An Investigation of Common Stress Placement Errors in English Word Roots and their Suffixed Derivatives by Arabic-Speaking EFL Learners

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Abstract
Suffixation influences lexical stress in one of three ways. A suffix attached to a word root/stem may take the stress itself, or it may cause it to move from where it was in the uninflected stem to another syllable, or it may keep stress as is. Stress misassignment is very common in the speech of Arabic-speaking English as a foreign language (EFL) learners. This study was conducted to investigate how Arabic-speaking EFL learners at Prince Sattam bin Abdulaziz University (PSAU) in Saudi Arabia assign lexical stress in word roots/stems and their suffixed derivatives to find out whether stress in suffixed words presented a greater challenge to the learners than stress in the stem; the study also aimed to examine whether errors in stress assignment were caused by first language (L1) interference. 112 students from PSAU were randomly chosen to pronounce 80 suffixed words as well as their roots/stems. The pronunciations were recorded, and the recordings were analyzed by the three researchers and three raters. The study concluded that suffixed words do not present a more significant stress assignment challenge than uninflected stems, the type of syllable attached to a word is not as important as the number of syllables, syllable weight and structure in a word, and that L1 influence may be one of the causes but not the only cause of lexical stress misassignment.

Keywords: Arabic-speaking English as a foreign language learner, English word roots, first language influence, stress placement, suffixed derivatives

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Introduction

Learners of a foreign language typically encounter a whole host of hurdles and detriments in their attempt to acquire the unfamiliar idiosyncrasies of the exotic language that they are grappling with (Han 2004; Robinson and Ellis 2008). Although learning a foreign language may sometimes be an easy and leisurely experience for some learners, for most learners the challenges are multifarious and at times dauntingly foreboding. Whatever the challenges that a learner is facing in their endeavor to acquire an acceptable level of understanding of the foreign language, it is nearly certain that their L1 will play a role, sometimes positive, sometimes negative, in the process. L1 influence can be positive when the structure is identical or similar for both languages, and it can be deleterious and even daunting when the languages are dissimilar, but more often than not L1 influence is viewed as more negative than positive (Yu & Chen, 2021).

English speech is one area where many EFL learners find themselves out of their depth (Bai & Yuan, 2019). Some learners believe that pronunciation is probably the most detrimental aspect of the English language (Burri, Baker & Chen, 2017). In addition, some EFL learners find aspects of supra-segmental phonology in English, such as stress and intonation, a bizarre or incomprehensible concept, especially if such aspects do not exist or are not as versatile in their native language as is the case in English.

English speech is not monotonous. Only in a very limited number of situations do we speak with a fixed, unvarying pitch. At the phrase/sentence level, the rises and falls in pitch result in varying intonation. At the lexical level, the highs and lows in speech are determined by word stress (Ladefoged & Johnson, 2014; Roach, 2009). Stress is a phonetic concept that is quite subtle and defies any easy, straightforward definition.

Arabic-speaking learners of English find stress rather difficult and elusive, and because stress misplacement frequently occurs in morphologically complex suffixed words amongst Saudi EFL learners, in the present study the researchers are mainly interested in exploring stress patterns in the pronunciation of suffixed words as well as in their stems, to find out how the subjects’ placement (or misplacement for that matter) of stress is influenced by suffixation. Because there is little research in the literature on the influence of suffixation on the pronunciation of morphologically complex English words, this study aims to find out whether the errors made by subjects in placing stress are more palpable/frequent in suffixed words than in their stems. This study also aims to determine whether the stress misplacements are individual and various/haphazard amongst the learners or if there is a pattern in the learners’ stress misplacement. In light of these objectives, the current study will be guided by the following research questions:

RQ1: To what extent does stress in suffixed words pose a challenge to Saudi EFL learners compared to stress in the uninflected stem?
RQ2: How do the different suffixes influence the assignment of lexical stress in the pronunciation of Saudi EFL learners?
RQ3: Are the errors in lexical stress assignment haphazard, or could they be caused by L1 influence or some other factors?
As for the structure of this paper, it outlines the major stress rules in Standard Arabic and then investigates the pronunciation of a substantial number of suffixed English words by Arabic-speaking EFL learners. Three tables are used to provide examples of the three different types of suffixation discussed below in the Data Collection section. Wherever there is consistency in the misplacement of stress in any given complex word, the stress assignment in that particular word will be tested against the rules of Arabic stress. The aim is to find out whether there is a pattern in the misassignment of stress, and then should a pattern be detected, the next aim is to explore possible causes of that pattern.

**Literature Review**

*Influence of suffixation on stress placement in English*

Brown (2014) explained that when a suffix is added to the stem of a word, it can influence stress placement in one of three ways, which means suffixes can be tossed into three categories: stress-attracting, stress-preserving and stress-fixing. Stress-attracting suffixes are so-called by Brown because the suffix itself receives the stress. Examples of these suffixes are -ee, -eer, -ese, and -ette. Stress-preserving suffixes do not alter the position of the stress in the word; the stress remains on the same syllable where it was before the addition of the suffix. These suffixes include -able and the eight inflectional suffixes -ed, -ing, third person -(e)s, plural -(e)s, -en, comparative and agentive -er, -est and apostrophe s. Stress-fixing suffixes are ones that the addition of which to the stem causes stress to shift to another syllable within the stem. Examples of these suffixes are -eous, -ious, -ion, -ty, -ic, -ography and -ive. In the current study, the researchers use the classification put forward by Brown (2014).

*Behavior of Stress in Arabic*

Watson (2011) points out that “Arabic recognizes three weights of a syllable: light, heavy, and superheavy” (p. 2). He identifies light syllables as open syllables that are composed of CV, e.g., /wa/ (and). A heavy syllable can be open or closed, and it is composed of CVV, e.g., the first syllable in /baadara/ (He took the initiative); or VVC, e.g., /aɪn/ (where); or it could be composed of CVC, e.g., /dɪˈaʃ/ (put). A superheavy syllable is closed or doubly closed and consists of CVVC, e.g., /dʒaːr/ (neighbour), or of CVCC, e.g., /taːft/ (under). Watson explains lexical stress rules in Arabic polysyllabic words; these rules are governed first and foremost by syllable weight. He posits that

A. if a final syllable in a word is superheavy, that syllable must receive the primary stress;
B. disyllabic words (those that consist of two syllables) have the stress on the first syllable unless the second is superheavy of course;
C. in words of three syllables or more, the penultimate syllable is stressed unless it is light; when it is light, stress falls on the antepenultimate.

This brief account of lexical stress behavior in Arabic is going to guide the researchers through their analysis of any aberrances/inaccuracies in the assignment of lexical stress by the subjects of the study and will shed light on the possible causes of stress misassignment whenever it happens.
Among the most recent studies on stress assignment in English word stems and their derivatives by EFL learners is Sugahara (2020). He investigates lexical stress in base words and derivatives by Japanese as well as Korean learners of English. There is a shortage in the literature of research on the influence of suffixation on stress assignment by Arabic-speaking EFL learners. The closest study to this theme is perhaps Sadi et al. (2022); the article investigates stress misassignment by Arabic-speaking EFL learners in monosyllabic vs polysyllabic words, simple vs compound words, and contracted vs non-contracted auxiliary verbs. The present study specifically addresses the issue of stress placement in suffixed and non-suffixed words.

Methods
The present study made use of a mixed qualitative-quantitative method. It uses the qualitative method to describe in depth the behavior of stress in the pronunciation of the subjects, and it uses the quantitative method by using statistics to determine whether the errors are idiosyncratic or if any errors are salient, frequent errors that can be seen as a pattern.

Participants
The researchers collected pronunciation data from 112 participants; a systematic sampling method was used, whereby on average 28 students were picked randomly from each of the four academic-year levels in the undergraduate program in the English Department at [University Blinded]. All the participants were students from Saudi Arabia. Data collection took place during the academic year 2020-2021. All participants had Arabic as their mother tongue. They had mainly two different English proficiency levels (intermediate/upper-intermediate and advanced).

Research Instruments
The level of proficiency of each participant was determined via a proficiency test – a former IELTS test that was modified by the researchers specifically for this purpose. Seventy-one students were intermediate/upper-intermediate. Their English proficiency was in the range of CEFR B1 – CEFR B2. 41 participants were advanced learners of English; they were in the CEFR C1 level.

Data Collection
The researchers made a list of random English words that exemplified the three types of suffixes discussed earlier: the stress-attracting (also called stress-carrying) suffixes to be studied in this paper were -ee, -eer, -ese, -ette and -esque; the stress-fixing (also called stress-shifting) suffixes were -eous, -graphy, -ial, -ic, -ion, -ious, -logy, -ive, -ty and verbal -ish; the neutral suffixes (no influence on stress) were -able, -age, -al, -en, comparative and agentive -er, -est, -ful, -ing, -like, -less, -ly, -ment, -ness, -ous, -fy, -wise, -y and adjectival -ish. For each individual suffix in all three categories, 2-4 example suffixed words were used. The researchers attempted to include various words of different syllable counts. However, for each suffix, it was only possible to include words composed of a different number of syllables from other suffixes. Some suffixes exhibited disyllabic words (the minimum number of syllables in a suffixed word), trisyllabic words, quadri-syllabic words, and sometimes words of five or more. For some other suffixes, this was not possible, as only disyllabic or only disyllabic and trisyllabic words existed.

The example words were put into longer utterances (phrases and full sentences) even though the researchers were interested in eliciting pronunciation data on the stimulus words only.
This approach, common practice among researchers such as Parlak and Ziegler (2017), was adopted to make sure that the participants pronounced the stimulus words as naturally as possible, just as they would pronounce them in typical, allegro, spontaneous speech since they had no idea which particular lexical item in the utterance the researchers were interested in. To make sure that the participants’ pronunciation of each utterance (and more importantly the stimulus word in that utterance) was clear, audible and true to their usual pronunciation, the students were asked to pronounce each utterance twice.

The data was collected in a controlled environment. The students were met in a language lab, one student at a time, and they saw the stimulus sentences/phrases on a computer screen. They were asked to use a microphone that was connected to the computer to read the stimulus utterances out loud. The Windows® voice recorder was used in this experiment to record the students’ pronunciations. At the end of each student’s session, that student’s pronunciations were saved as WAV audio files on the computer’s hard drive in a separate folder bearing the student’s name. At the end of the recording sessions, the researchers had 112 folders on the computer’s hard drive for the 112 students who participated in the study. Due to a large number of participants, the recording sessions were carried out on three consecutive days, with an average of 37 students each day.

**Stimulus Words**

The stimulus words were all common-core, familiar English words, and they were random words that encompassed the suffixation examples and their accompanying stress placement issues where it was likely for the learners to make errors. For each suffix, the researchers tried as much as possible to include words of varying lengths. For example, for the suffix -ment, the researchers used the three stimulus words move (monosyllabic), punish (disyllabic) and entangle (trisyllabic). This was done to investigate how suffixation influenced the subjects’ placement of stress in different words of different lengths / differing syllable counts. Eventually, the researchers came up with a list of 11 suffixed words for the first category (stress-attracting suffixes), 42 suffixed words for the second category (stress-preserving suffixes), and 27 suffixed derivatives for the third category (stress-fixing suffixes). The suffixed derivatives were 80 in total. But it is important to note here that the number of root words/stems was slightly different; that is because some suffixed derivatives had bound stems. Those bound morphemes could not be used in this study as stimulus words for the subjects to pronounce because they were not free-standing, meaningful English words.

**Data Analysis**

The three researchers, each on their own to strengthen inter-rater reliability, listened to all the pronunciations elicited from the students and assigned the stress placement to each word as pronounced by the particular student. Moreover, three raters who were not involved in this study, all of whom were either phoneticians or linguists with a proven interest in phonology, listened to the data and assigned the stress placement in every single word according to what they heard. At the end of this initial stage, the three researchers and the three raters met and compared their collected data. Whenever there was disagreement amongst the researchers and/or the raters with regards to stress assignment in a particular word from a particular participant, the pronunciation of that word was played back a few times until all the researchers and raters were confident that
they had correctly identified the syllable that was stressed in that particular instance exactly as uttered by the participant.

Once all pronunciations had been discussed amongst the authors and the raters and the stress placement data approved by all six of them, the authors created three tables for the three types of suffixes. Using IPA transcription, the tables showed the correct pronunciations of all stimulus words and the subjects’ mispronunciations (if any) of the stimulus words (both the suffixed derivatives and their uninflected stems). The correct pronunciation transcriptions were copied from Wells’ (2008) Longman Pronunciation Dictionary. The erroneous pronunciations were transcribed by the researchers themselves. The three tables also showed for every stimulus word the numbers (n) and percentages (100n/112) of the students who assigned stress to the wrong syllable in that particular word.

The main aim of the paper is to find out whether stress misassignment in English words by Arabic-speaking EFL learners is more common in suffixed (morphologically complex) words than in non-suffixed (simple) words, and whether stress misplacement exhibits a pattern that can be attributed to L1 influence.

Research Procedures

The researchers made a list of random English words of varying lengths and morphological complexity that were going to be used in the data collection phase. Those words were called the stimulus words, and they were 80 in total. The stimulus words were put into utterances (phrases and full sentences), which the subjects were asked to read out loud into a voice recorder. The students were met in a language lab, one student at a time, and they saw the stimulus sentences/phrases on a computer screen. As explained in the Data Collection section, each utterance had to be read out twice by the participant. A hundred and twelve participants were randomly selected from the Department of English at PSAU in the academic year 2020-2021. The process of data collection lasted for three days. In the next phase, the researchers and three raters listened to all pronunciations and analyzed and transcribed the gathered pronunciation data independently of each other. That phase lasted for another two weeks. In the third phase, the researchers and the raters met and discussed the results and ensured they had correctly identified the stressed syllable in each stimulus word for each participant. As explained in the Data Analysis section, the researchers then created three tables for the three types of suffixes. The tables showed the correct pronunciations of all stimulus words and the actual pronunciations from the participants, as well as statistics on the numbers and percentages of mispronunciations for each stimulus word. This data was used in the discussion to investigate the patterns as well as the idiosyncrasies of stress misplacement among the participants.

Results

Appendix A (stress-attracting suffixes) shows that, of the nine free-morpheme base words, two words had the stress placed on the wrong syllable by most of the students: in refuge, stress was placed on the second syllable instead of the first by 91% of the students, and evacuate was stressed on the ultimate syllable instead of the second by 93%. Appendix A also shows that, of the 11 suffixed derivatives, three words with the same suffix were mispronounced by most students. Those were the -ette suffixed words. The two -esque stimulus words also seem to have posed a
pronunciation challenge to some of the students. More than two-thirds of the participants mispronounced the word picturesque. A cursory glance at Appendices B and C indicates that a good number of stimulus words, both the stems and the derivatives, had the stress placed on the correct syllable by all students. In Appendix B, among the stems that were mispronounced was the word comfort. Just over half the respondents placed the stress on the second syllable instead of on the first. Comfortable was mispronounced by 37+36=73% of the subjects. In Appendices B and C, no participants mispronounced the words smart, Dublin, bride, critic, short, anchor, wood, big, funny, thank, wonder, complete, grace, repulsive, method, geology, civil, civility, possible, possibility, admissible or admissibility. For these words, it seems that the morphological structure did not have an impact on the students’ correct placement of stress. However, morphologically complex words like intoxicating, probably, entanglement, obligingness and indicative were mispronounced by most.

**Discussion**

It is assumed that L1 influence is highly likely to be the cause of an erroneous stress pattern when it is systematic and almost exclusively uniform (Sadi et al., 2022; Sugahara, 2020). Later in this section, there will be a lavish and detailed discussion of this mispronunciation with frequent reference to Arabic stress assignment rules as explained by Watson (2011) that were briefly outlined earlier in this study in the section on ‘Behavior of stress in Arabic’, and which are named rules A, B and C in this study.

Naturally then, whereas cases of correct pronunciation in the elicited data may not be very revealing, incorrect pronunciations – when uniform and consistent – can only be suggestive of some recurring and consistent influence. That error uniformity could be imputed to L1 influence, or it could be some ‘fossilized’ erroneous pronunciation practice that through years came to be so common that it is now almost the norm.

The word refuge is a disyllabic word. The syllable structure of the word is CVC.CVVC (where C stands for consonant, V for vowel, VV for long vowel or diphthong). According to Watson (2011), a disyllabic word in Arabic should have stress on the first syllable unless the second is superheavy. The second syllable in refuge, from an Arabic phonology perspective, is superheavy (CVVC), and since the vast majority of the subjects misplaced the stress in a way that sits well with Arabic phonology, that may be a powerful indicator that L1 influence is the culprit.

The word evacuate is quadri-syllabic, and it was ‘mis-stressed’ by even a larger portion of the participants. This word, however, may pose both an interesting issue and a challenge to the analysis. If the stress misplacement here were to be ascribed to L1 interference, then the stress would be placed on the penultimate syllable according to Watson (2011) because the ultimate syllable /et/ (VVC) is not superheavy, provided the penultimate is heavy. But since the penultimate here /ju/ (CV) is light, the stress should shift to the antepenultimate syllable if L1 were at play: the subjects would have assigned the stress correctly, i.e. on the antepenultimate, which happens to be the correct stressed syllable in this word /ɪˈvek.ju.et/. But that is not what happened. This means that although the vast majority of the students made exactly the same error, the phonology of their L1, deeply entrenched in their brains, may not have been the cause of this error. What then could have instigated this almost unanimous error?
This error could be explicated if we dig deeper into the syllabification of the word. At face value, the final syllable in *evacuate* may be judged, from the perspective of MSA phonology, to be a heavy syllable and not a super heavy one. However, the preceding syllable has the round-back vowel /u/ as its nucleus. Unless the speaker produces a glottal stop at the end of the syllable /ju/ prior to the syllable /eɪt/, as is the case in some English accents, the rounding feature of the vowel /u/ results in a pronunciation that sounds more like /ɪˈvæk.ɪt/ than /ɪˈvæk.ɪt/. The insertion of the /w/ consonant seems to serve the purpose of liaising the two vowels and making the pronunciation sound more seamless. This is in theory similar to the insertion of the linking /r/ and the intrusive /r/ in non-rhotic accents to achieve liaison and avoid uttering a word/phrase that sounds broken by a glottal stop. If the new proposed transcription of *evacuate* held true for how the participants viewed the word, then the ultimate syllable becomes superheavy (CVVC), and only then is it likely that most of them were beguiled by interference from their mother tongue into misplacing stress: they ended up placing stress on the ultimate superheavy syllable in the quadrisyllabic word because the phonology of their L1 dictated them to do so. However, it should be noted here that this type of evidence is by no means conclusive. It is one possible explanation of why most students misplaced the stress in this word, but there is definitely no infallible proof to ascertain that L1 interference must be the culprit.

Interestingly, whereas *refuge* was mispronounced by most students, its suffixed derivative was pronounced correctly by everyone. *Evacuate* was mispronounced by most, whereas its suffixed derivative was pronounced properly by more than half of the subjects. Provisionally, the researchers expected suffixed derivatives to pose a greater challenge to the learners in terms of stress placement than their stems, but those observations from Appendix A seem to flout the researchers’ initial assumption.

Naturally, when a word is pronounced correctly by EFL learners, it should be assumed that they are familiar with the correct pronunciation. However, it may be interesting to delve deeper into the phonological makeup of those words that were correctly articulated and to test them against the phonology of the learners’ L1. Since the learners do regularly mispronounce other words, and there are indications that their L1 is at play, it could hold true then that some words are correctly pronounced simply because their stress just happens to agree with the learners’ L1.

The word *refugee* is tri-syllabic. If the learners’ pronunciation of this word were to be dictated by L1 phonology, then the stress would be placed on the antepenultimate syllable /ref/ and not on the penultimate because the penultimate is a light syllable. But none of the students placed the stress on the first syllable. This incontestably shows that L1 interference had no role at all in this example. This is an interesting case that shows clearly that the subjects do pronounce some words correctly despite the fact that the MSA phonology may dictate otherwise. This can only be taken to mean that whenever the learners mis-assign the lexical stress in any given word, it is a sweeping statement to say the cause of this error is L1 interference, even if the error happens to testify to this assumption. It is also interesting to see examples in the elicited data of how the students may sometimes misplace stress in words where, if they applied L1 phonology, they would end up placing the stress correctly. For example, *ambitious* in Appendix C had the stress placed on the first syllable instead of the penultimate by a large percentage (76%). This error cannot be
imputed to L1 interference because according to rule C of MSA stress, the penultimate should be stressed in this trisyllabic word.

Another interesting finding from Appendix A is that the -ette derivatives were all mispronounced by most of the subjects, whereas their respective stems/roots were pronounced correctly, needless to say that the word brunette, however, did not have a free-morpheme stem anyway. As for launder and suffer, it is natural that the first syllable in each of them was stressed because the second syllable had a schwa at its nucleus. The schwa is a lax vowel that can never receive stress. It is not surprising then that all students pronounced those two words correctly. The words laundrette and brunette are both disyllabic. Their syllabic structures are CVVCC.CVC and CCVV.CVC, respectively. If we assume for the sake of argument that both of those words were mis-stressed due to L1 interference, the assumption does make sense, because the second syllable in each word is not superheavy, and so according to rule B in the ‘Behavior of stress in Arabic’ section, stress should be placed on the first syllable, which most of the students did. The word suffragette (CVC.CV.CVC) is trisyllabic. 95% of the students erroneously placed the stress on the first syllable instead of on the ultimate. Again, could this sweeping error be explained by recourse to MSA phonology? Rule C requires the penultimate syllable in a word of more than two syllables to be stressed if the ultimate is not superheavy, but since the penultimate in the word suffragette is light (CV), the stress had to shift to the first syllable, resulting in the faulty pronunciation /ˈsʌf.rə.dʒət/. Accordingly, it seems possible to assume that the -ette suffixed words were all mispronounced by most of the subjects due to clear interference from their mother tongue.

The suffixes -eer and -ese do not seem to pose any problems for the learners. The word picturesque (CVC.CV.CVCC) is again a trisyllabic word, and the ultimate syllable is super heavy. If the students were to apply rules of MSA phonology to this word, they should place the stress on the ultimate syllable then, but more than two-thirds of them did not. At this point, it can be conjectured that the errors in stress assignment committed by the subjects are somewhat complicated and cannot be explained simply by assuming that their mother tongue is dictating those errors because although some errors do strongly indicate that L1 influence is at play, there are other errors that are commonly committed by most of the students and that do not testify to this assumption.

An attempt to explicate why comfort was stressed on the second syllable by recourse to MSA phonology may be revealing. In the erroneous pronunciation transcribed in the second column /kɑmˈfɔːrt/, the students seem to have replaced the schwa with the long vowel /ɔː/, which changed the syllable makeup from CV(C)C to CVVCC. The latter structure would have been seen by those students as a superheavy syllable, and this likely is why they placed the stress on it. The same argument can be applied to the -able adjective derivative comfortable, which was mispronounced by 37+36=73% of the subjects. The stress was likely placed on the second syllable instead of on the first in this quadri-syllabic word following rule C of MSA stress. If this were the case, it could then be provisionally deduced that Arabic-speaking EFL learners’ placement of stress in suffixed words is more readily influenced by syllable structure and syllable weight than by what type of suffix is in question.
Because *shortage* and *anchorage* were mis-stressed by only a tiny fraction of the students, those two words will be overlooked in the discussion as they do not represent a pattern. The *-al* derivatives were all stressed correctly. Of course, this could be so because the learners were well aware of the correct pronunciation. But again for the sake of argument, if we attempted to test those words against MSA rules, the test may be suggestive of L1 influence, although there is no way to confirm this for certain.

The word *forbid* and its *-en* derivative *forbidden* present an interesting case. The disyllabic stem was mispronounced by most of the students, while the trisyllabic derivative was pronounced correctly by more than two-thirds of the students. The mispronunciation /ˈfɔːr.bɪd/ sits well with rule B of MSA stress, and the erroneous /ˈfɔːr.bɪd.ən/ sits well with rule C. It is becoming more and more obvious that in many cases stress assignment is dictated by the number of syllables in a given word, the syllable structure in that word and syllable weight, rather than by the type of suffix that happens to be attached to the word.

The word *wonder* was pronounced correctly by everyone, but its derivative *wonderful* was mispronounced by the vast majority of the students although *-ful* is a stress-preserving suffix. Again, L1 interference may explain this. Placing the stress on the first syllable in disyllabic /ˈwʌndə/ agrees with rule B, and on the penultimate in the trisyllabic /wʌnˈdər.fəl/ agrees with rule C of MSA stress, needless to say, changing the vowel in the penultimate syllable in *wonderful* from the lax, un-stressable schwa to the slightly stronger, stressable /ʌ/ made it possible to place stress on the penultimate.

Rule C may explain why the stress was placed on the wrong syllable by the vast majority of the subjects in each of the following words from Appendix B: /m.tn.kˈkeɪ.tɪɲ/, /prəˈbli/, /ə.blaiˈdʒiŋ.ɪnəs/, /hæzˈar.dəs/, /ʌθ.əˈwarz/ (ultimate is superheavy), and also in each of the following words from Appendix C: /ˈklaɪ.mət.ɪk/ (penultimate has a schwa, so stress shifted to antepenultimate), /ˈænˈa.ɪt.ɪk/, /ˈæn.ˈfɔːn.ɪndʒi.ˈkeɪl/, /ˈæm.ɪfəs/ and /ˈæ.ɡres.ɪv/. These are further examples suggesting interference from L1 phonology.

In summation, an attempt to account for lexical stress misassignment by Arabic-speaking EFL learners may not be straightforward; it is rather convoluted and in many cases inconsistent, making it extremely difficult to draw a clear-cut pattern that can unequivocally explain all such stress assignment errors heard often in the pronunciation of the subjects. The research questions have been addressed briefly earlier already, and it is apt to make a revisit to those questions at this point.

RQ1
Analysis of the elicited data does not suggest that suffixed derivatives present a greater challenge to Saudi EFL learners than do their derivatives in terms of stress assignment. It sometimes happened that the learners misplaced the stress in the stem but placed it correctly in the more morphologically complex derivative.

RQ2
The type of suffix attached to a word does not seem to play an important role in influencing stress assignment in that word in the pronunciation of the subjects of the study. Rather, syllable count,
syllable structure and syllable weight appear to have a more obvious effect on stress assignment in most of the words where stress was mis-assigned.

RQ3
A good number of stress assignment errors could be explained by reference to MSA rules of stress assignment, i.e., there was a clear indication of L1 interference, but no definitive conclusion could be drawn in this regard since there were also a lot of cases of mispronunciation that did not seem to follow a clear-cut pattern.

Conclusion
This study aimed to investigate how Arabic-speaking EFL learners at {University Blinded} in Saudi Arabia assign lexical stress in word roots/stems and their suffixed derivatives, to find out whether stress in suffixed words presented a greater challenge to the learners than stress in the root words; the study also aimed to examine whether errors in stress assignment exhibited a palpable pattern, in which case L1 influence would most probably be the cause of this error. It was found that mistakes are rife, not only in morphologically complex words of three syllables and more but also in morphologically simple, disyllabic words. Interestingly, the number one trigger of stress misassignment was not found to be suffixation; in fact, the type of suffix attached to a word does not seem to matter as much as the number of syllables, the structure of the syllables and the weight of syllables in a given word. Another finding was that a large number of cases of stress misassignment can be explained by recourse to MSA phonology, which means L1 influence is very much ‘alive and kicking’ in triggering those errors. However, it has been shown that there are also some cases of such errors that cannot by any means be attributed to L1 interference because they simply do not conform to MSA rules.

Limitations and Future Research
Many of the examples of stress misassignment do suggest that L1 interference may be at play, but there are a good number of errors that seem to be committed by a large portion of the subjects of the study that cannot be explicated in any way by reference to L1 interference. Since such errors do seem to follow a particular pattern but at the same time do not exhibit L1 interference, they should be an intriguing and unique area for further research. This phenomenon is beyond the scope of this study.

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### Appendix A. Stress-attracting suffixes

| Base word and its correct pronunciation | Mispunctuation(s) | No. (out of 112) and % of Mispunctuations | Suffixed derivatives and their correct pronunciation(s) | Mispunctuation(s) | No. (out of 112) and % of Mispunctuations |
|-----------------------------------------|-------------------|-------------------------------------------|-----------------------------------------------------|-------------------|-------------------------------------------|
| refuge /ˈref.ju:dʒ/                     | /refˈju:dʒ/       | 91 (81%)                                  | -ee refugee /refˌjuːˈdʒiː/                           | none              |                                           |
| evacuate /ˈɪ.væk.ju.ɪt/                | /ˈɪ.væk.juˈɪt/    | 93 (83%)                                  | none                                                | /ˈɪ.væk.ju.i:/    | 53 (47%)                                  |
| mountain /ˈmaʊn.tn/                     | none              |                                           | -eer mountaineer /maʊn.tˈniə/                       | none              |                                           |
| engine /ˈen.dʒɪn/                      | none              |                                           | -eer engineer /en.ˈdʒɪn/                            | none              |                                           |
| China /ˈtʃaɪ.na/                       | none              |                                           | -ese Chinese /tʃaɪˈniːz/                            | none              |                                           |
| Japan /dʒæˈpæn/                        | none              |                                           | Japanese /dʒæˈpəniːz/                               | none              |                                           |
| launder /ˈlaʊ.n.də/                     | none              |                                           | -ette laundrette /ˈlaʊ.nd.ret/                      | /ˈlaʊ.nd.ret/     | 93 (83%)                                  |
| –                                       | –                 |                                           | brunette /ˈbruː.net/                               | /ˈbru.net/        | 82 (73%)                                  |
| suffer /ˈsaʊ.fə/                       | none              |                                           | suffragette /ˈsʌf.rəˈdʒet/                         | /ˈsʌf.rə.ɹdʒet/   | 95 (85%)                                  |
| picture /ˈpɪk.tʃə/                     | none              |                                           | –                                                   |                   |                                           |
| –                                       | –                 |                                           | –                                                   |                   |                                           |
| –                                       | –                 |                                           | –                                                   |                   |                                           |

### Appendix B. Stress-preserving suffixes

| Base word and its correct pronunciation | Mispunctuation(s) | No. (out of 112) and % of Mispunctuations | Suffixed derivatives and their correct pronunciation(s) | Mispunctuation(s) | No. (out of 112) and % of Mispunctuations |
|-----------------------------------------|-------------------|-------------------------------------------|-----------------------------------------------------|-------------------|-------------------------------------------|
| refuge /ˈref.ju:dʒ/                     | /ˈrefˌjuːˈdʒiː/    |                                           | none                                                |                   |                                           |
| evacuate /ˈɪ.væk.ju.i:/                | /ˈɪ.væk.ju.i:/     |                                           | none                                                |                   |                                           |
| mountain /ˈmaʊn.tn/                     | none              |                                           | none                                                |                   |                                           |
| engine /ˈen.dʒɪn/                      | none              |                                           | none                                                |                   |                                           |
| China /ˈtʃaɪ.na/                       | none              |                                           | none                                                |                   |                                           |
| Japan /dʒæˈpæn/                        | none              |                                           | none                                                |                   |                                           |
| launder /ˈlaʊ.n.də/                     | /ˈlaʊ.nd.ret/      | 93 (83%)                                  | none                                                |                   |                                           |
| –                                       | /ˈbru.net/        | 82 (73%)                                  | none                                                |                   |                                           |
| suffer /ˈsaʊ.fə/                       | /ˈsʌf.rə.ɹdʒet/   | 95 (85%)                                  | none                                                |                   |                                           |
| picture /ˈpɪk.tʃə/                     | /ˈpɪk.tʃə.ɹdʒet/  | 77 (69%)                                  | none                                                |                   |                                           |

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| word   | /ˈkʌm.fərt/ | /ˈkʌmˈfɜːrt/ | 52 (46%) | -able  | /ˈkʌm.fər.tə.bəl/ | /ˈkʌmˈfɜːr.tə.bəl/ | 41 (37%) | -prob.able | /ˈprəb.ər.tə.bəl/ | None | 40 (36%) | - |
|--------|-------------|-------------|----------|--------|-----------------|-----------------|----------|-------------|-----------------|------|----------|----|
| comfort|             |             |          | -age   |                 |                 |          | -age        |                 |      |          |    |
| short  | /ʃɔːt/      | none        |          | -age   | /ˈʃɔː.tɪdʒ/     | /ˈʃɔː.tɪdʒ/     | 12       | -age        |                 |      |          |    |
| anchor | /ˈæŋ.kər/   | none        |          | -age   | /ˈæŋ.kər.ɪdʒ/   | /ˈæŋ.kər.ɪdʒ/   | 9 (8%)   | -age        |                 |      |          |    |
| bride  | /ˈbrʌd/     | none        |          | -al    | /ˈbrɪd.əl/      | none           |          | -al         |                 |      |          |    |
| critic | /ˈkrɪt.ɪk/  | none        |          | -al    | /ˈkrɪt.ɪk.əl/   | none           |          | -al         |                 |      |          |    |
| phenop. | /foʊˈnəm.ən/ | none        |          | -en    | /ˈfʊd.ən/       | none           |          | -en         |                 |      |          |    |
| wood   | /wʊd/       | none        |          | -en    | /ˈfɔːr.ɪdʒ/     | /ˈfɔːr.ɪdʒ/     | 79 (71%) | -en         |                 |      |          |    |
| forbid | /fɔˈbɪd/    | /ˈfɔːr.ɪdʒ/ | 79 (71%) | -er    |                 |                 |          | -er         |                 |      |          |    |
| smart  | /smɑːt/     | none        |          | -er    | /spaː.tə/       | none           |          | -er         |                 |      |          |    |
| Dublin | /ˈdæblɪn/   | none        |          | -er    | /ˈdæblɪn.ər/    | none           |          | -er         |                 |      |          |    |
| condition | /ˈkən.ˈdɪʃ.ən/ | /ˈkən.ˈdɪʃ.ən/ | 102 (91%) | -est  |                 |                 |          | -est        |                 |      |          |    |
| big    | /bɪɡ/       | none        |          | -est  | /ˈbɪɡ.əst/      | none           |          | -est        |                 |      |          |    |
| funny  | /ˈfʌn.ɪ/    | none        |          | -est  | /ˈfʌn.ɪ.əst/    | none           |          | -est        |                 |      |          |    |
| thank  | /θæŋk/      | none        |          | -ful  | /ˈθæŋk.ʃʊl/     | none           |          | -ful        |                 |      |          |    |
| wonder | /ˈwʌndər/   | none        |          | -ful  | /ˈwʌn.ədər.ʃʊl/ | /ˈwʌnˈdər.ʃʊl/ | 102 (91%) | -ful        |                 |      |          |    |
| Word  | Stress Placement  | Percent Incorrect |
|-------|-------------------|-------------------|
| roof  | /ruːf/            | none              |
| amaze | /əˈmeɪz/         | none              |
| intoxicate | /ˈɪnˌtɒk.ˈsɪ.ket/ | none              |
| life  | /lai/             | none              |
| cabbage | /ˈkæb.ɪdʒ/ | none              |
| care  | /keə/             | none              |
| remorse | /rɪˈmoʊs/ | none              |
| bad   | /bæd/             | none              |
| happy | /ˈhæpi/           | none              |
| probable | /ˈprɒb.ə.bəl/ | none              |
| move  | /muːv/            | none              |
| punish | /ˈpʌnɪʃ/         | none              |
| entangle | /ɪnˈtæŋ.ɡəl/ | none              |
| kind  | /kaɪnd/           | none              |
| happy | /ˈhæp.i/          | none              |

- **roof** /ruːf/ - 101 (90%)
- **amaze** /əˈmeɪz/ - none
- **intoxicate** /ˈɪnˌtɒk.ˈsɪ.ket/ - 106 (95%)
- **life** /lai/ - 43 (38%)
- **cabbage** /ˈkæb.ɪdʒ/ - 46 (41%)
- **care** /keə/ - 44 (39%)
- **remorse** /rɪˈmoʊs/ - 103 (92%)
- **bad** /bæd/ - 16 (14%)
- **happy** /ˈhæpi/ - 104 (93%)
- **probable** /ˈprɒb.ə.bəl/ - 22 (20%)
- **move** /muːv/ - 37 (33%)
- **punish** /ˈpʌnɪʃ/ - 37 (33%)
- **entangle** /ɪnˈtæŋ.ɡəl/ - 46 (41%)
- **kind** /kaɪnd/ - 43 (38%)
- **happy** /ˈhæp.i/ - 46 (41%)

**Note:** The table shows the stress placement errors for selected English words, with the percentage of incorrect stress placements. The correct stress placements are highlighted with a bold font.
| **word**       | **base** | **base pronunciation** | **suffix** | **correct** | **correct pronunciation** | **no. (out of 112) and % of mispronunciation** |
|----------------|----------|------------------------|------------|-------------|---------------------------|-----------------------------------------------|
| obliging       | /əˈblaɪdʒɪŋ/ | none                   | -ous       | /əˈblaɪdʒɪŋ.nəʊs/ | /əˈblaɪdʒɪŋ.nəʊs/            | 103 (92%)                                      |
| wonder         | /ˈwɒndər/ | none                   | wondrous   | /ˈwɒndər.dəʊz/ | none                      | -                                             |
| hazard         | /ˈhæz.əd/ | none                   | hazardous  | /ˈhæz.ə.ədəʊz/ | /hæz′ər.dəʊz/              | 94 (84%)                                      |
| diverse        | /dɪˈvaːs/ | none                   | -fy        | diversify    | /dɪˈvaːs.fər.ɪˈvaɪ/         | 97 (87%)                                      |
| glory          | /ˈɡlɒrɪ/  | none                   | glorify    | /ˈɡlɒrɪ.əˈvaɪ/ | /ˈɡlɒrɪ.əˈvaɪ/             | 91 (81%)                                      |
| clock          | /klaʊk/   | none                   | -wise      | clockwise    | /klaʊk.waɪz/              | 94 (84%)                                      |
| other          | /ˈʌð.ə/   | none                   | otherwise  | /ˈʌð.ə.əvaɪz/ | /ˈʌð.ə′vaɪz/               | 88 (79%)                                      |
| brain          | /breɪn/   | none                   | -y         | brainy       | /breɪni/                  | -                                             |
| leather        | /ˈleð.ə/  | none                   | leathery   | /ˈleð.ə.əri/  | none                      | -                                             |
| fool           | /fuːl/    | none                   | -ish       | foolish      | /fuː.ɪʃ/                  | -                                             |
| baby           | /ˈbeɪbi/  | none                   | babyish    | /ˈbeɪbi.ɪʃ/  | none                      | -                                             |

**Appendix C. Stress-fixing suffixes**

| **base**       | **base pronunciation** | **suffix** | **correct** | **correct pronunciation** | **no. (out of 112) and % of mispronunciation** |
|----------------|------------------------|------------|-------------|---------------------------|-----------------------------------------------|
| courage        | /ˈkær.ɪdʒ/            | none       | -eous       | courageous                | /kəˈrɛt.ɪdʒ/                            | -                                             |
| advantage      |                        |            |             | advantageous              | /ədˈvɑːntɪdʒ/                           | -                                             |
| Word          | Stressed Syllable | Error Syllable | Word          | Stressed Syllable | Error Syllable | Accuracy |
|---------------|-------------------|----------------|---------------|-------------------|----------------|----------|
| photo         | none              | –              | photography   | /fəˈtɒg.ə.ri/     | /fə.tɒgˈra.ri/ | 71 (63%) |
| lexicon       | none              | –              | lexicography  | /ˈlɛk.sɪˌkɒɡ.ə.ri/| /ˈlɛk.sɪˌkɒɡˈra.ri/| 80 (71%) |
| part          | none              | –              | partial       | /ˈpɑː.təl/        | none           | –        |
| proverb       | /prəˈvɜːb/        | 103 (92%)     | proverbial    | /prəˌvɜːb.i.əl/   | none           | –        |
| resident      | /ˈrez.i.ənt/      | –              | residential   | /ˈrez.ɪˈdɛn.tʃəl/  | none           | –        |
| climate       | /ˈklæm.ɪt/        | –              | climatic      | /ˈklæm.ɪt.ɪk/     | /ˈklæm.ɪt.ɪk/ | 73 (65%) |
| analyze       | /æn.ə.laɪz/      | 104 (93%)     | analytic      | /æn.əˈlɪt.ɪk/     | /æn.əˈlɪt.ɪk/ | 76 (68%) |
| morphology    | /məˈfɪnl.ə.dʒɪ/  | –              | morphological | /məˌfɒ.ˈlɒdʒ.ɪ.əl/| /məˌfɒ.ˈlɒdʒ.ɪ.əl/| 77 (69%) |
| complete      | /kəmˈplɪ.t/       | –              | completion    | /kəmˈplɪ.ʃən/     | none           | –        |
| celebrate     | /ˈsel.əˈbrɛt/     | 89 (79%)      | celebration   | /ˈsel.əˈbreɪ.ʃən/  | none           | –        |
| grace         | /ɡreɪs/           | –              | gracious      | /ˈɡreɪs.əs/       | none           | –        |
|               | –                 | –              | ambitious     | /əmˈbɪʃ.əs/       | /əm.ˈbɪʃ.əs/ | 76 (68%) |
| repulse       | /rɪˈpʌls/         | 27 (24%)      | repulsive     | /rɪˈpʌls.ɜv/      | none           | –        |
|               | –                 | –              | aggressive    | /ˈærˌɡres.əv/     | /ˈæ.ɡres.ɪv/ | 89 (79%) |
| indicate      | /ɪnˈdɪk.ə.trɪv/   | 107 (96%)     | indicative    | /ɪnˈdɪk.ə.trɪv/   | /ɪn.ˈdɪkˈeɪ.trɪv/| 99 (88%) |
| Word       | Stress | Type | Pronunciation | Correct Stress |
|------------|--------|------|---------------|----------------|
| method     | -      | -    | /ˈmeθ.əd/     | none           |
| civil      | -      | -    | /ˈsɪv.əl/     | none           |
| possible   | -      | -    | /ˈpɒs.ə.bəl/  | none           |
| admissible | -      | -    | /ədˈmɪs.ə.bəl/| none           |
| -          | -      | -    | -             | verbal-ish     |
| nourish    | -      | -    | /ˈnər.ɪʃ/     | none           |
| replenish  | -      | -    | /rɪˈplen.ɪʃ/  | none           |
| impoverish | -      | -    | /ɪmˈpɜrv.ər.ɪʃ/| none           |

Note: For each word, the correct stress pattern is indicated in the last column.