clusters that occur at the beginning of the words. This process is illustrated in the following table:

Table 3.1.Epenthesis in MA

Underlying representation	Surface representation	Gloss
t-ħʃam	təħʃam	'she gets shy'
t-staʕqal	təstaʕqal	'being kind'
n-ssʏal	nəssʏal	'I listen to music'

j-txabaţ	jətxabaţ	‘he flops’
t-dʒhad	tədʒhad	‘exhausting herself’
t-ssagam	təssagam	‘it gets better’
t-tfakar	tətfakar	‘you remember’
t-rdxi	tərdxi	‘she poses it’
j-lssqu	jəlssqu	‘they stick on’
t-tfaradʒ	tətfaradʒ	‘you watch TV’

Another type of insertion can be spotted in some participants’ words, such as /ʔambijaʔ/ ’prophets’ and /ʔadan/ ‘the prayer’s call’. The glottal stop /ʔ/ is inserted at the beginning of these words. Hence, the equivalent pronunciation of /ʔanbijaʔ/ and /ʔadan/ are /ʕambijaʔ/ and /ʕadan/.

The following representation explains type one epenthesis; /ə/ is inserted and associated with the free V slot:

7. Discussion of the findings

The analysis of the data show that the hypotheses are confirmed, MA includes deletion, insertion, metathesis, and additional non-assimilatory processes such as major class change and compensatory lengthening. The results indicate that the autosegmental phonology remains capable of explaining the non-assimilatory phonological processes that occur in MA. What sustains this model to be appropriate in the elucidation of these phenomena is manifested in the template’s syllable structure.

Conclusion

After applying non-linear phonology to MA, certain non-assimilatory processes were discovered namely metathesis, major class change, deletion, compensatory lengthening and epenthesis. Autosegmental phonology has proved useful in explaining the non-assimilatory processes that were extracted from the corpus of the study. The data collected was analyzed in parallel sequences, where one tier represents segments and the other tier represents suprasegmental data, as it could effectively handle the floating tones.

General Conclusion

In conclusion, this research is an attempt to apply Goldsmith's non-linear phonology on MA's speech. The major aim is to extract the non-assimilatory processes of MA and deduce if autosegmental theory provides a full-scale representation of these phonological phenomena.

Based on the MA's autosegmenatl analysis mentioned in the third chapter, a set of non-assimilatory processes have been extracted namely metathesis, epenthesis, deletion, major class change, and compensatory lengthening.

Metathesis process occurred in two types in MA. First type includes the interchange at the level of the word's root while adding feminine prefix 'at', such as /ktab/ that becomes /katbat/. Second type of metathesis included a segmental exchange while transforming a present simple verb to a causative verb, viz. /taqra/→/tqari/. Autosegmental phonology provided an explanation to this process through its independence of the segment's tier from the CV tier. Hence, the exchange of segments in metathesis was explained through the disassociation along with the association of segments with floating V slots.

Major class change is a process that took place in MA in order to separate disallowed vowel sequences as well as consonantal cluster. Thus, in certain conditions /w/ was kept to separate such a consonantal cluster and on other circumstances it was changed to /u/ to break vowel sequences. However, austosegmental phonology elucidated this case by delinking /w/ from the C slot and linking the /u/ with its equivalent free V slot while respecting the WFC.

Two types of deletion were spotted in MA dialect. First, it mentioned deleting the first vowel when two vowels meet in order to avoid vowel sequences. Second, it includes the deletion of /ə/, in the definite article, when attached to a non-coronal segment. Thus, these targeted segments were delinked from the segmental tier as they were considered to be floating segments.

Another extracted process was compensatory lengthening that occurred in words like /bajd/, when the /aj/ changes to /iː/, that is produced as /biːd/. Therefore, the /a/ was disassociated while /j/ was replaced by /i/, to be lengthened in order to compensate the place of the deleted vowel.

Epenthesis, on the other hand, took place in order to break disallowed consonantal cluster, such as /t-staʕqal/ that is produced as /təstaʕqal/. Non-linear phonology explained it through linking the /ə/ with the corresponding floating V slot.

Autosegmental phonology is useful in accounting MA's non-assimilatory processes. However, others like assimilatory processes cannot be explained using this template. Future research may use other approaches of generative phonology viz. linear phonology along with this theory.

1. Suggestions and Recommendations

There may still be some unidentified phonological processes in MA. Future studies may examine other phenomena in the phonology of MA, viz. stress, tone and intonation by using various generative phonology approaches. Researchers may also select participants in order to have more adequate results. Furthermore, one may split between the urban and the rural areas, as multiple changes take place in the dialect, in order to have more accurate finding specifying one area. Moreover, tackling generative phonology approaches, lone or incorporate, to detect the phonology of various Algerian dialects.

2. Limitations of the Study

This work has some limitations that need mention. First, this researcher did not identify all the phonological processes; it focused only on the non-assimilatory processes. Thus, further

studies are needed to investigate the phonological processes together with tonal processes. Nevertheless, this research serves as a stimulant for further linguistic research on MA.

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