Examining Quality-Sensitive Stress in a Selection of Five Transliterated Islamic Terminologies:

A Study in Optimality Theory

Heba Hossam El-Din Aslan Abd El-Salam

Women's College for Arts, Science, and Education, Cairo, Egypt

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Under the Supervision of

Dr. Mona A. Wahsh
Professor of English Literature, Women's College, Ain Shams University

Dr. Soheir G. Mahfouz
Associate Professor of Linguistics and Translation, Faculty of Al-Alsun, Ain Shams University

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Heba Hossam El-Din Aslan Abd El-Salam[1] Dr. Mona A. Wahsh[2] Dr. Soheir G. Mahfouz[3]

Abstract

This paper is an analytical study of phonology which examines the stress of five selected transliterated Islamic terminologies. This examination will adopt the quality-sensitive stress theory of Michael Kenstowicz[i] (1997) within the framework of optimality theory (OT)[ii]. By applying both; quality-sensitive stress theory and the exact pronunciation of modern standard Arabic (MSA)[iii], these five words are related to different kinds of feet; *Ka'ba* and *Ḥudaybiyah* belong to trochaic foot, while *Tawḥīd*, *Firdaws*, and *Qiblatayn* are related to iambic foot. As a result, these findings suggest that MSA belong to the iambic foot type.

Keywords: transliterated[iv] Islamic terminology, quality-sensitive stress, OT, MSA, pitch[v]

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[١]) MA Egyptian Student; specialized in linguistics, Department of English Language and Literature, Women's College for Arts, Science and Education, Ain Shams University, Cairo, Egypt.

[٢]) Professor of English Literature, Women's College, Ain Shams University.

[٣]) Associate Professor of Linguistics and Translation, Faculty of Al-Alsun, Ain Shams University.

Nowadays, the Islamic terminologies have a great impact in the world since 9/11; after 9/11 attacks, people in America and Europe began to be more sensitive to Muslims and their religious practices. Thus, new Arabic words started to take its place into the vocabulary of Europe and America in which it reflected the west's acquaintance with Islam. Accordingly, people started to be familiar with terms like *Qur'an*, *Shari'a* law, *Jihad*, and *Ḥijab* (Ezzat, 2010). As a consequence, most of the Islamic words are borrowed from its original MSA into English; such as the following borrowed transliterated Islamic terms: *Minbar* which means *pulpit* (Adamec, 2009, p. 253), *Fitra* which means *innate goodness and purity* (Oliver & Steinberg, 2005, pp. 135, 204), and *Umma* which means *community* (Burke, 2015, p. 33). Although the transliterated Islamic words were copied into the English language, but some of it resisted the phonological stress of English and preserved its own MSA stress. However, some non-native speakers of Arabic language pronounce Arabic terms incorrectly by accentuating the wrong syllables of it.

For example, in a video called *The Hudaibiyah Treaty, and its Consequences #25*, the voiceover of this video explains the consequences that led to the Hudaibiyah Treaty, he says:

ˋ When Muslims realized that soldiers have been sent against them, they changed their route and settled in Hudaibiyah.˝ Hence, this voiceover stresses the first syllable of the transliterated Islamic name *Ḥudaibiyah* /ˈhʊdejbejə/ (TRUTH SHALL PREVAIL, 2014, minute 1:06), yet the accurate MSA articulation should be stressing the third syllable in *Ḥudaibiyah* ˋ الْحُدَيْبِيَةُ ˝ (Abn Manthūr, p. ٧٩٥); /ħʊdaɪˈbejə/. Consequently, this paper is intended to show the precise utterance of MSA by examining the most sonorous vowel of the transliterated Islamic word to decide the most optimal stress of it asˋ vowel quality plays a role in determining the location of stress˝ (McCarthy, 2004, p. 191).

The quality-sensitive stress theory of Kenstowicz's (1997) goes back to Selkrik (1980). Liberman and Prince (1977), firstly, identified the phonological contrast by their feature [±stress] equal to [± heavy] in Vanderslice and Ladefoged (1972). Therefore, a syllable with a full vowel as its nucleus has a complete prominence over any syllable with a reduced vowel or sonorant consonant. Following these features, Selkrik (1980) stated his proposal towards stress according to vowel quality; this proposal produced a level of stress where the prominence is phonologically defined by the distribution of qualitative features of vowel quality. Then, if a syllable has a full specification for vowel height and backness, such as the low front vowel /æ/—it is specified as being [+ low] and [- back]—then it is more prominent than any syllable that does not have such a specification. Moreover, there are accompanying differences in duration and loudness, for instance, in *gymnast* /ʤɪmnæst/ or *mailman* /meɪlmæn/, the vowel /æ/ in the second syllables of these words is longer and more intense than the schwa /ə/ in *tempest* /tɛmpəst/ or *German* /ʤɝmən/ (Keating, 1994, pp. 9-10) (this proposal is displayed in terms of the constituent stress foot; see Figure 1).

Quality-sensitivity, in the paper ˋ Quality-Sensitive Stress˝ by Michael Kenstowicz (1997), is not a total rejection in the concern of metrical phonology (MP)[vi], but it can be regarded as an advancement in the tradition of MP. It is defined as follows: Stress is attracted to the most sonorous vowel in a word that consists of two syllables or more where sonority[vii] is decided according to the quality of the syllabic nucleus or the vowel (p. 157). So, when a syllable has a less resonant vowel, this syllable will never be heavier than one with a more sonorous vowel, for example, in any language; the syllable /ti/ will never be heavier than /ta/ since the vowel /i/ is less resonant than the vowel /a/. As a result, Kenstowicz (1996) states that the sonority of vowels vary according to two parameters: peripherality[viii] and height. For this reason, this leads to the sonority hierarchy for vowels: [a > e, o > i, u > ə > ɨ] (de lacy, 1997, pp. 50-51).

Accordingly, there are two factors which are distinguished: Firstly, lower vowels are more optimal than higher vowels and secondly, peripheral vowels are more optimal than central vowels (Kenstowicz, 1997, p. 157). Hence, the lower vowels which are [a > e, o > i, u] are ranked over the higher vowels [/ə/ > /ɨ/] and as for the peripheral vowels [/i e a o u/] they are ranked over the central vowels which are [/ə/ and /ɨ/] (de lacy, 1997, p. 51) (vowel sonority hierarchy clarifies the divisions of vowels; see Figure 2). As a consequence, several languages search for the most optimal vowel when accentuated by the following hierarchies: First hierarchy is: [a, ä > e, o > i, u] and second one is: [a, ä, e, o, i, u > ə] (McCarthy, 2004, p. 191). Consequently, whether a vowel is stressed or not, this can be judged by comparing that vowel to its neighboring vowels (Archangeli & Langendoen, 1997, p. 57). Furthermore, languages that make‟ a weight distinction between vowels of different heights‟ are based on the hierarchy of weight (vowel height and fullness; see Figure 3). Thus, vowels are arranged as follows: Low vowels are the heaviest, then mid vowels, followed by high vowels, and last in the hierarchy are reduced vowels (Gordon, 2006, pp. 28, 127).

Based on the theory discussed above, similar proposal exist to explain quality-sensitive stress. In her thesis‟ Stress and Weight in Québec French‟, Armstrong (1999) argues that Québec French[ix] is a quality-sensitive language; according to the stress rule of Paradis and Deshaies (1990), stress favors a syllable in which its‟ nucleus is neither high vowel nor schwa‟. So, this rule parallels kenstowicz's quality-sensitivity (1996): ‟ in several diverse languages stress seeks out the most optimal vowel‟. Armstrong, therefore, applies her proposal by adopting quality-sensitive stress within the framework of OT (Prince & Smolensky, 1993) in that she applies the sonority-based peak-prominence (PKPROM)[x] constraints on the hierarchy of vowels [*p/ə > *p/i, u, *p/e, o, *p/ä, a] (pp. iii, 33, 109, 110, 112) as Kenstowicz (1997) examined in his theory.

In addition, Armstrong reduces Kenstowicz's set of constraints by eliminating the constraint p/*ə from the constraint set because she assumes that schwa is weightless and also because Paradis and Deshaies (also Cedergren & Simoneau, 1985) make no distinction between low and mid vowels towards stress placement, then, the only necessary constraint is *p/i, u‟ which represents the preference for stress not to fall on a high vowel‟. Hence, Armstrong displays the following constraint *p/H(igh)—it is a constraint which is against accentuating a high vowel—and shows it on the word *Dîner* /diné/ (1999, pp. 112, 124) which means *to have dinner*‟(Dîner‟) (see Table 1, for explanation of the Québec French word Dîner). As a result, the proposal of Armstrong maintains Kenstowicz's (1997) theory of quality-sensitive stress in that stress favors a syllable with a low vowel over a mid and high vowel.

Method

Participants

Concerning the corpus size of the study, this paper examines five transliterated Islamic terms and they are Ka'ba, Tawḥīd, Firdaws, Qiblatayn, and Ḥudaybiyah. These five words are selected from five different sources: The name Ka'ba is extracted from the dictionary *Historical Dictionary of Islam* by Ludwig W. Adamec (2009), the term Tawḥīd is chosen from the research paper *Understanding the Concept of Islamic Sufism* by S. Biliqies (2014), the name Firdaws is selected from the online newspaper article‟ Maryam and the Minotaur‟ in

the *Al- Ahram Weekly Online* (2009), the term Qiblatayn is extracted from the book *Jerusalem and Its Role in Islamic Solidarity* by Y. Reiter (2008), and finally the name Ḥudaybiyah is chosen from the video *The Hudaibiyah Treaty, and its Consequences #25* by Truth Shall Prevail (2014).

Materials and Procedure

In this paper, the quality-sensitive stress theory of Michael Kenstowicz (1997) is adopted within the framework of OT in order to test five transliterated Islamic words. OT provides a clear way of expressing the hierarchies of quality-sensitive stress‵ with its key idea of ranked and violable constraints″. Thus, the OT model is extended by three proposals: First, the PKPROM constraint which is developed by Prince and Smolensky (1993) for quantitative distinctions in Hindi stress (McCarthy, 2004, pp. 191-192)—where Hindi stress states that‵ Stress falls on the heaviest available syllable, and in the event of a tie, the rightmost nonfinal candidate wins (Hayes 1991/95: 276)″ (Prince & Smolensky, 2004, p. 47)—is extended to vocalic distinctions, i.e. [a, ä > e, o > i, u] and [a, ä, e, o, i, u > ə]. Second, the constraint of PKPROM‵ is broken down into a set of micro constraints for each level in the hierarchy.″ Third, the prominence hierarchy is used in a‵ worst-to-best″ way rather than a‵ best-to-worst″ way (McCarthy, 2004, pp. 191-192).

The following illustrates the previous three proposals: [*P/i, u >> *P/e, o >> *P/a, ä] and [*P/ə >> *P/i, u, e, o, a, ä]. The order of these constraint rankings' hierarchies is fixed by universal grammar (UG)[xi] and cannot be reversed by individual grammars (McCarthy, 2004, p. 193). As a consequence, Kenstowicz's (1997) theory is directly related to Prince and Smolensky's (2004) proposal about fixed ranking and the sonority influence on syllable structure (de lacy, 2007, p. 283).

Procedure

The British English Received Pronunciation (RP)[xii] vowels and diphthongs are chosen to be the phonemes of the five transliterated Islamic terms. According to the above explanation of the quality-sensitive stress theory in the introduction, the arrangement of the RP vowels and diphthongs (Cruttenden, 2008, p. 92) is based on sonority, as follows: long vowels are sonorous than short vowels [aː, uː, iː > æ, ɒ, ʌ, e > ʊ, ɪ > ə] and long diphthongs are sonorous than short vowels [aʊ, aɪ > æ, ɒ, ʌ, e > ʊ, ɪ > ə]. The reason for only adopting three long vowels and two diphthongs from RP is that the MSA sound system has three long vowels which are [/ā, ū, ī/] and two diphthongs which are [/aw/, /ay/] (Ryding, 2005, pp. 25, 33). Hence, the chosen RP vowels and diphthongs are equivalent to those in the MSA. Then according to the above discussion of OT in the materials and procedure, the PKPROM constraint is added to the two sonority hierarchies of vowels and diphthongs, accordingly, they are the following: [*P/ə >> *P/ɪ, ʊ >> *P/e, ʌ, ɒ, æ >> *P/ iː, uː, aː] and [*P/ə >> *P/ɪ, ʊ >> *P/e, ʌ, ɒ, æ >> *P/aɪ, aʊ]. These two hierarchies are applied on the selected five Islamic words. Therefore, based on the latter vowels and diphthongs' sonority hierarchies, PKPROM is the higher-ranking constraint in the hierarchy, while the head-right (HEAD-R) is the lower-ranking one in it.

In other words, the entire PKPROM constraint rises above the constraint of HEAD-R which orients stress in the foot as a right-headed iamb. However, PKPROM is related to markedness[xiii] constraints family (Prince & Smolensky, 2004, p. 282), while the HEAD-R belongs to the alignment[xiv] constraints family (McCarthy, 2004, p. 594). If the various PKPROM constraints fail to make a decision and chose a retracted stress, so, another constraint instead of HEAD-R is admitted which is Nonfinality (NONFIN). NONFIN is a lower-ranking constraint in the hierarchy and it is also related to markedness constraints family

(Prince & Smolensky, 2004, p. 282). Consequently, each transliterated Islamic term in this paper is divided into two sections: A and B. Section A illustrates the word into six points: source of transliterated term, transcription[xv] (according to MSA dictionaries), pronunciation (based on *Forvo*[xvi] and *YouTube*[xvii] websites), function, definition, and original sentence. As for Section B, it explains the word into two points: Stress location; each extracted term is examined by a detailed discussion of the correct place of stress with an OT tableau, and pitch; the higher or the highest pitch in the chosen word is traced and accompanied with a pitch graph (according to *Praat*[xviii] software).

Analyses of the Five Transliterated Islamic Terms

1- Ka‘ba

Section A

1- **source of transliterated term.**ˮ **KA’BAH**˝ (Adamec, 2009, p. 174, line 11).

2- **transcription.**ˮ الكَعْبَةُ ˝ (Al-Baghdādy, 1977, vol. 4, p. ٤٦٣); /kəʕ.bə/.

3- **pronunciation.**ˮ كعبة ˝(كعبة ˝; الدمعة الأسلامية, 2011, minute 0:02).

4- **function.** Proper name (Badawi & Abdel Haleem, 2008, p. 808).

5- **definition.** It’s a cubic building located in the centre of the Holy Mosque of the holy city of Makkah. Originally, it was built by the Prophet Ibrahīm and his son Ismaīl. Ka‘bah is the first house of Allah ever known to mankind, and it is referred to in the Holy Qur’an as *al-bayt* which means *the House* or *al-bayt al-‘atīq* which means *the Old House* (Saleh, 2011, p. 118). This building is 12 meters long, 10 meters wide, 15 meters high, it is made of grey stone, and it has a small entrance on the northern side. Ka‘bah is covered during pilgrimage with a black gold–embroidered brocade curtain which is changed every year, and it is the prayer direction to which Muslims bow all over the world. The surrounding area of Ka‘bah is sacred thus forbidden to non-Muslims and no animals are to be killed in it (Adamec, 2009, p. 174).

6- **original sentence.**ˮ **KA’BAH.** ‘‘Cube.’’ A cubelike building, the most holy shrine of Islam˝ (Adamec, 2009, p. 174).

Section B

7- **stress location.** Ka‘ba /kəʕ.bə/

The Islamic name Ka‘ba /kəʕ.bə/ has two syllables: /kəʕ/ and /bə/. They are examined under

the PKPROM hierarchy in order to search for the most prominent vowel in this term to decide the stress location before the NONFIN constraint stresses the retracted syllable. According to the Generator mechanism (GEN)[xix], this name could be stressed either on the first syllable as in /ˈkəʕbə/ or on the second one as in /kəʕˈbə/. In the disyllabic word /kəʕ.bə/, both of the two candidates (a) (σ´σ) and (b) (σσ´) have vowels—the reduced central vowel /ə/ is known as *schwa* (Cruttenden, 2008, pp. 132, 133) with the tongue position between half-close and half-open (*A University Course in Practical Phonetics*, 1991, p. 104)—of equal sonority according to the PKPROM constraint; *P/ə.

For this reason, the PKPROM fails to decide the winner, yet, it assesses each candidate a violation * and accordingly the decision is passed on to the lower-ranking NONFIN to decide the winner between the two candidates. As a Consequence, the NONFIN constraint chooses the retracted stress which is candidate (a) (σ´σ) and values candidate (b) (σσ´) a fatal

violation *!, hence excludes it from the competition. So, candidate (a) gains this competition of stress location, as a result, it is the optimal output according to the Evaluator mechanism (EVAL)[xx] and it is indicated by a pointing hand ☞ in the OT tableau. Thus, the exact stress of the name Ka‘ba is on the first syllable /ˈkəʕbə/. Therefore, the NONFIN wins out over the PKPROM constraint. Hence, the hierarchy of this term is: *P/ə >> NONFIN (see Table 2, for explanation of the transliterated Islamic name Ka‘ba /ˈkəʕbə/).

8- **pitch.** The transliterated word Ka‘ba /kəʕ.bə/ is analyzed by Praat software for tracing the higher pitch in it. This software provides a graphical representation of the pitch (the low or high vocal cords) of this sound record. The upper part of the figure shows a visible representation of the sound (the waveform of the vocal cords) in a black color. Concerning the middle part, it has a grey spectrogram[xxi] drawn on it the pitch (the frequency of periodicity) as a black wave with the fundamental high and low frequencies which are arranged vertically from 75 to 500 Hz, and with a time scale which is ordered horizontally from left to right (Boersma & Heuven, 2001, p. 341). As for the bottom part of this graph, it represents a phonetic transcription.

In the graphical representation of the Islamic term Ka‘ba /kəʕ.bə/, the waveform, in the upper part, goes up in the first vowel /ə/, thus it is high, while it falls throughout the second one /ə/, hence it is low. Concerning the middle part, the pronunciation of the vowel /ə/ of the first syllable is more rapid, accordingly its articulation took 0.075907 seconds, as for the utterance of the vowel /ə/ of the second syllable, it is less rapid, and therefore its pronunciation took 0.160372 seconds. Moreover, ‟ In practice, when a speech sound goes up in frequency, it also goes up in pitch″ (Ladefoged, 2001, p. 164). As a consequence, the vowel /ə/ of the first syllable has a higher frequency variation in air pressure; as a result, it is on a higher pitch and has a higher energy. Then, the frequency of this sound is 234.3 Hz. On the other hand, the vowel /ə/ of the second syllable that is produced has no vocal folds variation; so, it is on a lower pitch and has a lower energy. For this reason, the frequency of this sound is 148.6 Hz. Furthermore, it is

‟ possible to determine the frequency of a sound by counting the peaks of air pressure in a record of its waveform″ (Ladefoged, 2001, p. 164). Consequently, the vowel /ə/ of the first syllable is the peak of the word Ka‘ba /ˈkəʕbə/ (for pitch representation of the transliterated Islamic name Ka‘ba; see Figure 4).

2- Tawḥīd

Section A

1- **source of transliterated term.**‟ *Tawhid* ″ (Bilqies, 2014, p. 55, line 2).

2- **transcription.**‟ تَوْحِيْداً ″ (Mas‘ūd, 1992, p. 857); /taʊ.ħi:d/.

3- **pronunciation.** توحيد ″ (توحيد ″; Jawad, 2011, minute 0:05).

4- **function.** Noun (tawhid,″ 2012).

5- **definition.** It means the unity of Allah; Monotheism. Tawḥīd has three kinds: First, Unity of Lordship, second, Unity of worship, and third, Unity of the Names and the Qualities of Allah (Al-Khudrawi, 2004, p. 525).

6- **original sentence.**

> Sufism, being the marrow of the bone or the inner dimension of the Islamic revelation, is the means par excellence whereby *Tawhid* is achieved. All Muslims believe in Unity as expressed in the most Universal sense possible by the *Shahadah*, *la ilaha ill'Allah*. (Bilqies, 2014, p. 55)

Section B

7- **stress location.** Tawḥīd /taʊ.ħi:d/

The transliterated term Tawḥīd /taʊ.ħi:d/ has two syllables: /taʊ/ and /ħi:d/. These two syllables are tested by the PKPROM hierarchy for reaching to the most sonorous vowel in this word to decide the place of stress before the HEAD-R constraint stresses the final syllable. According to GEN, this term could be accentuated either on the first syllable as in /ˈtaʊħi:d/ or on the second one as in /taʊˈħi:d/. Both candidates (a) (σ´σ) and (b) (σσ´), in the disyllabic word /taʊ.ħi:d/, have a diphthong and a vowel of equal sonority according to the PKPROM hierarchies mentioned above in the procedure; the long (Cruttenden, 2008, p. 92) back closing diphthong /aʊ/ (*A University Course in Practical Phonetics*, 1991, p. 122) and the long (Davenport & Hannahs, 2010, p. 44) high front vowel /i:/ (Davenport & Hannahs, 2010, p. 44) with close tongue position (*A University Course in Practical Phonetics*, 1991, p. 66).

Consequently, each candidate is assigned a violation mark * by *P/aʊ and *P/i: where both of the PKPROM constraints fail to make a decision, and so it is passed on to the HEAD-R which resolves the tie in favor of the final stress. In other words, the HEAD-R constraint evaluates candidate (a) (σ´σ) with a crucial violation *!, as a consequence ruled out, while candidate (b) (σσ´) is selected by the HEAD-R. Hence, candidate (b) obtains the stress location competition, therefore it is the optimal output according to EVAL and the pointing hand ☞ in the tableau shows the winner. Accordingly, the accurate stress of the term Tawḥīd is on the second syllable /taʊˈħi:d/. As a result, the HEAD-R constraint wins out over the PKPROM. Since these two constraints *P/aʊ and *P/i: are of equal sonority, therefore, they do not have a ranking and for this reason a broken line is drawn between them. Hence, the hierarchy of this word is: *P/aʊ, *P/i: >> HEAD-R (see Table 3, for explanation of the transliterated Islamic term Tawḥīd /taʊˈħi:d/).

8- **pitch.** The Islamic word Tawḥīd /taʊ.ħi:d/ is analyzed by Praat software in order to trace the higher pitch in it. In the graphical representation of this term, the waveform, in the upper part, goes up in the first diphthong /aʊ/, thus it is high, while it falls throughout the second vowel /i:/, hence it is low. Concerning the middle part, the articulation of the diphthong /aʊ/ of the first syllable is less rapid, accordingly its utterance took 0.176924 seconds, as for the pronunciation of the vowel /i:/ of the second syllable, it is more rapid, and as a consequence its articulation took 0.344116 seconds. Moreover, the diphthong /aʊ/ that is produced has no vocal folds variation; so, it is on a lower pitch and has a lower energy. So, the frequency of this sound is 185.1 Hz. On the other hand, the vowel /i:/ has a higher frequency variation in air pressure; then, it is on a higher pitch and has a higher energy. Consequently, the frequency of this sound is 203 Hz. Therefore, the vowel /i:/ of the second syllable is the peak of the word Tawḥīd /taʊˈħi:d/ (for pitch representation of the transliterated Islamic term Tawḥīd; see Figure 5).

3- Firdaws

Section A

1- **source of transliterated term.**‵ *Firdaws*˝ (Maryam and the Minotaur,˝ 2009, line 2).

2- **transcription.**‵ الفِرْدوس ˝ (Reḍa, 1960, vol. 4, p. 381); /fer.daʊs/.

3- **pronunciation.**‵ فردوس ˝ (فردوس ˝; khalid 316742, 2014, minute 0:38).

4- **function.** Noun ('Omar, 2010, p. 421).

5- **definition.** It means paradise which is the middle and the highest part of the Jannah (Zanaty, 2006, p. 77).

6- **original sentence.**‵ Last week at the headquarters of her new Cairo publishers, Dar Al-Ain, Mansoura Ezzeddin read from and signed copies of her second novel, *Wara' Al Firdaws* (Beyond Paradise), a sort of psychological thriller and Bildungsroman rolled into one˝ (Maryam and the

Minotaur,˝ 2009).

Section B

7- **stress location.** Firdaws /fer.daʊs/

The Islamic name Firdaws /fer.daʊs/ has two syllables: /fer/ and /daʊs/. They are examined under the PKPROM hierarchy in order to search for the most prominent vowel in this word before the HEAD-R gets a chance to stress the last syllable. According to the GEN mechanism, this term could be stressed either on the first syllable as in /ˈferdaʊs/ or on the second one as in /ferˈdaʊs/. In the disyllabic word /fer.daʊs/, candidate (a) (σ΄σ) which has the short mid front unrounded vowel /e/ (Davenport & Hannahs, 2010, p. 45) with the tongue position between half-close and half-open (*A University Course in Practical Phonetics*, 1991, p. 69) is eliminated by the higher-ranking PKPROM constraint; *P/e as it has a fatal peak violation *! by being syllabified as the most resonant vowel in this name, besides a violation * on the HEAD-R constraint.

Furthermore, the HEAD-R cell of candidate (a) is shaded; yet, a shaded cell has no role in choosing the optimal candidate (Dresher, 2009, p. 140). On the other hand, candidate (b) (σσ΄) has the back closing diphthong /aʊ/ (*A University Course in Practical Phonetics*, 1991, p. 127) which is like long vowels (Roach, 2004, p. 21). As a consequence, candidate (b) is selected by the constraint *P/aʊ as it satisfies the PKPROM hierarchy; aʊ > e. For this reason, the latter syllable is the only candidate left, hence it is declared the optimal output according to the EVAL mechanism and it is indicated by a pointing hand ☞ in the OT tableau. Then, the precise stress of the name Firdaws is on the second syllable /ferˈdaʊs/. So, the hierarchy of this term is: *P/e >> *P/aʊ >> HEAD-R where the PKPROM dominates the HEAD-R constraint (see Table 4, for explanation of the transliterated Islamic name Firdaws /ferˈdaʊs/).

8- **pitch.** The transliterated word Firdaws /fer.daʊs/ is analyzed by Praat software for tracing the higher pitch in it. In the graphical representation of this term, the waveform, in the upper part, goes up in the first vowel /e/, thus it is high, while it falls throughout the second diphthong /aʊ/, and hence it is low. Concerning the middle part, the utterance of the vowel /e/ of the first syllable is less rapid, accordingly its pronunciation took 0.109094 seconds, as for the articulation of the diphthong /aʊ/ of the second syllable, it is more rapid, and therefore its utterance took 0.255082 seconds. Moreover, the vowel /e/ has a higher frequency variation in air pressure; as a result, it is on a higher pitch and has a higher energy. Then, the frequency of this sound is 214 Hz. On the other hand, the diphthong /aʊ/ that is

produced has no vocal folds variation; so, it is on a lower pitch and has a lower energy. As a result, the frequency of this sound is 202 Hz. However, according to: the diphthong hierarchy which is discussed above in the procedure, the right MSA transcription besides Forvo website and Youtube video shown in Section A, and the examination of stress location displayed in Section B of the name Firdaws, the peak of this word should be the diphthong /aʊ/, yet the pitch graph represents the opposite (for pitch representation of the transliterated Islamic name Firdaws; see Figure 6).

4- Qiblatayn

Section A

1- **source of transliterated term.**ˮ *qiblatayn*˝ (Reiter, 2008, p. 26, line 29).

2- **transcription.**ˮ القِبْلَتين ˝ (Omar, 2008, p. 1771); /qeb.lə.taın/.

3- **pronunciation.**ˮ قبلتين ˝(قبلتين ˝; قناة التغيير, 2011, minute 0:08).

4- **function.** Plural noun of Qiblaˮ(قبلة,˝ ٢٠١٦).

5- **definition.** Qibla means the direction of the Ka'ba in Makkah to which the worshipper must direct himself for praying. However, during the early years of Hijra, the Prophet (PBUH) and his community turned at praying towards Jerusalem. The adoption of the qibla is necessary for the validity of praying, but only in great danger and on a journey qibla can be neglected (Donzel, 1994, p. 359).

6- **original sentence.**

> Jerusalem's sanctity within Islam is based first and foremost on its having been the first direction of prayer (*qibla*) before Muhammad adopted the Ka'ba as *qibla*. Thus, it is referred to as "the first of the two directions of prayer" (*ula al-qiblatayn*). (Reiter, 2008, p. 26)

Section B

7- **stress location.** Qiblatayn /qeb.lə.taın/

The transliterated term Qiblatayn /qeb.lə.taın/ has three syllables: /qeb/, /lə/, and /taın/. These three syllables are tested by the PKPROM hierarchy in order to search for the most sonorous vowel in this word to decide the place of stress before the HEAD-R stresses the final syllable. For GEN, this term could be accentuated either on the first syllable as in /ˈqeblətaın/, or on the second one as in /qebˈlətaın/, or on the third syllable as in /qebləˈtaın/. Both candidates (a) (σ΄σσ) and (b) (σσ΄σ), in the trisyllabic word /qeb.lə.taın/, are discarded from the competition by both of the constraints *P/e and *P/ə as candidate (a) has a crucial violation *! and candidate (b) performs even multiple fatal violations **! on the higher-ranking PKPROM, and they also have violations * on the lower-ranking HEAD-R constraint.

Moreover, candidates (a) and (b) have shaded cells on the HEAD-R, yet, shaded cells indicate that they are irrelevant to any further evaluation of the candidates (Davenport & Hannahs, 2010, p. 201). As for candidate (c) (σσσ΄) that has the long (Cruttenden, 2008, p. 92) front closing diphthong /aı/ (*A University Course in Practical Phonetics*, 1991, p. 118), it is chosen by the constraint *P/aı as it satisfies the PKPROM hierarchy; aı > e > ə and also the

HEAD-R constraint. Hence, candidate (c) acquires the stress location competition, as a result, it is the optimal output according to EVAL and the pointing hand ☞ in the tableau shows the winner. Therefore, the correct stress of the term Qiblatayn is on the third syllable /qeblaˈtaın/. Consequently, the hierarchy of this word is: *P/ə >> *P/e >> *P/aı >> HEAD-R where the PKPROM constraint dominates the HEAD-R (see Table 5, for explanation of the transliterated Islamic term Qiblatayn /qeblaˈtaın/).

8- **pitch.** The Islamic word Qiblatayn /qeb.lə.taın / is analyzed by Praat software in order to trace the highest pitch in it. In the graphical representation of this term, the waveform, in the upper part, goes up in the first vowel /e/, hence it is high, also it goes up in the second vowel /ə/, and thus it is high again. In the third diphthong /aı/, the waveform falls down, and so it is low. Concerning the middle part, the pronunciation of the vowel /e/ of the first syllable is the most rapid; accordingly its articulation took 0.063 seconds, as for the utterance of the vowel /ə/ of the second syllable, it is more rapid, and therefore its pronunciation took 0.085147 seconds. Concerning the diphthong /aı/ of the third syllable, it is the least rapid, and as a result its articulation took 0.323986 seconds. Moreover, the vowel /e/ has the highest frequency variation in air pressure; then it is on the highest pitch and has the highest energy.

So, the frequency of this sound is 213.8 Hz. On the other hand, the vowel /ə/ that is produced has no vocal folds variation; for this reason it is on the lowest pitch and has the lowest energy. Accordingly, the frequency of this sound is 205.5 Hz. Furthermore, the diphthong /aı/ has a higher frequency variation in air pressure; as a consequence it is on a higher pitch and has a higher energy. Thus, the frequency of this sound is 208.9 Hz. However, based on: the diphthong hierarchy which is mentioned above in the procedure, the exact MSA transcription in addition to Forvo and Youtube websites shown in Section A, and the examination of stress location displayed in Section B of the word Qiblatayn, the peak of this term should be the diphthong /aı/, yet the pitch graph represents the first vowel /e/ as the peak (for pitch representation of the transliterated Islamic term Qiblatayn; see Figure 7).

5- Ḥudaybiya

Section A

1- **source of transliterated term.**‟ Hudaibiyah″ (TRUTH SHALL PREVAIL, 2014, minute 1:06).

2- **transcription.**‟ الْحُدَيْبِيَةُ ″ (Abn Manthūr, p. ٧٩٥); /ħʊ.daı.be.jə/.

3- **pronunciation.**‟ حديبية ″ (حديبية ″; albasiranet, 2012, minute 3:29).

4- **function.** Noun (Lewis et al., 1971, vol. 3, p. 539).

5- **definition.** It is a town near Makkah where the Prophet Muḥammad (PBUH) and the Makkahns signed a mutual non-aggression treaty in the year 6/628 granting the Muslims the right to make an ‘umrah which is a lesser pilgrimage the following year ‟in exchange for the return of those QURAYSH who had made the HIJRAH without their guardians’ permission.″ This treaty was stopped by the Muslim conquest of Makkah in the year 8/630 (Newby, 2002, p. 84).

6- **original sentence.**

> In 628 C.E. The Messenger of the God and the Muslims decided to perform Hajj. It was against the social norm of Mecca, to prevent anyone from performing Hajj, even their enemies. The Messenger of the God with 1,400 Muslims, [sic] began a month long journey towards Mecca, wearing the dress of Hajj: two piece of unsown white cloth. The Muslims had with them, little provision for their journey, and their sacrificial animal. When the Meccan Polytheists learnt about this journey, they sent 200 soldiers to investigate. When they were spying on the Muslims, they realized that the Muslims were here only to perform Hajj. It was not an invasion. The Muslims were unarmed. When Muslims realized that soldiers have been sent against them, they changed their route and settled in Hudaibiyah. (TRUTH SHALL PREVAIL, 2014)

Section B

7- **stress location.** Ḥudaybiya /ħʊ.daɪ.be.jə/

The Islamic name Ḥudaybiya /ħʊ.daɪ.be.jə/ has four syllables: /ħʊ/, /daɪ/, /be/, and /jə/. They are examined under the PKPROM hierarchy in order to search for the most prominent vowel in this word before the NONFIN gets a chance to stress the syllable before the last. According to the GEN mechanism, this term could be stressed either on the first syllable as in /ˈħʊdaɪbejə/, or on the second one as in /ħʊˈdaɪbejə/, or on third syllable as in /ħʊdaɪˈbejə/, or on the fourth one as in /ħʊdaɪbeˈjə/. In the quadrisyllabic word /ħʊ.daɪ.be.jə/, candidate (a) (σ΄σσσ) which has the short high back vowel /ʊ/ (Davenport & Hannahs, 2010, p. 49) with the tongue position between close and half-close (*A University Course in Practical Phonetics*, 1991, p. 86) has multiple crucial violations **! by being syllabified as the most resonant vowel in this name and this is against the PKPROM constraint even though it satisfies the NONFIN constraint. However, its NONFIN cell is shaded, yet, shaded cells are those which do not affect the result because the competition is decided by a higher-ranking constraint (McCarthy, 2008, p. 45). Then, candidate (a) is cancelled from this competition by the constraint *P/ʊ.

Although candidate (b) (σσ΄σσ) is the most sonorous among the PKPROM hierarchy; aɪ > e > ʊ > ə, but due to the accurate utterance of MSA, this candidate is valued a fatal peak violation *!, yet it has no violation on the NONFIN constraint as it fulfills it, however, its cell is shaded. Thus, the constraint *P/aɪ excludes candidate (b) from the competition. As for candidate (d) (σσσσ΄), it has also multiple crucial violations **! on the PKPROM besides a violation * on the NONFIN with a shaded cell. Accordingly, *P/ə also eliminates candidate (d) from this competition. On the other hand, even though candidate (c) (σσσ΄σ) does not abide by the PKPROM hierarchy; aɪ > e > ʊ > ə, but an exception is displayed by selecting it by the constraint *P/e in order to stick to the precise MSA pronunciation. Furthermore, candidate (c) meets the NONFIN constraint. Consequently, the latter syllable is the only candidate left, hence it is chosen as the optimal output according to the EVAL mechanism and it is indicated by a pointing hand ☞ in the OT tableau. As a result, the right stress of the name Ḥudayibiya is on the third syllable /ħʊdaɪˈbejə/. As a consequence, the hierarchy of this term is: *P/ə >> *P/ʊ >> *P/e >> *P/aɪ >> NONFIN where the PKPROM constraint dominates the NONFIN (see Table 6, for explanation of the transliterated Islamic name Ḥudayibiya /ħʊdaɪˈbejə/).

8- **pitch.** The transliterated word Ḥudaybiya /ħʊ.daɪ.be.jə/ is analyzed by Praat software for tracing the highest pitch in it. In the graphical representation of this term, the waveform, in the upper part, falls down in the first vowel /ʊ/, so it is low, while it goes up in the second diphthong /aɪ/, and therefore it is high. In the third vowel /e/, the waveform goes up, and as a result it is high again, on the other hand, it falls down in the fourth vowel /ə/, and for this

reason it is low again. Concerning the middle part, the articulation of the vowel /ʊ/ of the first syllable is the most rapid; accordingly its utterance took 0.089697 seconds, as for the pronunciation of the diphthong /aɪ/ of the second syllable, it is the least rapid, and thus its articulation took 0.173207 seconds. In addition, the vowel /e/ of the third syllable is more rapid, and then its utterance took 0.131967 seconds. Finally, the pronunciation of the vowel /ə/ of the fourth syllable is less rapid, and hence its articulation took 0.157442 seconds.

Moreover, the vowel /ʊ/ has a higher frequency variation in air pressure; so it is on a higher pitch and has a higher energy. Consequently, the frequency of this sound is 220.1 Hz. The diphthong /aɪ/ that is produced has no vocal folds variation; so it is on the lowest pitch and has the lowest energy. As a result, the frequency of this sound is 199.5 Hz. The vowel /e/ is on a lower pitch and has a lower energy, thus the frequency of this sound is 218.2 Hz. The final vowel /ə/ is on the highest pitch and has the highest energy, and then the frequency of this sound is 247.9 Hz. Yet, according to: the correct MSA transcription besides Forvo website and Youtube video shown in Section A, and the examination of stress location discussed in Section B of the name Ḥudaybiya, the peak of this word is the vowel /e/, however, the pitch graph represents the peak on the last vowel /ə/ (for pitch representation of the transliterated Islamic name Ḥudayibiya; see Figure 8).

Results

This paper has been an analytical one as it examined a selection of five transliterated Islamic terminologies that have been borrowed from Arabic into English language by applying Kenstowicz's quality-sensitive stress theory within the framework of OT according to the right utterance of MSA. The findings in this paper have a number of implications for the study of stress. First, three of the five Islamic words that are explained have shown that by using the HEAD-R they belong to iambic foot type (σσ´) and they are Tawḥīd /taʊˈħi:d/, Firdaws /ferˈdaʊs/, and Qiblatayn /qebləˈtaɪn/. On the other hand, the other two transliterated terms which are Ka'ba /ˈkəʕbə/ and Ḥudaybiya /ħʊdaɪˈbejə/ are related to trochaic foot type (σ´σ). Therefore, the transliterated Islamic words that belong to iambic foot are (right-headed syllable), while those which are related to left-headed syllable or any syllable before the last are related to trochaic foot. This finding suggests that MSA belong to iambic foot type (right-headed syllable) (σσ´) because the terms that are related to iambic foot type outnumbered those which belong to trochaic ones (see Table 7, for MSA is a right-headed syllable).

Concerning the second finding, the five Islamic words abide by the rules of both; the OT constraints (PKPROM, HEAD-R, and NONFIN) and the exact pronunciation of MSA. The transliterated name Firdaws /ferˈdaʊs/, for instance, follows the requirements of the PKPROM; *P/e >> *P/aʊ >> HEAD-R by accentuating the most resonant vowel which is the long back closing diphthong /aʊ/, and at the same time fulfills MSA articulation. When the constraints of PKPROM fail to make a decision in choosing the optimal candidate, hence, the HEAD-R makes it by selecting the candidate that is a right-headed syllable; as in the term Tawḥīd /taʊˈħi:d/. This word has a diphthong /aʊ/ and a vowel /i:/ of equal sonority, as a consequence, this term sticks to the rule of the HEAD-R; *P/aʊ, *P/i: >> HEAD-R by stressing the right-headed long high front vowel /i:/ and it also satisfies the accurate utterance of MSA. Yet, if this choice of the HEAD-R constraint is not suitable to the precise MSA pronunciation, as a result another one should be used. This alternative is NONFIN. It resolves the tie in favor of a retracted stress; as in the name Ka'ba /ˈkəʕbə/. This word has two equivalent reduced central vowels /ə/ and /ə/, it meets both; the requirement of the NONFIN constraint; *P/ə >> NONFIN by accentuating the left-headed vowel /ə/ and the native MSA articulation.

Accordingly, the numbers of terms that are decided by the PKPROM are three, as for the HEAD-R, it is only one word, and concerning the NONFIN, it is also one term (see Table 8, for conclusion of the three constraints towards the five transliterated Islamic terminologies). Thirdly, the higher-ranking vowels and diphthongs on the PKPROM hierarchy; [*P/iː, uː, aː] and [*P/aɪ, aʊ] are assessed a fatal violation *! either on the HEAD-R or on the NONFIN, while the lower-ranking vowels; [*P/ə >> *P/ɪ, ʊ >> *P/e, ʌ, ɒ, æ] are only evaluated with a violation * on either the HEAD-R or on the NONFIN constraints due to the importance of the former (higher-ranking vowels and diphthongs) and the less importance of the latter (the lower-ranking vowels). Consequently, the number of words that have higher-ranking vowels which have a crucial violation *! on the HEAD-R are none, while the number of terms that have lower-ranking vowels which take a violation * on the HEAD-R constraint are two, and it is only one word on the NONFIN. Therefore, these four terminologies mentioned in this finding abide by the rules of violation in OT (see Table 9, for violations of higher and lower-ranking vowels on HEAD-R and NONFIN constraints).

Fourth finding, the vowels which are weaker in the sonority hierarchy; [*P/ə >> *P/ɪ, ʊ >> *P/e, ʌ, ɒ, æ] are assigned a fatal *! or multiple crucial **! peak violations if they are in a competition with the higher-ranking vowels; [*P/iː, uː, aː] or diphthongs; [*P/aɪ, aʊ]. This is because, based on Kenstowicz's quality-sensitive stress,—as in the word Qiblatayn /qeblaˈtaɪn/—the place of stress must not be on the first or the second syllables as the short mid front unrounded vowel /e/ is weak and the schwa vowel /ə/ is even arranged in the hierarchy as the weakest among the vowels. Thus, when the short vowels /e/ and /ə/ are in a competition with the long front closing diphthong /aɪ/, the latter diphthong wins. For this reason, the vowels /e/ and /ə/ are valued multiple fatal **! and crucial *! peak violations. However, when a weak vowel is assessed a fatal peak violation*!, then this means that stressing this vowel is incorrect. Moreover, when a weak vowel is evaluated with multiple peak violations **!, so this shows that accentuating this vowel is an even more irrelevant stress. As a consequence, weak vowels in the PKPROM hierarchy follow both requirements of quality-sensitive stress and OT violation. Though this previous statement should be fulfilled, an exception may appear in weak vowels as it will be shown in the coming section of discussion.

Finally, the fifth finding in this paper states that the winning candidate does violate a constraint, but other competing candidates violate a more highly ranked one, hence this helps the winning candidate to still be the winner. In other words, when a candidate has a violation * or a crucial violation *! on lower-ranking constraints, this will not exclude it when it has a good performance on higher-ranking ones. Yet, there are no winning candidates in this paper that have fatal violations on lower-ranking constraints. Concerning failing vowels, for instance, although the short high back vowel /ʊ/ in the Islamic name Ḥudaybiya /ħʊdaɪˈbejə/ has no violation on the NONFIN, but it fails the stress competition, accordingly it is assigned multiple crucial violations **! on the PKPROM. As a result, the higher and lower-ranking vowels sticks to the strict constraint domination in OT except for some terms in Arabic as the name Ḥudaybiya that may not follow this above statement in order to satisfy the correct MSA utterance. Then, the number of the winning candidates in the Islamic words that have a violation * or a fatal violation *! on the HEAD-R and the NONFIN are none, while the number of the failing candidates in the transliterated terms that have crucial *! or multiple fatal **! violations on the PKPROM are three (see Table 10, for winning and failing vowels that have crucial *! or multiple fatal **! violations on HEAD-R, NONFIN, and PKPROM constraints).

Discussion

In this paper, there are seven points or notices that need to be discussed. Firstly, the examination of the five transliterated Islamic terminologies through adopting Michael Kenstowicz's (1997) quality-sensitive stress within the framework of OT have shown the same results as Armstrong's (1999) thesis" Stress and Weight in Québec French" which is explained above in the introduction in that stress is preferred not to fall on a high vowel, as in the word Dîner /diné/ (p. 112). The same is, for example, in the Islamic name Ḥudaybiya /ħʊdaɪˈbejə/ which is stressed on the third syllable since it has the front close-mid vowel /e/ (Collins & Mees, 2008, p. 63). Second point, concerning the vowels or diphthongs of equal sonority, in the table of the term Tawḥīd, a broken line is drawn between the two constraints; *P/aʊ and *P/iː, while in the table of the name Ka'ba, the constraint *P/ə of the two vowels /ə/ is drawn in the same column. This is because the diphthong and the vowel of the word Tawḥīd are related to different hierarchies while the two vowels of the name Ka'ba belong to the same hierarchy. Thirdly, one exception is revealed in the term Ḥudaybiya. This word is accentuated on the third syllable /ħʊdaɪˈbejə/ even though the vowel /e/ is from among the weak vowels in the sonority hierarchy mentioned above in the procedure. This exception is done in order to meet the right pronunciation of MSA.

Fourth point, different lower-ranking constraints are chosen for the three transliterated terms: Firdaws, Qiblatayn, and Ḥudaybiya. The HEAD-R is selected for the two words: Firdaws and Qiblatayn, while the NONFIN is chosen for the name Ḥudaybiya. This is because both of the terms Firdaws /ferˈdaʊs/ and Qiblatayn /qebləˈtaɪn/ are stressed on the last syllable from the right; therefore, the HEAD-R is a suitable lower-ranking constraint. On the other hand, the name Ḥudaybiya /ħʊdaɪˈbejə/ is accentuated on the syllable before the last; thus, the NONFIN is an appropriate lower-ranking constraint. Fifthly, although MSA dictionaries, Forvo and YouTube websites, and Kenstowicz's (1997) theory of quality-sensitive stress have shown the exact articulation of the five transliterated Islamic words, but when these terms were analyzed by Praat software in order to discover the higher or the highest pitch of these words, three weaknesses were found. First weakness is displayed in the name Firdaws. This term is stressed on the second syllable /ferˈdaʊs/; consequently by testing it by Praat software the expected consequence is that the long diphthong /aʊ/ in the second syllable should have the most energy. On the contrary, the opposite conclusion happened in that the short vowel /e/ in the first syllable gained a higher energy and its frequency is 214 Hz, while the diphthong /aʊ/ had a lower one and its frequency is 202 Hz.

Second weakness is shown in the word Qiblatayn. This term is accentuated on the third syllable /qebləˈtaɪn/; as a consequence by analyzing it by Praat software the expected result is that the long diphthong /aɪ/ should have the most energy. However, the opposite outcome occurred in that the short vowel /e/ in the first syllable obtained the most energy and its frequency is 213.8 Hz, while the diphthong /aɪ/ had a lower energy and its frequency is 208.9 Hz. Third weakness is found in the name Ḥudaybiya. This word is stressed on the third syllable /ħʊdaɪˈbejə/; accordingly by examining it by Praat software the expected consequence is that the short vowel /e/ should have the most energy. Yet, the opposite conclusion happened in that the weakest vowel /ə/ in the hierarchy acquired the most energy and its frequency is 247.9 Hz, while the vowel /e/ had a lower energy and its frequency is 218.2 Hz. Sixth point, due to 9/11 terrorist attacks on the US, Muslims and Islam come under focus and discussion (Salem, 2011). From a theoretical and practical point of view, this present study is important as it tested the stress of five selected Islamic terms that are borrowed from Arabic into English language. Hence, in this paper the accurate stress of MSA is fully explained which is unknown to a vast popularity of foreign people who are non-

native speakers of Arabic but they exert lots of efforts to pronounce these loan words exactly as its native people do.

In a theoretical way, as a result, Kenstowicz's (1997) quality-sensitive stress within the framework of OT and MSA dictionaries were adopted to explain on which proper syllable the vertical line or stress should be placed concerning each examined term in order to search for the precise stress location of these five words. Practically, on the other hand, Forvo website and YouTube videos, and Praat software were used to display the acoustic and visual sides of these terms. As for the findings reached to above, the correct utterance of the transliterated words is more obvious than before. For instance, if the transliterated Islamic name Ḥudaybiya used to be incorrectly accentuated by foreign people on the first syllable /ˈhʊdejbejə/ as mentioned earlier in the introduction, then this term is now apparent since it is tested in this paper in that it should be stressed on the third syllable /ħʊdaɪˈbejə/. Seventh and final point, further work is required in the future to gain a more complete understanding of the subject of borrowed words as their stress is based on the stress patterns of the languages from which they are borrowed from (Birjandi & Salmani-Nodoushan, 2005, p. 110). These future researches should be done by all means of information such as books, dictionaries, research papers, theses, newspaper articles, radio, and television.

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[i]He is an American phonologist who has worked throughout his career in generative phonology, and studied a wide range of different languages. When Morris Halle retired, Kenstowicz took over as professor of phonology at Massachusetts Institute of Technology (MIT)

(Carr, 2008, pp. 82, 101).

[ii]It is a transition occurred in the 1990s in the history of generative phonology. This transition was transferring the rules and constraints from SPE tradition to OT (Carr, 2008, p. 34). Its first public appearance was made in April 1991 when Alan Prince and Paul Smolensky presented a paper under the title *Optimality* at the University of Arizona Phonology Conference in Tucson (Archangeli & Langendoen, 1997, p. 1). OT is a constraint-based theory (de Lacy, 1997, p. 28)—each rule in OT is known as a ` constraint˝ (Nathan, 2008, p. 147)—in its evaluation of output

structures, in which all evaluations of different possible output forms happen simultaneously without ordering (de Lacy, 1997, p. 28). This theory was firstly

a 80 and 200 Hz, while it may go up to about 400 Hz for a woman's voice (Ladefoged, 2001, p, 2005, p. 23).