A Comparison of the Pedagogical Applicability of Two Approaches to Teaching English Word Stress Patterns

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Abstract
The present study has compared the pedagogical applicability of Dickerson's (1989) four word stress rules with Yamini's (1997) three word stress rules in the Iranian EFL context. The two different sets of rules were taught to 64 freshmen in an Iranian university, who were assigned to two homogenized groups of 32 students. At the end of fourteen-week instructions and after administering the post-test, it was confirmed, through an independent-samples t-test, that there was no significant difference between the mean scores of the two groups. In other words, both approaches yielded similar results in predicting and detecting lexical stress in the Iranian EFL situation. Meanwhile, a paired t-test indicated that learning the rules of word stress and vowel quality patterns had improved the students' pronunciation to a great extent, in comparison with the results of the pre-test.

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Introduction

Lexical stress is an area of the sound system where the learner needs careful guidance from the teacher (Dickerson, 1989). It indicates the placement of stress on a specific syllable within a word. Correct word stress patterns are essential for the learner's production and perception of English. If a non-native speaker produces a word with the wrong stress pattern, an English listener may have difficulty understanding the word, even if most of the individual sounds have been well pronounced (Kenworthy, 1990).

"For many reasons, the centrality of word stress has not been appreciated by pronunciation teachers or materials developers" (Dickerson, 1981, p. 57). The researcher knows teachers who believe that there is no need for EFL students to get, even reasonable, mastery over correct stress patterns. They continue to believe that the goal is communication, and the important point is that a speaker be understood by a listener. But it should be borne in mind that students are good imitators. Whether a teacher pronounces the word adoLEscent, for example, with the correct stress on **é** or aDOlescent with a wrong stress on **ó,** students try their best to imitate him/her while they are not aware which pattern is right. It is the teacher's responsibility to provide students with accurate models.

Generally, in English, stress is variable, but this does not mean that we are allowed to put stress on whatever syllable we choose. The place of stress is predictable and rule-governed (Kreidler, 1993). If learners are taught how to accent a syllable or word on the basis of stress rules and how to pronounce it according to vowel quality patterns, provided that the rules are internalized, they will get equipped with a mobile dictionary of pronunciation in the mind and they need not look up the stress patterns of most English words in a dictionary. This necessitates the explicit teaching of lexical stress patterns as the correct placement of stress can affect the perception of comprehensibility, as well, "the degree to which a speaker's utterance is understood by a listener" (Tarone, 2005, p. 493). In the same line, Sardegna (2009) indicated that intensive instruction in the use of pronunciation learning strategies was effective for improving students' reading of English word stress. Also, Hismanoglu (2012) found that teaching word stress patterns to Turkish EFL learners had profound effects on their correct detection and utterance of stressed syllables.

Dickerson (1989) and Yamini (1997) are two researchers who have worked on lexical stress patterns in the English language. They have innovated two sets of different, but related rules by means of which they predict and detect stressed words or syllables. The purpose of this study is to compare and evaluate the applicability of these rules to the teaching of stress to Iranian EFL students. The two sets of stress rules are compared and investigated to see which one lends itself more readily, satisfactorily and effectively to language pedagogy. In addition to their stress rules, Dickerson and Yamini have originated different approaches to teaching vowel quality patterns. It is believed that learning stress rules by themselves without taking account of how individual elements of words, that is vowel and consonant letters, are pronounced does not guarantee adequate improvements in pronunciation and ultimately leads nowhere. Therefore, the researcher decided to provide a course in which vowel quality patterns were taught along with the rules of stress. Unfortunately, time limitations prohibited the treatment of equally important consonant rules.

This study was limited to a practical comparison of the predictive accuracy and pedagogical applicability of Dickerson's (1989) rules of primary stress and vowel quality patterns with those of Yamini's (1997). Other degrees of stress than the main do not concern us here, nor do the sounds of consonants. I will not attack the rhythm or intonation of the English sentences, either.

The linguists who first suggested applying rules for detecting stressed syllables were Yarmohammadi and Pouretedal, 1996, p. 8).They devised rules utilizing spelling as a guide to spot word stress. They showed that spelling patterns include enough information as to which syllables should be stressed. But their rules are only a theory and do not have any instructional value. "These rules, as they are, are not pedagogically applicable to EFL situations" (Yarmohammadi and Pouretedal, 1996, p. 8). Wayne Dickerson (1989) is an expert who translated Chomsky and Hallé's (1968) stress rules into a framework to be applicable to language pedagogy. He modified the previous rules for the learners to help them predict stress and vowel quality patterns through orthography, and devised his four word stress rules. For more pedagogical applicability, Dickerson's (1989) rules have been simplified and consolidated by Yarmohammadi (1996), whose work this author mostly benefits from in this study.

On the other hand, Yamini (1997) innovated a set of three word stress rules utilizing a numerical system in order to predict and detect word stress and vowel quality patterns. In his study, each vowel receives a number according to its position in the word. Although his work is different from Dickerson's in methodology, one could say that the two approaches are, to some extent, related because both of the scholars take spelling into consideration as a point of departure. In the following sections, Dickerson's and Yamini's approaches to teaching lexical stress and vowel quality patterns will be briefly discussed, respectively.

Dickerson's Four Word Stress Rules (Yarmohammadi, 1996)

To understand Dickerson's rules, the most requisite information is distinguishing two expressions basic in the application of the rules, namely the Key Syllable and the Left Syllable. "The Key Syllable is the last vowel spelling pattern and all extra letters at the end of a word or before an ending" (Dickerson, 1981, p. 63). Examples:

relev/ANT (V stands for a vowel letter and C for a consonant.)
VCC = the Key Syllable

forg/ET tomat/O bes/IDE
VC Key (K) V K VCe K
(In this system, a word-final **e** after a consonant letter is not considered a vowel.)

"The Left Syllable is the vowel spelling pattern and all extra letters immediately to the left of the Key" (Dickerson, 1981, p. 64). Examples:

un/EV/en pr/AGM/atism c/IRC/ul/ar/ly
Left/K K / Ending (E) L /K/ E/ E

It should be noticed that both the Key and the Left syllables begin with a vowel letter.

As for endings, they are of two types, neutral and stress-governing (Dickerson, 1981 and Yamini, 1997). Neutral endings, such as **-s**, **-'s**, **-ly**, **-ful**, and **-ness**, have no effects on the placement of stress or on vowel quality patterns. By contrast, stress-governing endings, such as **-al**, and **-ion (-on)**, have deep effects on both stress and vowel quality. It is therefore important to distinguish the two types of endings. The relevant criteria are simple. All neutral endings start with a consonant letter, whereas all stress-governing endings begin with a vowel letter. With regard to stress assignment, neutral endings are treated as 'invisible'. Neither Yamini nor Dickerson takes neutral endings into account when assigning stress to words. In other words, whenever they talk of endings, they mean stress-governing endings.

1. Prefix Weak Accent Rule (PWAR)

> ***From the Key: Accent Left but not a prefix. If you can't accent Left, accent Key.***

In all the four rules, stress is assigned on the basis of endings, and different endings belong to different rules. In other words, it is only after recognizing the nature of endings that it will be possible to decide on which rule to operate. In the domain of rule number one are the following endings: (In the examples, **P** stands for a prefix or part of a prefix and **N** for a neutral ending.)

No	Category	Parts of Speech	Examples
1	Short Verbs	verbs	l/IM/it, def/INE L /K P/ K
2	-ible Keys	noun, adj, adv	v/IS/ible/ness, dig/EST/ible L/ K / N P/ L /K
3	-able	noun, adj, adv	m/EM/or/able, appr/OV/able L /K/ E P / K / E
4	-age	noun, adj	c/OV/er/age, adv/ANT/age L /K/ E P / K / E
5	-al	noun	cANNibal, commITTal
6	-ar	noun, adj, adv	pOPular, subsOLar
7	-ary	noun, adj, adv	sECRetary, prelIMinary
8	-atism	noun	prAGMatism,consERVatism
9	-atist	noun	dOGMatists
10	-ative	noun, adj, adv	tALKatively
11	-atize	verb	AUTomatizes
12	-atory	noun, adj, adv	mIGRatory
13	-ature	noun	lITerature
14	-en	all words	cITizens
15	-er	noun, adj, adv	thermOMeter
16	-ery	noun, adj	wATeriness
17	-ive	noun, adj, adv	sENsitive
18	-or	noun, adj	profESSor
19	-ory	noun, adj, adv	cATegory
20	-ure	noun	advENTure

Table 1: PWAR

As an example, in the word AVerage, ***-age*** is the ending, ***-er-*** the Key, and ***-av-*** is the Left. According to the rule we stress –**av-** because the Left is not part of a prefix. But in the word refORMatory, **re-** is a prefix and cannot, as the rule says, carry stress, so the Key is accented.

2. V/VC Weak Accent Rule (VWAR)

From a V or VC Key: Accent Left. If you can't accent Left, accent Key.

In the word domains of the VWAR are some endings other than the ones mentioned in the previous rule domain.

No	Category	Parts of Speech	Examples
1	-ic Keys	all words	acad/EM/ic, hist/OR/ic L /K L /K
2	-al	verb, adj, adv	t/OT/al/ly, ext/ERN/al L /K/N L/ K / E
3	-an	noun, adj, adv	AFR/ic/an, h/UM/an/ly L /K/ E K / E/ N
4	-ance	noun	tOLerance, abUNDance
5	-ancy	noun	ELegancy, relUCTancy
6	-ant	noun, adj, adv	cONSonant, IGNorantly
7	-ence	noun	exISTence, indepENDence
8	-ency	noun	AGencies, inconsISTency
9	-ent	noun, adj, adv	prESident, absORBent
10	-is	noun	EMphasis, megAPolis
11	-oid	noun	dELToid, trAPezoid
12	-ous	adj, adv	gENerous, nERVousness
13	-um	noun	OPTimum, referENDum

Table 2: VWAR

For instance, in the word prESident, the Key Syllable ***-id-*** is a VC, so stress moves to the Left. However, in referENDum, the Key Syllable ***-end-*** is not a V or VC but a VCC, and according to the rule, the Left cannot be stressed, so accent must stay on the Key.

3. Key Strong Accent Rule (KSAR)

For strong sequences: Accent the Key Syllable.

Strong sequences are of two groups:

1) ia, iate, iable, ience, ion, etc., which begin with **i** and are called **iV** sequences; and
2) ea, eal, ean, eum, eous, etc., which start with **e** and are termed as **eV** sequences.

The reason why they are called sequences and not endings is that endings, obviously, occur at the final positions of words, but these strings appear both word finally and medially. The domain of this rule is as follows. (In the examples, S stands for a strong sequence.)

No	Category	Examples
1	Strong iV sequences	m/ED/iate, adv/ERB/ial, ass/OC/iate K / S K / S K / S VirgINia, CanADian, sEriously OPium, evolUTion, disobEDience intERior, automATion, promOTion
2	Strong eV sequences	OC/ean, petr/OL/eum, simult/AN/eous/ly K / S K / S K/ S / N lINear, AReas, stEReo, NapOLeon

Table 3: KSAR

4. Left Strong Accent Rule (LSAR)

For terminals and short nouns: Accent the Left Syllable.

In short, terminals are the last spelling patterns of long words of three or more syllables in their uninflected forms. Because the last spelling patterns of long words which have not been treated by the previous rules are neither an ending nor a sequence, the expression terminal is used. In words with terminals, the Key is the vowel spelling pattern and all extra letters immediately to the left of the terminal. Furthermore, short nouns are nouns with only two syllables in their uninflected forms. Here, the Key is the last spelling pattern and all extra letters at the end of the word. The following are the word domains of the LSAR. (T stands for a terminal.)

No	Category	Parts of Speech	Examples
1	-acy (a unit)	long noun	c/OMP/lic/acy, ULT/im/acy L / K/ T L / K/ T
2	-ate	long words	cert/IF/ic/ate, ass/IM/il/ate L/ K/ T L /K/ T
3	-ish	long adj	dr/AG/on/ish, cl/EV/er/ish/ly L / K/ T L /K/ T / N
4	-ism	long noun	met/AB/ol/ism, cr/IT/ic/ism L /K/ T L/K/ T
5	-ist	long noun	cOMMunist, ecONomist
6	-ize (-ise)	long verb	rECognizing, fOSSilize
7	-y	long noun	electrICity, photOGRaphy
8	-y	long -fy words	clARifying, sATisfy
9	Other Terminals	long noun, verb, adj	bOOMerang, cONSTitute tELegram, phOTograph
10	Short Nouns	short noun	stOMach, mODern EXPert, lIZard

Table 4: LSAR

Yamini's Three Word Stress Rules (Yamini, 1997)

In Yamini's system a numerical approach is used. From the end of the word toward the beginning each vowel is assigned a number according to the place it is in. That is, the last vowel on the right gets number 1, the second number 2 and so on and so forth. The consonants are numbered 0. Consonant clusters of two or more are assigned 00, but no more 0s because clusters of more consonants will not affect the stress and vowel quality pattern of the word.

Examples: d I f f e r e n t , g l O b a l
300 20 1 2 0 1

Yamini's rules are briefly explained in the following.

1. The 2001 Stress Rule

1) N= 2001 / 2X*1 → 2′ (N stands for number)
2) N= 3201 → 4′
3) N< 2001 → 3′
4) 3ø → ′2

If the number is 2001, or if 2 is followed by 001 or X, the number 2 vowel receives the main stress.
Examples:

d e p E n d e n t	, c O m m on l y	, a v O i d a n c e
2 0 0 1	2 0 0 1	2 X0 1

In assigning numbers to vowels, one may come across combinations of vowels. Care should be taken not to go wrong. It should be asserted that the combinations of two vowels which begin with **a**, **e**, or **o** are numbered differently from those beginning with **u** or **i**. When numbering, in the former case the rightmost vowel is marked as an 'X' and the left vowel is given a suitable number in accordance with its position in the word. Examples:

a c c O u n t a n t ,	c o n v E y a n c e
2 X 00 1	2 X 1

In the latter, the combinations starting with **u** or **i** are assigned two consecutive numbers in accordance with their positions in the word. Examples:

c o n v E n t i o n a l ,	p r o f E s s i o n
4 0 03 2 0 1	3 00 21

In cases where two consecutive numbers form 32, the stress may be shifted to 4. Examples:

e d u c A t i o n a l ,	s u b s t i t U t i o n a l
4 0 32 0 1	4 0 32 0 1

This is true provided that stress does not stay on 2. In the word oriEntal, for example, the 2001 is made, thus the stress falls on the penultimate syllable although there is a 32 in the word. If the number thus made is less than 2001, the left of the number, that is 3, is stressed. Examples:

c O n s o n a n t ,	t e m p t A t i o n
3 0 0 2 0 1	3 021

In case there is no 3, 2 will carry the main stress. Examples:

t O t a l ,	p r I v a t e
2 01	2 0 1

The following endings are in the domain of the 2001 Stress Rule.

No	Endings	Examples
1	-al (not in nouns)	a b d O m i n al, f A t a l l y 3 0 2 0 1 2 01
2	-an	A l A s k a n, C A s p i a n 2 0 0 1 3 00 21
3	-ance	a b U n d a n c e, d I s t a n c e s 2 0 0 1 200 1
4	-ancy	expEctancy
5	-ant	impOrtant
6	-ence	Evidence
7	-ency	consIstency
8	-ent (not in verbs)	absOrbent
9	-ic	d i p l o m A t i c, p h o t o g r A p h i c 3 02 3 0 0 2
10	-id (in adjectives)	t I m i d, f r I g i d n e ss 3 0 2 3 0 2
11	-is	megApolis
12	-(it)y	c o m p l E x i t y, a b I l i t y 3 0 201 302 01
13	-oid	dEltoid, trApezoid
14	-on	irritAtion, o b s e r v A t i o n a l 4 0 23 01
15	-ous	nErvously, cUriousness
16	-um	cAlcium, Opium

Table 5: The 2001 stress rule domain

In Yamini's terms, endings and combinations of endings equal 1. But there are endings that equal 2, -ic and -id in the 2001 Stress Rule and -ible in the 3/2 Stress Rule (to be discussed in the next part). Then E (+E)= 1 but ‹-ic›, ‹-id› and ‹-ible›= 2 (E stands for a stress-governing ending. As was stated earlier, neutral endings are not accounted for in both of the approaches.

2. The 3/2 Stress Rule

To apply this rule, certain practice with prefixes is necessary in addition to the information about the endings that fall under the domain of this rule.

1) 3-p → 3′ (p = prefix)
2) 3+p → 2′
3) 3∞ → 2′

In this rule 3-p is a vowel that carries number 3 and is not part of a prefix whereas 3+p is a number 3 vowel that constitutes part of a prefix. The rule says: In stressing words with certain endings (listed below), stress vowel number 3 if it is not part of a prefix. If it is, return to the previous vowel, that is, number 2, and put the stress mark on it.
Examples:

h E r i t a g e, c U s t o m a r y, a d j U s t a b l e, p r o p O s a l
3 02 01 3 0 02 0 1 3002 00 1 3 0 2 0 1

In the domain of the 3/2 Stress Rule are the endings below.

No	Endings	Examples
1	-ible	v I s i b l e n e s s, d i g E s t i b l e 3 0 2 3 0 02
2	-able	m E m o r a b l e, d i s p r O v a b l e 3 0 201 3 00 2 0 1
3	-age	c ó v e r a g e, a d v á n t a g e 3 02 0 1 3 0 0 2 00 1
4	-al (in nouns)	cAnnibal
5	-ar	pOpularly
6	-ary	sEcondary
7	-atism	dOgmatism
8	-atist	prAgmatist
9	-ative	nEgatively
10	-atize	cInematizing
11	-atory	lAboratory
12	-ature	lIterature, mIniature
13	-e (in verbs)	p r o m O t e, d e f I n e 3 0 2 01 30 20 1
14	-en	frOzen
15	-er	bAárbers
16	-ery	sUrgeries
17	-ive	sEnsitiveness
No	**Endings**	**Examples**
18	-or	dirEctor
19	-ory	tErritory
20	-ure	advEnture

Table 6: The 3/2 stress rule domain

In both of the approaches verbs are treated in a different way. In Yamini's approach, short verbs are categorized under the domain of the 3/2 Stress Rule. Short verbs are verbs of less than three syllables. In both approaches, verbs of three or more syllables ending in -ate, -(f)y and -ize(-ise) are excluded. They are treated, in Yamini's and Dickerson's, in the 3-1 rule (to be discussed in the next part) and LSAR respectively.

According to the 3/2 Stress Rule, verbs' last vowels on the right get number 2 and not number 1 if they do not have an ending or **e** at the end. Examples:

f o r g E t , s u p p l Y , p r o v I d e d , d e v O t e
3 00 2 3 0 0 2 3 02 0 1 3 0 2 01

3. The 3-1 Stress Rule

The remaining words that are not accented through the two previous rules are accounted for in the 3-1 Stress Rule. This rule is so called because if there is a 3 in words of this rule, it will be stressed. Vowel number 1 receives a degree of stress which is not, of course, the primary stress. Degrees of stress other than the main do not concern us here. The following are the word domains of the 3-1 Stress Rule.

No	Endings	Examples
1	-acy	c A n d i d a c y, i l l I t e r a c y 3 0 0 2 01 3 02 01
2	-ate	c e r t I f i c a t e, c O n c e n t r a t e d 30 201 3 0 0 2 00 E+E=1
3	-ish (adj)	drAgonish, clEverish
4	-ism	c A p i t a l i s m, eclEcticism 3 0 20 E+E=1
5	-ist	ecOnomist, graphOlogist
6	-ize (-ise)	fOssilize, rEcognizing
7	-y	technOlogy, psychothErapy
8	-(f)y	idEntify, dissAtisfies
9	Long words with other endings	pAragraph, bOOmerang, tElegram Opposite, rIdicule, sUbstitute
10	Short nouns	Expert, hAzard, pAnel

Table 7: The 3-1 stress rule domain

The rule 3-1 goes well with Dickerson's LSAR although both have the same shortcoming. The problem with the rules is that nouns and verbs of the same spelling cannot be accented with certainty. Consider the following examples:

Verbs (3/2 & PWAR)	**Nouns** (3-1 & LSAR)
condUct	cOnduct
incrEase	Increase
rebEl	rEbel
suspEct	sUspect

In the words above, the verbs carry the main stress on the last syllable and the nouns on the first. However, there are many bisyllabic nouns that are stressed on the final syllable.

Examples: **Verbs & Nouns**
advAnce, concErn, repOrt, surprise, contrOl

The verbs in this list are correctly stressed by the 3/2 Stress Rule and PWAR; but the nouns which should follow the 3-1 and LSAR act as exceptional cases. Therefore, it can be claimed that the rules for short nouns in both approaches are not as accurate as the other rules.

Methodology

Participants

The participants of the study were 64 EFL students, both male and female, of an Iranian university. The reason why these students were selected was that they had insufficient background about stress patterns, and their only knowledge of stress originated from the previous instruction they had received in high school.

Instruments

In order to determine the subjects' entry level of competence in recognizing stressed vowels, a test of a hundred and fifty items, devised by the researcher, was administered to the subjects. This test comprised three parts. Part A intended to evaluate the participants' capability in attending to and marking stressed vowels of English words in isolation. In part B, they listened to fifty words which they had on their papers and were expected to detect and mark the stressed vowels. Part C required the testees to produce words orally with careful concentration on correct stress patterns. In this part, the spoken data were audio-taped for further evaluation.

To design the test, the researcher included words in all the domains of both Dickerson's and Yamini's rules with great care. In other words, different words governed by different rules were almost of equal frequency in the distribution to ascertain the subjects' acquaintance with stress patterns in different given situations.

Moreover, through the administration of the Oxford Quick Placement Test (2004), the subjects' proficiency was evaluated. This test, together with the test of stress, was the tool by means of which the participants were homogenized. According to the scores they made in the two tests, they were paired and then assigned randomly to two groups.

Procedure

The test of stress served two functions, as a pre-test and a post-test. As a pre-test it sought to figure out the subjects' entry performance. The participants had to be divided into two groups so that they could be instructed according to the two different approaches. An independent-samples t-test was used to ensure that no significant difference existed between the two groups.

The participants took part in stress classes as part of their regular course work and during their scheduled class time. This course was part of their conversation course and was instructed once a week for 90 minutes. The students knew that they were

going to be evaluated and get grades on the subject matter at the end of the semester, so they closely followed the course. The words selected to work on in class, the exercises assigned for homework, the way materials were presented, and even the way the instructor treated the students were the same for both classes. The only difference was that each group worked on a different set of rules.

The period of instruction was confined to fourteen sessions for each group during which the demonstration of the rules was accompanied by various examples to help the participants internalize the rules. In the process of teaching, examples were adapted from Dickerson (1989), Yarmohammadi (1996), Yarmohammadi and Pouretedal (1996), Yamini (1997), and *Oxford advanced learner's dictionary* (2005). But the best source that the researcher took advantage of was a great software dictionary which, in fact, facilitated the task of finding words with certain endings: *Random house Webster's unabridged dictionary on CD-ROM* (1999).

As a post-test, the test of stress patterns attempted to determine the subjects' achievement at the end of the semester as their terminal behavior. The nature of the post-test, the stages of evaluation and the way the exam papers were marked were the same as those of the pre-test. The only difference therein was the administration of a new part consisting of 10 nonsense words which carried the endings practiced in class, which could be pronounced correctly according to the rules. Some examples are **imborate**, **pantalimary** and **napitorion.** The researcher's intention was to observe how the subjects would react to, or pronounce, these nonsense words. In other words, the participants were supposed to apply the rules of stress and vowel quality patterns to words not existing in English, hence the degree of the applicability of the approaches. This was a reasonable strategy to ascertain the subjects' internalization of the rules. It should be mentioned that the participants were unaware that the 10 words were man-made.

Results

In order to compare the mean scores of both groups of the participants, an independent-samples t-test was utilized twice, once after the pre-test to prove the homogeneity of the two groups, and another time after the post-test to compare the applicability of the two approaches to teaching stress patterns. Furthermore, through a paired t-test, the degree of achievement the subjects had made toward the end of the semester was measured.

Based on the data collected through the pre-test, the subjects were homogenized, paired and then assigned to two groups. It was necessary to ensure that there was no statistically significant difference between the means of the two sets of scores made by the two groups. To fulfill this requirement, the researcher had to conduct a t-test the results of which are given in the following table.

	Levene's Test for Equality of Variances		t-test for Equality of Means				
	F	Sig.	t	df	Sig. (2 tailed)	Mean Difference	Std. Error Difference
Var. assumed	.621	.444	-.07	52.16	.944	-.08375	-.5555
Var. not assumed			-.07	52.34	.944	-.08375	-.5555

Table 8: T-test results of the pre-test

As can be seen, the level of significance is .944; therefore, the mean scores of the two groups were not significantly different in the initial stage of the research. In other words, the participants' proficiency and their knowledge of stress were almost equal in both classes.

After the instruction period, when the subjects were tested in the post-test, the collected data were analyzed to make certain whether or not the two approaches created any difference. It was confirmed that there was not any significant difference between the mean scores of the two groups. That is to say, the two approaches, Dickerson's and Yamini's, were equally applicable in language pedagogy.

As was discussed earlier, 10 nonsense words not existing in the English language were made, which the students were asked to produce orally as part of the post-test. The logic behind was to judge whether the rules could be applied to completely new words. Table 9 demonstrates the results of the post-test of stress plus nonsense words disregarding the participants' scores of the placement test. It illustrates that the significance value is .727, which means the two sets of scores are not significantly different.

	Levene's Test for Equality of Variances		t-test for Equality of Means				
	F	Sig.	t	df	Sig. (2 tailed)	Mean Difference	Std. Error Difference
Var. assumed	.572	.222	-.35	52.21	.727	-2.4815	-.3333
Var. not assumed			-.35	52.42	.727	-2.4815	-.3333

Table 9: Results of the post-test of stress plus nonsense words

At the beginning of the semester the course started based on the assumption that the two approaches to teaching patterns of stress did not have any superiority over one another, so in the initial stage a so-called null hypothesis was formed. At the end of

the research the collected data supported the stated idea, and therefore the null hypothesis was not rejected. But there still remains a word that is worth mentioning.

As a personal experience, the researcher noticed that the students who were taught with Yamini's rules showed great interest, and managed to learn the rules much more easily than those instructed with Dickerson's rules. As the course progressed the instructor got more aware that detecting stressed vowels and practicing vowel quality patterns were much stimulating for the students working with numbers, utilizing Yamini's approach. They could remember numbers and practice the internalization of the related rules much readily. But for the students applying Dickerson's approach, working with the Key and Left syllables brought about some difficulty. They needed a lot of practice to distinguish syllables, and therefore much class time was spent on that requisite skill. Therefore, after the instruction period and before administering the post-test, the researcher did not expect the two approaches to be equally effective, but to his surprise, the results did not yield any significant difference between the two.

Having observed no significant difference between the approaches, the re-searcher operated a paired t-test in order to find out how much, or how little, each group had progressed in comparison to its entry performance of the pre-test. After all, he wanted to answer the question of whether teaching stress and vowel quality rules were beneficial per se. The paired t-test yielded the following results.

Pairs	Tests	Paired Differences			t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean			
1	1 - 2	-4.632	5.711	.926	15.47	26	.001

Table 10: Paired t-test results (Group 1)

Pairs	Tests	Paired Differences			t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean			
1	1 - 2	-5.237	6.153	.998	22.20	26	.000

Table 11: Paired t-test results (Group 2)

The variables in Table 14 are the post-test of stress for group 1, regardless of the test of nonsense words and the pre-test of stress. In Table 15 the variables are the same as above but for group 2. Table 14 shows that the result is significant at .001 level while in Table 15 the significant level is .000. So, it is quite apparent that the participants have gained throughout the course. That is, learning the rules of stress and vowel quality patterns has been very fruitful and the students have bettered their pronunciation a good deal.

Discussion and conclusion

Based on the assumption that the pronunciation of English words is predictable and rule-governed, the present study attempted to compare two sets of pedagogically-applicable stress rules innovated by two phoneticians, Yamini and Dickerson. The goal has been to help university students predict the pronunciation of the new words they come across.

When the course started, the assumption was that both approaches were going to generate similar results and there was no superiority of one over the other. As the course progressed, the researcher observed that learning the rules of stress and vowel quality patterns created much interest and enthusiasm among the participants because that was something new and the university had not provided any course of the kind before. This eagerness was considerably greater among the students taught with Yamini's rules in comparison with their counterparts in the other group.

It was observed that for the students working with numbers learning the rules was simpler and more straightforward than for those students working with the Key and Left syllables. That is why the researcher did not really expect the two approaches to produce comparable outcomes. The only rules which can be said to cause almost the same degree of difficulty and confusion for the subjects were Dickerson's PWAR and Yamini's 3/2 Stress Rule. Both of these rules require detailed knowledge of the nature of the English prefixes, and much time and energy had to be devoted to the recognition of prefixes in the English words. Most of the exceptions the students could find were related to the domains of these two rules.

However, it deserves to be noticed that whether or not the rules are easy to learn and understand, they cannot be helpful unless they are internalized. In other words, stopping to think about the rules will detract from the accuracy, fluency and natural flow of speech. One does not become an expert in the pronunciation of the English words immediately after learning the rules. It is only through practice and rehearsal that the knowledge becomes automatic. Therefore, the author suggests that more time be spent on teaching and practicing pronunciation rules.

As stated earlier, the author anticipated that Yamini's approach would be more applicable. Nevertheless, when the post-test was administered, statistics did not support his belief. Although a paired t-test confirmed that the students' pronunciation had improved a lot, an independent samples t-test supported that there existed no significant difference between the two approaches. It is concluded from the study that teaching pronunciation rules to EFL students yields fruitful results no matter which one of the approaches is adopted.

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