



The Effect of Gender on VOT of Stops of Iraqi EFL learners

Ahbab Lazim

University of Mosul, College of Education for Humanities

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Abstract

English is one of various languages such as Swedish, Korean, Telugu and Arabic which studied gender's effect on voice onset time (VOT). This research mainly investigates the impact of gender on the VOT of the voiceless stop consonants related specifically to Iraqi Mosuli EFL learners to see if there are certain variations in their VOT values or not. In this research, 20 Mosuli Iraqi EFL (male and female) students in fourth- year, the Department of English, College of Education for Humanities and College of the Arts, University of Mosul took part. VOT. values of /p, t, k/ which are followed and are preceded by the long vowel /i:/, in three different positions in isolation are measured to give an overall view of the students' production of the stops and to see if there is certain variation between the subjects' measurements or not. Results show that there are certain variations between male and female averages of the stops in which male participants tend to produce longer values than female ones in isolation. This research concludes that males' production voiceless stops are better than females' ones in initial and medial positions while female's production of unreleased stops are better than male in final position. In addition to the physiological articulators' differences, we may also infer that academic and practical study in first and second year for both genders are not sufficient to enhance better pronunciation of the stops. Therefore, this research recommends further practical and academic study for both genders.

Correspondence:

ahbab.lazim@uomosul.edu.iq

المستخلص

تمت دراسة تأثير الجنس على قيم زمن بدء الجهر بالصوت للغات مختلفة مثل الإنجليزية والسويدية والكورية والتيلجو والعربية. ان هذا البحث يبحث وبشكل اساسي في تأثير الجنس على قيم الجهر بالصوت للأصوات الصحيحة التي لا صوت لها والتي لفظها متعلمون موصليون للغة الإنجليزية كلغة أجنبية لمعرفة فيما إذا كان هناك اختلاف معين في زمن الجهر ام لا. شارك في هذه الدراسة ٢٠ طالبا (ذكرا وانثى) من المرحلة الرابعة من قسم اللغة الإنجليزية، من كلية التربية للعلوم الإنسانية وكذلك من كلية الآداب في جامعة الموصل. تم قياس زمن بدء الجهر بالصوت للأصوات الثلاثة الصحيحة متنوعة ومسبوقة بالحرف العلة الطويل /i:/ ، في ثلاثة أوضاع مختلفة في بداية ووسط ونهاية الكلمات المفردة لإعطاء نظرة شاملة حول لفظ الذكور والإناث لهذه الاصوات وفيما إذا كان هناك اختلاف في هذه القيم ام لا. اظهرت النتائج أن هناك تبايناً معيناً لمعدلات زمن بدء الجهر بالصوت للذكور والإناث حيث يميل متعلمي اللغة الإنجليزية من الذكور إلى ان تكون هذه القيم أطول من تلك القيم العائدة للإناث للكلمات المفردة. ان نتائج هذه البحث ان لفظ الذكور فيما يخص الاصوات الصحيحة الوقفية أفضل من نتائج الإناث في بداية ووسط الكلمات بينما نتائج الإناث لنفس هذه الاصوات أفضل من نتائج الذكور في نهاية الكلمات. بالإضافة إلى وجود اختلافات فسيولوجية بين كلا الجنسين والتي ذكرت في دراسات سابقة، نستنتج أيضاً أن الدراسة الأكاديمية والعملية في السنة الأولى والثانية لكلا الجنسين ليست كافية لتعزيز نطق أفضل للأصوات التي لا صوت لها. لذلك، يوصي هذا البحث بمزيد من الدراسة العملية والأكاديمية لكلا الجنسين .

1: Introduction

VOT, is mainly used as a temporal acoustic parameter to distinguish among stop consonants: voiced and voiceless (Khatab, 2006 :1; Alanazi, 2017: 9). Ladefoged and Johnson (2015) state that VOT of the stops is measured from the release of the stop consonants till the closure; the start of the vibrations of the vocal folds of the vowel is in milliseconds. If voicing starts before the release of stops; during the closure, VOT has a negative value and it is called “voicing lead”. In addition, “Short lag” refers to positive VOT. when the voicing starts up

to 25ms after the release. And, “Long lag” refers to positive VOT. when voicing starts after more than 25ms of the release.

Lisker and Abramson, 1964; Kent and Read, 2002, give to the literature some averages of English voiceless stops starting from 30 to 80 ms in which / p / has a lowest values; about 58 ms. , / t / about 70 ms and / k / has a value about 80 ms which is the longest.

There are many universal factors that may have their effects on the value of VOT. Gender is one of those variables that affect VOT values. Gender's effect has been studied in different languages as well as in different Arabic dialects. Some studies have investigated such an effect in English (Swartz, 1992), in Swedish (Lundeborg et al, 2012), in Korean (Oh, 2011), and in Telugu (Madhu et al, 2014). Other studies have investigated male and females' VOT values in isolated words (Smith, 1978; Ryalls et al, 1997; Whiteside and Irving, 1998), while others examined VOT values in carrier phrases (Sweeting and Baken, 1982; Swartz, 1992).

1.1The Statement of the Problem

In the literature, genders' effects on the VOT. measurements attracted little attention of some researches. Researches on English measurements of VOT of stops related to Arab EFL learners have revealed inconsistent results based on gender which indicate a need for further investigation. By using VOT. values which are taken from the waveform of production of adult Iraqi Mosuli male and female speakers of English, to see the differences between them. Kewley-Port and Preston (1974) mention that participants' values may be influenced by the speed of vocal folds. This research mainly investigates the effect of Iraqi Mosuli gender on VOT. It is expected that there will be

differences in the production of Arabic Mosuli background (male and female) of the English stops. In other words, we can say that there are production problems; whether Iraqi Mosuli male and female learners are going to produce English voiceless stops equally or not (higher or lower).

1.1 The Aim of the Research

This research aims to perform an acoustic analysis of the VOTs' values of the English voiceless stops produced by Iraqi Mosuli EFL learners in relation to the factor of gender; males' and females' variation in isolation.

1.3 Limits of the Research

Beside the differences between men and women in using language, there are other differences in other aspects in which this research does not deal with such as: age, fundamental frequency, pitch, speaker's variability, social class, the number of the syllables inside the given word and speaking styles.

1.4 Procedures and Data Collection

As to the procedures and data collection that are followed in this research are as the following:

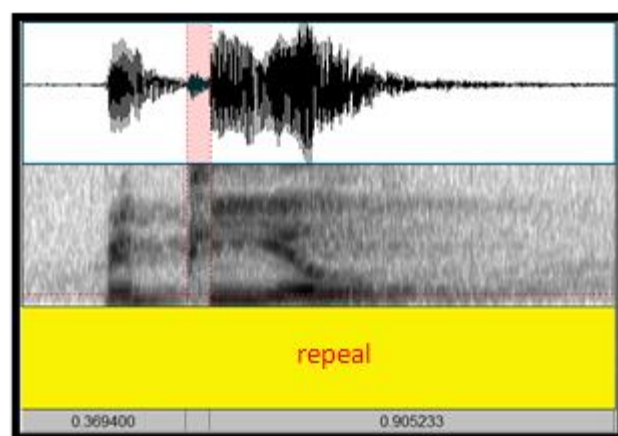
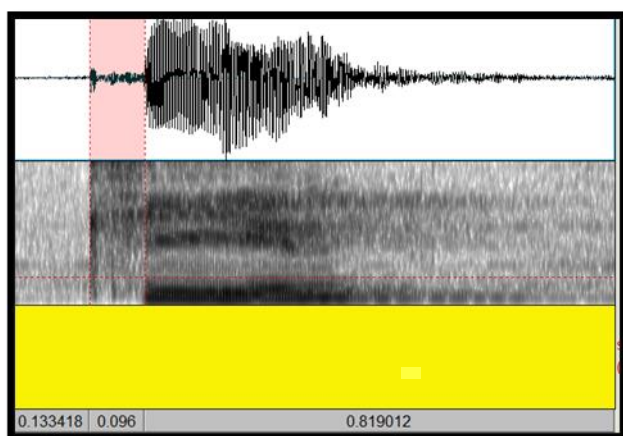
1. An equal subjects, 20 (10 male and 10 female), fourth-year students in the English Department, the College of Arts and the College of Education for Humanities, the University of Mosul are selected to pronounce the tokens
2. Nine tokens containing the English stops; /p, t, k/ are followed by the long vowel /i:/ in initial, medial positions and are preceded by /i:/ in final ones. Each token is put in isolation.

Table 1: The words of the test in different positions and their transcriptions.

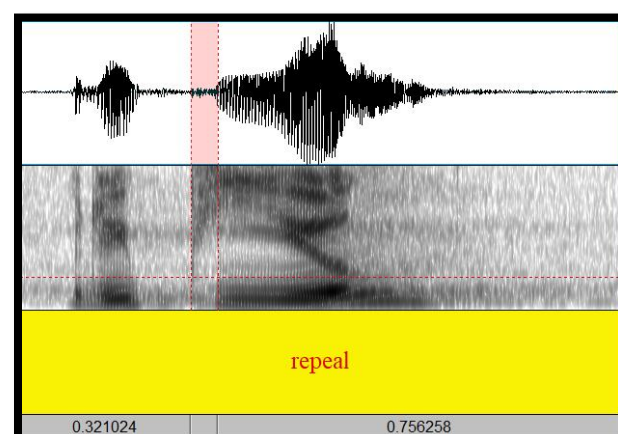
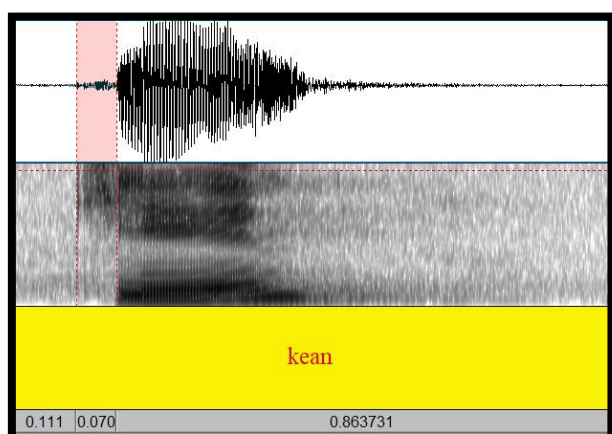
Stops	Positions	Words	Transcriptions
/p/	Initial	Peal	/'pi:l/
	Medial	Repeal	/rɪ'pi:l/
	Final	Leap	/'li:p/
/t/	Initial	Team	/'ti:m/
	Medial	Thirteen	/θɜ:'ti:n/
	Final	Meat	/'mi:t/
/k/	Initial	Keen	/'ki:n/
	Medial	Marquise	/ma:'ki:z/
	Final	Leak	/'li:k/

3. By using English script “Times New Romans”, the tokens are printed on flash cards (8cm x 12cm) with a font size of “100”. The words are read by all participants in isolation only.

4. VOT values in initial and medial positions are measured from the release of the stop to the beginning of the voicing of the following vowel /i:/ for male and female participants. (see Figures 1,2, 3 and 4)

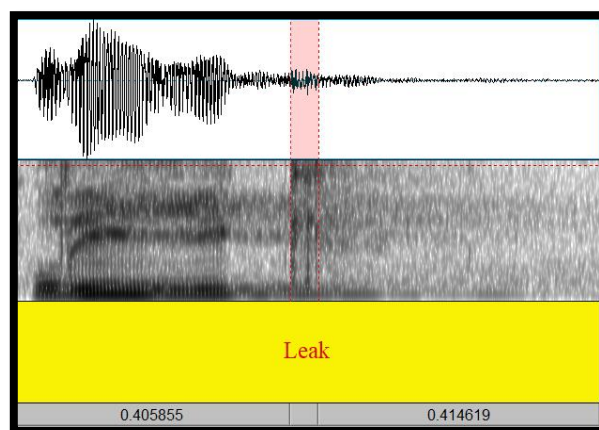
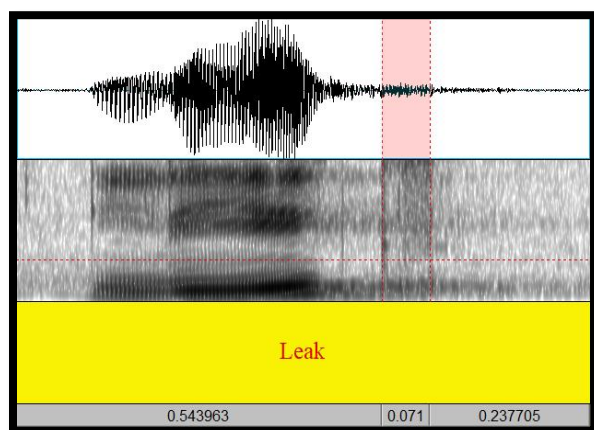


Figures 1, 2. Male waveforms of initial /k/ of 'keen' and medial /p/ of 'repeal'



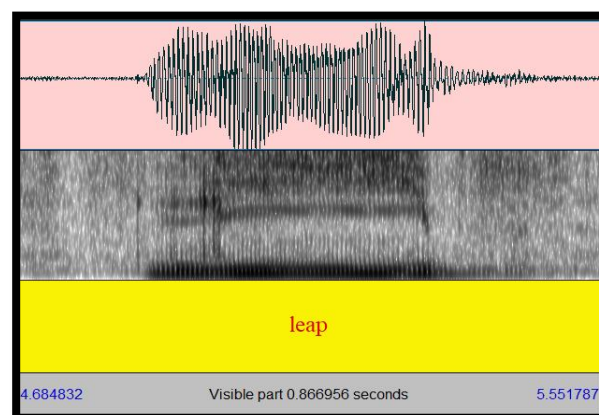
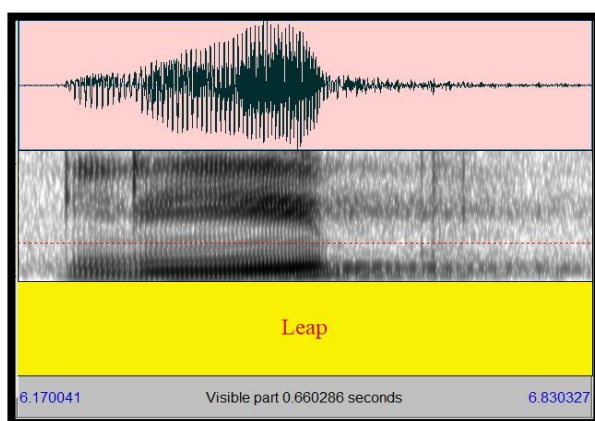
Figures 3, 4. Female waveforms of initial /k/ of 'keen' and medial /p/ of 'repeal'

5- VOT. of stops in final position in isolation for both genders cannot be measured since they are either released or unreleased (Fry, 1979: 136). (see Figures 5, 6, 7 and 8).



Figures 5 and 6. Male

Figures 5, 6. Male and female waveforms of final released /k/



Figures 7, 8. Male and female waveforms of final unreleased /p/ of the word 'leap'

1.5 The Model Adopted

The model used in this research for analyzing the acoustic waveforms of the voiceless stops of all subjects' values, beside "elicitation procedure" to measure VOT of stops from the stops' releasing to the voicing of the following vowel, is "Lisker and Abramson's classic study". Besides, their three criteria of visualizing the subjects' values are: voicing lead, short lag and long lag.

2. The Theoretical Part

Between the variables that may affect VOT values of stops is “gender”. Previous studies of Gender’s effect on VOT values in isolation have been studied in different languages, viz., English previous studies, Arabic previous studies, other languages and previous Arab EFL learners’ studies are presented in sub sections.

2.1 Previous English Studies

Previous researches mention that women’s speech may vary from men’s mainly because men have longer vocal tract than women (Klatt, 1975; Smith, 1978; Pickett, 1980 and Simpson, 2001). Such physiological differences between both genders are related to the glottis’ shape, the vocal folds’ thickness, the vocal tracts’ size, as well as speech rate. This may lead to an unequal male and female pronunciation of stops hence gender bias become clear.

Some English previous researches report higher VOT. values in females’ speech; Whiteside and Irving (1998) reveal that the clarity of women’s speech is the reason for their higher VOT values for the stop consonants in comparison with men’s values. In measuring consonants’ values of children, Whiteside et al (2004). notice longer VOT in girls than boys. Similarly, they relate the results to the differences of the larynx and vocal tract. Also, Karlsson et al, (2004) in investigating the effect of genders on stop consonants in isolated words find that female speakers have longer values than male speakers. Finally, Morris et al. (2008) notice the same results that females tend to produce longer VOT. Values of stops after long and short vowels in isolated words than men. Other researches have investigated male and females’ VOT values in isolated words and in carrier

phrases (Smith, 1978; Swartz, 1992; Ryalls et al., 1997). However, Sweeting and Baken (1982) do not show any differences in females' and males' results.

2.2 Previous Other studies

Oh (2011) shows that in both contexts; in isolation and carrier phrases, men produce longer VOT values than women. He claims that sociolinguistic factors may play a significant role for such variations in Korean.

Kim and Lotto (2002) find that gender difference is not statistically significant in measuring VOT values of Korean stops. In addition, Lundeborg et al. (2012) find no differences of VOT values of children for both genders in both tasks in sentence completion and picture naming in Swedish. Madhu et al. (2014) find no significant distinction of men's and women values in Telugu. Yu et al. (2015) analyze VOT. values of /p, t and k/ in isolation to explore age and gender variation. Results show longer females' values in comparison to males' values.

2.3 Previous Arabic Studies

As to previous Arabic studies, Khattab et al. (2006) find that gender plays sufficient role of Jordanian Arabic values of /t/ and /t̤/ in the sense that females made longer VOT than the males. Almbark (2008) concludes that the socio-phonetic factors which manipulate on the values of emphasis in female Syrian Arabic. Also, Al Malwi (2017) asserts the same results of women's longer values in the same language. Rifaat (2003) states no values' differences between both genders. Also, Abudalbuh (2010) does not find any values difference of /t̤, t/ followed by long vowels in monosyllabic minimal-pairs in the north of Jorden. Suleiman (2020) states that the gender-based differences in the values of Mosuli Arabic stops are not significant. And, he investigates the measurements of Arabic /p/ and /b/ initially in isolation related to male and female Saudi ESL learners. As

for /b/ values, the results do not show any production variation between male and female participants. For the sound /p/ no statistical difference was found in the results between the same participants.

3. Data Analysis and Discussion

3.1 Data Analysis:

Appendix 1 and 2 present details of “VOT” values of the students of the three voiceless stops /p /, /t / and k / followed by the vowel /i:/, in different positions; initial, medial and preceded by the same vowel in final position in isolation. Tables 2. And 3 below, which are extracted from Appendix 1 and 2, represent the total averages of both genders can be used as co-reference from time to time in the following sections.

Table 2: Male VOT averages of voiceless stops in isolation.

Position	/p i:/	/t i:/	/k i:/
Initial	25	56	91
Intervocalic	52	71	79
Final	----	----	----

Table 3: Female VOT averages of voiceless stops in isolation

Position	/p i:/	/t i:/	/k i:/
Initial	18	52	71
Intervocalic	29	55	77
Final	----	----	----

3.1.1 Initially for Males:

The VOT average of initial /p/ followed by /i:/ is (25) ms . While the VOT average of initial /t/ followed by /i:/ is (56) ms. Finally, the VOT average of initial /k/ followed by /i:/ is (91) ms Figure (9) below which presents the numerical results of male EFL learners' initial voiceless stops in isolation.

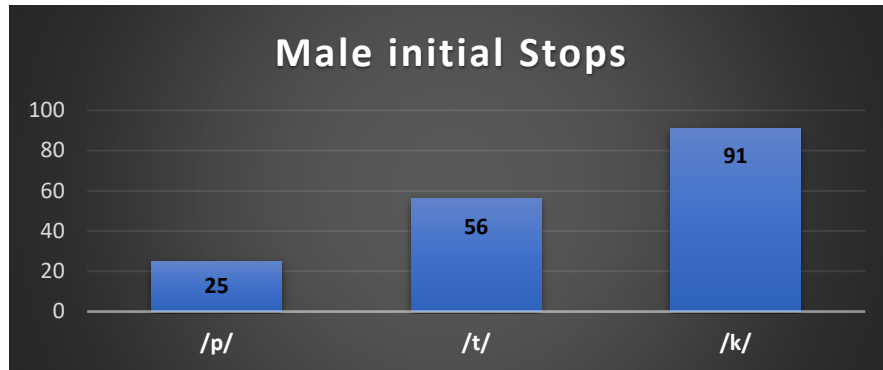


Figure 9. Male results of initial /p/ /t/ /k/followed by /i:/ in isolation

3.1.2 Initially for Females:

The VOT average of initial /p/ followed by /i:/ is (18) s. While, the VOT average of initial /p/ followed by /i:/ is (52) ms. Finally, the VOT average of initial /k/ followed by /i:/ is (71) ms. Figure 10 below presents the numerical results of female EFL learners' initial voiceless stops in isolation.

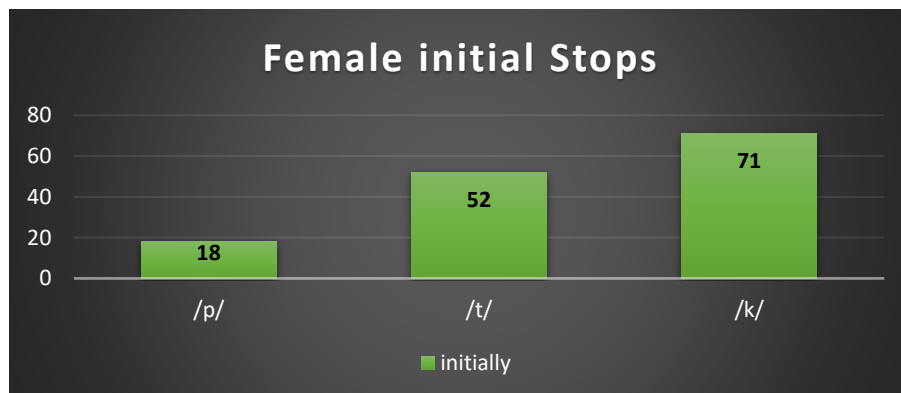


Figure 10. Female results of initial /p, t, k/followed by /i:/ in isolation

3.1.3 Medially for Males:

The VOT average of medial /p / followed by /i:/ is (52) ms. While, the VOT average of medial /t/ followed by /i:/ is (71) ms. Finally, the VOT average of medial /k/ followed by /i:/ is (79) ms . Figure 11 below presents the numerical results of male EFL learners of voiceless stops in isolation.

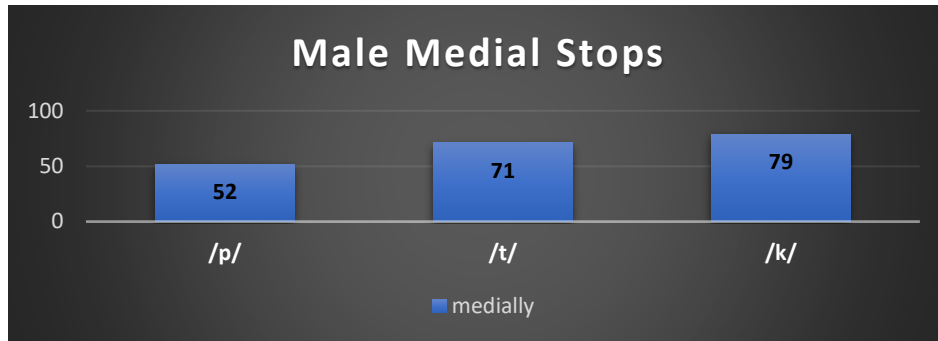


Figure 11. Male results of medial /p , t, k/ followed by /i:/ in isolation

3.1.4 Medially for Females:

The VOT average of medial /p / followed by /i:/ is (29) ms . While, the VOT average of medial /t/ followed by /i:/ is (55) ms. Finally, the VOT average of medial /k/ followed by /i:/ is (77) ms . Figure 12, below presents the numerical results of female EFL learners of voiceless stops in isolation.

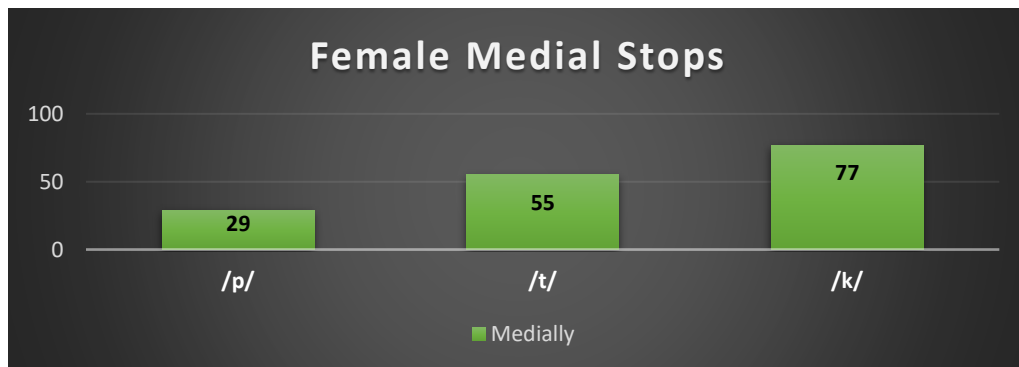


Figure 12. Female results of medial /p , t, k/ followed by /i:/ in isolation

3.1.5 Finally for Males:

In final position in isolation, voiceless stops are generally released or unreleased since they are followed by nothing and preceded by the long vowel /i:/. Therefore, In final position and according to Appendix (1) which shows result of all male participants, the most frequent voiceless stops found to be unreleased is [p̚] in the sense that only (4)out of 10 male tokens are released, while (6) male tokens are unreleased. As for the voiceless stop /t/, the number of male tokens that are released are (7) and (3) are unreleased [t̚]. As for the final voiceless stop /k/, all participants' male results are released (see table 4 and figures 13 and 14).

Table 4: Male numerical ranges of final released and unreleased /p, t, k/ in isolation.

Stops	/p/	/t/	/k/
Male: R	4	7	10
Male: U	6	3	----

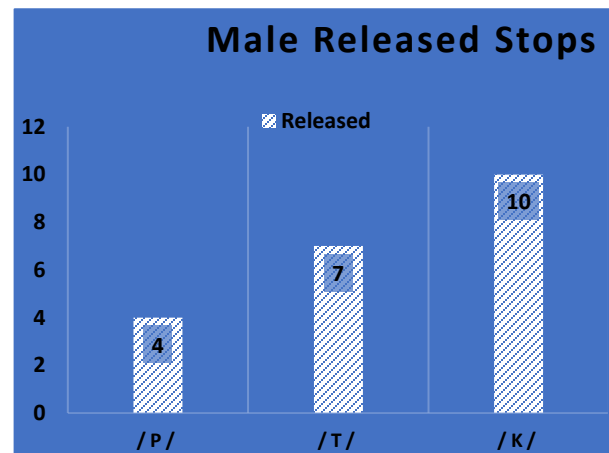
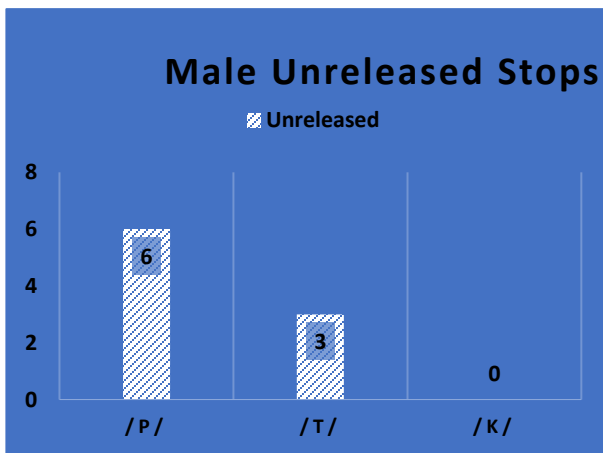


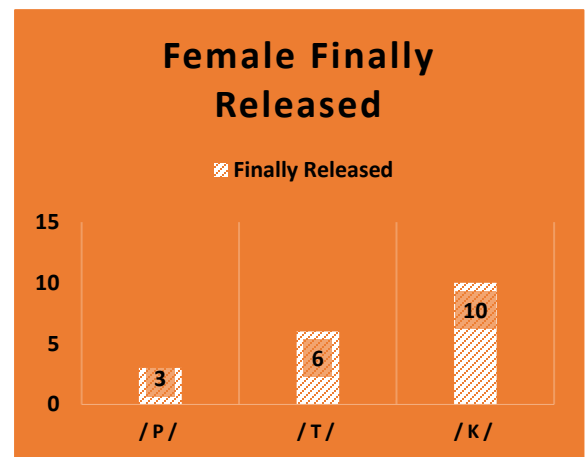
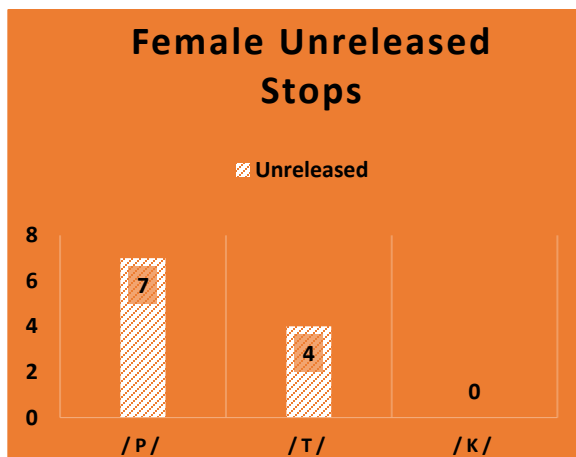
Figure 13,14. Male numerical released and unreleased final /p, t, k/in isolation

3.1.6 Finally for Females:

In final position, these sounds are preceded by a long vowel /i:/. Most female participants' final results in isolation have also released and few individual unreleased /p/ (see Appendix 1). Accordingly, the number of female tokens that are unreleased [p̚] are (7)out of 10 females and the number of /p/ tokens that are released are (3). And, the number of final unreleased [t̚] are (4) and released /t/ are (6). While the number of final /k/ tokens that are released are (10) (see table 5 and figures 15 and 16).

Table 5. numerical female ranges of released and unreleased /p, t, k/ in final position in isolation.

	/p/	/t/	/k/
Female: R	3	6	10
Female: U	7	4	----



Figures 15,16. Female numerical released and unreleased final /p, t, k/in isolation

3.2 Discussion

VOT can be considered an acoustic cue that categorized stops acoustically into ‘voiced’ and ‘voiceless’ (Lisker and Abramson, 1964). Besides, English language has only short and long-lag stops. VOT values can be affected by several factors; one of them is gender. By adopting the model of this research “Lisker and Abramson, 1964” who proposed certain averages for the VOT. Values for English stops (see p:2) .

In this research, certain essential comparisons between male and female VOT averages of the three voiceless stops followed and preceded by /i:/ in different positions in isolation are presented in order to make a kind of overall view about participants’ production of the voiceless stops in English.

3.2.1 Males and Females VOT Values Initially:

This section includes two main comparisons, viz. a comparison of the initial VOT averages of both genders with the model of this research in isolation and a comparison of the initial VOTs averages of both genders with each other in isolation

3.2.1.1 VOT Values of Stops with the Model:

A deep look to Appendixes (1 and 2), tables (2 and 3) and figures (9 and 10) which present Iraqi EFL (male and female students’ initial production of stops in isolation, it is found that: on the averages level, VOT averages of the initial voiceless stops /p, t, k / followed by / i: / in isolation are: (25, 56, 91) ms. for male participants and (18, 52, 71) ms. for female ones. On one hand, male and female VOT averages for initial /p, t, k/ display positive VOT. varying between short-lag and long-lag. On the other hand, as for male VOT. averages for all initial stops, and in relation to Lisker and Abramson’s VOT value and in relation to Lisker and Abramson’s VOT values in initial position, males tend to display lower VOT. values for /p, t/ and equal VOT. values for /k/. As for female

participants, VOT. values for initial stops do not confirm with Lisker and Abramson 1964 VOT. values since they display lower VOT values (short lag) of stops in initial position in isolation.

3.2.1.2 VOT Averages of Both Genders:

A look to the Appendixes (1 and 2), VOT averages in tables (9 and 10) and figures (5 and 6) related to Iraqi EFL (male and female) learners in initial position, we notice the following:

- (a)- Male VOT average of initial /p/ in isolation are (25) ms. which is higher than female average which is (18) ms. in the same position.
- (b)- Male and female VOT averages of initial /t/ in isolation are (56, 52) ms. which are equaled.
- (c)- Male VOT values of initial /k/ are (91) ms. which is higher than female VOT average which is (71) ms. in the same position.

3.2.2 Male and Female VOT Averages Medially:

This section includes two main comparisons: viz. a comparison of the medial VOT values of both genders with the model “Lisker and Abramson (1964) ” in isolation and a comparison of the medial VOT values of both genders with each other in isolation.

3.2.2.1 VOT Values with the Model:

As for medial VOT. values of / p, t and k / , appendixes (1, 2), tables (2 and 3) and figures (11 and 12) which present Iraqi EFL (male and female) learners’ medial production of stops in isolation, this research finds the following: On the averages level, VOT. values of the medial voiceless stops /p, t, k / followed by / i: / in isolation are: (52,71,79) ms. for male participants and (29, 55,77) ms. for female ones. On one hand, male and female VOT averages for medial /p, t, k/ display positive VOT varying between short-lag and long- lag. On the other hand,

as for male VOT. averages for all medial stops, they display equal VOT. values for /p/ only and lower VOT. values for /t, k/ related to Lisker and Abramson's VOT. values in isolation. As for female participants, All VOT. averages for medial stops do not confirm with Lisker and Abramson (1964) VOT. values for English stops since they also display lower VOT. values than those of Lisker and Abramson (1964) for all stops in medial position in isolation.

3.2.2.2 VOT Averages of Both Genders:

Another look to the Appendixes (1 and 2), VOT averages in tables (2 and 3) and figures (11 and 12) related to Iraqi EFL (male and female) students in medial position, this study notices the following:

- (a)- Male VOT average of medial /p/ in isolation is (52) ms which is higher than female average which is (29) ms in the same position.
- (b)- Male VOT average of medial /t/ in isolation is (71) ms which is higher than female average which is (55) ms in the same position.
- (c)- Male and female VOT averages of medial /k/ are; (79, 77) ms which are equaled in the same position.

3.2.3 Male and Female Numerical Ranges Finally:

In final position in isolation, voiceless stops are generally either released or unreleased since they are followed by nothing. This section presents two comparisons between male and female unreleased numerical ranges and the other one between male and female released numerical ranges.

3.2.3.1 Unreleased Numerical Ranges

According to appendixes (1, 2), tables (13, 14, 15 and 16) which show unreleased numerical ranges for male and female participants of both genders, this research finds the following:

(a)- Female unreleased numerical range for /p/ is (7) which is higher than male unreleased numerical range for /p/ which is (6).

(b)- Female unreleased numerical range for /t/ is (4) which is higher than male unreleased numerical range for /t/ which is (3).

(c)- Male and female unreleased numerical ranges for /k/ in isolation are (0, 0) which are equaled.

3.2.3.2 Released Numerical Ranges

According to appendixes (1, 2), tables (2 and 3) and figure(13, 14, 15 and 16) which show released numerical ranges for male and female participants of both genders in isolation, this research notices the following:

(a)- Male released numerical range for /p/ is (4) which is higher than female released numerical range for /p/ which is (3).

(b)-Male released numerical range for /t/ is (7) which is higher than female released numerical range for /t/ which is (6).

(c)- Male and female released numerical ranges for /k/ in isolation are (10,10) which are equaled.

3.2.4 VOT values and previous studies

This section presents a comparison of the initial VOT. values with previous English studies as far as gender's production variation of voiceless stops. As regard Appendixes (1, 2) and tables (2,3) which show VOT. values of /p, t, k/ in isolation, this research notices that male VOT. values are higher than female VOT. values in initial and medial positions of stops in isolation. Firstly, such results compromise with previous studies such as Klatt (1975), Smith 1978, Pickett (1980), Simpson (2001) which state that male VOT. values are longer than female ones as far as voiceless stops production (see, 2.1). Secondly, such

results do not compromise with other previous English studies such as; Swartz (1992), Ryalls et al (1997), Whiteside and Irving (1998), Koenig (2000), Karlsson et al (2004) and Morris et al. (2008) which state that female VOT. values are shorter than male ones as far as voiceless stops production (see, 2.1). Finally, male and female VOT. values of /t/ initially and /k/ medially are equaled which compromise with English previous studies such as Sweeting and Baken (1982) which have same results, only for these two sounds in these two positions in isolation.

3. Conclusions:

The acoustic analysis of the VOT values of voiceless stops related to Iraqi EFL students concludes the following:

1- In Initial position, male VOT averages of /p/ and /k/ in isolation are higher than female average in the same position. Male and female VOT averages of /t/ in isolation are equaled.

2-In medial position, male VOT averages of /p/ and /t/ in isolation are higher than female averages in the same position. Male and female VOT averages of medial /k/; are equaled in isolation.

3- In final position, female unreleased numerical ranges for /p/ and /t/ are higher than male unreleased ones. Male released numerical ranges for /p/ and /t/are higher than female released ones. Male and female released and unreleased numerical ranges for /k/ are equaled in the final position in isolation.

4-Males and females display positive VOT varying between short-lag and long-lag. Males tend to display lower VOT values for the stops /p, t/ and equal VOT values for /k/ only related to Lisker and Abramson's VOT in isolation.

5-As to an overall view of both genders' production of voiceless stops, males' production as far as voiceless stops are concerned is better than female ones in initial and medial positions while females' production of final unreleased stops is better than male ones.

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Appendix1. Individual VOT values and their averages of English voiceless stops after long vowel /i:/ produced by Iraqi male EFLs in isolation in initial, medial and final positions. All values are in millisecond (ms) , AV. = total average, R= released and U= unreleased.

Appendix 2. Individual VOT values and their averages of English voiceless stops after long vowel /i:/ produced by Iraqi Female EFLs in isolation in initial, medial and final positions. All VOT values are in millisecond (ms) and AV. = total average, R.= released and U. = unreleased

Sound	Position	Tokens	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	AV.
P	Initial	Peal	18	26	33	18	40	28	23	21	31	١٦	25
	Medial	Repeal	52	56	54	41	63	53	50	57	52	٤٦	52
	Final	Leap	U	U	U	R30	R75	R34	U	U	R61	U	----
T	Initial	Team	21	50	77	56	34	55	67	70	77	56	56
	Medial	Thirteen	89	80	71	60	44	84	77	75	73	65	71
	Final	Meat	R80	R80	R67	U	R81	R88	U	R68	R78	U	----
K	Initial	Keen	91	94	90	90	82	97	92	96	99	85	91
	Medial	Marquise	72	75	90	91	84	78	69	89	79	70	79
	Final	Leak	R40	R83	R89	R50	R76	R76	R38	R88	R99	R89	----

Sound	Position	Tokens	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	AV.
P	Initial	Peal	24	16	13	18	24	15	13	12	23	28	18
	Medial	Repeal	38	22	20	27	32	20	26	34	35	37	29
	Final	Leap	R٢٦	U	R25	U	R17	U	U	U	U	U	----
T	Initial	Team	58	30	51	66	58	45	54	61	40	58	52
	Intervocalic	Thirteen	57	57	43	68	54	50	47	61	52	66	55
	Final	Meat	R58	U	R49	R55	R66	R50	U	U	R52	U	----
K	Initial	Keen	70	56	61	85	79	90	63	89	66	58	71
	Intervocalic	Marquise	78	61	71	85	83	66	78	88	78	89	77
	final	Leak	R76	R71	R67	R64	R76	R83	R٣٧	R63	R66	R70	----