

Arabs' Identification of English Weak-Form Words

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Abstract:

This study addresses the issue whether the identification of L2 speech patterns evolves during the course of naturalistic L2 acquisition by adults. Naturally produced stimuli of English weakform words were presented to two groups for forced choice identification as «weak» or «strong» form: (1) relatively inexperienced Arab speakers of English; and (2) experienced Arabs. The experienced listeners identified English "weak" and "strong" forms significantly better than the inexperienced ones. The difference is probably because the experienced group had a course on the suprasegmental aspects of English phonetics whereas the other group had only segmental training at the time of the study. It appears that identification of the second language sound patterns develops as more experience in the second language is gained. This finding is incongruent with the contrastive analysts' view that a second language learner continues to speak and hear in terms of the sound patterns of his native tongue. We thus propose that the segmental and suprasegmental aspects of the target language would be better taught as they occur in connected speech. (Research supported by Yarmouk University).

Introduction

When an adult learns a second language he often speaks with a 'foreign accent'. This is both because he has not yet perfectly learned the sound patterns of the target language (L_2) and because he continues to some extent to speak and hear in terms of the phonological and phonetic categories of his native tongue (L_1). This problem is often predicted to have been caused by the 'overlap' of the sound patterns of the first and the second language (Weinreich 1953). The segmental interference which results from the structural level differences between L_1 and L_2 , articulatory complexity of new sounds, and linguistic environment or position is the most widely studied aspect of interference in second language acquisition. This is probably because the learning of novel categories, unlike syntactic or semantic learning, involves articulatory gestures as well as abstract linguistic categories. Thus, until very recently, most previous research on second language acquisition has dealt primarily with segmental level (i.e. phonemic) differences between L_1 and L_2 as a source of interference.

The difficulty that second language learners encounter is attributed to the fact that it is almost impossible to acquire a target language perfectly after a critical age (12-13 years) since the child has already trained his organs of speech to produce the sound patterns of his native tongue (Politzer 1965, p.9). Moreover, he has also learned to perceive and identify the phonological and phonetic differences and similarities which are relevant to his vernacular sound system. That is, the child has fixed his perception of all languages (Lehman 1972, pp. 231-234). However, such claims do not make use of the fact that second language learning evolves as more experience and training in the target language are added. This implies that current approaches to the study of second language acquisition fail to account for continuous learning as well as the possible independent systems that second language learners may develop. The acquisition of new sounds or contrasts in the target language is predicted by such approaches to be all or none and across-the-board. A good number of the examples in the literature of second language acquisition points out that second language learners actually tend to create a novel phonological system termed 'interlanguage' which has been used to describe a learner's foreign language competence (Selinker 1972; Nemser 1971;). This system is perceived as an 'approximative' one which develops gradually as more experience is gained by learners (Johansson 1973; Dickerson 1975; Flege 1981).

For some linguists, experience (a term used here to refer to the quantity of training in the different aspects of the second language received by second language learners) has little or no role in improving the adult's ability to learn novel sounds or sound contrasts after a 'sensitive' period⁽¹⁾ since speech acquisition has already passed (Krashen, Scarcella, and Long 1982). For others, however, the interlanguage is constantly evolving as it is modified to approximate the second language more closely. The gradual improvement of second language learner's production and perception has been recently reported (Flege 1980; Flege and Port 1981; Port and Mitleb 1983; Flege 1984; Mitleb 1984). Several studies have provided evidence

that exposure to and training in the phonological sound patterns of the target language have a noticeable effect on the evolution of the novel segmental and suprasegmental⁽²⁾ aspects of the target language. Flege (1980), Flege and Port (1981), Port and Mitleb (1983), and Mitleb (1985) found that advanced Arabs learning English, unlike beginners, were able to produce vowel duration⁽³⁾ but not consonant closure duration⁽⁴⁾ difference of the feature 'voicing' approximating the target norms more closely. It is to be recalled that Arabic, unlike English, does not exhibit vowel duration or stop closure duration differences as an effect of voicing (Port, Al-Ani and Maeda 1980; Mitleb 1981; Mitleb 1984).

Recently, Flege (1984) reported that temporal manipulation of vowel and fricative constriction durations affected the perception of Arabs of word-final fricative voicing. However, he provided evidence of the effect of experience on the perceptual performance of second language acquisition. In his study, Arabs with more training in English performed significantly better than beginners in perceiving the difference between English /s/ and /z/. Also, the recognition of naturally produced stimuli of English sound contrasts by Arabs was found to have been affected by the experience in the second language (Mitleb 1985).

Other studies relating to the question of perceptual learning also provided support for the assumption that speech perception evolves as a result of more experience in the novel phonetic contrasts. Thus Mackain, Best, and Strange (1981) found that Japanese advanced learners of English, unlike beginners, were similar to English speakers in the perception of English /l/ and /r/ contrast. This contrast is not found in Japanese sound patterns (Price 1981). Moreover, Lisker (1970) presented endpoint stimuli of synthetic voice onset time (VOT)⁽⁵⁾ continuum (VOT values of +10 ms. and +60 ms) to native speakers of Russian learning English. Stimuli such as these will be heard by native English speakers as /ba/ and /pa/, but both are heard as /pa/ by the Russian Speakers. This is because the distinction between short-lag (+10 ms) and long-lag (+60 ms.) is not linguistically distinctive in Russian. However, after several sessions of training, the Russian subjects showed considerable improvement in assigning different category labels to the two stimuli although they did not divide the continuum as consistently as native English speakers (Lisker 1970).

Thus, it has been reported that language background plays an important role in perceiving the novel phonetic dimensions such as VOT (Lisker and Abramson 1970; Barry 1973). Also, production studies have shown that the learner's native sound patterns effect the production of new sounds and sound contrast both of the segmental level (Lado 1957) and the suprasegmental level (Suomi 1976; Flege 1979; Mitleb 1985). Recent studies on the issue of second language acquisition have revealed that deviations from the target norms that are suprasegmental such as stress, intonation and speech timing may have greater effect on the perception of foreign accent (Tarone 1976).

Perceptually, native speakers were found to depend more on increases in frequency, amplitude, and length than on loudness to identify stressed from unstressed syllables (Liberman 1967). Non-native speakers, however, either fail to use some acoustic cues as those just mentioned or use them inappropriately in their speech (see Adam 1979 for review). As for production, Adam (1979) found that non-native speakers of English were able to approximate the native norms for stressed syllables but not for unstressed ones. Also, Fokes, Bond, and Steinberg (1983) reported that non-native speakers of English had considerable difficulty to produce unstressed syllables but not stressed ones.

Thus, since suprasegmental properties (including stress, intonation and speech timing) can apparently vary from language to language (Port, Al-Ani, and Maeda 1980; Keating 1979; Mittleb 1984) they must be learned by second language learners. In Arabic, for example, every word has an 'inherently-stressable syllable' (Abdalla 1960). Monosyllabic words, in isolation, receive a primary stress regardless of their grammatical category (Al-Ani 1970). However, Arabic, unlike English, does not possess weak-form words. This means that grammatical words such as /waa/ 'and' is produced with a strong form in all positions whereas in English **and** has both a weak-form [ɒn] (sometimes [n] after t, d, s, z, f) and a strong form [ænd] as a cited form (see Roach 1983 for discussion of English weak-form words). Moreover, stress placement in Arabic is decided simply in relation to the number of syllables of the word (Al-Ani 1970, p. 87) whereas in English stress is decided on the morphological, phonological and grammatical structure of the word in addition to the number of syllables (Roach 1983, pp. 75-76). This basic difference between Arabic and English must be overcome by Arabic speakers learning English to approximately produce and perceive English speech.

This study seeks evidence for the hypothesis that experience in the second language is an important factor in modifying the speech perception of the second language learners of the segmental and suprasegmental aspects of the second language. An attempt will be made to provide support for the hypothesis that it is the conscious knowledge of the segmental rules of the second language which interferes with the 'natural syllabic production units' (Tarone 1976). This interference, in turn, may affect speech perception decisions.

Methods:**Subjects:**

Two groups of subjects who were maximally differentiated according to their experience in the different aspects of English phonetics and phonology participated in this study, all right-handed with normal hearing according to self report. The first group, designated the 'inexperienced' or 'beginners' Jordanians, consisted of fifteen students (mean age: 22 years) who passed a pronunciation course at the time of the study. The course aims at giving students instructions and training in English segmental structure⁽⁶⁾. The 'experienced' or 'advanced' group consisted also of fifteen Jordanian students who passed another pronunciation course to which the first

is a prerequisite. The course was designed to prepare the student to be a persuasive speaker and a critical listener. Emphasis was placed on the suprasegmental aspects of English phonetics and phonology⁽⁷⁾. Both groups were English majors who also had studied English from grade 5-12 in Jordan.

Moreover, subjects of the two groups had passed the courses of language skills required to specialize in English language and literature with a point average of 75% and above.

The courses are:

- (1) Communication skill: A two semester sequence of courses designed to enhance students' skills in reading, listening comprehension, speaking and writing. The program is designed to help students internalize essential syntactic patterns of English.
- (2) Language through literature: A two semester sequence of courses designed primarily for potential English majors and designed to teach language through literature of all kinds. The courses contain a principal emphasis on reading and writing.

Thus, the two groups received almost the same training in the different aspects of English language except pronunciation. However, this does not exclude the fact that both groups were exposed indirectly to the segmental and suprasegmental aspects of English phonetics.

Experiment Stimuli:

Thirty six English weak-form words were prepared, as can be seen in Table 1. Each word was used in both weak form and strong form in English sentences. The total of 72 sentences were placed in a predetermined quasi-random order for reading by a native speaker of English.

Table 1

English Weak-Form Words			
and	from	them	is
of	the	must	had
as	at	do	was
for	him	does	that
but	some	shall	has
will	his	am	have
than	would	are	be
an	her	can	us
he	a	not	to

Stimuli generation:

A native English speaker who taught the two English pronunciation courses at Yarmouk University in the department of English was asked to read the 72 sentences from cards at a normal speaking tempo into a microphone positioned at 12". She was recorded on an **Akai** tape recorder in a recording booth at the language laboratory of the Language Center at Yarmouk University. Four seconds' interval was allowed after each sentence, giving a playing time of 4 min 52 sec.

Analysis:

The generated stimuli were played for the two groups of subjects. They heard the stimuli at a comfortable listening level through head-phones while seated in listening booths at the Language Laboratory. A response booklet was prepared. The subjects were instructed to identify the 'weak-form word' with "weak" or "strong" form by checking off their responses in the booklet. A confusion matrix for the 2160 responses (72 tokens X 2 groups X 15 subjects each) was prepared.

Results:

Results of this identification test presented in the confusion matrix show the effect of the experimental factor on the performance of the two subject groups. We

Table 2
Number of responses of native Arabic speakers for English strong and weak forms

	Response			
	Inexperienced		Experienced	
	Strong	Weak	strong	weak
Strong	390	150	450	90
Stimuli				
Weak	250	290	126	414

found that listeners who had the advanced pronunciation course (i.e. suprasegmental aspects of English phonetics and phonology performed better than the listeners with the prerequisite course (i.e. articulatory English phonetics) in identifying weak forms from strong forms of English weak-form words. It can be seen that the group which had no training in the suprasegmental aspects of English phonetics (including weak-form words) performed at 54% and 72% for weak forms and their strong counterparts, respectively. The misidentification difference of 18% reached a significant level by Chi-square test of variance ($X^2 = 16$, $P < .001$). The advanced listeners, however, showed somewhat equal identification percentage for the two categories of weak-form words. The weak-form words were heard as weak 77% whereas their strong counterpart as strong 84%. The 7% percent difference fell short of significance ($X^2 = 3$, n.s.).

Furthermore, we see evidence of noticeable difference between the identification of "strong" and "weak" form in the responses of both groups. The strong forms 'misperception as "weak" were 28% and 16% for 'beginning' and 'advanced' level groups, respectively whereas the weak forms misperceptions as 'Strong' were 46% and 23% for beginning and advanced learners, respectively. As can be gathered from the confusion matrix, therefore, the two groups showed considerable difference in the number of misidentified categories. Thus, Chi-square tests on the identification confusion show that advanced level learners are significantly different from the beginning listeners in the number of misidentified "strong" forms ($X^2 = 11$, $P < .001$) and 'weak' forms ($X^2 = 21$, $P < .001$) of English weak-form words.

Discussion:

The results of this experimental study show that our Jordanian listeners who had studied the segmental and suprasegmental courses succeeded in perceiving the difference between the "strong" and "weak" forms of the English weak-form words. The other group who had only segmental training, however, failed to show evidence of progress in drawing a distinction between the two categories of weak-form words. These observations, which are admittedly limited in scope, provide support for the contention of Mackain et al (1980), Flege (1984), and Mitleb (1985) studies in which they found that training in the target language is an important factor which distinguishes between two groups of second language learners. It is to be recalled that Mackain et. al. (1980) found that the group of experienced Japanese responded better than the inexperienced ones to the distinction between English /l/ and /r/. Flege (1984) found that Arabs, advanced learners of English became more sensitive to the temporal implementation cues of English "voicing" of /s/ and /z/ than the inexperienced Arabs. Moreover, Mitleb (1985) reported that experience in the second language had a significant effect on the responses of Arabs learning English to the different sound contrasts examined in his study.

Such findings lead Mackain et. al. (1980), Flege (1984), and Mitleb (1985) to conclude that the ability of second language learners to increase their perceptivity of

second language sounds and sound contrasts evolves as their experience with the second language sound patterns increases, during naturalistic learning process. This, however, runs counter to the contention of the contrastive analysts' view that the complete "transfer" of the native sound patterns is the source of the foreign-accented speech (Lado 1957). Apparently this approach does not account for experience with the second language, among other factors, as a significant factor that affects the development of "interlanguage" (Johansson 1973; Dickerson 1973; Flege; 1981; Mitleb 1984). Results of this study suggest that the two groups of listeners responded differently to the "strong" forms of the weak-form words although the transfer is presumably complete. That is, the significant difference found between the two groups is not expected by contrastive analysts since Arabic does not differ from English with respect to the pronunciation of certain grammatical words with their strong form.

The results of our experimental study also seems to provide a tentative support for the hypothesis that second language learners' 'conscious knowledge' of the language rules of second language which are mainly limited to the segmental, discrete, and sequential language units interferes with the attempt to perceive articulatory units (units of articulatory syllable in the speech flow). That is, when non-native speakers are exposed to novel suprasegmental rules of the target language such as stress, speech timing, and intonation, they possibly tend to hypercorrect their speech behavior to make it conform more to the segmental rules of the target language (Tarone 1972). Thus, the relative success of the advanced listeners in distinguishing the difference between "weak" and "strong" forms of the English weak-form words is probably because they had taken a course on the suprasegmental aspects of English phonetics and phonology. However, the failure of the other group is possibly due to the lack of direct training in the suprasegmental aspects of English sound patterns. That is, this group of subjects might have used their "conscious knowledge" of the segmental rules of the target language to perceive the difference between weak and strong forms. Thus, they perceived about half of the weak forms as strong forms whereas the strong forms were significantly less confused. The difference in the perception of the two categories of the English weak-form words is possibly a result of an attempt to preserve the segmental nature of the target language units that such listeners know about. Whether or not such learning strategy was involved, the advanced level listeners are distinguished from the beginning level listeners on the basis of their perceptual behavior of the English weak-form words.

Thus, since our experimental findings appear to support the claim that experience in the second language rules plays an important role in the evolvement of the perceptivity of the second language sound patterns we propose that a conscious knowledge of the suprasegmental rules of the target language could help second language learners to perceive and produce the target language more closely to approximate native speakers' norms. Central to this knowledge would be: first, to indicate to language learners that native speakers of the second language do not speak in segmental phonemes but rather they "blend" across word boundaries and run their sounds together to preserve rhythmic and timing patterns. Second, the sound

patterns of the target language would be better taught as they occur in connected speech rather than in isolated forms. This is because segmental, discrete, and sequential language units are blended together in running speech. Once the faulty blending habits are acquired by second language learners, they would be difficult to unlearn (Tarone 1972). And finally, the importance of the suprasegmental aspects of the second language would seem to encourage introducing the rhythmic structure, intonation patterns and syllable structure of the target language in an early stage of the process of second language acquisition. However, further research is clearly needed to further determine the nature of experience in the different aspects of the second language that is necessary to render changes in L₂ perception. Based on previous research, one tentative conclusion is that training in laboratory conditions may not be as effective in modifying speech perception as hearing L₂ in naturalistic conditions.

Notes:

1. Studies in language acquisition posit a 'Language Acquisition Device' in young children (Wilkinson 1972, pp. 55-60) and suggest that "... there seems to be a biologically, determined critical stage for language acquisition in humans during childhood." (Slobin 1971, p. 56). The gradual loss of the capability of learning a second language in detail normally occurs with most people before or in their early teens.
2. Units larger than the segment such as stress, tone, and duration (vowel and consonant length) are said to be properties of suprasegmental units (prosodic features) such as the syllable or word. Such units are best seen as extending over units which encompass more than a single segment (see Hyman 1975, pp. 186-238 for discussion of Suprasegmental Phonology).
3. The duration of the vowel is measured from the onset of glottal vibration to the closure for the following consonant shown by the abrupt cessation of energy in all the informants. This duration is one of the perceptual cues of English voicing in word-final position.
4. Consonant closure duration is the time needed to achieve a certain degree of closure of the relevant articulators used to produce a certain obstruent sound. This time is measured from vowel offset to the noise burst signalling consonant release. This duration is another cue of voicing in English word-final obstruents.
5. VOT, which refers to the relative timing of stop release and vowel onset, functions as a perceptual cue to the voicing contrast between stop categories as /b,d,g/ and /p,t,k/ in most (if not all) languages where word-initial stops are distinguished in production by VOT values.
6. This course is based on the following chapters of **Better English Pronunciation**: (1) problems in pronunciation, (2) how the speech organs work in English, (3) the consonants of English, (4) consonant sequences and (5) the vowels of English (see O'Connor for details).
7. This course is based on chapters 6 (words in company) and 7 (intonation) of the same textbook in addition to some exercises of conversational passages for practice.

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