BLOCKING AND EXTENDED EXPONENCE OF SUFFIX PRONOUNS IN ARABIC PERFECTIVE VERB CONJUGATION

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ABSTRACT

Noyer (1997) utilized blocking and extended exponence to encode pronouns in the conjugation of imperfect verbs in Arabic. His findings were criticized by Stump (2001) and Xu (2010), because the formulation was considered too complex. Xu (2010) offered *a unified integrated account* based on *Optimality Theory* while still relying on *blocking and extended exponence*. However, their formulation only focuses on the pronouns of imperfect verb conjugations. So far, the optimality of conjugations of perfective Arabic verbs which are also complex in nature, have not been considered yet in their studies. This study extends the work of Xu (2010) by developing the formulation of the optimal forms of the suffix pronouns of the Arabic perfective verb conjugations. The results of study reveal that several exponences which in different situations, each can realize several assingments. Instead, there is an assignment that is realized by more than one exponence

KEYWORDS: suffix pronouns, blocking and extended exponence, optimality theory, perfective verb.

INTRODUCTION

Morphology is the linguistic device that provide a theory which gives us opportunity to describe the internal structure of words for all languages in detail and carefull way (Jensen, 1990: 1). The morphological structure of each language has its own complexity and uniqueness. This means that for capturing the morphological phenomenon in each language, then describing it, and providing a sharp and detailed analysis of those phenomenon, require a given theory or model.

Before the 60s, in the era of structuralism took an important role in the study of linguistics, Hockett (1954) emerged with two paradigms of morphological thinking, namely *Item and Process* (IP) and *Item and Arragement* (IA). In the next generation, in 1972, Matthews completed the

morphological study by criticizing the concepts of *word and paradigm*. This notion wants to state that each form of word that come from the same lexeme is one paradigm, so that each word and it's set of derivative words is one paradigm.

In the next period, Generative Grammar or TGG proposed by Chomsky in 1965, offered a different view from the previous research, that is the transformation of deep structures into surface structures (Chomsky, 1965). The idea was then criticized by Mc Carthy (1981). He said that not all changes are transformations. When studying the conjugation of Arabic verbs, he proposed an autosegmental phonology framework that provided a formal analysis of a series of multilevel segments in various sequences. In this way, typical discontinuous morphemes in Arabic can be explained in order of their level. However, the autosegmental phonology proposed by Mc Carthy is less universal. It cannot be applied to languages that have properties not discontinuous morpheme, as experienced by most flective languages. Moreover, the concept to capture the mechanism of word formation and its changes offered by Mc Carthy, does not consider the morphosyntactic issues which led to the change of word form taken place. Features which have various forms in the series of segments that make up words are not involved in the process of forming words at each tier or level. Therefore, there are several questions which cannot be answered using this framework, including why a word form appears with the same segment features, but represents different meanings; does each tier represents semantic elements or is it just a sequence of word formation.

In 2006, Mc Carthy tried to offer a new perspective to analyze morphological events in each language, using optimality theory. Actually this analysis model was first coined by Prince and Smolensky (1993) for various fields in linguistics. The paradigm of thinking adopted by this model is to compare the output or surface structure with the input or structure that is the focus of attention (Gaber, 2012). In morphological studies, the model seeks to spark new "glasses" in encoding very diverse morphological phenomena in various languages of the world (Mc Carthy, 2006: 308). This theory is universal, as well as local, because the main consideration in the analysis process is the hierarchy of constraints. Every process that occurs in a linguistic event, whatever the level and type of study can be ascertained to have constraints. To obtain the optimal form or entity, it must be seen which constraints can be followed and which constraints are violated. The most minimal violations are optimal, or even those that do not violate the constraints at all. In this context, each constraint is made in stages according to the severity of the constraint. The constraints in question are the rules that exist in each language, which are both unique and universal

This study will try to capture the prominal suffixes in conjugating verbs in Arabic perfective, using the OT design, by paying attention to 4 things, namely meaning assignment,

exponential distribution, subsegmentation (Bank, 2017), and morphological templates (Aronoff, 2010). The verb conjugation has been used as the object of study, but so far it has not used the OT design, especially considering 4 unified aspects, not fragmentation. That is, each phenomenon will be assessed from the four aspects, especially in finding its constraints.

The conjugation of perfective verbs in Arabic involves a variety of features. As stated by Bybee (1985: 2007) that the study of language is the study of the relation of meaning to form. every feature, some are realized by one form, some are realized without additional form, and some are realized by more than one form, which in this context, they are called exponents.

Here is the example of conjugation of Arabic perfective verb   قال /qa:l/ 'said'

قَال   qa:l-   'said' (pf, active voice)

qa:l-a	3 sg msc
qa:l-a:	3 dl msc
qa:l-u:	3 pl msc
qa:l-at	3 sg fmn
qa:l-ata:	3 dl fmn
qul-na	3 pl fmn
qul-ta	2 sg msc
qul-tuma:	2 dl msc
qul-tum	2 pl msc
qul-ti	2 sg fmn
qul-tuma:	2 dl fmn
qul-tunna	2 pl fmn
qul-tu	1 sg neu

The main problem in this study is how to capture and formulate the mechanism of conjugation of the verbs above, specifically about the realization of suffix pronouns attached to verbs, using the OT approach that considers meaning assignment, exponential distribution, and subsegmentation, and morphology templates. To answer these questions, there are several intermediate questions that must be answered first, i.e.

a). How to identify and determine each feature in the conjugation, which realizes the meaning to form relation?

b). What is the meaning of the assignment of affix / -t- / and how is the distribution and agreement? This question arises because / -t- / is an affix whose distribution can be found in many

places, so it needs to be assigned a meaning assignment.

c). What are the constraints in evaluating these forms, how is the hierarchy?

This study aims to describe the process of verbal inflection of Arabic, especially on Arabic verb perfective, which focuses more on the pronominal suffixes attached to the verb. Each pronominal suffix attached to the perfective verb indicates the function of the subject. However, some of these suffixes - which in this context I call exponents - have similar characteristics so that it can be assumed that there are some who have the same meaningful assignment. In other words, it looks like it overlaps one suffix with another suffix

In the paradigm of computer programming, to make a detailed, careful, and itemized algorithm, a full description is required with complete and complex content. To meet this condition, this research was conducted. That is, the study of how to capture the phenomenon of inflective change in Arabic perfective verbs that is influenced by the pronominal suffixes will be the basic material for subsequent studies, particularly formulating algorithms for the benefit of computational linguistics, especially in the inflective process of Arabic morphology.

METHOD

This research will examine the realization of OT in Arabic verbal inflection, particularly perfective verbs. The object of study is the pronoun suffixes in Arabic perfective verb conjugation. The data used is taken from the Arabic grammar book by Wright (2005).

In accordance with the OT framework, what is highlighted is the output that arises as a result of "conflicts" between constraints. Although the concept of OT is illustrated by a formula that starts with an input, which the generator can then generate various possible outputs, but the optimal output is the object of study that actually exists in that language. Forms that already exist in the Arabic conjugation system for example (as in the example of chapter 1) are optimal and logical forms, whose appearance is the result of minimal violations of the constraints, or even where there are no violations at all of the constraints. How to find a constraint is a part of work that is closely related to the language grammar system, as well as the universal grammatical system. In the language of Wunderlich (2004), "the main ideas of OT is finding contraints". Still according to him, grammatical constraints are not rules that must not be violated. Mc Carthy (2006: 308) also confirms this by stating, "The most important element of OT is constraint violability." The constraint is needed to evaluate or assess the output so that its appearance becomes optimal.

The data in this study are in the form of dummy data showing the conjugation phenomena of Arabic verb perfective. Data is taken from Arabic grammar book by Wright (2005). The focus of attention is 14 suffix pronouns attached to the perfective verb as follows.

/zahab-a/	'he went'
/zahab-a:/	'they (dual) went'
/zahab-u:/	'they (pl) went'
/zahab-at/	'she went'
/zahab-ata:/	'they (dual) went'
/zahab-na/	'they (pl) went'
/zahab-ta/	'you (msc) went'
/zahab-tuma:/	'you (dual) went'
/zahab-tum/	'you (pl) went'
/zahab-ti/	'you (fmn) went'
/zahab-tuma:/	'you (dual) went
/zahab-tunna/	'you (pl) went'
/zahab-tu/	'i went'
/zahab-na:/	'we went'

In this study, data in the form of words with the patterns mentioned above will be analyzed in several stages, those are

1. observing suffix pronouns in Arabic conjugative verb conjugations

2. Identify carefully and in detail every feature that exists and state a specific meaning

3. Identifying the constraints of the morphological rules of Arabic that allow a form that is considered optimal

4. Modelling the phenomena that occur by considering constraints using tableaus

5. Make an analysis of the model built.

RESULT AND DISCUSSION

Arabic Pronouns

As a flective language, Arabic has conjugations of verbs based on root systems and patterns, which adopt 14 personal pronouns, both perfect and imperfect verbs. The 14 pronouns are classified into three major groups, namely persona, gender, and number. In persona, there are first, second and third persona. Each person is divided into 3 types, namely singular, dual, and plural, and gender classification becomes masculine and feminine. In a stand-alone form, here are 14 personal pronouns in Arabic

Suffix Pronouns of Perfective erb

/huwa/	'he'	3 tgl msc
/huma/	'they'	3 dl msc
/hum/	'they'	3 pl msc
/hiya/	'he'	3 tgl fmn
/huma/	'they'	3 dl fmn
/hunna/	'they'	3 pl fmn
/anta/	'you'	2 tgl msc
/antuma/	'you'	2 dl msc
/antum?/	'you'	2 pl msc
/anti/	'you'	2 tgl fmn
/antuma/	'you'	2 dl fmn
/antunna/	'you'	2 pl fmn
/ana/	'I'	1 tgl fmn/msc
/nahnu/	'we'	1 dl/pl fmn/msc

The pronoun will change its form when it is added to the verb conjugation, both in the perfective and the imperfect verb. Consider the following example:

Perfective Verb Conjugation	Imperfective Verb Conjugation
/katab-a/ 'he wrote'	/y-aktub-u/ 'he writes'
/katab-a:/ 'they wrote' {dual}	/y-aktub-a:ni/ 'they write' {dual}
/katab-u:/ 'they wrote' {pl}	/y-aktub-u:na/ 'they write' {pl}
/katab-at/ 'she wrote'	/t-aktub-u/ 'she writes' {msk}
/katab-ata:/ 'they wrote' {dual}	/t-aktub-a:ni/ 'they write' {dual}
/katab-na/ 'they wrote' (pl)	/y-aktub-na/
/katab-ta/	/t-aktub-u/
/katab-tuma:/	/t-aktub-a:ni/
/katab-tum/	/t-aktub-u:na
/katab-ti/	/t-aktub-i:na/
/katab-tuma:/	/t-aktub-a:ni
/katab-tunna/	/t-aktub-na/
/katab-tu/	/ʔ-aktub-u/
/katab-na:/	/n-aktub-u/

Table 1.
Verb Conjugation: Perfective & Imperfective

The main points in this research are finding constraints, ranking them, and finally the most optimal form is the least violation of the constraints.

Meaning Assignment (MA)

A form is a morpheme that certainly has meaning, both grammatical and lexical meaning. When the form changes, the meaning will certainly change as well. The meanings that are realized by a form are called meaning assignments, which in the context of this OT study, enter the realm of grammatical meaning.

Referring to table 1, specifically to the conjugations of Arabic perfective verbs, the meaning assignment for pronouns suffixes will be displayed in the following paradigm.

Exponents	Meaning assigment
1. /–a/	{3}
2. /–a:/	{dual}
3. /–u:/	{pl, msc}
4. /-t/	{fem}
5. /-na/	{pl, fem}
6. /-t-/	{2}
7. /-0-a/	{msc}
8. /-0-uma:/	{dual, msc/fem}
9. /-0-um/	{msc, pl}
10. /-0-i/	{fem}
11. /-tu/	{1, sg}
12. /-na:/	{1}

Tabel 2.
Exponent paradigm and MA of arabic perfective verb

On the left side are a number of markers which express three grammatical categories simultaneously, namely persona, number, and gender. While the right side is the grammatical category stated by the markers on the left side. The markers on the left side, in this study, we refer to as exponents, while the markers on the right side we call meaning assignments. For example, the verb / katab-a / 'he wrote'. The suffix / -a / on the verb marks and states "he" which in the grammatical category is the third person, singular, masculine. However, to determine the meaning assignment of each exponent, it cannot be done directly by looking at the grammatical category of the lexeme. That is due to the existence of the exponent, which not only appears in the verb / katab-a /, but also appears in the verb / katab-at / 'she wrote' and the verb / katab-a: / 'they (dual) wrote'. With such a situation, / -a / is an escalator declaring a third, single person, because to protect the possibility that the marker joins other markers as in / katab-a: / and / katab-at /. If {+ mask} is created, it is certain that the exponent is only for masculine, even though it is possible to bookmark

other features, it still exists.

The next exponent is / -a: / tasked to mark dual numbers. Another feature, namely the masculine third persona feature is not mentioned, because it is included in the scope of the first marker, namely / -a /. Likewise, the exponent / -at / only expresses the {+ fem} feature, because indeed only the {fem} feature is attached to the exponent, while the other feature, namely, a single third person is already represented in the exponent / -a /.

Masculine plural feature expressed by exponent /-ū/. When viewed in the form of the verb that is symbolized by this exponent, the feature realized is the third fascination of the masculine plural. The masculine third persona feature has been stated before by the exponent / -a /, so the form that should appear is /katab-aū/. /katab-aū/ is not acceptable in the Arabic phonological system, because it contains vocal clusters. This is a constraint that must not be violated by such a form. In addition, the choice will focus on /-ū /, because if it is the opposite, i.e. focuses on /a/ or /ā/, it will realize the {3, -fem} and {dual} features.

/-t/ is an exponent for {fem}, because the only marker that realizes the third persona is feminine, while /-0-i/ is a marker for feminine features too, but for the second persona. The number 0 in the middle is to state that there is another marker that preceded it, namely /-t-/. In addition, 0 can also be interpreted that before the exponent in question, is not a stem verb. The marker was intentionally not included in the exponent, because it had realized another feature, namely the second persona

What is quite problematic is the exponent / -t- / in the singular first persona feature. As explained earlier that the exponent /-t-/ in majority realizes the second persona, both masculine and feminine, both singular and plural. In fact, in the conjugation of Arabic verbs, the first person, singular, masculine and feminine uses / -t- / as the markers who realize it. In this case, we use what Xu calls * FEATURE SPLIT (2011), which is a constraint that tries not to change the features of an exponent, but retains it by making the most optimal formulation. In such phenomena, it can be solved by looking closely at the vowel after the exponent /-t-/. Only vowel /-u/ realizes the first singular persona feature. So, we can say that /-t-/ can realize the second persona if without /-u/ afterwards. If the exponent /-t-/ is terminated by vowel / -u /, then the exponent realizes the first single persona feature

Realization of OT in Perfective Verbal Suffixes

Exposure to the previous sub-section has provided information about the meaning assigment of the conjugation suffix pronouns in Arabic perfective verbs, along with the explanation. In the next stage, the realization of OT will be carried out following the exposures,

especially on some exponents with constraints, namely on / katab- / with the environment {3, sg, fem}, {3, pl, msc}, {1, sg, msc/ fem}, and {2, dual, msc /fem}.

A) /katab-at/ {3, sg, fem}

Given form	constraints		
/katab-/ {3, sg, fem}	/-a/{3}	/-t/{fem}	/-a:/ {dual}
☞ /katab- a t/ sg 3 fem			*
/katab- a:/ 3 sg dual		*	

Tableau 1.

In tableau 1, the form /katab-at/ is a verb that is given a pronoun /-at/ suffix with the environment {3, sg, fem}. There are constraints that are found related to the appearance of the form, namely exponent /-a/ which realizes the third persona, exponent /-t/ which realizes feminine features, and exponents that contain elements /-a/ also, but end in vocal lengthening /-:/, i.e. / a: / for the {dual} environment. The three exponents are considered constrained because they have the elements needed in the environment {3, sg, fem}. The constraint /a:/ for {dual}, because in the exponent contains feminine features as well, so it is possible to obstruct the formation of /katab-at/. In addition, there are two possible forms that emerge with these 3 constraints, namely /katab-at/ and /katab-a:/. However, the most optimal form is /katab-at/, because it violates the lowest constraint, which is in the right position, namely /-a:/ {dual}. Figure ☞ shows the most optimal form after going through several constraints
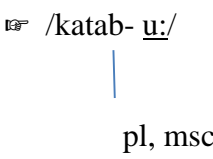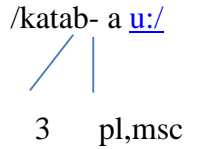
739

B) /katab-u:/ {3, pl, msc}

Given form	Constraints			
/katab-/ {3, pl, msc}	*vocal cluster	/-u:/ {pl, msc}	/-a/ {3}	/-a:/ {dual}
☞ /katab- u:/ pl, msc			*	*
/katab- a u:/ 3 pl,msc	*			

Tableau 2

Tableau 2 presents the optimal form for / katab- / with features {3, pl, msk}, which is / katab-u: /. If referring to table 1 about meaning assignment, the feature {3} is realized by / -a /, but in the existing form, the / / a / component does not appear, but is replaced by / -u: / which realizes {pl, msk }. There are 2 questions that arise from this phenomenon. First, why is the form that appears is /katab-u:/ not /katab-au:/, whereas the second form is more fulfilling the existing meaningful assessment? In Arabic phonotactics, vocal clusters are not permitted, so the form / katab-au: / becomes unacceptable, because it violates * VOCAL CLUSTER. The form /katab-u:/ becomes optimal because the exponent /-u:/ realizes {pl, msc} even though it violates the third person feature namely /-a:/
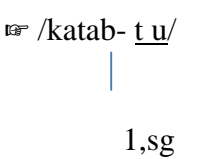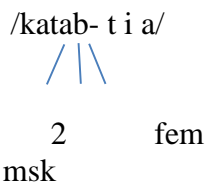
C) /katab-tu/ {1,sg, msc/fem}

Given form	constraints			
/katab-/ {1,sg, msk/fem}	*Feature split (/-t-/ {2} → /-tu/ {1, sg}	/-t-/ {2}	/-0-i/ {fem }	/-0-a/ {msk }
☞ /katab- t u/ | 1,sg		*	*	*
/katab- t i a/ / |\ 2 fem msk	*	*		

Tableau 3

The exponent / -t- / dominates the features of the second persona in conjugation perfective verb. However, there is one feature namely {1, sg} which is also realized by the exponent / -t- /, so that it raises constraints in optimizing the form /-tu / which is not the second persona. There are 4 constraints in this form, as shown in tableau 3. The highest and heaviest constraints are *FS, as Xu explained in Section 2.3. *FS is a principle which states that an exponent cannot be divided to realize some features. With this principle, / -t- / it remains an exponent that realizes feature {2}, unless it is terminated by vowel / -u /, so that it can realize feature {1, sg}

D) /katab-tuma:/ {2, dual, msc/fem}

Given form	constraints				
/katab-/ {2, dual, msk/fem}	/-t-/ {2}	/-0-uma:/{dual, msk/fem}	/-a:/ {dual}	/-0-i/ {fem}	/-0-a/ {msk}
☞ /katab- t uma:/ 2 dual msc/fem				*	*
/katab- t a:/ 2 dual		*		*	*
/katab- t i a/ 2 fem msk		*	*		

Tableau 4.

In the formation of / katab- / with features {2, dual, msk / fem}, there are 3 possible forms that appear, namely / katab-ta: /, / katab-tia /, and / katab-tuma: /. However, the form / katab-tuma: / is the most optimal, because it only violates the two lowest weighted constraints, as shown in tableau 4. / katab-tuma: / contains the feature {2} which is realized by / -t- / , includes the {dual} feature realized by / -a: /, and also includes the {dual, msk / fem} feature.

CONCLUSION

To encode the change in verb forms in the conjugation of Arabic perfective verbs, a careful identification of the suffix pronouns is needed. The form-meaning relation expressed by the suffix pronoun is not one to one relation. That is, not every exponence realizes only one meaning or one assignment.

This study reveals that several exponences which in different situations, each can realize several assingments. Instead, there is an assignment that is realized by more than one exponence. An exponence /-a/ for example in the environment of third persona. Then, when we look at verbs with a plural masculine third persona environment, the exponence / -a / is no longer found. The expression changes to / -u: /. The solution is in tableau 2. Likewise, the exponence /-t-/ which shows two assigments, i.e. second and first persona. In order to find the most optimal form, a number of constraints must be identified as in tableau 3.

This research has succeeded identifying the meaning assigment of each suffix pronoun for Arabic perfective verbs using realization OT. However, there are still other challenges that have not been resolved in this study. Further research can, among other things, be dedicated to formulate an optimal form of inflectional morphology, particularly for suffix pronouns in perfective verbs which are sequenced with object pronouns as in transitive verbs /a'ṭaytumu:ni:/ 'you gave me'.

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