



ISSN: 1817-6798 (Print)

Journal of Tikrit University for Humanities

available online at: <http://www.jtuh.tu.edu.iq>

A STUDY OF SENTENCE STRESS PRODUCTION BY IRAQI ARABIC EFL LEARNERS

A B S T R A C T

Asst. Prof.Dr. Hasan Shaban
Ali Al-Thalab

Ghufran Ahmed Fadhil
Al-Kalawi

TIKRIT UNIVERSITY/ COLLEGE OF
EDUCATION FOR HUMANITIES /
DEPARTMENT OF ENGLISH

* Corresponding author: E-mail :
ghu.med1993@gmail.com

07718688216

Keywords:

Sentence stress, F0, intensity, duration, pitch, production

ARTICLE INFO

Article history:

Received 4 July. 2021

Accepted 17 Aug 2021

Available online 10 July 2022

E-mail

journal.of.tikrit.university.of.humanities@tu.edu.iq

E-mail : adxxxx@tu.edu.iq

Stress is an important feature in suprasegmentally phonology, the study of sounds beyond the segment. In sentence stress, stress is placed randomly due to the native speaker's intention. The difficulty comes from many factors like L1 interference, experience, age of learning etc. as a result they might affect learners' performance. The present study aims at the following: 1) Identifying the mean values of the acoustic factors: intensity (dB), F0 (Hz) and duration (m s) for each vowel in the given sentence. 2) Investigating the difference in the mean values of the three acoustic factors, i.e. intensity, F0 and duration between the groups of Iraqi learners and the English group of native speakers, concerning the stressed vowels. Accordingly, the following is hypothesized: L1 interference is the main cause of speakers' English stress difference. 3) Identifying whether there is any statistical significance between F0, intensity and duration in the production of sentence stress. The results of the preceding objectives are as follows: 1) The difference between the Iraqi Arabic learners and the English native speakers is found to be not significant; even though, there are remarkable differences in vowel production. 2) There are no statistical differences in the three factors F0, intensity and duration. In conclusion, the study experimented two essential aspects L1 interference and language proficiency and it is found that both hypotheses are not true acoustically but they can be seen as active on the level of production.

© 2022 JTUH, College of Education for Human Sciences, Tikrit University

DOI: <http://dx.doi.org/10.25130/jtuh.29.7.1.2022.21>

دراسة النبر في نطق الجملة من قبل العرب العراقيين المتعلمين للغة الإنكليزية كلغة أجنبية

أ.م.د. حسن شعبان علي الثلاب/ جامعة تكريت/ كلية التربية للعلوم الانسانية/ قسم اللغة الانكليزية

غفران احمد فاضل

الخلاصة:

النبر هو سمة مهمة في علم الأصوات الفوققطعية ، وهو دراسة الأصوات لأكثر من مقطع في الجملة.

ينقل النبر بشكل عشوائي بين مقاطع الجملة تبعا لمقصد المتكلم الذي يتكلم اللغة الأم، أما بالنسبة لمتعلمي اللغة فتأتي الصعوبة من العديد من العوامل مثل تداخل اللغة الأم وعمر الخبرة في التعلم وما إلى ذلك مما قد تؤثر على أداء المتعلمين. تهدف الدراسة الحالية الى ما يلي: (١) تحديد القيم المتوسطة للعوامل الصوتية: الشدة ، F0 والمدة لكل حرف علة في الجملة موضوع البحث. (٢) استقصاء الفرق في القيم المتوسطة للعوامل الصوتية الثلاثة ، أي الشدة ، F0 والمدة بين مجموعات المتعلمين العراقيين ومجموعة المتحدثين باللغة الإنجليزية ، فيما يتعلق بحروف العلة ذات النبر. وفقا لذلك: تداخل اللغة الام هو السبب الرئيسي لاختلاف النبر اللغة لدى المتحدثين باللغة الانكليزية. (٣) معرفة ما إذا كان هناك أية دلالة إحصائية لهذه العوامل في إنتاج النبر في الجملة. في الختام ، جربت الدراسة جانبا أساسيا: تداخل اللغة الاولى ووجدت أن الفرضية ليست صحيحة من الناحية الصوتية ولكن يمكن اعتبارها فعالة على مستوى الإنتاج.

1. Introduction

Stress is the effort made by people to make a syllable in a word as more prominent than others or a word that can be more prominent than other words in a sentence. It is an important feature in suprasegmental phonology, the study of sounds beyond the segment (Ladefoged and Johnson, 2015: 259). There are two types of stress, lexical stress and sentence stress, that can be examined by researchers. Lexical stress is the characteristic of a single word and its position is often fixed in a word; however, it generally depends on the type of language whether it is predictable or not. However, there are definite criteria for lexical stress placement and many studies have been done concerning the production and perception of English lexical stress (Al-Thalab *et al*, 2018; Al-Thalab, 2021). As for sentence stress the matter is not so, it is placed randomly due to the native speaker's intention (Thornbury, 2006: 110; Gimson, 1994: 225). It is more difficult than the first type since it is affected by many factors like L1 interference, experience, age of learning etc. as a result they might affect learners' performance. So the problem that exists in a sentence stress placement may create problem to most EFL learners who are unable or encounter difficulty to assign it correctly. In this case, EFL learners need to depend on special acoustic parameters to indicate

the most prominent word in a given sentence and this is the gist of the current study.

1.1 The Adopted Model

The model of this study is Chen *et al.* (2001) "A study of sentence stress production in Mandarin speakers of American English." In this study, the researcher measures the three acoustic features F0, vowel duration and intensity of Mandarin speakers and American English speakers to assess the difference in their production of English sentence stress.

2. Literature Review

2.1 Stress

Stress is defined as "the linguistic manifestation of rhythmic structure" (Hays, 1995: 1) a structure various grades which can be determined by various spheres of stress. At the level of the English content word, there is one strongest stressed syllable, and there is also one strongest stressed at the level of the phrase (ibid: 24). The rest of syllables or words may also be stressed, but less powerfully. When a stress is a feature of words, it is called lexical stress; when it is a feature of phrases, it is a feature of phrases, then it is phrasal stress (Scarborough et.al, 2009: 136).

2.2.1 Sentence stress

Sentence stress is generated by the speaker that supplies the hearer with guides to what key is in a message. In case of conversation, he stresses the words that hold the most important information. "The manner in which sentences are given stress is similar to the way found in polysyllabic words" (Gimson, 1994: 225).

2.3 Theories of stress

2.3.1 The Metrical Theory

Metrical phonology (MP) is a main modern theory founded by Liberman and Prince (1977), and evolved ever after. MP is resolved firstly to handle rhythmic (prosodic) phenomena, specifically stress, it has concentrated on the foot as a

"phonological unit". There are two main codes, the metrical tree and metrical grid (Trask, 1996: 223; Katamba, 1989: 226).

2.3.2 Stress Typology Model (STM)

Vogel (2000) and Vogel and Altmann (2002) (adjusted) cited in Altmann (2006: 30) introduce this model, the stress Typology Model (STM), which stands on a typology of stress phenomena. It includes a binary branching hierarchy which is concerned with stress employment or other suprasegmental features (e.g. tone) regarding the word level. The model relies also on the surface-observable samples of every language calling for no further notional devices. It concentrated mainly on primary word stress paying no attention to secondary stress.

2.4 The Acoustic Characteristics of Speech Sounds

A sound is any physical phenomenon that can stimulate the auditory nerve via the mechanism of the air (Catford, 1977). The human hearing apparatus perceives speech sounds via waves. Air carries these waves which is the commonest medium of communication. The usual source from which vibrations in pressure are initiated are the vocal folds. From the particles, which are the source, these vibrations are transmitted and by waves of alternative pressure and rarefaction vibrate at the same frequency as the original vibrator. After that, these waves spread spherically from the source and are carried to ear to be accented for by the listener as sound (Malmberg, 1963) (Gray and Wise, 1959; Gimson, 1989 cited in Al-Marzuq, 1998: 44).

The important acoustic features are as follows:

1) *Frequency* is a technical expression used to refer to an acoustic characteristic of a sound. It is the number of total cycles, i.e. repetitions, that the vibrator produces in one unit of time. The pitch of a sound relies on the vocal folds' average of frequency. Frequency is the acoustic evaluation that is most straightway identical to the sound's pitch. The frequency of the vocal folds' diversity in speech might be between 80 and 200 Hz in a male voice. It may arise to nearly 400 Hz in a female voice. The dominant frequencies in voiceless sounds are commonly 2000 Hz (Ladefoged, 2001: 164-5).

2) According to acousticians, *intensity* is the power that streams in a unit of time namely (sec.) over an area of 1.24 cm to the orientation of the spread of a progressive wave (Brosnahan and Malmberg, 1970). The loudness of a sound relies on the amount of difference in air pressure that takes place.

3) Sound *duration* is the exact time it consumes to generate a sound. It is possible to measure and limit the amount of time, while the important temporal factor is not stable but proportional. The proportional duration of a specific phone relies on the surroundings, and the speed of one's speech, and other aspects (Al-Ani, 1970: 75).

3.Method

3.1 Participants

The subjects that participate in the current study are of two groups, the British English group and the Iraqi Arabic group. The first group (the control group) includes 8 adults (4 males and 4 females) who speak British English as L1. All English subjects are English native speakers who are (typically from England). The English females' average age is 29 years (range=28-32 years). The English males' average age is 33 years (range= 28-41 years). The second language group is the Iraqi Arabic which consists of 24 subjects. This group is divided into 4 subgroups, the Iraqi Arabic advanced group (teachers), the MA research group, the MA courses group and the 4th year students' group. The advanced (teachers) group females' average age is 38 (range= 29-45), the males' average age is 42 (range= 29-51). The MA research group females' average age is 30 (average= 27-33), the males' average age is 28 (range= 24-51). The MA courses group females' average age is 26 (average= 24-27), the males' average age is 32 (range= 24-41). The 4th year(college) group females' average age is 23 (average= 22-26), the males' average age is 23 (range= 23-24).

3.2 Speech materials

The sentence "*I bought a cat there*" is given to all the participants emphasizing sentence stress. The production of the four cases of sentence stress with different stress assignment in each case. The four sentences with different stress positions, written in uppercase, bold and italics, are: "***I*** bought cat there", "***I***

BOUGHT cat there”, “I bought **CAT** there”, “I bought cat **THERE**”. The same method was followed by (Chen et.al, 2001).

3.3 Audio Recording

Since the researcher is unable to record the voices in the universities (in a sound-attenuated booth) or sound laboratories, all participants are contacted through WhatsApp application. In audio recording the following criteria are to be followed: (1) each participant is contacted by a voice call and is asked to read the sentences orally to make sure whether there are any speech or language disorders; (2) they are asked to sit in a very quiet room that is not affected by any outside noise; (3) they are also demanded to speak in a high and clear voice; (4) the words in uppercase, bold and italics are to be emphasized, i.e. stressed; (5) they should leave a space 3-5 seconds between sentences. The criteria are sent to the participants in a word document form.

3.4 Acoustic Analysis

The four sentences that have been converted are downloaded into a computer (DESKTOP-5TOHCL0). By using the same computer, the sound files are opened by “Praat software program (2020)” (Boersma and David, 2020). The sentences that were produced by each participant are viewed as Praat waveform. Each sound file includes 4/5 sentences, by using the Praat cursor, a selection of one sentence is made and then the selection of the word generally and the vowel particularly is done to have only the vowel nucleus to be analyzed. The pitch range in this analysis is between 75-500 Hz, the drawing method chosen here is the speckles. The intensity range in this analysis is between 50-100 db. The duration here is measured in (m s).

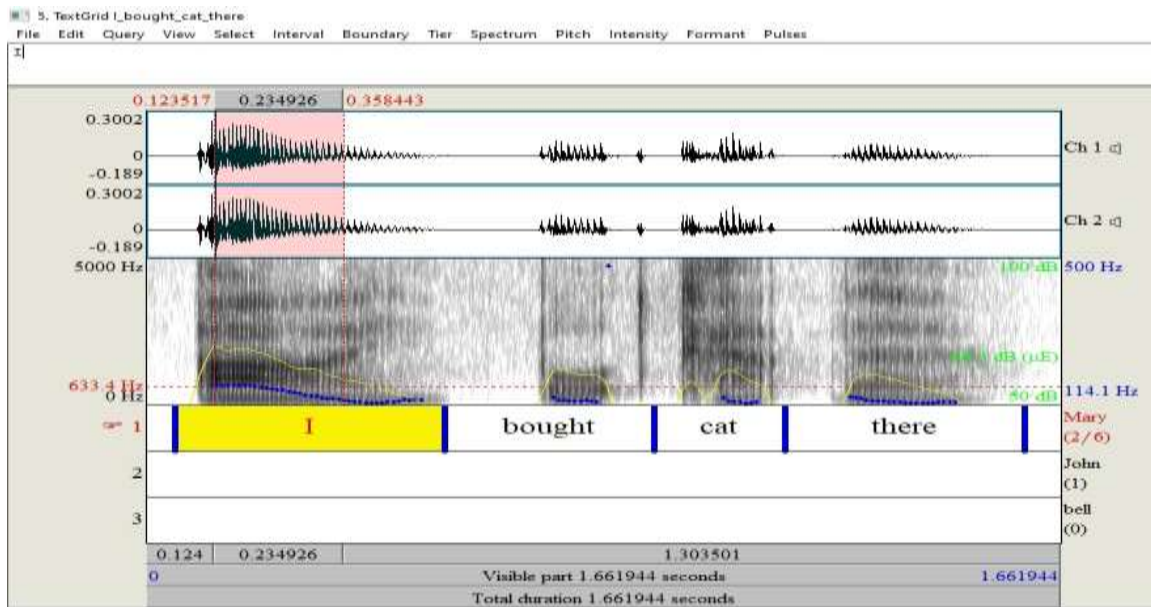


Figure (3.1) Praat analysis for the word ‘I’ within the sentence ‘I bought a cat there’

4. Data Analysis and Results

4.1 Research Question1: How are the three factors F0 (Hz), vowel intensity (dB), and vowel duration (m s) identified?

This part includes the results of the acoustic analysis of F0 (Hz), intensity (dB) and duration (ms) that are analyzed by using Praat Software Program. These values are put in numbers after analyzing the four words *I*, *bought*, *cat*, *there* for the British English group and the Iraqi Arabic four groups. The English group consists of 8 participants (4 females and 4 males). Each Iraqi Arabic group involves 6 participants (3 females and 3 males). Table (4.1) shows the measurements of the three acoustic factors F0, intensity and duration produced by the English native speakers clarifying the values of the stressed sentence only.

Table (4.1) Native Speakers Group

Subject	Sentence	F0	Intensity	Duration
Speaker 1	I	186.61	70.27	0.19
	Bought	183.75	72.56	0.16
	Cat	177.30	72.34	0.07
	There	151.18	70.90	0.12
Speaker 2	I	207.47	78.45	0.28
	Bought	252.79	81.08	0.18
	Cat	245.76	81.75	0.07
	There	171.38	76.92	0.15
Speaker 3	I	206.66	78.90	0.29
	Bought	235.97	77.57	0.20
	Cat	211.24	78.40	0.10
	There	212.25	80.75	0.11
Speaker 4	I	228.46	74.71	0.16
	Bought	222.97	78.83	0.13
	Cat	217.66	72.55	0.07
	There	189.98	69.91	0.19
Speaker 5	I	130.12	69.98	0.23
	Bought	133.26	68.33	0.11
	Cat	129.13	63.82	0.10
	There	125.13	63.25	0.15
Speaker 6	I	146.82	74.09	0.16
	Bought	109.46	77.26	0.14
	Cat	127.52	76.15	0.08
	There	125.01	74.14	0.14
Speaker 7	I	196.21	71.43	0.15
	Bought	187.09	72.01	0.11
	Cat	219.88	74.80	0.05
	There	225.44	66.78	0.16
Speaker 8	I	124.47	77.86	0.18
	Bought	166.81	76.95	0.17
	Cat	136.43	71.11	0.14

4.2 How will English Native Speakers group and Iraqi Arabic speakers differ in acoustic characteristics of English sentence stress?

Does L1 interference cause the difference or L2 effect utilizes major influence?

In this part, the focus will be on the mean values of F0 (Hz), intensity (dB), and duration (m s). They are analyzed, as mentioned before, by Praat Software Program. After analyzing, they are counted to find the mean values of each acoustic factor, i.e. F0, intensity and duration. That is for each word, i.e. *I*, *bought*, *cat* and *there* and for all groups. There will be figures clarifying the difference in mean values between groups for the stressed sentence only.

4.2.1 The Iraqi Advanced Group and English Native Group

Based on the acoustic analysis of the independent sample T- test, it was found that the T-value of (F0), (intensity) and (duration) for the word *I* is (1.04), (0.124) and

(0.78), which are less than the tabulated T-value of (2.18), and this means that there is no significant difference between the advanced group and the English group in F0, intensity and duration. The T-value of (F0), and (duration) for *bought* is (1.900) and (0.561) being less than the tabulated T-value of (2.18), which means that there is no significant difference between the two groups in F0 and duration, while having a T-value of (intensity) that is (2.808), which is more than the tabulated T-value of (2.18), that results in having a significant difference between the two groups in intensity. Regarding the word *cat*, the T-value of (F0) and (intensity) is (1.526), (1.699) which is less than (2.18) that makes no significant difference between the two groups in F0 and intensity while having (5.571) as a T-value of (duration) which is more than (2.18) resulting in a significant difference between the two groups in duration. The T-value of (F0) and (duration) for the word *there* is (2.028), (1.385) showing no significance between the two groups since they are less than (2.18), contrasting with intensity that is (2.37) and being higher than the tabulated T-value (2.18), it makes a significant difference between the two groups. See the following table and for more clarification see figures (4.1) and (4.2):

Table (4.2) Statistical analysis for the British group and the Iraqi advanced group

Word	Acoustic Characteristic	Groups	Mean	Std. Deviation	T-value	Significance
I	F0	Advanced	1.977.967	2.684.144	1.04	Not Significant
		Natives	1.783.525	3.922.641		
	Intensity	Advanced	741.467	582.987	0.124	Not Significant
		Natives	744.612	366.841		
	Duration	Advanced	.2267	.04546	0.780	Not Significant
		Natives	.2050	.05529		
Bought	F0	Advanced	2.454.100	6.662.230	1.900	Not Significant
		Natives	1.865.125	4.976.656		
	Intensity	Advanced	813.533	317.366	2.808	Significant
		Natives	755.738	420.713		
	Duration	Advanced	.1583	.01722	0.561	Not Significant
		Natives	.1500	.03295		
Cat	F0	Advanced	2.326.733	7.470.405	1.526	Not Significant
		Natives	1.831.150	4.702.419		
	Intensity	Advanced	785.667	476.716	1.699	Not Significant
		Natives	738.650	536.366		
	Duration	Advanced	.1633	.02338	5.571	Significant
		Natives	.0850	.02777		
There	F0	Advanced	2.382.917	9.166.199	2.028	Not Significant
		Natives	1.646.338	4.185.329		
	Intensity	Advanced	779.100	379.907	2.370	Significant
		Natives	716.362	555.637		
	Duration	Advanced	.1800	.02966	1.385	Not Significant
		Natives	.1550	.03586		

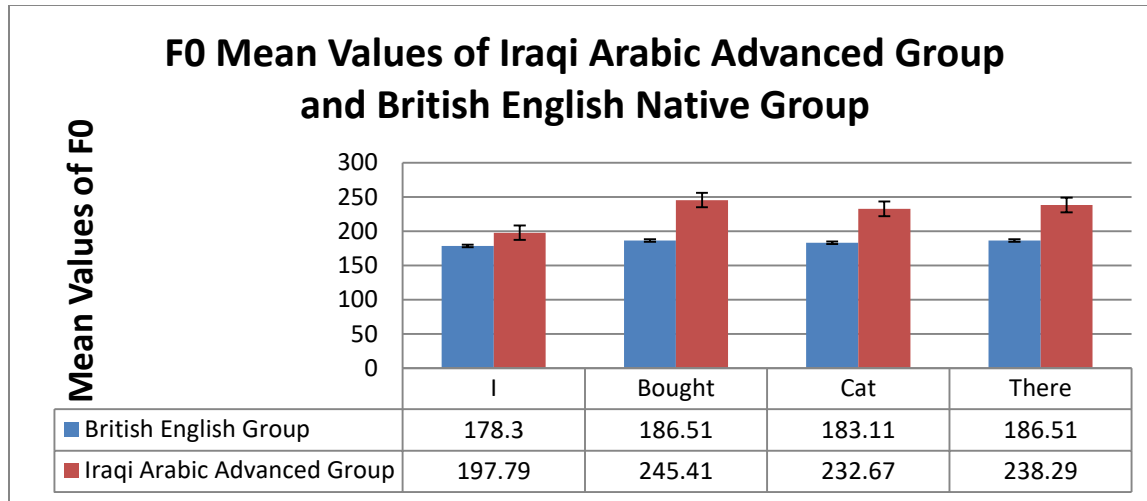


Figure (4.1) F0 mean values of British English group and Iraqi advanced group

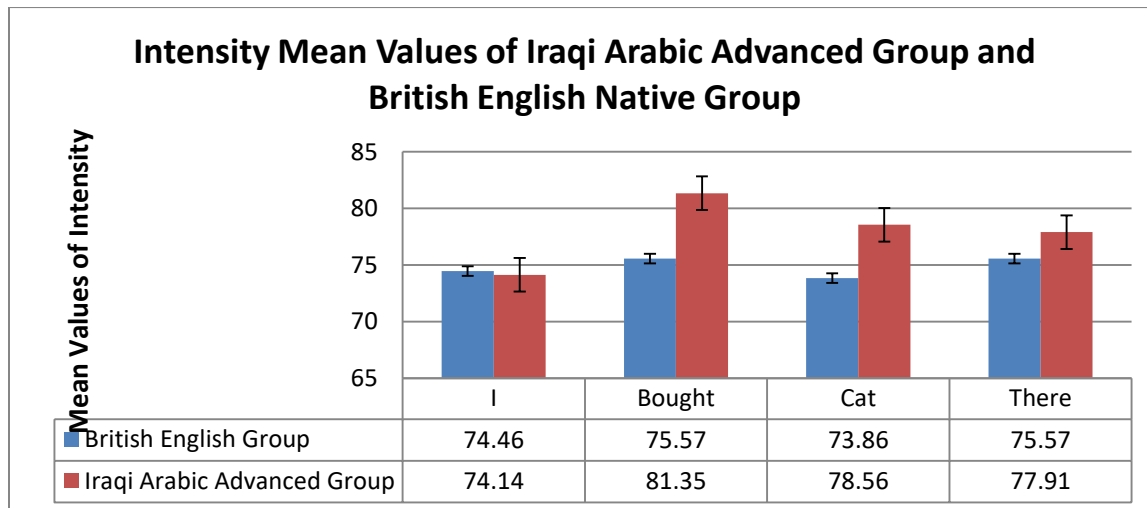


Figure (4.2) Intensity mean values of British English group and Iraqi advanced group

4.2.2 The Iraqi Research Group and English Native Group

Using the T-test for two independent samples, it was found that the T-value of (F0), (intensity) and (duration) is (1.583), (0.884) and (0.492), which are less than the tabulated T-value of (2.18), which means that there is no significant difference between the MA Research group and English group in F0, intensity and duration. The T-value of (F0) for the word *bought* is (1.916) which is less than (2.18) that makes no significant difference between the two groups in (F0). The T-value of (intensity) and (duration) is (2.760) and (2.466), which are more than (2.18), making a significant difference between the two groups in (intensity) and

(duration). As for the T-value of (F0) and (intensity) for the word *cat*, it is (1.422) and (0.866) and being less than (2.18) makes if not a significant difference between the two groups in F0 and intensity. The T-value of duration is (4.625) which is more than (2.18) what makes it a significant difference between the two groups in duration. The T-value of (F0), (intensity) and (duration) is (1.576), (1.165) and (1.242), which are less than (2.18), what means that there is no significant difference between the two mentioned groups in (F0), (intensity) and (duration). See table (4.3) and figures (4.3) and (4.4) for the sake of illustration:

Table (4.3) The statistical analysis for the British group and the Iraqi research group

Word	Acoustic Characteristic	Groups	Mean	Std. Deviation	T-value	Significance
I	F0	MA Research	3.159.367	24.501.661	1.583	Not Significant
		Natives	1.783.323	3.922.641		
	Intensity	MA Research	770.750	728.278	0.884	Not Significant
		Natives	744.612	366.841		
	Duration	MA Research	.2200	.05797	0.492	Not Significant
		Natives	.2050	.05529		
Bought	F0	MA Research	2.549.833	8.388.025	1.916	Not Significant
		Natives	1.865.125	4.976.656		
	Intensity	MA Research	809.383	251.322	2.760	Significant
		Natives	755.738	420.713		
	Duration	MA Research	.2067	.05317	2.466	Significant
		Natives	.1500	.03295		
Cat	F0	MA Research	2.396.217	9.951.269	1.422	Not Significant
		Natives	1.831.150	4.702.419		
	Intensity	MA Research	765.533	624.139	0.866	Not Significant
		Natives	738.650	536.366		
	Duration	MA Research	.2033	.06563	4.625	Significant
		Natives	.0850	.02777		
There	F0	MA Research	2.094.433	6.483.455	1.576	Not Significant
		Natives	1.646.338	4.185.329		
	Intensity	MA Research	760.783	873.929	1.165	Not Significant
		Natives	716.362	555.637		
	Duration	MA Research	.1983	.09065	1.242	Not Significant
		Natives	.1550	.03586		

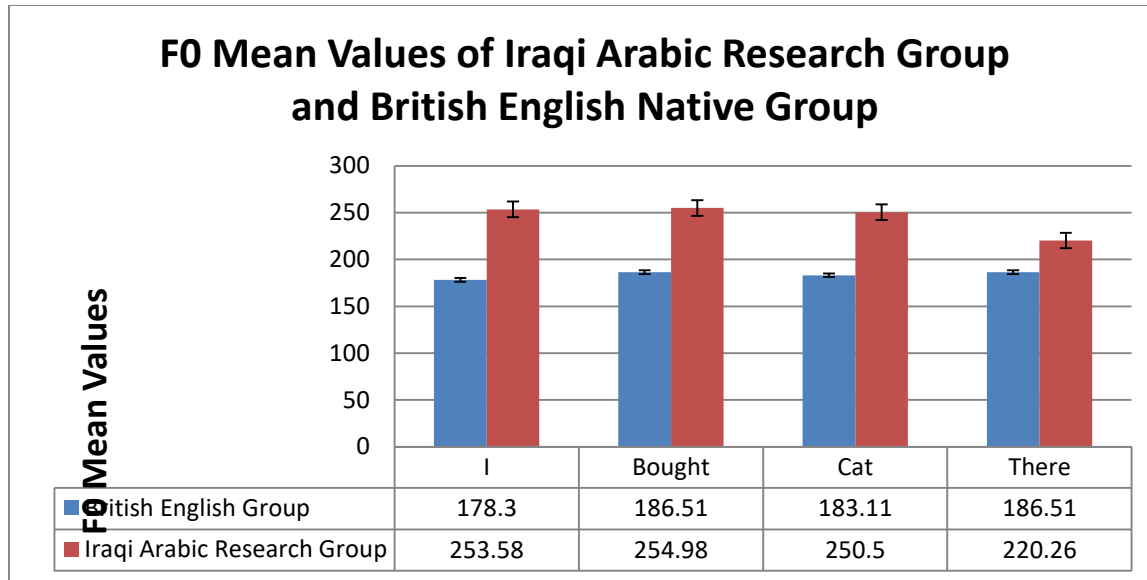


Figure (4.3) F0 mean values of British English group and Iraqi research group

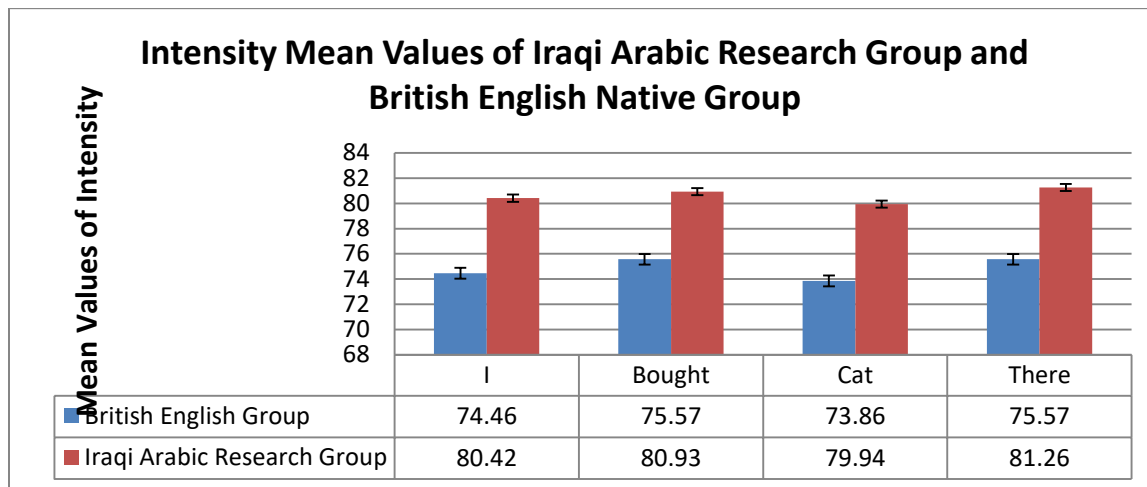


Figure (4.4) Intensity mean values of British English group and Iraqi research group

4.2.3 The Iraqi Courses Group and English Native Group

After using the T-test for two other samples, it was found, on the one hand, that the T-value of (F0) and (duration) is (2.117), (1.560), which are less than the tabulated T-value of (2.18), which means that there is no significant difference between the MA courses group and English group in (F0) and (duration). On the other hand, (intensity) is (3.143) which is more than (2.18), which means that there is a significant difference between the two groups in intensity. As for the word *bought*, the T-value of (F0) is (1.916), which is less than the tabulated T-value of

(2.18), making no significant difference between the two groups in (intensity), whereas having a T-value of (intensity) and (duration) that is (2.760) and (2.466) which are more than (2.18), which means that there is significant difference between the groups in (intensity) and (duration). In the same way, the word *cat* has (1.719) as a T-value of (F0) and consequently is less than (2.18) which makes no significant difference between the two groups concerning F0, while having (2.518) and (3.105) as a T-value of (intensity) and (duration) and being more than the tabulated T-value, it makes no significant difference between the aforementioned groups in intensity and duration. Last but not least, the T-value of (F0), (intensity) and (duration) is (2.314), (3.821) and (2.412), which are more than the tabulated T-value of (2,18), so there is a significant difference between the two groups in (F0), (intensity) and (duration). See the table (4.4) and figures (4.5) and (4.6) that follows:

Table (4.4) Statistical analysis for the British group and the Iraqi Courses group

Word	Acoustic Characteristic	Groups	Mean	Std. Deviation	T-Value	Significance
I	F0	MIA Courses	2.535.860	9.074.662	2.117	Not Significant
		Natives	1.783.626	3.922.641		
	Intensity	MIA Courses	804.283	328.877	3.143	Significant
		Natives	744.612	366.841		
	Duration	MIA Courses	.2850	.13172	1.560	Not Significant
		Natives	.2050	.08829		
Bought	F0	MIA Courses	2.649.833	8.388.026	1.916	Not Significant
		Natives	1.565.125	1.976.656		
	Intensity	MIA Courses	809.383	261.322	2.760	Significant
		Natives	765.738	420.713		
	Duration	MIA Courses	.2067	.08317	2.466	Significant
		Natives	.1500	.03296		
Cat	F0	MIA Courses	2.508.633	9.770.303	1.719	Not Significant
		Natives	1.831.150	4.702.419		
	Intensity	MIA Courses	799.400	278.840	2.518	Significant
		Natives	738.680	536.366		
	Duration	MIA Courses	.1600	.06099	3.105	Significant
		Natives	.0550	.02777		
There	F0	MIA Courses	2.202.650	4.797.549	2.314	Significant
		Natives	1.646.335	4.185.329		
	Intensity	MIA Courses	812.633	300.200	3.821	Significant
		Natives	716.362	555.637		
	Duration	MIA Courses	.1983	.02927	2.412	Significant
		Natives	.1550	.03686		

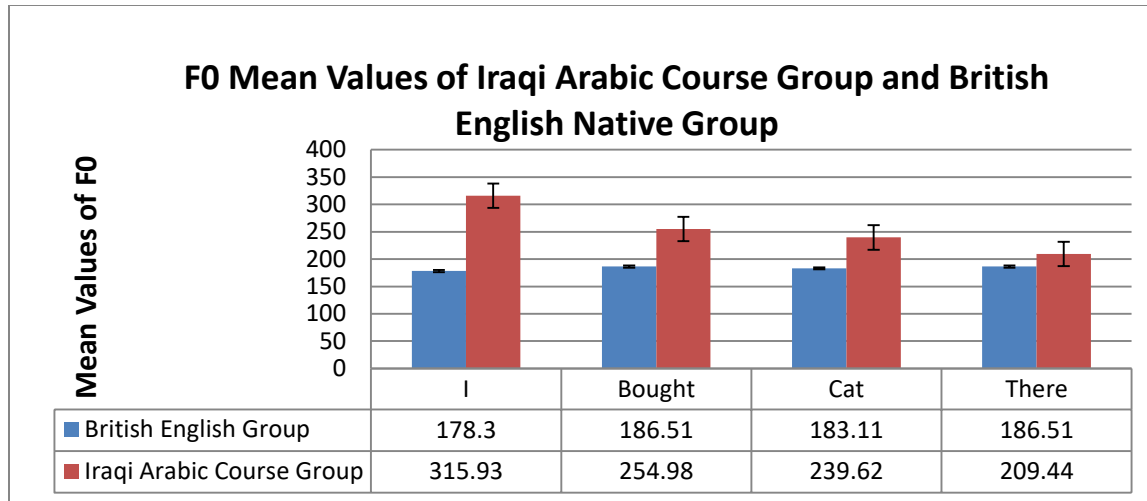


Figure (4.5) F0 mean values of British English group and Iraqi courses group

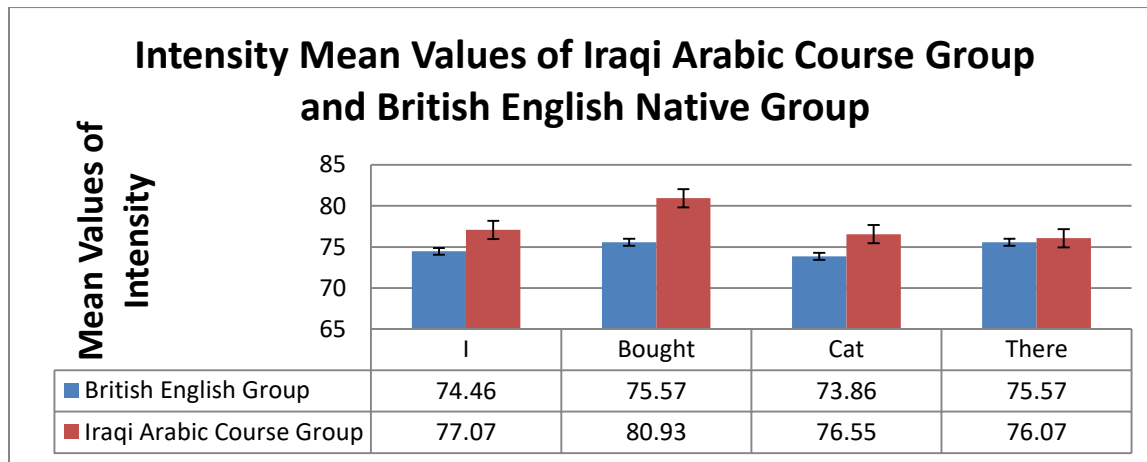


Figure (4.6) intensity mean values of British English group and Iraqi courses group

4.2.4 The Iraqi 4th Year Group and English Native Group

After using the T-test for two independent samples, it was found that the T-value of (F0), (intensity) and (duration) for the word *I* is (1.30), (0.379) and (0.267), for the word *bought* is (1.72), (0.341) and (0.101), and for the word *there* is (0.96) , (0.34) and (0.101), which are less than the tabulated T-value of (2,18), which means that there is no significant difference between the fourth stage students and the English group in the three acoustic factors of these three words. As for the word *cat*, the T-value of (F0) and (intensity) is (0.228) and (0.226), which are less than the tabulated T-value of (2,18), which means that there is no significant difference between the two groups in (F0) and (intensity), while having higher T-value of (duration) that is (5.144) which is more than the tabulated T-value of

(2,18), and that means there is significant difference between the two groups in duration. See the table below as well as the figures (4.7) and (4.8):

Table (4.5) Statistical analysis for the British group and the Iraqi 4th year group

Word	Acoustic Characteristic	Groups	Mean	Std. Deviation	T- Value	Significance
I	F0	4th Stage	2.05.1944	37.89	1.30	Not Significant
		Natives	178.35	39.23		
	Intensity	4th Stage	758.317	940.942	0.379	Not Significant
		Natives	744.612	366.841		
	Duration	4th Stage	.2133	.06088	0.267	Not Significant
		Natives	.2050	.05529		
Bought	F0	4th Stage	2.476.317	8.323.193	1.720	Not Significant
		Natives	1.865.125	4.976.656		
	Intensity	4th Stage	768.983	997.037	0.341	Not Significant
		Natives	755.738	420.713		
	Duration	4th Stage	.1517	.02714	0.101	Not Significant
		Natives	.1500	.03295		
Cat	F0	4th Stage	188.42	36.72	0.228	Not Significant
		Natives	1.831.150	4.702.419		
	Intensity	4th Stage	728.567	1.114.425	0.226	Not Significant
		Natives	738.650	536.366		
	Duration	4th Stage	.1733	.03670	5.144	Not Significant
		Natives	.0850	.02777		
There	F0	4th Stage	209.88	37.41	0.96	Not Significant
		Natives	186.51	49.77		
	Intensity	4th Stage	76.90	Ey1.97	0.34	Not Significant
		Natives	75.57	Nis.21		
	Duration	4th Stage	0.15	0.027	0.101	Not Significant
		Natives	0.15	0.033		

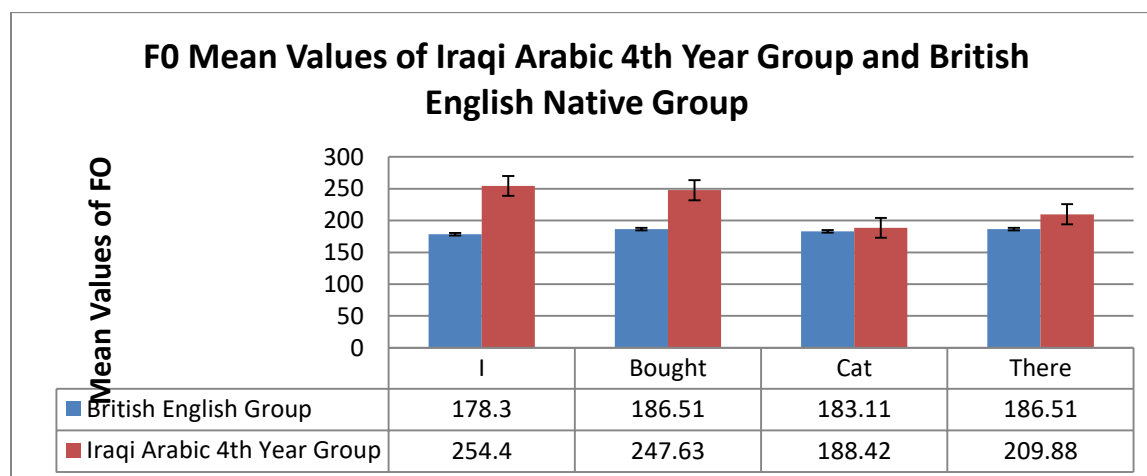


Figure (4.7) F0 mean values of British English group and Iraqi 4th year group

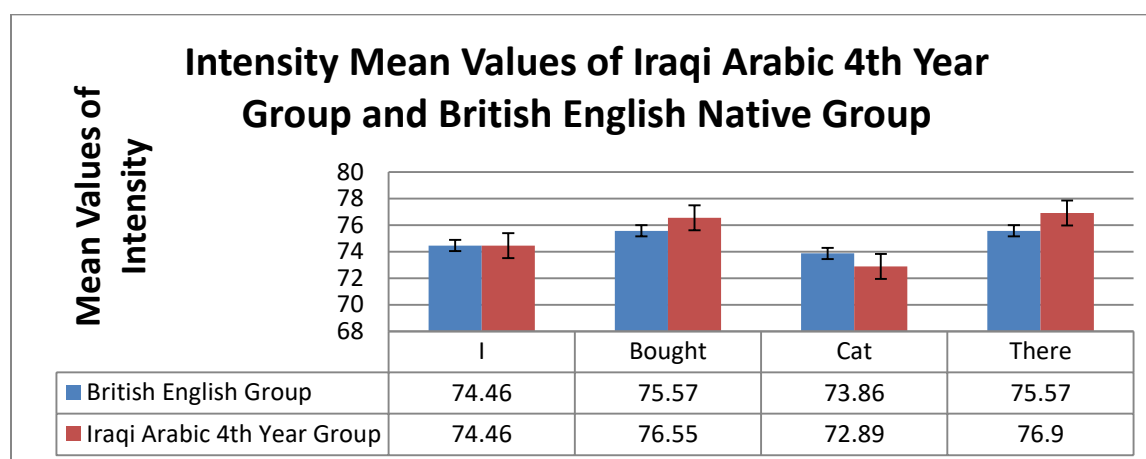


Figure (4.8) intensity mean values of British English group and Iraqi 4th year group

5. Discussion

The current study makes a comparison between Iraqi Arabic foreign learners and a group of British English native speakers. All four groups could pronounce the stressed vowel with effort and correctly. Generally, stressed vowels were spelled with higher F0, larger intensity and longer duration compared to unstressed vowels. There are salient differences in vowel production that were remarked between groups.

In consistence with research question two (b) that wonders whether L1 interference makes a difference, it is found that the four Iraqi show no significant difference from the English native speakers group, but absolutely there are remarkable differences in vowel production among these groups. This finding does not support the L1 hypothesis. From another prospect, the average age of learning of the MA research group is 11 years while the average age of the learning of the 4th year group is 9. That concludes the possibility that Iraqi 4th year group acquired language at earlier age what gave them the chance to be more experienced and more stress controlling than MA research group. This might be because when 4th year students started learning English, they were in earlier age and very new to the process of learning. So they were exposed to the process of learning which regarded to be acquisition. This contrasts with MA research group that began learning English late in childhood. This might be the reason behind 4th year group not showing as much Iraqi interference as the MA research group. This view comes

in accordance with the preceding findings that prefers the early age of learning that gives accurate production results what makes the accent less foreign like (Piske, 2001; Wang, 2013).

In comparison with literature, the four Iraqi groups produced higher F0 than the native groups and produced higher F0 than the native group and this is harmonious with what was found by Chen et al. (2001), Ng and Chen (2011) and Wang (2013), even though the difference is not significant. As for duration, the four Iraqi groups produced longer duration than native speakers and that is consistent with what was found by Wang (2013). The finding of Chen et al. (2001) and Ng and Chen (2011) are not the same where the results revealed that Mandarin speakers and HK Cantonese speakers generated stress with shorter duration. Furthermore, the intensity results showed that there is no significant difference that is consistent with the findings of difference that is consistent with the findings Chen et al. (2001) and Ng and Chen (2011). The result is found to be different by Wang (2013) where there was significant difference in intensity.

6. Conclusion

In spite of the remarkable difference between the Iraqi Arabic learners and the British English natives in the production of the given sentence, yet there is no significant difference in the three acoustic factors. That might be because the L1 interference is not so affective.

References

Al-Ani, S. (1970). Arabic phonology. Paris: Mouton, The Hague.

Al-Marzuq, Z. (1998). The identification of long versus short vowels in English by advanced Iraqi learners of English: a perceptual study. The University of Basrah: Master's diploma thesis.

Al-Thalab, H., Yap, N., Nimehchisalem, V. and Rafik-Galea, S. (2018). Perception of English Lexical Stress: Some Insights for English Pronunciation Lessons for Iraqi ESL Learners. Journal of Tikrit University for Humanities 34001.

Al-Thalab, H. (2021). A Cross- Linguistic Study on the Production of English Lexical Stress: Reliance on Language Proficiency Cue. Tikrit University Journal of Language Studies. V. 4 n. 3.

Altmann, H. (2006). The perception and production of second language stress: A cross linguistic experimental study. University of Delaware.

Boersma, P. and Weenink, D. (2020). Praat: Doing phonetics by computer [computer program]. Version 6.1.15, received 1 June 2020. From <http://www.fon.hum.uva.nl/praat/download-win.html>.

Brosnahan, L. and Malmberg, B. (1970). Introduction to phonetics. Cambridge: CUP

Catford, J. C. (1970). Fundamental problems in phonetics. Bloomington: Indian U Press.

Chen, Y., Robb, M. P., Gilbert, H. R., & Lerman, J. W. (2001). A study of sentence stress production in Mandarin speakers of American English. The Journal of the Acoustical Society of America 109(4). 1681-1690

Gimson, A. C. (1994). Gimson's pronunciation of English. Revised by Cruttenden, A. London: Arnold.

Hays, B. (1995). Metrical stress theory: principles and case studies. Chicago: University of Chicago Press.

Katamba, F. (1989). An introduction to phonological theory. London: Longman.

Ladefoged, P. (2001). A course in phonetics. 4th ed. Boston: Heinle & Heinle.

Ladefoged, P. and Johnson, K. (2015). A course in phonetics. 7th ed. Stanford: CT Cengage Learning.

Malmberg, B. (1963). Phonetics. New York: Dover Books

Ng, M. L., & Chen, Y. (2011). Proficiency in English sentence stress production by Cantonese speakers who speak English as a second language (ESL). International Journal of Speech-Language Pathology 13(6). 526-535

Scarborough, R., Keating, P., Mattys, S., Cho, T. and Alwan, A. (2009). Language and speech/ Optical phonetics and visual perception of lexical and phrasal stress in English. 52-135

Thornbury, S. (2006). An A-Z of ELT. London: MacMillan.

Trask, R. L. (1996). A dictionary of phonetics and phonology. London: Routledge.

Wang, J. (2013). Production of sentence stress in English: comparing Mandarin/ English, Hong Kong Cantonese/English and Guangdong Cantonese English bilinguals. The Chinese University of Hong Kong.