New Perspectives on the Complexity of Net. Language: A Phonological Analysis of Morphologically Complex Words

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Abstract

Linguistic complexity is one of the currently most hotly debated notions in linguistics. The importance of a language to its users has overtime, motivated linguists and researchers to study and analyze its patterns and structures. A morphological and phonological analysis is crucial for the analysis and understanding of the patterns and structures of a language.

Morphologically, English permits the appropriate extension of existing words to serve new purposes by the addition of prefixes and suffixes. As far as the internet' texts under analysis are concerned, common suffixes include: *s, ed, ing, ly,* and *tion*. The suffixes *s, es, ed,* and *ing* account for almost two-thirds of the words in the internet texts under analysis. The morphological analysis shows that an English word permits up to four morphemes at the end of a word, whereas the use of a prefix is rare. This process creates unlimited number of complex words. Such complexity depends on the number of components (morphemes) that can be added. Increasing the number of these components contributes to lengthening the word to which they are attached, which creates a complexity in pronunciation, reading, spelling and even parsing as part of the morphological analysis.

Phonology plays a central role in restrictions on stacking up affixes in multiplying complex words. The relevant complexity measures are three metric variables: the length of morphemes in terms of the number of phonemes, the number of morphemes and the length of words in terms of the number of morphemes. Length may be understood in terms of orthography and number of written letters, or phonology and the number of phonemes. From a phonological point of view, the phonological restriction is higher in terms of derivational affixes than inflectional affixes where the stress non-neutral suffixes such as *(ion, ity, ist, ian)* play a crucial role in affecting the prosodic context of a complex word and consequently in restricting the combinability of suffixes and their order in words. A case that shows a relative complexity in the 'internet' language. Thus, it is relatively complex language in its morphology and phonology.

Introduction

All languages, from the scientifically linguistic point of view, are equal. Phonology, morphology, syntax, and semantic are components of languages that are interrelated. Mathew (1991: 3) states that morphology is a simple term for that branch of linguistic which concerns with formation of word in different uses and construction. A morpheme, according to Crystal (1994:88), "is the smallest meaningful element into which words can be analyzed". It is essential to deal with the processes in which morphemes undergo changes in a language.

The most unpretentious "definition" of the complexity of a certain system or unit refers to the number of elements or components of this unit and more "complex" conceptions may also take into account the complexity of the components. The analysis of this research paper confines itself to those relatively simple levels. However, the number of different component types, the number of possible interactions between the parts and the number of different rules determining these interactions are beyond the scope of the analysis. In this research, the researcher explores a number of views for assessing linguistic complexity. An analysis of morphologically complex words on the morphological and phonological levels has been done with the aim of shedding a spotlight on a number of issues such as linguistic complexity in general and the morphological complexity of words in particular. Furthermore, some related issues such as productivity, complex words, restrictions on morpheme combination and so forth are also dealt with. It is hypothesized that:

- A language is more complex if it makes more extensive use of derivational and inflectional morphemes.

-Some domains of language, like morphology, are more suitable for research in complexity.

-It has been claimed that morphology interacts with phonology in English "the morphological make-up of a word has considerable influence on its pronunciation".

Languages are the chief tools of the internet. Internet has been mainly written in English. Over the last ten years, the number internet users who use English has increasingly grown. The rapid growth of the internet which has resulted in a number of challenges in the domain of linguistics is the core motivation of this research. In this context, the growing importance of languages, especially English, has prompted the development of tools and techniques needed for ease and active using.

Nonetheless, such study and its analysis will be of special value for researchers, teachers, learners and those who are interested in the English language, let alone students who study in the English departments in particular and 'internet' users in general. It really fills a gap in literature.

Section One
Complexity

1.1Complexity in Linguistics

According to Juola (2007:1) the question of "linguistic complexity" is interesting and fruitful. Unfortunately, the intuitive meaning of "complexity" is not amenable to formal analysis where

complexity can be assessed in various frameworks. As expected, languages are all about equally "complex," but further that languages can and do differ reliably in their phonological, morphological and syntactic complexities along an intuitive continuum. Many ad-hoc complexity measures have been proposed, of which (Nichols 1986) is an obvious example; she counts the number of points in "a typical sentence" that are capable of receiving inflection. McWhorter's definition (McWhorter, 2005) encompasses a number of similar ad-hoc measures (e.g., a language is more complex if it has more marked members in its phonemic inventory, or if it makes more extensive use of inflectional morphology), but he ties this, at least in theory, to a single numerical measure, namely the length of the grammar that a language requires. Despite the obvious practical difficulties (how do you compare two different inflectional paradigms, or how do you balance simple morphology with complex phonology), this provides a reasonable formulation for judging complexity. In addition to the question of "length" which is another measure for linguistic complexity (cited in Juola, 2007: 2).

Related to the question of length, the researcher in the present research argues for another question, namely, the question of "number", where the complexity of a system and subsequent subsystems is highly dependent on the number of constituents of that system or subsystem. However, this is a general viewpoint for complexity regardless of the system or the examples under study.

Kusters (2003:5-7) discusses several theoretical issues concerning complexity. First he argues that complexity can only be a 'relational' concept. That is, a concept that depends on the relationship between aspects of language on the one hand and aspects of an evaluator on the other hand. This evaluator may be a linguist (or linguistic theory), a hearer, a speaker, a first or second language learner and so on. Much of the confusion around complexity according to Kuster (ibid.) can be cleared when explicitly making what kind of evaluator there in mind when using the word 'complexity'.

Dressler (2005:17) believes that the concept of complexity is basically relative. It relates to many aspects of life let alone in a language. Any thing is always characterized by being as more or less complex than another according to one or several properties of these things. He questions how to identify the relevant properties and how to calculate complexity.

With operationalisation of complexity, Kusters (2003:2) strongly argues against the unfounded claim that 'complexity in one domain

would correlate with lack of complexity in another'. Nevertheless, some domains of language, like morphology, are more suitable for research in complexity than others, which, however does not mean that the complexity to find complexity would imply that there would be no complexity differences.

1.2 Complex Morphology

Morphology is the study, identification, analysis and description of the minimal meaning bearing units (morphemes) that constitute a word. Morphological analysis is the process of categorizing and building a representative structure of the component morphemes where both orthographic rules and morphological rules are important for categorizing a word's morphemes. For instance, the plural of *party* is *parties* where orthographic rules indicate changing the *–y* to *-i-* and adding *–es*. Furthermore, morphological rules tell us that *fish* has null plural (Jurafsky and Martin 2008: 30). In morphology, two questions are still a challenge. First, what is the correct level at which complexity should be measured: morphemes, words or systems? And second, are the relevant properties to be considered from phonological or orthographical standpoints, or even both? Earlier results show that morphological systems tend to be organized around basic (neutral) parts. When the number of parts increases, systems tend to saturate the existing dimensions. It seems important that a system keeps an important adaptive potential by employing highly generative basic parts.

Two extreme views of how morphologically complex words are processed and represented have been proposed. The first posits a prelexical decomposition of each word into its constituent morphemes with morphemic lexical representations (Taft & Forster, 1975). The other extreme claims that morphologically complex words are processed and represented as monomorphemic words using their full form (Butterworth, 1983). The majority of recent theoretical studies, however, are between these two extreme positions in the sense that they assume two different formats of processing or representation of complex words: a decomposed format and a direct or full form format (cited in McQueen &Cutler, 1998:413).

It is widely argued that morphologically complex words are decomposed into their constituent morphemes during visual word recognition, so that a word like *marshy* is recognised in terms of its components parts i.e., the stem word *marsh* and the grammatical morpheme *–y*. On the other hand, Juola (2007:15) focuses not only on the mathematical aspects of complexity, but on the psychological ones.

In this regards, *Dual-mechanism morphology* refers to a family of psycholinguistic models which hold that morphologically complex word forms can be processed both associatively, i.e. through stored full-form representations and by rules that decompose or parse inflected or derived word forms into morphological constituents.

Linguistically, an important distinction is made between derivation and inflection. Derivational morphology concerns the generation of distinct words from a base morpheme across different grammatical categories. For example, *dark, darkness,* and *darken* all are derived from a single base morpheme. Inflectional morphology is concerned with the systematic marking of grammatical information on a word stem. For example, nouns may have distinct case forms; adjectives may agree with the nouns they modify; and verbs may have distinct forms for tense, aspect, mood, voice, and valence, as well as number, person, and gender agreement. In an inflectional expression, semantic units are bound into a single word in the form of affixes to a stem (e.g., *helped*) or in the form of a change in the stem itself (e.g., *wrote*). Unlike derivations, inflections which are morphemes that do not change the class of the word they are affixed to and generally can be added to every word within the same grammatical class.

1.3 Productivity and Complexity of Morphology

Morphological patterns vary greatly in their productivity, the ease with which new lexical items can be created and understood. Productivity in derivational morphology is possible to a much greater extent than in inflectional morphology. For instance, in addition to *dark, darkness,* and *darken* a derivational paradigm can allow such forms as *undark, darkish,* and *darkity.* As such examples suggest, this greater productivity of derivations can lead to larger changes in pronunciation and meaning compared to inflectional morphology, a case which leads to more complexity in derivational morphology than in inflectional morphology. This kind of complexity can be obviously seen on the phonological and orthographical levels. On the other hand, the meaning changes that result from inflection are largely constrained by the grammatical system under consideration, besides the changes in pronunciation and spelling. Derivational meaning changes are subject to variations in transparency. In some cases the meaning of a complex word form can easily be derived from its constituent parts e.g., *short, shortness,* whereas in other cases it is not e.g., *fine, final*. Many complex word forms are nonnative words that constitute sublexicons with their own morphological rules. The Latin, Greek, and early French and Germanic roots of many English words form a case in

point. The case of productivity shows that the distinct word forms in a language compose a complex network, the nature of which can be the object of experimental research (Berent,et al., 1999:33).

The amount of productive morphological categories measures the morphological richness of the language. From this point of view Dressler (1999: 589) differentiates between morphological complexity and morphological productivity which is considered a useful tool for the description of languages where some linguists believe that complexity and unproductive morphology are strongly related. Following this they propose a modification of the notion of Dressler's morphological complexity by equating complexity with the unproductive morphology. In this sense, morphological complexity and static morphology would be the same. In contrast, the researcher here in the present research has another view concerning the relation between complexity and productivity. In fact, those linguists argue for the complexity of formation, i.e., the ease of forming new lexical words. Whilst the researcher here argues for the complexity of spelling, pronunciation or reading resulted from productive morphological patterns by believing that there is a strong relationship between complexity and productivity. That is, whenever there is productivity, it will lead to complexity on the morphological, phonological and orthographical levels. Here, the outsider is the recipient of the internet information or the learner of a language who suffers from such complexity.

1.4 Sources of Morphological Complexity

The fact that word structure contributes complexity to the grammars of languages naturally raises the question of where these things come from. As argued by a number of linguists, they do not follow the intrinsic nature of the task of mapping between content and form, so where do they come from? Empirically, it seems clear that most of the ways in which grammars are morphologically complex arise as the outcome of a historical change and restructurings of various sorts. Many of these fall under the broad category of 'Grammaticalization'. Canonically, this involves the development of phonologically and semantically reduced forms of originally independent words, leading eventually to grammatical structure. Originally full lexical items may generalize their meanings in such a way as to limit their specific content, leading to their use as markers of very general situation types. When this happens, they may also be accentually reduced, leading to further phonological simplification. This, in turn, may lead to their re-analysis as clitics, with an eventual

development into grammatical affixes, and so new morphology is born. But within linguistic systems, there are other possible paths that can lead to morphology where before there was only phonology and syntax. For example, phonological alternations, when they become opaque in some way, can also be reinterpreted word and are regarded as the key units of morphological analysis (Anderson, 2012:11).

Section Two
Complex Words

2.1 Morphemes

A morpheme is the smallest unit of linguistic meaning. A single word may be composed of one or more morphemes, for example: un+system+atic+al+ly (the word unsystematically can be analyzed into 5 separate morphemes). It is the grammatical unit that cannot be further analyzed and in which there is an arbitrary union of a sound and a meaning. Every word in every language is composed of one or more morphemes.

Examples of one morpheme: cat (1syllable), butter (2 syllables),crocodile (3syllables)
Examples of two morphemes: kind + ness, admire+ able
Examples of three morphemes: boy + ish + ness, desire + able + ity
Examples of four morphemes: gentle + man + li + ness, un + desire + able + ity
Examples of more than four morphemes: un + gentle + man + li + ness anti + dis + establish + ment + ari + an + ism

Morphemes are classified into "free" and "bound", the former morphemes can stand by themselves and can be used as a word on its own (without the need for further elements, i.e. affixes), for example: girl, system, hope, act, phone, happy. The latter morphemes are morphemes which cannot occur on their own as independent (or separate) word. Affixes (prefix, suffix and infix) are examples of bound morphemes. Prefixes are bound morphemes which occur only before other morphemes, for instance: (un-) in (un-cover, un-do), (dis-) in (dis-pleased, dis-like),(pre-) (pre-school). Suffixes are bound morphemes which occur following other morphemes, for Examples: -er (singer, performer), -ist (typist, pianist), -ly (manly, friendly). Infixes: Bound morphemes which are inserted into other morphemes.

Roots are non-affix lexical content morphemes that cannot be analyzed into smaller parts such as cran (as in cranberry), act, beauty, system. Roots can be classified into two types: Free root morpheme: run, bottle, phone and bound root morpheme: receive, remit, uncount,permit.

When a root morpheme is combined with affix morphemes, it forms a stem. Other affixes can be added to a stem to form a more complex stem. Consider the following example:
Root: believe (verb)
Stem: believe + able (verb + suffix)
Word: un + believe + able (prefix + verb + suffix)
Root: system (noun)
Stem: system + atic (noun + suffix)
Stem: un + system + atic (prefix + noun + suffix)
Stem: un + system + atic + al (prefix + noun + suffix + suffix)
Word: un + system + atic + al + ly prefix + noun + suffix + suffix + suffix

From the grammatical and morphological point of view, bound morphemes are further classified into derivational, such as, (ness, less, ee, ic,etc) and inflectional, such as (-ed; -s of the 3rd person singular in verbs and plural of regular nouns; comparative -er and superlative –est). There are many differences between them in term of using and meaning. However, the differences between these two kinds of morphemes are outlined in the following table:

Derivational Morphemes vs. Inflectional Morphemes

Derivational Morphemes	Inflectional Morphemes
1. Derivational morphemes derive a new word by being attached to root morphemes or stems.	1. Inflectional morphemes signal grammatical information such as number (plural), tense, possession and so on. They are thus often called bound grammatical morphemes
2. In English, They can be both suffixes and prefixes. Examples: beautiful, exactly, unhappy, impossible, recover	2. In English , They are only found in suffixes . Examples: boys, Mary's , walked
3. Change of Meaning Examples: un+do (the opposite meaning of 'do') sing+er (deriving a new word with the meaning of a person who sings).	3. No change of Meaning Examples: walk vs. walks toy vs. toys
4. Change of the syntactic category(optionally) i) Change of category :Noun to Adjective	4. Never change the syntactic category of the words or morpheme to which they are attached. They are always attached to completed words

boy (noun) + ish --> boyish (adj.) **Elizabeth (noun) + an --> Elizabethan (adj.)** **affection (noun) + ate -->affectionate (adj.)** **Verb to Noun sing (Verb) + er -->singer(noun)** **predict (Verb) + ion --> prediction (noun)** **Adjective to Adverb exact (adj) + ly ->exactly (adv) quiet (adj) + ly --> quietly (adv.)** **Noun to Verb moral (noun) + ize -->moralize (verb)** **Adjective to Noun specific (Adj.) + ity -->specificity (noun)** **ii) No change of category:friend+ship (Noun --> Noun)** **pink+ish (Adjective --> Adjective) re+print (Verb --> Verb)**	**Examples: walk vs. walked or walks (V--> V) boy vs. boys (N --> N)** **eat vs. eating (progressive) (V-->V)** **In English, inflectional morphemes typically follow derivational morphemes. Examples: unlikelihood, unlikelihoods(not*unlikeslihood).** **English Inflectional Morphemes examples:** **-sthird person singular present:She waits at home.** **-ed past tense :She waited at home.** **-ing progressive:She is eating the donut.** **-en past participle:Mary has eaten the donuts.** **-s plural: She ate the donuts.** **-'s possessive: Disa's hair is short.** **-er comparative; Disa has shorter hair than Karin.** **-est superlative: Disa has the shortest hair.**

2.2 Bases

Every word must contain a base that expresses the fundamental meaning of the word. Bases normally belong to a lexical category such as noun, verb etc. for instance, *'apple, girl* and *air'* are all examples of bases that are nouns. *'help, play and write'* are all examples of bases that are verbs. In addition bases can usually stand on their own. They do not have to co-occur with another morpheme and are therefore called free-morphemes.

2.3 Complex Words

"[W]e say that *bookishness* is a complex word, whose immediate components are *bookish* and *-ness,* which we can express in shorthand by spelling the word with dashes between each morph: *book-ish-ness*. The process of dividing a word into morphs is called parsing" (Denning et al, 2007:19). Needless to say, that in English a morphologically complex word is a word that consists of two or morphemes, but, the question is how a complex word can be built up

out of two or more morphemes? The answer is that there are two basic possibilities. The first is to combine two free morphemes. Although free morphemes can form a simplex word on their own, it is possible to combine two (or more) of them to create a complex word. This process is termed compounding; the resultant words are compounds, for examples: sea + horse - sea horse, head + strong – headstrong.

The second type of complex word, next to compounds, involves affixation. That is, it involves the combination of a bound morpheme with a free morpheme, or with a complex word. This type comes in two subtypes. In one type of affixation process, the affix makes a whole new word out of the word it attaches to, with a different meaning and often also of a different lexical category:

buildVERB build-erNOUN
largeADJECTIVE en-largeVERB
industryNOUN industry-alADJECTIVE industry-al-izeVERB

This process of affixation is called derivation; the affixes involved hence are derivational affixes. It is also possible to derive a new word, usually of a different lexical category, by adding a derivational affix to a word. Interestingly, it seems that sometimes it is possible to do exactly the same without adding any affix. Consider the following examples: to build – a build-er / to dance – a danc-er /to run – a run-er/ to kill – a kill-er/ to cook – a cook

"Let us consider the complex word *blender*. What can we say about its morphology? One aspect we can mention is that it consists of two morphemes, *blend* and *er*. Besides, we can say that *blend* is the root, since it is not further analysable, and at the same time the base to which the suffix-*er* is attached. To conclude, if we carry out morphological analysis, we usually show what morphemes a word consists of and describe these morphemes in terms of their type."(Plag et al, 2007:57). These examples show that it is possible to take a verb that implies some 'doer' and derive a noun from it that refers to this 'doer' by adding the suffix –er. In the last example, however, there is precisely the same relationship between the verb *to cook* and the noun cook as in the other examples, but in this case no suffix –er shows up.

2.4 Morphological Analysis of a Word

Words are analyzed morphologically with the same terminology used to describe different sentence types:

- **A simple word has one free root, e.g., *book.***
- **A complex word has a free root and one or more bound morphs, or two or more bound morphs, e.g., *unhand, handy, handful.***
- **A compound word has two free roots, e.g., *handbook, handrail, handgun***

- A compound-complex word has two free roots and associated bound morphs, e.g., *handwriting, handicraft.*

2.5 Factors that Influence a Word's Behaviour

Baroni (2001:125) believes that the following factors are the most effective on the behavior of words:

1-Length of word, stem, prefix, and root in segments and in syllables.
2-Type and token frequencies of word, prefix, and root.
3-Ratio of prefix frequency to pseudo-prefix frequency (i.e., how many words begin with the prefix string, but do not actually contain that prefix, plus other criteria that would make it possible to parse out the prefix).
4-Root frequency for productively related forms only.
5-Ratio of root frequency to pseudo-root frequency.
6-Semantic transparency of prefix and stem, as rated by subjects.
7-Stem autonomy
8-Frequency of the stem when autonomous.
9-Ratio of autonomous stem frequency to word frequency.
10-Whether the root occurs word-initial.
11-Frequency of root when word-initial.
12-Stress position.

2.6 Number of Affixes in a Word

The extent to which a language makes full use of its morphological capabilities can vary independently of the structure of the system itself. English presents with many word forms that incorporate a more diverse collection of information than that which are used to in languages like Arabic, but the individual components are relatively transparent and the degree of elaboration in words that occur in actual texts is moderate. English has a rich system of "lexical suffixes" constituting its morphology, and these correspond functionally to independent words in other languages. Where some languages display very little organization that is originally morphological, still others provide rather more to explore. The English affixes ordering system that is notably vigorous in its morphology is exemplified in the following sections.

2.7 Level of Ordering and the Phonological Restrictions

Level of ordering is a mechanism for expressing constraints on affix ordering, and the correlation between the order of affixes and their phonological behaviour, which is usually associated with a number of hypotheses in lexical phonology. For instance, for English it has been claimed that stress-neutral suffixes are peripheral to stress-shifting suffixes. Level ordering is certainly language-specific in nature

since languages may differ in the number of levels they have, and they may exhibit no level ordering at all (Booij,2005:173).

For English, Kaisse (2005:14) assumes two classes of suffixes, cohering and non-cohering suffixes. This distinction is also referred to as class I versus class II suffixes, or stress-affecting versus stress-neutral suffixes. Some examples of these two classes of suffixes as given by Kaisse are listed below:

1-stress-shifting suffixes: *-age, -al, -ant, -ance, -ary, -ate, -ic, -ion*

2-stress-neutral suffixes:*-able, -er, -en, ful, -hood, -ish, -ism,* -ness, *-less, -like, -ment*

On the other hand, English affixes can be grouped in two broad classes on the basis of their phonological behavior: neutral and non-neutral. Neutral affix: no phonological effect on the base to which it is attached: examples (ness, less)/ *abstract-abstractness/ serious-seriousness/ alert- alertness/ home-homeless/ power-powerless*. Non-neutral affix: effect on segmental or suprasegmental structure of the base. Examples of non-neutral affixes: (ic, ee) '*strategy – stra'tegic/'morpheme – mor'phemic/'photograph–photo'graphic/em'ploy–emplo'yee,de'tain /detai'nee,/ 'absent–absen'tee.*The suffix-ee is an auto-stress suffix (attaches the stress itself)and--ic is a(pre-accenting) suffix (syllable immediately before it is stressed) (ibid.).

As pointed out in Raffelsiefen (1999:236) a serious problem for this classification is that the set of stress-neutral suffixes does not coincide with the class of non-cohering suffixes. The vowel-initial stress-neutral suffixes listed in (2) such as *-er* and *-able* behave in fact as cohering suffixes, like the suffixes in (1). A cohering suffix is a suffix that does not form a prosodic domain of its own, but forms one prosodic word with the stem to which it is attached. Such behaviour is exhibited by stress-neutral suffixes of English such as *-er* and *-ing*, as can be seen from the syllabification patterns of words with these suffixes: *ba.ker, ba.king* (the dots indicate syllable boundaries). The distinction cohering / non-cohering has been introduced by Dixon (1977: 93) and Booij (2005: 162-165), on the other hand, the consonant-initial suffixes in (2) do behave as non-cohering: they either form a prosodic word of their own (for instance, *-ful* and *-hood*), or they form an extra syllable adjoined to the prosodic word node of the stem, as in the case of *-ness* and *-less* (these suffixes cannot form a prosodic word of their own since they lack a full vowel).

Kaisse (2005:15) rightly concludes that 'level ordering' is not the right mechanism for expressing restrictions on affix combinations in

English. However, it should be realized that rejecting level ordering does not imply rejection of the basic tenets of 'Lexical Phonology'. The influence of morphological structure on the phonetic shape of complex words can be realized from the phonotactics of bound morphemes, phonologically motivated periphrasis, and the role of phonological output conditions in making a choice between competing affixes, and the relevance of prosodic properties of affixes for their combinability.

2.8 Restrictions on Affixes Ordering or Combinations

In English, there are severe restrictions on possible combinations of affixes and bases. These restrictions on a given derivational affix are mostly dependent on certain phonological, morphological, semantic, or syntactic properties of bases. For example, the verbal suffix *-ize* only occurs with nouns and adjectives that end in an unstressed syllable. Similar, or even more complex, restrictions seem to hold for affix-affix combinations. For instance, the word *atomic* can take the suffix *-ity* as a nominalizing suffix, whereas the word *atomless* cannot take *-ity*, but the competing nominalizing suffix *-ness* (atomlessity* vs. *atomlessness*) (Plag, 2003: 3).**

Booij (2002:235) argues that phonological properties of affixes play a role in accounting for the restrictions on affix sequences. This is another example of how phonology influences morphology. He assumes the following hypothesis: The more it leads to violations of prosodic output conditions, the more attachment of an affix will be avoided.

The ordering of affixes and the restrictions on their combination within complex words is one of the traditional topics of morphology. Recently, new attempts have been made to find generalizations for restrictions on stacking up affixes, in particular Hay for English. Hay and Plag (2003:1) state that:

> **"There is a long-standing debate about the principles and mechanisms that constrain the combinatorial properties of affixes, in particular of English suffixes. One group of scholars argues for the existence of lexical strata with strong restrictions holding between the different strata. This view is disputed by scholars who claim that it is selectional restrictions of individual suffixes that are responsible for the combinatorial properties of suffixes. Most recently, Hay has proposed a psycholinguistic model of morphological complexity, according to which an affix which can be easily parsed out in processing should not occur inside an affix which cannot. This model has been called 'complexity-based ordering."**

2.9 The Strata Model

Proponents of stratum-oriented models assume that most, if not all combinatorial restrictions among English suffixes can be explained by the fact that these suffixes belong to different lexical strata and that these strata interact phonologically and morphologically in intricate ways. This is known as level-ordering, which in turn is part of most models of Lexical Phonology. According to the level-ordering hypothesis, English suffixes and prefixes belong to the following classes or strata:

(1) Class I suffixes: +ion, +ity, +y, +al, +ic, +ate, +ous, +ive, +able, +ize
Class I prefixes: re+, con+, de+, sub+, pre+, in+, en+, be+
Class II suffixes: #ness, #less, #hood, #ful, #ly, #y, #like, #ist, #able, #ize
Class II prefixes: re#, sub#, un#, non#, de#, semi#, anti# (Spencer, 1991:79).

In general, the suffixes belonging to one stratum share a number of properties that distinguish them from the suffixes of the other stratum. Thus, suffixes can only combine in such a way that they attach to suffixes of the same stratum or of a lower stratum. This is perhaps the most important generalization concerning suffix combinations that emerges from stratum models, since impossible combinations such as those in **atomlessity*, are ruled out on principled grounds, consider the following table. However, there are serious problems with this approach.

stratum 1 suffixes	stratum 2 suffixes
Stratum 1 suffixes tend to be of foreign origin ('Latinate').	Stratum 2 suffixes are mostly Germanic.
Stratum 1 suffixes frequently attach to bound roots and tend to be phonologically and semantically less transparent than stratum 2 suffixes.	Stratum 2 suffixes frequently attach to free roots and tend to be phonologically and semantically more transparent than stratum 1 suffixes.
Stratum 1 suffixes cause stress shifts, resyllabification, and other morphonological alternations.	Stratum 2 suffixes do not.
Stratum 1 suffixes are less productive and less semantically compositional than stratum 2 suffixes.	Stratum 2 suffixes are more productive and more semantically compositional than stratum 1 suffixes.
Crucially, stratum 1 suffixes do not occur outside stratum 2 suffixes.	Stratum 2 suffixes do occur outside stratum 1 suffixes.

One major theoretical weakness of level ordering is that the two strata are not justified on independent grounds. In other words, it is unclear what is behind the distinction between the two strata, and which property makes a suffix end up on a given stratum. It has also been argued that the stratum problem is in fact a phonological one, with differences between different etymological strata being paralleled by phonological differences (Hay and Plag, 2003:5). However, this is related in particular to a model of how morphology interacts with phonology which is the main insight of the theory of 'Lexical Phonology'. This theory comprises a set of hypotheses of which the most important one is that ' morphology and (lexical) phonology apply in tandem ' (Booij, 2005: 175).

Another serious problem is that a stratum cannot be defined by the set of suffixes it contains, because many suffixes must belong to more than one stratum. This set of affixes show stratum 1 behavior in some derivatives, whereas in other derivatives they display stratum 2 behavior, with sometimes even doublets occurring (*compárable* vs. *cómparable*). Furthermore, there are a number of unexpected suffix combinations. Thus stress-neutral *–ist* appears inside stress-shifting *-ic*, or stress-neutral *-ize* appears inside stress-shifting *-(at)ion*.

In order for the model not to make wrong predictions, dual membership of affixes (or some other device weakening the overall model) becomes a necessity. Giegerich (1999) discusses cases of apparent dual membership of affixes in great detail and - as a consequence - proposes a thoroughly revised stratal model, in which the strata are no longer defined by the affixes of that stratum, but by the bases. This base driven stratification model, which is enriched by many suffix-particular base-driven restrictions, can overcome some inadequacies of earlier stratal models, but at the cost of significantly reducing the overall predictive power of the model. These restrictions are a well-taken step towards making predictions concerning suffix order within strata, and therefore represent a significant step forward from earlier Lexical Phonology models (cited in Hay &Plag,2003:5)..

2.10 Selectional Restriction Model

Certain problems remain, however. For example, Fabb and Plag point out that there are numerous other important (phonological, morphological, semantic, syntactic) restrictions operative in English suffixation. Level ordering says nothing about these restrictions. For example, Fabb (1988:532) finds that the 43 suffixes he investigates are attested in only 50 two suffix combinations, although stratum restrictions would allow 459 out of the 1849 possible ones. He replaces

stratal restrictions by individual selectional restrictions and proposes four classes of suffixes:

a. Group 1: suffixes that do not attach to already suffixed words (28 out of 43)

b. Group 2: suffixes that attach outside one other suffix (6 out of 43)

c. Group 3: suffixes that attach freely (3 out of 43)

d. Group 4: problematic suffixes (6 out of 43)

Plag (2002: 293) argues that this classification has also serious shortcomings. Firstly, there are numerous counterexamples to the above generalizations, secondly, the classes of suffixes are arbitrary and it is not clear why a given suffix should belong to a certain class and not to a different one, and thirdly, the classification again makes no predictions on many other restrictions. For any given affix, its phonological, morphological, semantic and syntactic properties and/or the properties of its derivatives must be stated in its lexical entry. Plag (ibid.) shows that these diverse properties together are responsible for the possible and impossible combinations of a given affix both with stems and with other affixes. What has been analyzed as would-be stratal behavior therefore falls out from the phonological, morphological and semantic properties of the affix. Since these properties must be stated anyway to account for the particular behavior of a given affix.

2.11 Complexity Based Ordering

Hay proposes an account of ordering based on parsability, an account which Plag has named "complexity-based ordering". Complexity-based ordering maintains that processing constrains ordering. The general claim of affixes ordering by Hay and Plag (2003:1) in their study to test the predictions of complexity based ordering through an investigation of 15 English suffixes and their potential 210 two suffix combinations is that: "affixes can be approximately ordered along a hierarchy of complexity, with more separable affixes at one end, and less separable affixes at the other end. More separable affixes can attach outside less separable affixes, but not vice-versa". Some affixes are highly parsable, and words containing these affixes tend to be accessed via their parts in speech perception. Other affixes are less parsable, and words containing them tend to be accessed whole. Less parsable affixes cannot attach to more parsable affixes, as stated below:

> **"While some affixes basically tolerate no internal structure, others will tolerate structure to some minimum degree. The degree of internal structure tolerated by an affix is not**

determined by selectional restrictions, however. Rather, it is determined by how much structure that affix, itself, creates. Phrased in terms of processing, an affix which can be easily parsed out should not occur inside an affix which cannot" (ibid.).

Hay's account therefore captures one of the main insights of Lexical Phonology: that affixes create different boundary strengths, and that boundary strength is related to ordering. However, this account is extended by considering boundary strength to be gradient, and a function of decomposability in speech perception. The overall result is that, the less phonologically segmentable, the less transparent, the less frequent, and the less productive an affix is, the more resistant it will be to attaching to already affixed words.

Central to this account is the claim that any individual affix occupies a range of separability - it is more separable in some words than others. As such, there are systematic word-based exceptions to ordering generalizations: cases in which words with low levels of decomposability can take an affix that comparably highly decomposable words might not (e.g. *government* is less decomposable than *bafflement*, leading *governmental* to be more acceptable than *bafflemental*). The fact that the prediction extends to the parsability of affixes as they occur in specific words accounts for the so-called dual-level behaviour of some affixes. An affix may resist attaching to a complex word which is highly decomposable, but be acceptable when it attaches to a comparable complex word which favours whole-word access. Complexity based ordering predicts that it should be possible to arrange affixes into a loose hierarchy of juncture strength, such that (allowing for syntactic, semantic and pragmatic restrictions) anything below an affix on the hierarchy can precede it, but not follow it, and anything above an affix on the hierarchy can follow it but not precede it. Importantly, as clearly illustrated by Plag (2002:311), such a hierarchy would not be workable if completely deterministic and categorical. Complexity based ordering thus also allows for affixes to occupy overlapping regions on the hierarchy such that, for example, the highly decomposable words containing one affix may be positioned above the less decomposable words containing a second affix.

HYPOTHESIS 1: The hierarchy hypothesis (Hay 2002:532)

Suffixes can be ordered in a hierarchy of juncture strength, such that affixes following an affix A on the hierarchy can be freely added to words containing A, but affixes preceding A on the hierarchy cannot freely attach to words containing A.

a. Hierarchy of suffixes: X-Y-Z-A-B-C-D
b. Possible combinations: BASE-A-B, BASE-X-A-C, BASE-Y-Z-A
c. Impossible combinations: *BASE-A-Z, *BASE-Y-A-Z, *BASE-X-A-Y

The 15 suffixes ranking according to different measures and their phonological restrictions, Hay and Plag (2003:20-24)

Affix	Rank hierarchy complexity
th	1
en	2
er	3
ling	4
ee	5
ess	6
ly	7
dom	8
ship	9
hood	10
ish	11
less	12
ful (adj.)	13
ness	14
ful (n.)	15

Plag (2002:539) argues against the hierarchy hypothesis, claiming that parsing criteria alone cannot possibly account for patterns of affix co-occurrence in English. Rather, he argues, the ordering of affixes is determined by a set of selectional restrictions. This competing hypothesis is shown as follows:

HYPOTHESIS 2: The selectional restriction hypothesis (the order of affixes is determined by selectional restrictions).

Section Three
The Data Analysis

The data of the present study are randomly chosen from "Yahoo News" website. The first page of this site displays the top news worldwide. The researcher has chosen three texts from Yahoo news (see the appendix) in order to be analysed phonologically and morphologically. The texts are displayed or published in the afore-mentioned website in (25/12/2013), (12/3/2014) and (7/4/2014). The morphological analysis is confined with parsing the complex words (more than one morpheme) in order to know the number of free and bound morphemes (inflectional and derivational) in every word,

however compound words are beyond the limitations of this analysis. As far as the phonological analysis is concerned, it will be limited to knowing the phonological type of morpheme, that is, whether it is neutral or non-neutral/ stress shifting or not. Other related phonological properties of bases or affixes under study will be considered. However, the present analysis will be done depending on 'level ordering model'. Sometimes other models of suffixes combinability are used. Nevertheless, words ending in the same suffix are grouped and phonologically analyzed together for the economy of space (as you know there many new limitations on publishing researches in Iraqi academic journals, namely, the research must have no more than 25 pages to be published).

Complex words	Morphological analysis	Complex words	Morphological analysis
barricades	barricade#s	sections	sect#ion#s
attackers	attack#er#s	sources	source#s
casualties	cause#al#(i)ty#s	streets	street#s
centers	center#s	teams	team#s
civilians	civil#ian#s	vans	van#s
demands	demand#s	victims	victim#s
hundreds	hundred#s	thousands	thousand#s
explosives	explosive#s	officers	office#er#s
perpetrators	preperate#or#s	investigations	investigate#ion#s
officials	office#al#s	distractions	distract#ion#s
colleagues	colleague#es	generations	generate#ion#s
actions	act#ion#s	responsibilities	respons#ible#ity#s

Phonological analysis: Inflection is the process of changing the form of a word so that it expresses information such as number, person, case, gender, tense, mood and aspect, whereas the syntactic category of the word remains unchanged. As an example, the plural form of the noun in English is usually formed from the singular form by adding an -(e)s marks a noun as plural, and the present tense verb as (third person) singular as *civilians* and *demands*. Morphologically speaking, these complex words consist of two or more morphemes, however, the largest number of them consists of two morphemes, namely the base (free or bound morpheme) and the inflectional bound morpheme (suffix), where there are no restrictions on such kind of combinability in morphology. One of the most important uses of inflectional suffixes is in creating a plural or in conjugating a verb. Generally, inflectional suffixes appear at the end of the complex words. They serve a grammatical function, thus, there are many words of such kind. The

inflectional bound morpheme -(e)s is neutral (has no effect on the base). But, -(e)s is phonologically conditioned, i.e. this morpheme is pronounced as /s/, /z/ or /iz/ in certain phonological contexts. This is related in so far to 'allomorphy'. Allomorphic alternations could be of a phonological (or non-phonological) kind as the conditions for the selection of an allomorph could be phonological (or semantic, morphological, lexical) (Thakur, 2002: 4). It is well known that the alternation between /iz/, /z/ and /s/ as exponents of 'plural' in English is of a phonological kind, i.e., it depends on the last sound of the stem before adding the plural marker –(e)s. If the last sound is voiceless, this morpheme is pronounced /s/ as in *streets*. It is pronounced /z/, if the last sound is voiced as in *barricades, centers, demands, hundreds, teams, vans, victims, thousands*. Still, it is pronounced /iz/, if the word ends with the following sounds:/s, z,d3, ʃ, tʃ / as in *sources*. In sum, the choice between these alternations is phonologically conditioned. Morphologically conditioned phonology is usually referred to as 'mor(pho)phonology'. However, the line between morpheme-specificity and generality is not always easy to draw.

More complex words in the above table are those that consist of three morphemes, namely, *attackers, civilians, officials, sections* and *officers*. It is clear from their morphological analysis found in the second column (# indicates morpheme boundaries) that the first morpheme in all of them is the base whereas the last one is the plural inflectional suffix -(e)s previously explained. As for the second morpheme in all of them, they are:-er, -ian, -al, (at)ion and -er, respectively. However, the combinability of these suffixes with the base depends on the idiosyncrasy of the word itself. Phonologically speaking, (-ian, -al, (at)ion) are stress shifting morphemes, that is they affect the phonological context of the bases (both segmentally and suprasementally) to which they are attached, whilst -er is stress neutral, i.e., it does not affect the base.

The most complex words in the 'internet' texts are: *investigations, perpetrators, responsibilities* and *casualties.* The first two words consist of three morpheme whereas the second two words are the longest of them, both of them consist of four morphemes: (respons#ible#ity#es) (cause#al#(i)ty#es) (the base plus three suffixes). Notice that the combination of suffixes in these complex words ends with the inflectional suffix -(e)s. Broadly speaking, restrictions on a derivational affix are mostly dependent on certain phonological, morphological, semantic, or syntactic properties of bases. For example, the verbal suffix *-ise* only occurs with nouns and adjectives

that end in an unstressed syllable. Similar, or even more complex, restrictions seem to hold for affix-affix combinations. For instance, the word *casual* can take the suffix *-ity* as a nominalizing suffix, whereas the word *civil* cannot take *-ity*, but the competing nominalizing suffix –*ian as in civilian.*

To sum up, it is evident that the morphological complexity of a word is increased proportionally with the increasing number of affixes attached to the base and consequently with increasing length of the word. In addition, this morphological complexity is highly affected by many phonological and morphological factors.

Complex words	Morphological analysis	Complex words	Morphological analysis
accused	accuse#d	evacuated	evacuate#d
armed	arrest#ed	gathered	gather#d
arrested	arm#ed	indicated	indicate#d
billed	bill#ed	loaded	load#ed
branded	brand#ed	owned	own#ed
claimed	claime#d	posted	post#ed
collapsed	collapse#d	rammed	ram#ed
condemned	condemn#ed	rocked	rock#ed
declared	declare#d	shattered	shattered
defeated	defeat#ed	showed	show#ed
demolished	demolish#ed	toppled	topple#d
denied	deny#d	killed	kill#ed
described	describe#d	vowed	vow#ed
emailed	email#ed	wounded	wound#ed
unmarried	unmarry#ed	entitled	entitl#ed

Phonological analysis: (-ed) marks a verb as either a past tense or a past participle, e.g. *She walked* or *She has walked.* Inflectional suffixes are grammatically important, but do not change the part of speech (noun, verb, adjective, etc.) of the word, nor do they alter its meaning. Needless to say that the complex words in this group share the same ending, namely -(e)d. this inflectional bound morpheme is the unmarked (suffix) of the past tense in English. It is also phonologically conditioned, it has three allomorphic realisations, namely: /id, d, t/. Of course, this is dependent on last sound of the verb to which it is attached. For example, if it ends with the sound /t/ or /d/, the past tense morpheme is pronounced /id/ as in *arrested, branded, defeated, evacuated, indicated, indicated, posted, loaded* and *wounded.* It is pronounced /t/ if the verb ends in voiceless sounds, such as /p, k, Ɵ, f, ʃ, s/ as in *rocked* and *demolished*. The last allomorphic alternation of the

past tense morpheme is /d/. It is pronounced /d/ if the verb ends with one of the voiced sounds, such as /z, m, l, m, r/as in *accused, armed, billed, claimed, collapsed, condemned, declared, described, denied, emailed, injured, owned, rammed, shattered, showed, toppled, killed,* and *vowed.* In all the examples given above the vowel pronunciations of the base do not change under the influence of inflectional bound morphemes but, some spelling modifications to the base have been done.

Languages tend to have their inflectional endings peripheral to derivational morphemes, and this may be seen then as a general principle on affix ordering. Crucially, these inflection endings only occur in complex words that consist of more than one prosodic context. The suffix forms a prosodic word of its own, and hence, the inflectional ending occurs at the end of the prosodic word that precedes the suffix. This shows how prosody influences the interaction between inflection and derivation.

Complex words	Morphological analysis	Complex words	Morphological analysis
mourning	mourn#ing	reporting	report#ing
driving	driv(e)#ing	admitting	admit#ing
orchestrating	orchestra#at(e)#ing	attacking	attack#ing
meeting	meet#ing	bombing	bomb#ing
pulling	pull#ing	surrounding	surround#ing
setting	set#ing	referring	refer#ing

Phonological analysis: The third inflectional bound morpheme is (ing). (-*ing*) marks a verb as a present participle: e.g. *She is learning.* This morpheme has only one allomorphic realization: /iŋ/ with any base to which it is attached. Syntactically speaking, one of the most important uses of inflectional suffixes is in creating gerund of a noun or in conjugating a verb. It is a cohering suffix. A cohering suffix is a suffix that does not form a prosodic domain of its own, but forms one prosodic word with the stem to which it is attached. Such behaviour is exhibited by stress-neutral suffixes of English such -*ing*, as can be seen from the syllabification patterns of the complex words with this suffix: *mourn.ing, drive.ing, or.chest.rate.ing, meet.ing, pull.ing, set.ing, refer.ing, report.ing, admit.ing, attack.ing, bomb.ing* and *surround.ing* (the dots indicate syllable boundaries).

Complex words	Morphological analysis	Complex words	Morphological analysis
earlier	earl(i)#er	highest	high#est
larger	large#er		

Phonological analysis: (-er) marks an adjective or adverb as comparative: e.g. *quicker, sooner. -est* marks an adjective or adverb as superlative: e.g. *quickest, soonest.* Once again a cohering suffix is a suffix that does not form a prosodic domain of its own, but forms one prosodic word with the stem to which it is attached. Such behaviour is exhibited by stress-neutral suffixes of English such as *-er* as can be seen from the syllabification patterns of words with these suffixes: *early.er, high.est* (the dots indicate syllable boundaries).

Periphrasis, the expression of certain cells of a morphological paradigm by means of multi-word units, may be conditioned by phonology. English is a straight forward case of such a language where the comparative and superlative forms of adjectives is only synthetic if the stem is monosyllabic (*high – higher-highest*), or bi-syllabic with a light second syllable, as in *(early – earlier-* earliest).

Complex words	Morphological analysis	Complex words	Morphological analysis
election	elect#ion	organisation	organise#ation
information	inform#ation	diversion	divers(e)#ion
cooperation	cooperat(e)#ion	situation	situat(e)#ion
regulation	regulat(e)#tion	foundation	found#ation

Phonological analysis: In human language, words are often constructed from multiple morphemes, or meaning-bearing units, such as stems and suffixes. Identifying the morphemes within words is an important task for learners. In general, derivational suffixes are used to form a word in a different part of speech or to create a word within the same part of speech with a subtly different meaning.

In addition to the capacity of derivational suffixes to change word meaning, some suffixes called 'stress-controlling suffixes' also serve the important role of affecting which syllable of a word receives the primary stress. Suffixes that do not control syllable stress patterns are called 'stress-neutral'. Since stress-controlling suffix patterns can be difficult to recognize, however, they are often difficult for non-native speakers to naturally acquire. The stress patterns only reveal themselves when it is understood that syllables must be counted in relation to the syllable on which the suffix occurs. For instance, *-(at)ion* is one of the most frequently used stress-controlling suffixes. In words that include the *–(at)ion* suffix, the primary stress usually falls one syllable previous to the *–(at)ion*, no matter how many total syllables the word contains, as in: *election, information, cooperation, organization* and *diversion*. Notice how the underlined syllables before the suffix (-(at)ion) carry the primary stress of these complex word.

Complex words	Morphological analysis	Complex words	Morphological analysis
governor	govern#or	terrorist	terror#ist
bomber	bomb#er	behaviour	behav(e)#our

Phonological analysis: A cohering suffix is a suffix that does not form a prosodic domain of its own, but forms one prosodic word with the stem to which it is attached. Such behaviour is exhibited by stress-neutral suffixes of English such as (-or, *–er* and *–ist*) as can be seen from the syllabification patterns of words with these suffixes: (*govern.or, bomb.er* and *terror.ist)*. The first two examples show that it is possible to take a verb that implies some 'doer' and derive a noun from it that refers to this 'doer' by adding the suffix -er. The choice between competing affixes may be determined by prosodic output conditions. A good example in the domain of word formation is the competition in English between the deverbal nominalizing suffixes *–er, -or and -ar* which are added to the words to form nouns (doer of the action). These suffixes look like allomorphs in the sense that they are phonologically similar (they are in complementary distribution). However, it is not possible to assign them a common underlying form, and derive the surface forms by means of well-motivated general phonological rules or constraints of English. There is no general phonological constraint for English that vowels in word-final unstressed syllables must be reduced to schwa. Hence, *-er* cannot be derived phonologically from *-or*. So in fact they can be seen as competing affixes (different affixes with the same meaning and domain of application). This selection process of competing allomorphs can be modelled in terms of optimality-theoretical model: each combination of a stem and an allomorph is a candidate, and the ranked set of phonological constraints will determine the optimal candidate. On the other hand, the third example shows it is possible to form nouns or adjectives from nouns by adding the bound suffix *(–ist)*, it also indicates the meaning of (doer of the action).

Complex words	Morphological analysis	Complex words	Morphological analysis
establishment	establish#ment	statement	state#ment
involvement	involve#ment		

Phonological analysis: Within English, derivational suffixes are used to create a new word (with its own distinct meaning) based on another word. Good examples are: *establishment, involvement* and *statement.* Each one of these complex words consists of two morphemes: the base and the nominal suffix (-ment). The derivational suffix (-ment) is

stress-neutral one. Neutral suffix has no phonological effect on the base to which it is attached. Here, it is neither influence the segmental or suprasegmental features of the base, nor its spelling. By adding this suffix, the word is changed from verb to noun.

Complex words	Morphological analysis	Complex words	Morphological analysis
enquiry	enquir(e)#y	insurgency	insurgenc(e)#y
ministry	minist(e)r#y	priority	prior#ity
presidency	presidenc(e)#y	security	secure#ity
democracy	democr(ate)#(c)y	responsibility	respons(e)#ible#ity
productivity	product#iv(e)ity	clarity	clear#ity
worthy	worth#y		

Phonological analysis: Derivational suffixes are used to create a new word (with its own distinct meaning) based on another word within English. This allows the root word to be modified for use in multiple parts of speech, and with subtle changes in meaning even when it remains in its original part of speech. An important phonological aspect of some derivational suffixes is their ability to control which syllable of a word receives the primary stress. When these words are then turned into nouns through adding the suffix (*–ity*) or (*-y*) the stem vowel remains lax/short, but (*–ity*) & (*-y*) are from those suffixes that affect word stress: -(*–ity*) or (*-y*) words are pronounced with the main stress on the antepenultimate syllable, i.e., the syllable right before the suffix – which is pronounced with a full vowel, as all stressed syllables. In addition to that, derivational suffixes can combine, providing flexibility in creating other words, but such activity can lead to spelling complications. For example, *(-ity)* can combine with "-able," but the result is "-ability" as in *responsibility*.

Complex words	Morphological analysis	Complex words	Morphological analysis
Egyptian	Egypt#ian	importance	import#ance
terrorism	terror#ism	reluctance	reluct#ance
directorate	direct#or#ate	allowance	allow#ance
spinsterhood	spinster#hood	employee	employ#ee
statistics	stat(e)#ic#s	childish	child#ish

Phonological analysis: Derivational suffixes are used to create a new word (with its own distinct meaning) based on another word within English. This allows the root word to be modified for use in multiple parts of speech, and with subtle changes in meaning even when it remains in its original part of speech. Here, the suffix (-ian) is added to a noun to form another noun with indirect change in meaning.

Phonologically speaking, some derivational suffixes have the ability to control which syllable of a word receives the primary stress. When this noun is then turned into a noun through suffix (*-ian*) the stem vowel remains lax/short, but (*–ian) is* from those suffixes that affect word stress: -(*–ian)* words are pronounced with the main stress on the syllable right before the suffix which is pronounced with a full vowel, as all stressed syllables. Likewise, the nominal derivational suffix *(-ism)* forms nouns from other nouns as in (*race/racism, organ/organism)*. This suffix has the phonological effects on the base to which it is attached. The third complex word consists of three morphemes: the base or the root , the second bound derivational morpheme *(-or)* and the third one, namely *(-ate)*. The last bound morpheme is stress-controlling derivational suffix, i.e., the two syllables previous to *(-ate)* are stressed, anyhow this suffix is used to form noun, verbs and adjectives.

Complex words	Morphological analysis	Complex words	Morphological analysis
reportedly	report#ed#ly	scholarly	scholar#ly
critically	critic#al#ly	wisely	wise#ly

Phonological analysis: Derivational suffixes can combine, providing flexibility in creating other words, but such activity can lead to spelling complications. For example, when "-ly" is added to a word ending in "-ic" to make an adverb, the result is usually "-ically" as in *critically*. Both of these two complex words have three suffixes and they end with the productive suffix (-ly). It is used to form adverbs from adjective. Needless to say that (-ly) is a tress neutral suffix. It neither affects the segmental nor the suprasegmental properties of the base to which it is attached. However, *ly* is strongly productive derivational morpheme since it is applying to many adjectives.

Complex words	Morphological analysis	Complex words	Morphological analysis
exceptional	except#ion#al	critical	critic#al
controversial	controverse#al	national	nation#al
proposal	propose#al	special	specify#al
governmental	government#al	societal	society#al
natural	nature#al	terrible	terror#ible
financial	finance#al	successful	success#ful
powerful	power#ful	strategic	strategy#ic
famous	fame#ous		

Phonological analysis: The derivational suffixes at the end of these two complex words (-al), (ible), (ic) and (-ful) are used to form adjectives.

The former is used after the suffix (-ion) where both of them are stress-non neutral suffixes and the primary stress is on the syllable previous to (-ion). The latter is stress-neutral, where there is no change in the prosodic context of this word.

Complex words	Morphological analysis	Complex words	Morphological analysis
terrorise	terror#ise	strategize	strategy#ize
prioritize	prior#ity#ize		

Phonological analysis: The word in the above table is also complex. It consists of two morphemes: the base plus the verbal suffix *(-is(z)e)*. *The derivational verbal bound morphem (-ise*) forms verbs from adjectives or nouns as in (*normal /normalise, synchrony/synchronise).* The verbal suffix *-ise* only occurs with nouns and adjectives that end in an unstressed syllable.

Suffixes and Spelling Change

In general, adding a suffix sometimes changes the spelling of a base word, and learners need to be directly taught the suffixes that cause changes. The three most common spelling changes resulting from the addition of suffixes are:

1. Consonant doubling (runner, running): The consonant is doubled so that the first syllable will form a CVC pattern. Most CVC words contain a short vowel sound. Therefore, the second consonant acts as a diacritical mark, ensuring that the short vowel sound of the root word is maintained.

2. Changing y to i (flies, happiest, loneliness): Words that end in y change the y to i before adding a suffix. The letter y at the end of a word or syllable acts as a consonant and stands for the /y/ sound. However, the letter *y* at the end of a word either stands for a vowel sound (fly) or is part of a vowel digraph (play). The change from *y* to *i* ensures that the vowel sound the *y* stands for in the word is maintained.

3. Deleting the silent *(e*) as in (making). When a word ends in silent *(e)*, the letter is removed before adding the suffix (except s).

Complex words	Morphological analysis	Complex words	Morphological analysis
reassure	re#assure	reactive	re#active
proactive	pro#active	unmarried	unmarry#ed

Phonological analysis: This is the only complex word in the text under analysis that takes a prefix. It takes the prefix *(re-)* at its onset. It consists of two morphemes: the bound derivational prefix *(re-)* that is used to give the meaning of (again) and the base. Like most prefixes,

(re-) **does not change the form of the word. Prefixes before the stem do not work the same as suffixes. They do not carry primary stress.**

Results and Conclusions

The following conclusions can be drawn:

Morphological analysis of English texts is not an easy task and it affects higher level applications such as part-of-speech tagging and parsing. Due to the rich "root-and-pattern" linear morphology and the complex word formation process of root and patterns, hundreds of words can be derived from a single root by following certain patterns and conjoining affixes to the word. The attachment of affixes significantly increases the complexity and the number of derived words. But, a complex word may show both inflection and derivation. A case that creates a rich area for researches in complexity.

An affix is a letter, or group of letters, that is added to the end or the beginning of a root (base) word. Common suffixes include: *s, ed, ing, ly,* and *tion*. The suffixes *s, es, ed,* and *ing* account for almost two-thirds of the words in the internet texts under analysis. The morphological analysis shows that an English word permits up to four morphemes at the end of a word. A case that shows relative complexity in the internet language. It is relatively complex language on the morphological level. Derivational suffixes can combine, providing flexibility in creating other words, but such activity can lead to spelling complications. For example, "-ity" can combine with *(-able)* but the result is *(-ability)* (*desirability, predictability*), and when "-ly" is added to a word ending in "-ic" to make an adverb, the result is usually "-ically" (*critically)*. There are many interactions between phonological forms and morphological structures. Since morphology is the study, of the structure of words. There are some observations about words and their structure: some words can be divided easily into parts which still have meaning. But, some words have meaning only when used with other words. Some of the parts into which words can be divided can stand alone as words, but, others cannot. Some word-parts that can occur only in combination must be combined in the correct way. This depends greatly on the phonological restrictions.

Phonology plays an important role in restrictions on stacking up affixes in multiply complex words. The relevant complexity measures are three metric variables: the length of morphemes in terms of the number of phonemes, the number of morphemes and the length of words in terms of the number of morphemes. From a phonological point of view, the phonological restriction is higher in terms of

derivational affixes than inflectional affixes where the stress non-neutral suffixes such as *(ion, ity, ist, ian)* play a crucial role in affecting the prosodic context of a complex word and consequently in restricting the combinability of suffixes and their order in words.

In conclusion, morphologically, English permits the appropriate extension of existing words to serve new purposes by the addition of prefixes and suffixes. As far as suffixes are concerned, English permits up to four suffixes at the end of a word. This process can create unlimited number of complex words. Such complexity depends on the number of components (morphemes) that can be added. Increasing the number of these components contributes in lengthening the word to which they are attached. A case that creates a complexity in pronunciation, reading, spelling and even parsing as part of the morphological analysis. As far as prefixes are concerned, they are so rare in the text under analysis (e.g. *re-assure*), but in general, English permits the legitimate extension of existing words to serve new purposes by the addition of prefixes. This process can create arbitrarily long words, for example, the prefix *re-* (again) can be added as many times as desired. Word like *re-assure or re-reply* (assure or reply again) are easily extended to *re-re-re-assure* or *re-re-re-reply* and can therefore be prefixed with an endless stream of *(re-)s*, each time creating a new level of counteraction.

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Appendix

1.Deadly blast rocks Egyptian police station

A powerful car bomb explosion has rocked a police headquarters in an Egyptian city north of Cairo, killing at least 14 people and injuring 150, officials said.
Al Jazeera's Mohamed Fahmy, reporting from Cairo, said Ansar Beit al-Makdis, an armed group active in the Sinai peninsula, has claimed responsibility for bombing on Tuesday.
The group, which is also known as Ansar Jerusalem, posted their statement on the Internet, Fahmy said.
Egypt's interior ministry said preliminary investigations showed it was a suicide bomber, driving a car loaded with explosives, who rammed through the barricades around the police station in Mansoura and then detonated the car, according to Al Jazeera's Gregg Carlstrom, who is reporting from Cairo.
The bombing set off a riot in Mansoura on Tuesday afternoon, with hundreds of people attacking a business establishment and setting on fire two vans reportedly owned by the Muslim Brotherhood, according to Al Jazeera's Mahmoud Sobky, who is reporting from Mansoura.
But the Brotherhood denied any involvement in the blast and condemned it in an emailed statement.
"The Muslim Brotherhood considers this act as a direct attack on the unity of the Egyptian people and demands an enquiry forthwith so that the perpetrators of this crime may be brought to justice," the statement said.
Thousands of people gathered on the streets of Mansoura during the funeral for the bomb victims.
Egypt's interim President Adly Mansour has declared three days of mourning for the victims.
"The state has already defeated terrorism in the 1990s, and will overcome it again," Mansour said, referring to a years-long insurgency that killed hundreds of people.

He said the "war on terrorism" has now become a priority, adding that the presidency "will not hesitate to take exceptional measure" to secure the country.

An interim government spokesman had earlier accused the Muslim Brotherhood of orchestrating the attack and branded the group a "terrorist organisation."

The Prime Minister Hazem el-Beblawi described the attack as a "terrorist incident," and vowed that the perpetrators "will not escape justice."

"The incident we saw was the most heinous form of terrorism," Beblawi said.

Arrests made

Mohamed Ibrahim, Egypt's Interior Minister, said four people have been arrested after admitting their involvement to the incident.

"The attacks are an attempt to create a diversion and to terrorise people because of the referendum," he said. "But I want to reassure people that there is a plan in place, in cooperation with the armed forces to protect all of the election centers at the highest level."

Sections of the five storey building in the Nile Delta city has collapsed after the blast and police evacuated surrounding buildings.

The bombing comes weeks before Egypt is to hold a referendum on a new constitution, billed by the army-backed government as the first step towards democracy since the military toppled former president Mohamed Morsi in July.

Al Jazeera's Fahmy said five high-ranking police officers were among the dead and that that two other senior officers were critically injured.

"The explosion was so strong that parts of the gate surrounding the directorate are demolished," Fahmy said. "The injured are both police and civilians. Rescue teams are pulling people from under rubble."*Inside information*

Earlier, Fahmy said information indicated that the attackers may have had inside information about who was at a meeting in the building.

Omar al-Shawatsi, the governor of Dakhalya, of which Mansoura is the capital, told state media all of the casualties were police.

"The explosion was caused by a car bomb," Shawatsi said.

The impact of the explosion was felt around 20 kilometres away and shattered the windows of nearby buildings, security sources said.

The Daqahleya region's head of security, Sami El-Mihi, was wounded in the blast and two of his aides were killed, security sources said.

2- (12) things successful people do at the first hour of their workday

Successful people greet their colleagues each morning.The first hour of the workday is critical, since it can affect your productivity level and mindset for the rest of the day."Successful people understand the importance of having control over their mornings and know how to use that time wisely," says Lynn Taylor, a national workplace expert and the author of " Tame Your Terrible Office Tyrant: How to Manage Childish Boss Behavior and Thrive in Your Job ." "These people are able to weed out the noise in their first hour and focus on what matters."

Everyone has their unique method of prioritizing, she says. "But all successful people stay focused when they start their day, and with years of practice, they realize that many things can wait, and others cannot." Here are 12 things successful people do in the first hour of the workday:

They step back and reflect. Taylor says it's important to take a moment to look at the big picture. "It's easy to jump in and 'just do it' when you get to work, but successful people look at their larger goals in order to better prioritize."

They strategize. Successful people take a few minutes at the start of their workday to think about where their career or business should be going, says Laura Vanderkam, author of " What the Most Successful People Do Before Breakfast ." " Few people spend much time on these questions to begin with, let alone when their brains are fresh. But pursuing strategic clarity is a worthy objective. It's hard to get somewhere if you don't know where you're going."

They check their to-do lists and calendars. You don't want to overwhelm yourself first thing in the morning, but it's important that you take a quick look at your to-do list and calendar to know what's ahead. Missing any early meetings or deadlines would likely cause stress and could ruin your entire day. They update their to-do lists and calendars. "Without a plan, you can't spend your time wisely. But plans must be adaptable," Taylor says. Early in the day is the best time to update your schedule.

They acknowledge and plan for the tough projects. There are always difficult projects looming that get put aside. "Address how you're going to attack them first thing so they don't hang over your head all day," Taylor says.

They don't address "people conflict." Successful people know that timing is everything. If you need to resolve conflict with your peers or

boss, don't engage first thing, Taylor says. "Your colleagues are likely overwhelmed when they arrive to work, so you'll want to wait a few hours until everyone is more relaxed, which is usually after lunch, " she suggests.

They write something that requires thought. Writing requires discipline, and research finds that willpower is at its peak early in the day, after a good breakfast, Vanderkam says. "Like a muscle, willpower gets fatigued from overuse in the course of the day as you respond to distractions and difficult people." The first hour of the day can be a great time to write a well-crafted email introducing yourself to a new client, a proposal or report, marketing materials, or even an op-ed or article.

They greet the team. Good, successful bosses and employees are aware of their team, and they take the time to greet them first thing. "It shows compassion and naturally builds rapport and camaraderie," Taylor says. "This is the first hour of their day, too, and your actions have a significant impact on their attitude and productivity."

They glance at emails. "There's the famous instruction from Julie Morgenstern that we should never check email in the morning," Vanderkam says. "It makes sense. You want to start the day in a proactive fashion, not a reactive fashion. However, I'm pretty sure 99% of us do check email pretty near the start of the day." The trick is to glance at it, and not get bogged down in stuff that doesn't matter, she explains.

3- I would never be a second wife: UAE women slam 'spinster' comment

Young UAE women have hit out at controversial comments encouraging Emirati men to take more than one wife. Federal National Council (FNC) member Ahmad Al Amash said earlier this week, during governmental discussions, that the reluctance of Emirati men to take a second wife was creating "a financial burden on the country". He said that many men were unwilling to take a second wife due to financial costs involved – but that instead created "a bigger problem." "It increases spinsterhood in the country," a UAE newspaper reported FNC member Al Amash as saying. But 25-year-old UAE government employee Hinaya Al Ameri insisted: "I would never be a second wife. I would not because of every natural instinct in me as a woman.

"No matter how old I get I do not think I would ever accept it." Al Ameri said that every woman had the right to decide if she wanted to become a second wife – but it was only fair that her rights are protected. "If a woman wants to be the second wife, it is her choice.

"I do not judge her as I cannot put myself in her place," she said.
Emirati male Salman Al Zarei, also 25,
wondered why men were being asked to solve the problem of unmarried women.
"Multiple wives is something that older generations did but is becoming generations difficult now," the TV director said.
"Not (just) for financial reasons but bringing up one family is hard enough and comes with a whole set of problems and responsibilities."
He added: "I do not see why we as Emirati men should bear the burden of spinsterhood."
Another 25-year-old, female researcher Fatima Nasser, said that a regulation for polygamy – the taking of more than one wife or husband – needs to be implemented before other regulations are introduced.
"Polygamy should be regulated and only allowed for special situations to ensure that one is not abusing this privilege," Nasser, who similarly said she would not want to be a second wife, commented.
In Islam a man is entitled to marry up to four wives. However, there is fierce debate both at a scholarly and societal level in which situations it should be implemented. Asked about further comments Al Amash made – that housing allowances should be increased for Emiratis with more than one wife – Afra Al Basti, FNC member and chairman of the Dubai foundation for women and children, said it "could solve problems."
According to the National Bureau of Statistics in 2010 there are 479,109 Emirati males and 468,888 national females in the UAE.

تعقيد لغة الانترنت: تحليل صرفي وصوتي للكلمات المعقدة صرفيا

م. ماجدة صبري فارس

الجامعة المستنصرية–كلية التربية

التعقيد اللغوي هو أحد المفاهيم المجادل عليها بشكل كبير. فاهمية اللغة لمستخدميها حفز عبر الزمن اللغوين والباحثين على تحليل قواعدها وتركيبها.

ومن الناحية الصرفية تسمح اللغة الانكليزية التوسيع المناسب للكلمات الحالية لكي يخدم اغراض جديدة وذلك بواسطة اضافة البوادئ واللواحق. وفيما يخص تحليل النص الماخوذ من الانترنت والذي تحت الدراسة فقد اظهرت اللغة الانكليزية السماح لاربع لواحق متتابعة في نهاية الكلمة حيث كان استخدام البوادئ نادرا. وهذه العملية تخلق عدد غير محدود من الكلمات المعقدة. يعتمد مثل هذا التعقيد على المكونات التي يمكن اضافتها. فكلما زاد عدد هذه المكونات فانه يشارك في زيادة طول الكلمة. وهذه الحالة تخلق صعوبة في اللفظ والقراءة والاملاء وحتى الاعراب باعتباره جزء من علم الصرف.

علم الصوت يلعب دورا مهما في تقييد اضافة اللواحق والبوادئ في الكلمات المعقدة. فمقاييس التعقيد المرتبط هي ثلاث متغيرات قياسية: طول المقطع الصرفي فيما يخص عدد الاصوات فيه و وطول الكلمة فيما يخص عدد المقاطع و كذلك عدد المقاطع. وقد يفهم الطول فيما يغص علم الكتابة بعدد الحروف المكتوبة والصوت يفهم فيما يخص عدد الاصوات الملفوظة. ومن وجهة نظر صوتية فان القيود الصوتية اعلى بالنسبة للمقاطع الاشتقاقية منها بالنسبة للمقاطع القواعدية. حيث تلعب اللواحق غير المحايدة من ناحية شدة الصوت دورا اساسيا في التاثير على السياق الصوتي للكلمة المعقدة. وهي حالة تظهر تعقيد نسبي في لغة الانترنت لهذا فهي معقدة نوعا ما من ناحية الصرف والصوت.