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# On the lexical stress patterns of Ilami Kurdish

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**ABSTRACT.** This paper aims to investigate the stress patterns of Ilami Kurdish, a southern variety of Kurdish language, based on the criteria proposed by Kager (1995) and also Hayes (1995) regarding the stress patterns of human languages, including 'boundedness', 'quantity sensitivity', 'word headedness', 'foot headedness' and 'directionality'. After analyzing Ilami Kurdish data and specifying the stress patterns of this dialect of Kurdish, we adopt Optimality Theory framework, which is a modern perspective towards phonology, to show how the optimal candidates are in conformity with the universal phonological constraints in Ilami dialect. All in all, it can be said that Ilami is a right-bounded quantity-sensitive variety as far as monomorphemic words are considered.The next part of the research is devoted to the study of the stress pattern of compound words in Ilami Kurdish. In order to evaluate the stress pattern of these constructions, we use PRAAT software program to analyze the data collected from native speakers of Ilami. Concerning the stress pattern of compounds, it was observed that this is always the rightmost syllable of the final morpheme that bears the strong stress, regardless of the length of word and the number of morphemes. Actually, this tendency always violates the main-left (C) universal constraint according to which a clitic group (c) is left- headed.

**Keyword:**Ilami Kurdish, optimality theory, metrical phonology, stress.

## Sobre os padrões de estresse lexical do Curdo Ilami

**RESUMO.** Este artigo visa investigar os padrões de tonicidade do dialeto Curdo Ilami, uma variedade sulista da língua curda, baseado nos critérios propostos por Kager e Hayes em relação aos padrões de tonicidade de línguas humanas, que incluem 'limitação', 'sensibilidade para quantidade', 'wordheadedness', 'footheadedness' e 'direcionalidade'. Após analisar dados do dialeto Curdo Ilami e especificar seus padrões de tonicidade, nós usamos a Teoria da Otimidade, que é uma perspectiva moderna em relação à fonologia, para verificar como os candidatos ideais estão em conformidade com as restrições do dialeto. Em geral, pode-se dizer que o Ilami é uma variedade delimitada à direita e sensível para quantidade, quando palavras monomorfêmicas são consideradas. A parte seguinte da pesquisa é centrada no estudo de padrões de tonicidade de palavras compostas em Curdo Ilami. Para avaliar o padrão de tonicidade dessas construções, nós usamos o software PRAAT para analisar os dados coletados com falantes nativos de Ilami. Até o momento, considerando-se o padrão de tonicidade de palavras compostas, nota-se que é sempre a sílaba mais à direita do morfema final que apresenta tonicidade, independentemente do comprimento da palavra ou do número de morfemas. Na verdade, esta tendência sempre viola a restrição universal principal-esquerda(C) de acordo com a qual a tonicidade é sempre percebida no elemento esquerdo da construção em um grupo clítico.

**Palavras-chave:** Curdo Ilami, teoria da otimidade, fonologia métrica, tonicidade.

## Introduction

"The study of word stress addresses the location of prominent syllables within words, as well as the rhythmic, positional, quantitative, and morphological factors that govern patterns of syllable prominence" (Kager, 1995, p. 367).

Kager (1995) states stress is different from tone and pitch accent in several ways. First, stress is culminative, i.e., in stress languages as Classical Arabic, Czech and French (Hyman, 1977), every (content) word has at least one stressed syllable. Second, stress is hierarchical, since a prominence hierarchy may occur among multiple stresses. Third, stress is delimitative in systems where it marks word edges. Fourth, stress is rhythmic in systems where stressed and unstressed syllables alternate, and where clashes (adjacent stresses) are avoided. Naturally, stress does not assimilate to adjacent syllables, as this would produce clashes. And finally, stress contrasts tend to be enhanced segmentally: stressed syllables may be strengthened by vowel lengthening or by gemination, while unstressed syllables may be weakened by vowel

reduction.According to the criteria mentioned above, Ilami Kurdish, which will be examined in this paper, is by definition a 'stress variety' in which every (content) word has at least one stressed syllable.

The purpose of the present research is to study the lexical stress patterns of Ilami Kurdish, which encompasses both monomorphemic and compound words, by answering the following questions:

- Based on the classification proposed by Kager (1995) and Hayes (1995), what are the stress patterns of Ilami Kurdish dialect?
- Considering the universal phonological constraints of monomorphemic and compound (polymorphemic) words, how are optimal candidates produced in Ilami Kurdish?

The reason why, in addition to monomorphemic words, compounds are also taken into account is that, specifying Kurdish stress patterns in larger units enables us to notice if compounding affects those stress patterns explained for monomorphemic words by changing the position of the primary stress.

As far as lexical stress of Ilami Kurdish is considered, we were unable to find a research work directly related to our study, but there are lots of researches investigating word stress patterns of other languages. For example:

Franzén and Horne (1997) probe word stress in Romanian. They state that one can obtain a better understanding of Romanian stress, if one adopts the view that stress is assigned lexically by rules that interact with morphological rules that attach derivational and inflectional affixes to word stems. It is further argued that derivational, rather than inflectional, affixes can influence word stress in Romanian and this pattern is observed in both nouns and verbs. Respecting the exceptions found in this language, they point to the necessity of including the notion of extrametricality in order for the stress pattern they show.

McCarthy and Cohn (1998) present a complete account of word stress in Indonesian and the ways in which it interacts with affixation, limitations on root structure, syllabification, and reduplication. The analysis is set within Optimality Theory which leads the author to the conclusion that there is no inherent logical connection among Optimality Theory, Alignment and Parallelism.

Frid (2001) gives an introduction to how lexical word stress in Swedish can be analyzed within Metrical Phonology and Optimality Theory. After representing the structure and features of monomorphemic words, he analyzes both compounds and derivatives and discusses how the position of stress may be affected by derivation and compounding. He concludes that a characteristic feature of monomorphemic words is that a grammatical word must have at least one foot, and that there is a preference for left-headed, binary feet finally in the word. The basic foot type is the moraic trochee, but in pre-stress position syllabic trochees may occur. Final stress is avoided, unless marked in the lexicon. Regarding complex words (compound words and derivatives with more than one morpheme), he states that these constructions must be treated on a higher level than the prosodic word, as unlike monomorphemic words, compound words are left-headed.

Khan and Bukhari (2015) give a detailed description of the lexical stress pattern in Pahari, an undocumented and unwritten Indo-Aryan language. After establishing the lexical typology, they assess the stress pattern of monomorphemic words in this language. They claim that Pahari is typologically a quantity-sensitive, rhythmic, and unbounded language. The lexical accent in Pahari depends on syllable weight and shows a "default to the same side" tendency. Additionally, they show that in this language, superheavy syllables bear the main stress irrespective of their place of occurrence in the word and the penult gets the main stress when all syllables have equal weight (heavy-heavy or superheavy-superheavy). They also conclude that when a syllable does not fit into the stress pattern of the language, extrametricality is used to make it fit.

The present paper is structured as follows: section 2 explains the theoretical bases of the study. Section 3 briefly introduces the Kurdish language and its varieties. Section 4 provides information about the research procedure, participants and elicitation tools. Section 5 evaluates the Ilami Kurdish data collected from Ilami native speakers. Section 5 concludes.

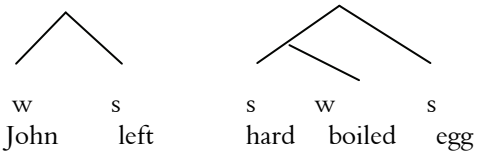
## Theoretical Bases

In order to specify Ilami Kurdish stress patterns, we investigate this dialect to explain how syllable, foot and words become stressed. In order to achieve this goal, we use several means expounded bellow: Metrical Phonology, Optimality Theory and, finally, PRAAT software program, which can acoustically validate the results.

## Metrical Phonology

Standard metrical theory (Hayes 1995; Halle & Idsardi 1995; Halle & Vergnaud 1987) defines stress as the head of a metrical constituent. On this view, whenever there is a foot, there is a stress, and vice versa (Duanmu, 2004).

Originally introduced as a hierarchical theory of stress, this approach has been developed to cover the whole domain of syllable structure and phonological boundaries. The underlying metrical structure of words or phrases may be represented in the form of a metrical tree, whose nodes reflect the relative metrical strength between sister constituents, as in the following examples (w = weak, s= strong) Cristal, 2003:




Regarding the stress patterns of the world's languages, Hayes makes the following claims:

_ That all iambic languages are sensitive to syllable weight (quantity); in particular, they stress every heavy syllable (Prince's (1990) 'weight-to-stress' principle). By contrast, some trochaic languages are quantity-insensitive.

_ That any iambic language, such as Cambodian (Teresa, 1991), may mix feet of the form (◡ ◡ ´), (◡ —´ ), and (—´) within the same word (when ◡ represents light syllables and — represents heavy syllables). Trochaic languages, such as Chimalapa Zoque (Knudson, 1975),are divided into two separate types according to the foot shapes they allow, and 'neither' type is a mirror image of the iambic case.

(1) **Iamb** (◡ —́) or, if necessary, (◡ ´) or (—́ )

(2) **Moraic Trochee** (´ ◡) or (—́ )

(3) **Syllabic Trochee** (´σσ), where each σ may be either — or ◡

_ That iambic languages often lengthen stressed syllables in branching feet (**iambic lengthening**, or **IL**), turning (◡ ´ ) into (◡ —´ ). Trochaic languages do not.

_ That iambic languages often assign feet from left to right (LR): there are no clear cases of RL iambs. Trochaic languages may assign feet in either direction.

_ Additional fact: For trochaic languages, LR footing is in complementary distribution with final-syllable extrametricality. (This is a striking gap in the languages that Hayes catalogs, though Hayes does not explicitly note it, and to our knowledge it has not been previously noticed) (as cited in Eisner, 1997).

**Optimality Theory**

In Optimality Theory (OT), phonology is considered a universal set of constraints which are hierarchically ranked on a language-specific basis. The relation between input and output of linguistic units is accounted for by respectively generating for each input all possible outputs and evaluating these outputs so as to select the optimal one. Importantly, constraints may be violated, depending on the ranking of other constraints. (Gussenhoven & Jacobs, 2012). For example, in English, the negative prefix 'in'- (e.g. 'insufficient') has two output forms, 'im'- (before bilabials, as in 'impossible', 'immodest'), and 'in'-elsewhere ('inarticulate', 'involuntary', etc.). The co-existence of these forms means that there is conflict between the class of Faithfulness constraints (which require identity between input and output) and Markedness constraints that impose unmarked structures on the output, such as the class of constraints, which impose restrictions on possible sequences of sounds-in this case, a constraint requiring that adjacent consonants have identical place of articulation-which needs to be resolved by an appropriate ranking of the relevant constraints (Crystal, 2003).

This is basically a table containing constraints that, by convention, are ranked from highest on the left to lowest on the right along the top row of the tableau. Down the left-hand column are the possible output candidates, which are generated by a function referred to as GEN. Possible output candidates may take any form, but typically those candidates closest to the optimal output candidate are represented in the tableau for space considerations. In the top left-hand corner is the input form. Given below is the general tableau of OT:

**Table 1.** Optimality theory general tableau (Katamba & Stonham, 2006).

| INPUT | Constraint 1 | Constraint 2 | Constraint 3 |
|---|---|---|---|
| Candidate A | ⋆! | | |
| ☞Candidate B | | | ⋆ |
| Candidate C | | ⋆! | |
| Candidate D | | | ⋆⋆! |

As shown in Table 1, violations of constraints are indicated by the diacritic <⋆>. Fatal violations, that is, the most serious violations of a non-optimal candidate, are indicated by <!> and the optimal output candidate is marked by <☞>. In order to separate constraints that are ambivalent as to ranking, we employe a dashed line (Katamba & Stonham, 2006).

Frid (2001) uses the following constraints to assess the stress patterns of monomorphemic and

derivatives in Swedish. In order to analyze the stress patterns of Ilami Kurdish words, we also use these constraints to evaluate the adequacy of such phonological constraints and to observe in which order these constraints should be ranked.

FOOT-BINARITY

Feet consist of two syllables *or* two morae.

WEIGHT-TO-STRESS PRINCIPLE (WSP)

Bimoraic syllables are feet heads.

RHYTHTROCHEE

Feet are left-headed.

F'RIGHT

Words are right-headed; the right edge of the word is aligned with the right edge of a strong foot.

ALIGN-FOOT-RIGHT

Feet are formed from left to right in the word.

GRWD=PRWD

A grammatical word must be a prosodic word.

STRESS-TO-WEIGHT PRINCIPLE (SWP)

Feet head are (minimally) bimoraic.

SUPERHEAVY-TO-STRESS PRINCIPLE (SHSP)

Trimoraic syllables are strong foot heads.

NONFIN

Main stress does not come on the final syllable.

NOCLASH

Foot heads are not adjacent.

SYLMON

Syllables are monomoraic.

WEIGHT-BY-POSITION' (WBP')

Starting at the main stressed syllable, coda consonants are moraic.

HEADMATCH(FT)

A foot head specified in the input form is also foot head in the output form.

## Kurdish Language

Kurdish as a new western Iranian language is used as a medium of communication by a multitude of speakers settling in wide geographical areas of Iran, from west encompassing Kurdistan, Kermanshah and Ilam to the east (Khurasan), Iraq, Turkey, mainly in the east and southeast of the country, and Syria. There are also Kurdish speakers settled in east of Caspian Sea, central Anatolia and also Armenia, Azerbaijan and Turkmenistan. Based on approximations, Turkey, Iran and Iraq shelter 43, 31 and 18 percent of the Kurds, respectively. There are 6 percent of the Kurds living in Syria and the remaining 2 percent live in the former Soviet Union, mainly Armenia and Azerbaijan (Gunter, 2004).

This language has three main dialect groups: The northern Kurdish dialects usually called *Kurmanji* are spoken in northwest Iraq, Turkey and Khurasan, in Iran; (Gunter, 2004). Regarding the central Kurdish dialects, there are two main dialects, namely, *Mukri*, which is spoken in Iran, to the south of Lake Urmiya, and *Sorani*, to the west of Mukri, in the province of Erbil, in Iraq. The southern Kurdish dialect group includes *Kermanshahi*, *Laki* (and also *Ilami*) (Asatrian, 2009; Mackenzie 1963; Oranskij, 1979).

The linguistic variations of these dialects are so great that it is possible to say every tribe and every valley has its own dialect. It seems that this phenomenon is common to all people living in mountainous areas. Although, the lexical resource of Kurdish is basically Iranian, it has been influenced by Arabic, especially in the religion module. It should be stated that as the majority of the Kurds are Muslims (with a minority of Jews and Yazidis), naturally the language of the Koran is essential for them (Bois, 1966).

Ilami, a less studied dialect, is one of the Kurdish varieties, which is spoken by about 200000 individuals in Ilam, a small mountainous city located in the west of Iran. Ilami shares some features with Kermanshahi in most of its linguistic (e.g. syntactic, morphological and lexical) modules, but shows some idiosyncratic characteristics too.

Ilami Kurdish, like many Iranian varieties, has lost its gender and case marking systems in nouns and pronouns. This can be considered as a sharp distinction in comparison with the owning varieties of Kurmanji which mark gender and/ or different cases. In contrast, Ilami has pronominal affixes used to construct case relations which are not usually found in northern dialects of Kurdish (Bynon, 1979).

## Methodology

Data come from 9 Ilami native speakers who have lived in the region for a long span of time. The procedure of data collection was carried out within a period of 2 months, altogether. It might be worth mentioning that participants were all adults over 25 years old of both genders (5 females and 4 males). For eliciting the relevant data, both pictures (for concrete entities) and written forms (for more abstract ones) were used. After looking at the relevant picture/written form shown, they were requested to articulate the Kurdish term for that picture/written form and then judge the phonological and morphological structure of the words including, but not limited to, syllable and main stress identification.

In order to record their voices, a microphone attached to a computer was used. Then, we used PRAAT software package to evaluate the acoustic nature of some of the compounds. This tool, on one hand, enables us to observe the stress patterns of compound words in a more concrete way, and to validate the Optimality's results on the other. Praat was designed by Paul Boersma and David Weenink at the University of Amsterdam. It is a scientific computer software used to analyze speech in phonetics:

Roach states that

> […] all stressed syllables in words have one characteristic in common, namely, 'prominence'. Prominence is produced by four main factors: (i) loudness (intensity), (ii) length, (iii) pitch (Fundamental Frequency/ F0), (iv) quality. Generally, these four factors work together in combination, but experimental works have shown that these factors are not equally important; the strongest effect is produced by pitch, and length is also a powerful factor. Loudness and quality have much less effect" (Roach 2009, p. 74).

Thus, stress is represented as a rise in pitch, greater intensity (loudness) or greater vowel length. In order to analyze it, we use various elements of acoustic analysis, such as waveform, spectrogram, and pitch contour as illustrated in Figure 1:

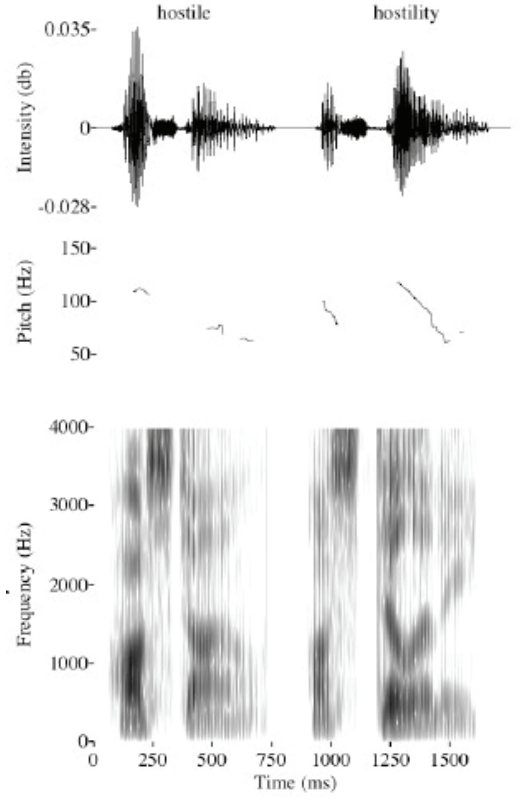



**Figure 1.** The waveform, spectrogram, and pitch contour of sound (Roach, 2009).

- At the top, the waveform indicates the greater intensity of the stressed syllable,
- In the middle, it presents the higher pitch shown in the pitch track,

At the bottom, the spectrogram indicates the greater length of the stressed syllable (Roach, 2009).

## Findings

In this section, within the Metrical Phonology and Optimality Theory frameworks, Kurdish data will be analyzed. It should be noted that the findings of the study are a collective finding of all participants. Additionally, for the analysis of the stress pattern of compound words, sample spectrograms were given.

## Metrical Phonology and Ilami Words

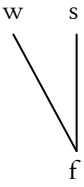
In order to specify Ilami Kurdish stress pattern, we will examine this dialect through relevant data to see how syllable, foot and words become stressed. At the first step, we examine Ilami Kurdish data based on the criteria proposed by Kager and Hayes including 'Boundedness', 'Quantity Sensitivity', 'Word Headedness', 'Foot Headedness', and 'Directionality'.

## Boundedness

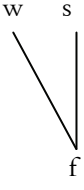
A major distinction can be drawn between systems in which stresses fall within limited distances, both from each other and from word edges, and systems where the distribution of stresses is not restricted in this way. The relevant parameter of boundedness has two values: bounded and unbounded. Bounded feet contain no more than two syllables, while unbounded feet are not subject to any restrictions on size (Kager, 1995) .

The following examples taken from Ilami native speakers indicate in which class Ilami Kurdish is placed, bounded or unbounded:

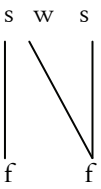
(4) *mu.* ˈ*rəʒ* 'ant'



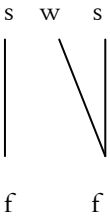

(5) *qə.* ˈ*la* 'crow'



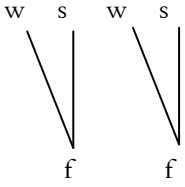
(6) *kæl.læ.* ˈ*ʃer* ‘rooster’




(7) *mæl.li.* ˈ*tʃəg* ‘sparrow’




(8) *kwə.tʃəg.ga.* ˈ*nəg* ‘a kind of rectangular stone’




As shown above, a disyllabic foot is regularly made of a weak (= w) and strong (=s) syllable. It is noteworthy that the main stress of the word is usually realized on the final syllable of the ultimate foot, which is marked with a small raised vertical line (ˈ).Nevertheless, there is a specific phonological context where the primary stress falls on the initial syllable of the disyllabic words. This point is illustrated by the Kurdish examples given below:

(9) ˈ*rɐ.qwəl* ‘a kind of local vegetable’
(10) ˈ*nɐ.qwəl* ‘candy’
(11) ˈ*nɐ. qət*! ‘shut up’
(12) ˈ*ʃɐ. kər* ‘thought’
(13) ˈ*ʃɐ. kər* ‘thanks God!’

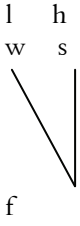
Here is the first syllable of the disyllabic words that bears the primary stress. Another characteristic worth noting is that this is the neutral way of articulating the words (and not, for example, the focalized forms of the words, which is irrelevant to our discussion).

Based on the examples mentioned thus far, it can be stated that Ilami Kurdish is a ‘bounded’ variety which places the strong stress on the rightmost syllable or seldom on the leftmost syllable of the foot.

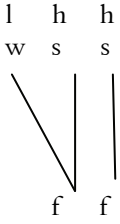
### Quantity Sensitivity

This parameter represents whether a language distinguishes between different syllable weights or not. In Quantity-sensitive languages, the weight of different syllables plays an important role in the construction of feet. For example, in Pahari language,there is a concordance between syllable weight and the placement of primary stress (Khan & Bukhari, 2015). According to this criterion, we can determine whether Ilami Kurdish is a QS or QI variety:

(14) *dʊ̈.* ˈ*jæt* ‘girl’




(15) *rʊ̈.tʃær.* ˈ*məg* ‘aged man’




(16) *də.* ˈ*kɑn* ‘store’


As shown above, strong syllables are always heavy and in contrast, weak ones are light. At least, based on the analyzed examples, it can be assumed that Ilami Kurdish is a quantity-sensitive variety.

### Foot Headedness

Feet are classified as ‘left-headed’ (the leftmost rhyme is stressed) or ‘right-headed’ (the rightmost rhyme is stressed) (Crystal, 2003). As far as Ilami Kurdish is taken into consideration, it is the rightmost syllable which plays the head role in the feet. So as a quantity-sensitive variety, Ilami feet could be either (x) or (.x) accordingly.

(17) *xwæl.læ.* ˈ***ku*** ‘ash’
l hh
IAMB (. x) (x)

(18) *wa.* ˈ***ran*** ‘rain’
l h
IAMB (. x)

### Word Headedness

Respecting Ilami examples, it seems that in Ilami words the head (=strong foot) tends to be right-bounded. Should we take the following examples into account, we figure out that the strong foot is always right-bounded. For this reason, ERF (end rule final) places the x, indicating the main stress, at the right edge of the word.

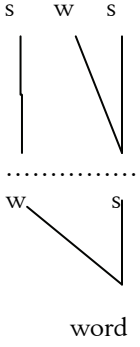
(19) *xu.wa* 'salt'
l h
IAMB (.x)
ERF ( x)
(20) *re.war* 'pedestrian'
l h
IAMB (. x)
ERF ( x)

### Directionality

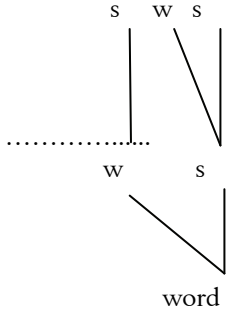
One parameter of directionality determines the direction in which foot construction scans the stress domain: starting at the right edge (right to left), or at the left edge (left to right). As a rule of thumb, construction starts at the word edge where the stress pattern is invariant, while at the other edge it systematically varies with the number of syllables in the word (Kager, 1995).

In order to know whether foot construction is a right to left or left to right procedure, we will analyze the following examples:

(21) *xwæl.læ.ku* 'ash'




(22) *bæl.læ. tʃæq* 'elbow'




As the strong stress is always realized on the right side of the word, the construction of the foot seems to be a right-to-left process.

### Optimality Theory and Ilami Monomorphemic Words

In this part of the research, we testify our Kurdish data in OT to see how relevant constraints are ranked and in what ways the optimal output(s) win the competition:

**Table 2.** Evaluation of /təlizən/ (TV).

| /təlizən/ | Noclash | Swp | F'right | Footbin | Sylmon | Nonfin |
|---|---|---|---|---|---|---|
| ☞a.(tə.li)'(.zən) | | | | | ⋆ | ⋆ |
| b. '(tə.)'(lizən) | ⋆! | ⋆ | | ⋆ | ⋆ | |
| c. (tə.li.)zən | | | ⋆! | | ⋆ | |
| d. '(tə.li)(zən) | | | ⋆! | | ⋆ | |
| e.(tə.li.zən) | | | | ⋆! | ⋆ | |

According to Table 2, candidate (b) could not be the optimal output due to the violation of NOCLASH, SWP and FOOTBIN constraints. Candidate (c) and (d), on the other hand, violate F'RIGHT constraint as the strong feet of the mentioned candidates are positioned at the left edge of the words. Candidate (e) violates the FOOTBIN constraint, which commands the feet to be made of two syllables or two morae each. Finally, it seems that candidate (a) satisfies all the constraints other than the non-fatal constraint NONFIN, according to which 'the main stress is not realized on the final syllable'.

**Table 3.** Evaluation of / tæmɑtæ / (tomato).

| /tæmɑtæ/ | Noclash | Swp | F'right | Footbin | Nonfin |
|---|---|---|---|---|---|
| ☞a.(tæ.mɑ)'(.tæ) | | | | | ⋆ |
| b. '(tæ.)'(mɑ.tæ) | ⋆! | ⋆ | | | |
| c. '(tæ.mɑ).tæ | | | ⋆! | | |
| d. tæ.mɑ.)(tæ) | | ⋆! | ⋆ | | |
| e. tæ.mɑ.tæ) | | | | ⋆! | |

As shown in Table 3, both candidates (b) and (d) violate SWP constraint because they contain feet with less than two morae. Candidate (b) also does not satisfy NOCLASH, as feet heads are adjacent. Respecting candidates (c) and (d), they both violate F'RIGHT constraint, and ultimately candidate (e) violates FOOTBIN constraint. The optimal candidate which again violates NONFIN constraint will be our optimal output.

**Table 4.** Evaluation of / qwəruʒənæk / (Adam's apple).

| /qwəruʒənæk/ | Noclash | Swp | F'right | Footbin | Sylmon | Nonfin |
|---|---|---|---|---|---|---|
| ☞a.(qwə.ru.)'(ʒə.næk) | | | | | ⋆⋆ | ⋆ |
| b.'(qwə.)'(ru.ʒə.næk) | ⋆! | ⋆ | ⋆ | ⋆ | ⋆ | |
| c.(qwə.ru.ʒə.)'(næk) | | | | ⋆! | ⋆ | ⋆ |
| d. (qwə.)(ru.ʒə.)'(næk) | | ⋆⋆! | | ⋆⋆ | ⋆ | ⋆ |

Analyzing Table 4, we notice that candidate (b) has violated several constraints, including SWP, NOCLASH, F'RIGHT,and also FOOTBIN, SYLMON. It is important to bear in mind that SYLMON is a non-fatal constraint; therefore, candidate (a) is still our optimal output, regardless the violation of this constraint twice. Candidates (c) and (d) violate the same constraint and were eliminated from the winning list. Moreover, candidate (d) violates SWP which is a fatal limitation.

As stated before, there are some phonological contexts where the initial syllable of the (foot) takes the main stress and becomes the head of the foot. It is a little baffling why the first (and not the last) syllable of the foot is stressed.

By analyzing our Kurdish data, we figured out that these cases are originally monosyllabic and the dominant tendency is to make them disyllabic through inserting a schwa sound into the coda:

(23) *rɐqwl* → *ˈrɐ.qwəl*

It should be noted that this insertion process does not shift the stress to the next syllable which is the regular pattern in Ilami Kurdish.

**Table 5.** Evaluation of / rɐqwəɭ/.

| /rəqwɭ/ | Nonfin | FT |
|---|---|---|
| ☹a. ˈ(rɐ.qwəɭ) | | ⋆ |
| b. (rɐ. ˈqwəɭ) | ⋆! | ⋆ |
| ☹c. ˈ (rɐqwɭ) | | |

Note: The unhappy face (☹) indicates an undesirable optimal candidate (Katamba & Stonham, 2006).

As seen in Table 5, candidate (b) violates NONFIN constraint, which is considered as a fatal limitation. On the other hand, candidates (a) and (c) are both optimal as FT does not lead to the candidate's expulsion from the optimal set, ,that is to say, the insertion of schwa seems to be optional in this context and the use of such forms supports this fact.

### Compounds

As pointed out earlier, studying compound words can help us know whether they have similar stress patterns in comparison with monomorphemic words. In other words, by studying these cumulative constructions, we can figure out if combining several morphemes can affect the stress pattern of monomorphemic words. Below are some examples of Kurdish compounds that are composed of two or more morphemes. For convenience's sake, word by word translation is given for each example.

(24) *nam ˈzəg* 'the internal organs of the tummy'
inside tummy
(25) *zəg ˈqej* 'fat'
tummy big
(26) *ʃiwə ˈra* 'brother in law'
husband brother
(27) *tʃ͡æqu ˈdæm* 'shrewd'
knife mouth
(28) *xwar ˈza* 'nephew/ niece'
sister born
(29) *rö ˈdar* 'impolite'
face having
(30) *dʒ͡a xuri peja ˈlæ* 'a kind of dish'
place pot glass
(31) *dæ maɭ aw dær kəri ˈjag* 'despicable'
from house towards out made

As can be seen, in all the compounds mentioned above, this is the final syllable of the last foot that takes the primary stress of the construction. In other words, it does not matter how long the compound is, because the strong stress falls on the final syllable by rule. Obviously, before combining, each morpheme has its own strong stress; however, when combined with other morphemes, they may behave in two different ways: 1) if placed at the left side of the word, it will not bear the strong stress (but it may take the secondary/tertiary one), 2) if placed at the right side of the word, the final syllable always takes the strong stress. Should we take examples (24) and (25) into consideration, we figure out that /zəg/, in both examples, participates in the word creation process. However, in the former, it is placed at the right side of the word and takes the strong stress;nevertheless, in the latter as the leftmost morpheme,it does not take the main stress. The spectrograms of these words are represented in the figures 2, 3 and 4.

As shown in Figure 2, this is the rightmost syllable of the word /nɑmzəg/ which takes the primary stress. In the same vein, the primary stress tends to the right edge of the word /zəgqej/ which is shown below (Figure 3).

Figures 2 and 3 confirm the fact that lexical stress in Ilami compound words/ syntactic phrases is not sensitive to the words themselves, but only to the position in which they appear. An acoustic analysis of a longer compound shows further concrete evidence of this fact (Figure 4).

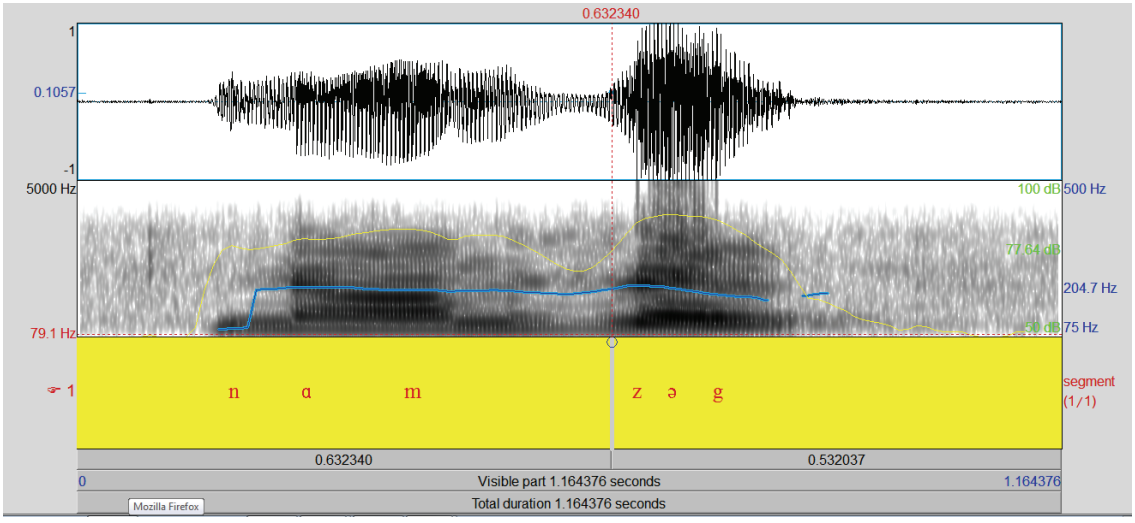



**Figure 2.**Spectrogram of /nɑmˈzəg/.

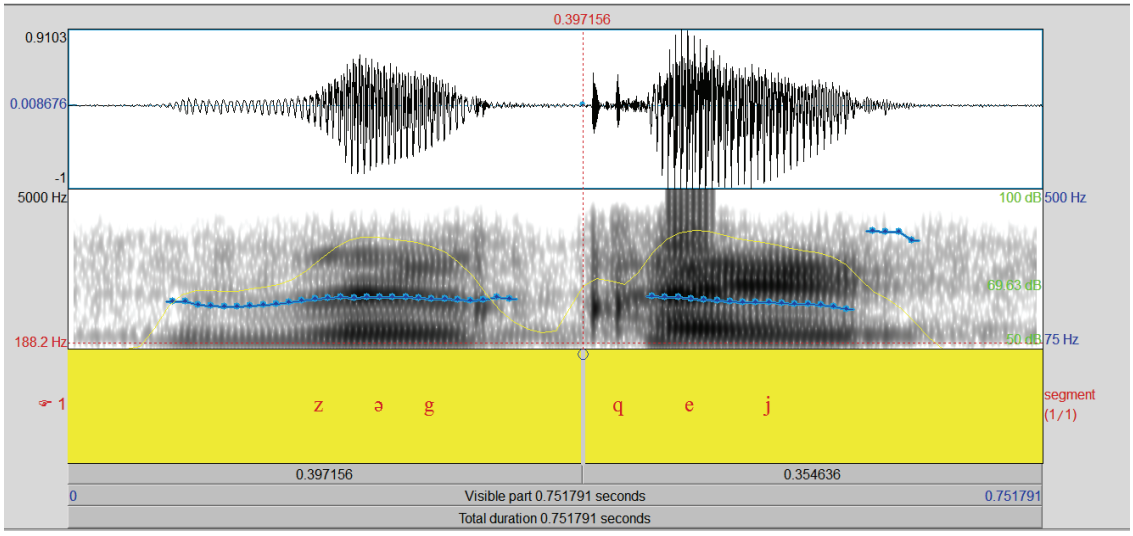



**Figure 3.**Spectrogram of /zəgˈqej/.

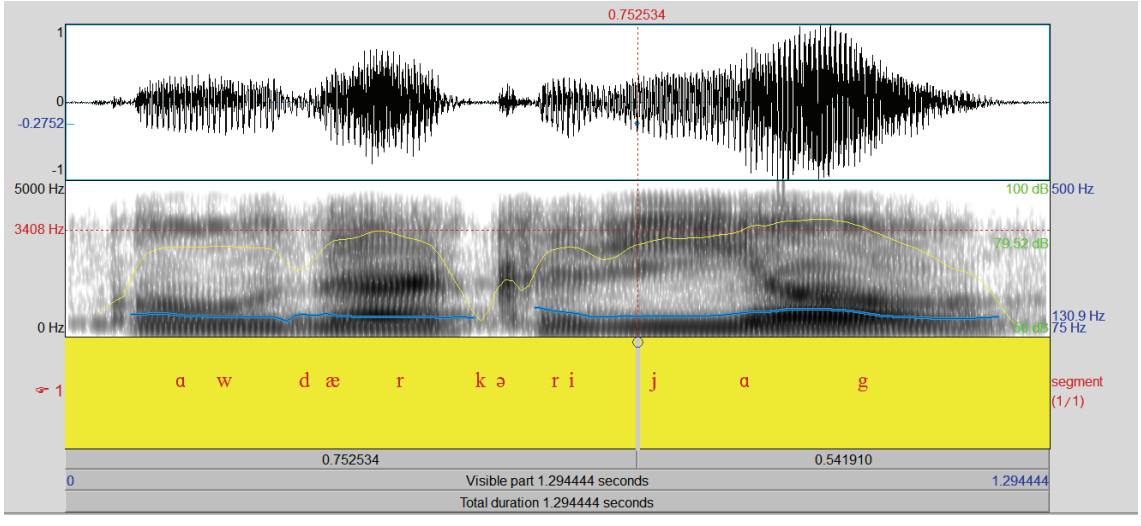



**Figure 4.** Spectrogram of /ɑw dær kəriˈjɑg/.

Figure 4, representing the word /ɑw dær kərijɑg/,also tells us that the length of the word may not affect the position of the primary stress. The fact that primary stress is systematically realized on the final syllable of the compound words leads to the violation of the MAIN-LEFT (C) constraint,according to which the head of a clitic group (i.e. a group of morphemes and the like) is always the leftmost element of the group. It has already been stated that this way of articulating the words is the neutral form and in this paper the pragmatic effects of speech on stress position were not discussed.

## Conclusion

In this paper, the stress patterns of Ilami Kurdish monomorphemic and compound words were analyzed. Based on the analyzed data, it could be concluded that Ilami is a right-bounded variety; nonetheless,there are some cases which surprisingly place the strong stress on the first syllable of the word. In addition, by using the OT framework, we represented how the candidates may violate the universal constraints and the way the optimal candidate wins the competition. Based on the analyzed data, relevant OT constraints could be ranked in the following way:

NOCLASH, SWP, F'RIGHT, FOOTBIN>> SYLMON, NONFIN

NONFIN>>FT

We should keep in mind that the ranking shown in (b) is restricted to the exceptional cases, where the stress position is determined differently (see table 4).

Regarding the compound words of Ilami Kurdish, it is predictably the rightmost syllable of the word that takes the strong stress and the length of the word does not affect the position of the main stress. There is a sharp difference between the stress pattern of compound words in Ilami and Swedish. As mentioned above, in Swedish (Frid, 2001), there are differences between monomorphemic and compound words in terms of positioning the stress. This led Frid (2001) to define different constraints for compound words. In contrast,Ilami Kurdish shows similarities between monomorphemic and compound stress patterns as both are considered as right-headed varieties.

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