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words like: is, as, his have /z/ in final position. Therefore generally, we suggest that students should be asked about words' transcription.

Beside teaching segmental phonemes, due attention must also be paid to certain phonetic features (i.e. suprasegmental features) among which duration of vowels and its relation with the following fricatives play an important role. Therefore, it is the teachers' responsibility to make their students understand such features by giving them minimal pairs, let us say: Price /praɪs/ and Prize (n.) /prɪz/. The teacher might tell students that through the diphthongs in this minimal pair are phonemically the same, they are not phonetically so: /z/ in /praɪz/ is longer than its cognate in /praɪs/. On the other hand, /z/ is slightly shorter in duration if it is compared with /s/ in the same context. Such voicing contrast is important in phonemic categorizations, flege (1984) shows that:

Increasing vowel duration from 150-350 ms resulted in a net increase of 78% in /z/ responses in stimuli having fricatives 150-200 ms long. Decreasing fricative duration from 300-100 ms resulted in a net increase of 82% in /z/ responses when the preceding vowel was 200-300 ms long (p.128).

In order to improve the Iraqi learners' speech and make them manifest such important phonetic features in their speech they should first be good listeners. To achieve this, they should abandon their L₁ phonetic features, in favour of L₂ features (Flege 1984, p. 123). In addition to this, teachers should depend mainly on audio-visual teaching aids and tape-recordings at a very early stage of acquisition. Consequently the learners' speech perception will evolve as a result of exposure to native speakers of English.

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Arabic do not use the same temporal relation to differentiate word-final /s/ vs. /z/ in either English or Arabic (Flege, 1984, pp. 125-126. Flege, in this research found that the inexperienced (1) Arabs did not respond to the cited relation because there is no temporal difference between Arabic /s/ and /z/, unlike the experienced (2) Arabs whose perception is so sensitive to this temporal relation because they have been exposed to the phonetic features for a long time. Therefore, it is very demanding to acquire the English phonetic features beside the phonemic ones. This is the most difficult problem that faces almost all Iraqi learners of English and, in fact, they ignore the existence of such features in English. Normally, they tend to produce and perceive sounds in English as if they were identical to their L1 cognates, while they are phonetically different (Ibid, p. 123) for instance, they produce the sounds /z/ and /s/ in English just in the same way as they produce them in their native languages. In other words, because of their lack of experience of L2 phonetic features, Iraqi learners of English impose L1 features on what they say in English.

Suggestions and Recommendations

In general, the English writing system is problematic to our students. And in particular, as the Iraqi students learn the English Spelling System, they find that the two English letters s and z are not in one-to-one correspondence with the phonemes /s/ and /z/. The two phonemes, in fact, are realized by various letter sequences. Therefore, teachers should always encourage their students to use dictionaries. Teachers can also be good helpers in this respect by giving the following information to help them in detecting whether the final spelling sequences might be pronounced /z/ or /s/ :

1. All words ending in a -ss sequence should be pronounced /s/ like bless, loss, brass, boss, Miss, glass, less, class, cross, doss, dress, gross, lass, hiss, fuss.
2. All words ending in a-zz sequence, though they are rare in final monosyllabic words, must be pronounced with /z/ such as: fuzz, jazz.
3. All words ending in a-ce sequence must be pronounced as /s/. They are great in number, e.g. race, peace, mace, lice, ice, mice, mince, nice, once, sauce, slice, rice, space, dice, fleece, force, chance, hence, choice, trace, voice...etc.
4. All words ending in a-ze sequence should be pronounced with /z/, e.g. prize, blaze, booze, breeze, maize, seize, size, craze, daze, freeze, frieze, furze, gaze, glaze, graze, haze, ooze, wheeze...etc.
5. Some English words end with the letter-s which is sometimes pronounced as /z/, and other times as /s/. Such words are not problematic since their pronunciation can easily be recognized. Also, they are few. Words like choas, bias...etc. end with /s/, but news, for example, ends with /z/. Most structural

(1) Those who had arrived in the United States just two months prior to the experiment.

(2) Those specialists who had lived in the U.S. for an average of 5.8 years.

of Education. After listening five times to these recorded items, the students' task was to identify on their auditory answer sheets the final sounds they heard. The speech perception data comprised the following items.

- | | | | | |
|-----------|--------------|----------|-------------|------------|
| 1- base | 2- drop* | 3- rise | 4- ease | 5- dect* |
| 6- brace | 7- goose | 8- safe* | 9- pause | 10- grease |
| 11- song* | 12- use (n.) | 13- size | 14- smooth* | 15- loose |

For production data, another random list of items was prepared and presented to the students individually. Each student was asked to produce each item twice in a quiet room.

The data for this test consisted of these items :

- | | | | | |
|----------|---------------|-----------|-----------|----------|
| 1- piece | 2- close (v.) | 3- shape | 4- niece | 5- ooze |
| 6- thing | 7- force | 8- please | 9- grief | 10- rice |
| 11- lose | 12- think | 13- ice | 14- sight | 15- race |

1- Perception test :

The overall number of true scores by all students, i.e. Arabs and non-Arabs in perceiving 1000 stimuli (100 x 10) equals to 777 (sample mean \bar{x} 7.77). Arabs scored 546 (i.e. 70.27 % of the overall number, sample mean \bar{x} = 8.029) ; whereas the non-Arabs scored 231 (i.e. 29.729 %, sample mean \bar{x} 7.218).

In order to see whether the differences resultant from each group's responses in this test are significant or not, the two-sample t-test was applied. This is the most appropriate statistical test because the Arabs and non-Arabs are not equal in number i.e. not identical.

We assume that there is no difference between the two groups in perceiving the stimuli. Thus, with standard deviation (SD)=3.82 for Arabs, and 3.846 for non-Arabs, $t=1.32$. (N.s.)(i.e. not significant).

2. Production test:

The overall number of true scores by all students in producing 1000 stimuli equals to 760 (sample mean \bar{x} = 7.6). Arabs scored 509 (66.97% of the overall number, sample mean \bar{x} 7.48). The non- Arabs scored 251 (33.02 %, \bar{x} = 7.84). Standard deviation for Arabs = 1.498, and 1.348 for non-Arabs. Thus $t=1.291$ (N.S.)

Results and Discussion

Reasons for the Problem:

As noted earlier, the English language exhibits a remarkable difference in the relation that holds between vowel duration and the following fricative in CVC and CV:C citation forms. Native speakers of English are very sensitive to this inverse temporal relation, while several studies show that native speakers of

* These words have been introduced in both production and perception tests to distract the students' attention from the goal of this study.

continued glottal vibration', (Haggard ; 1978, p. 96). Haggard concludes that : devoicing the voiced fricatives is considered the result of physiological and aerodynamic constraints rather than a matter of dialectal allophone rules

which means that devoicing is physiologically and aerodynamically determined and therefore it is assumed to be a universal tendency.

- 3- Length of preceding sounds : Vowels are said to be universally longer in duration before voiced consonants than before voiceless ones, (Gimson, 1970, p. 179 ; Soli, 1982, p. 366 ; Flege & Hillenbrand, 1986, p. 508 ; Peterson & Lehiste, 1960, p. 191 ; Al-Jazary, 1981, p. 301 ; Mitleb, 1984, p. 23). This lengthening is not restricted to fricatives ; it applies to the contexts with voiced consonants. For example, the vowel in use (v.) /ju:z/ is much longer than the same vowel in use (n.) /ju:s/. In view of this point, Soli (1982) says that :

" Vowels preceding a final voiced consonant may be 80 - 90 ms longer, than when they precede the consonants unvoiced cognate" (p. 366).

- 4- Length of the following fricatives : In addition to the previous point, the voicing effect on vowel duration has a close relation with the duration of the final fricative. Vowel duration and the following fricative duration have an inverse relationship, (Al-Jazary, 1981, p. 300 ; Soli, 1982, p. 366 ; Flege & Hillenbrand, 1986, p. 509 ; Mitleb, 1984, p. 26). Such reciprocal relation in CVC and CV : C structures has been accepted universally ; however, recent phonetic studies reveal that voicing effect on vowel duration is not an absolute universal, but rather a language specific (Mitleb, 1984, p. 23). Some phoneticians studied this phonetic phenomenon in Arabic. Flege & Port (1981), for instance, did not find a significant duration difference of voicing feature in Arabic (cited in Mitleb, 1984, p. 24).

Bearing in mind the previous studies, we will do the following experiment testing the hypothesis that both Arab and non-Arab learners of English confuse final /s/ and /z/ in monosyllabic words in production and perception .

Method

- A. Subjects : The experiment involved 100 subjects. They were undergraduate students in their first year, at the Department of English, College of Education. Among them were 68 Arabs.
- B. Stimuli : Two different tests were carried out, one examined the subjects' perception of the two sounds, and the other examined their production. The material for the first test was a random list of 15 words chosen to cover occurrences of 10 words ending with either /s/ or /z/. The list was recorded on a tape and presented to the subjects in the language laboratory of the College

The Problem of Learners' Recognition of Final /s/ vs. /z/ in English Monosyllabic

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Abstract

A general problem faced by the majority of Iraqi learners of English is their inability to devoice fricatives in word-final position. This research, therefore, has been carried out to look into the recognition and production of the final fricatives /s/ and /z/. Thus, 100 students were given two different stimuli ; one examining their auditory perception of the two final fricatives, while the other examining their production. The results of the experiment indicate that while Arab learners do face the problem of recognizing final /s/ and /z/ in English monosyllabic words, due to negative transfer, they are not the only learners to have this difficulty of perceiving and producing these two fricatives ; rather the problem extends to include learners who are speakers of other languages such as Kurdish. This problem, we believe, results from perceptual factors. If a person perceives the fricatives correctly, then there is a strong possibility that he will produce them correctly unless he suffers from a certain physiological abnormality. This study therefore sought to examine this interdependence between perception and production in the hope of finding an explanation for the learners' problem.

Introduction

The distinction between the fricative consonants /s/ and /z/ is determined by many phonetic features :

- 1- Force of articulation : /s/ is pronounced with more muscular energy and a stronger breath force unlike /z/. That is why the former is described as fortis and the latter as lenis (Gimson 1970, p. 179).
- 2- Voicing : The fortis fricative consonant /s/ is always considered voiceless in all positions. The lenis /z/ tends to be fully voiced when it occurs in intervocalic position, i.e. between two vowel sounds, e.g. lazy /'leizi/, haphazard /,hæ p'hæzəd / , below zero / bi'l əʒ 'zi:ərəʒ/. But in initial and final positions in particular, the lenis fricative may be partially voiced or devoiced (ibid) - Such a phonetic variant [Z₀] occurs with silence preceding as in initial position or following as in final position, e.g. zoo /zu:/ and ooze /u:z/ .

The widespread occurrence of "devoicing" in fricatives that are 'voiced' has been studied by many phoneticians. This phonetic phenomenon (i.e. devoicing) is defined as 'the presence of measurable friction in the absence of