The Learning of English Prosodic Structures by Speakers of Tunisian Arabic : Word Stress and Weak Forms

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ABSTRACT

This paper investigates the effects of stress patterns of Tunisian Arabic, the native language, and French, the first foreign language, on the learning of English word stress, including function words. Results show that Interference from French in the assignment of stress to English-French cognates and from Arabic in basic English words occurred in 61% and 80% of the cases respectively. These results were significant at the .01 level.

The errors in stress placements were inversely proportional to the level of proficiency in English, although the use of French stress rules decreased considerably among advanced learners. Students, however, continued to incorrectly assign stress to function words. Listening tests administered to native speakers of English suggested that the inappropriate stressing of weak forms severely affects intelligibility. The results confirm earlier findings on the same population (Ghazali 1973) and show the importance of mastering English rhythmic structures for intelligibility.

1.   INTRODUCTION

In learning the sound structures of English, native speakers of Tunisian Arabic (TA) who have already been exposed to French, generally do very well when tested on their production of individual segmental aspects such as the distinction between tense and lax vowels [1], and the various consonantal sounds of English, including clusters in complex onsets and codas. Where foreign accent is perceptible and where even intelligibility may sometimes be undermined is in their rendering of prosodic structure such as word stress and general rhythm.

 It was shown in an earlier study [2] when French was the major language of instruction in Tunisia that, on the one hand, students learning English tended to use the French word stress pattern with English/French cognates such as the word "restaurant" or "balance" which tended to receive final stress instead of the correct initial stress in English.   On the other hand, stress assignment in basic English words such as "begin" , upset or " backward " seemed to be quantity sensitive. Final syllables are stressed if their rhymes are one of the following two types VVC or VCC, otherwise the penultimate is stressed. Thus, most students incorrectly put initial stress on "until" or "upset", but final stress on "backward". The   rule that subjects are using, however, is precisely that which assigns stress to TA words.

The subjects that took part in the above mentioned investigation were all high school students with approximately 3 years of English. Thus, we have no information as to how students would produce English word stress at more advanced levels. Furthermore, no attempt was made at that stage to assess the results of incorrect production of stress patterns on intelligibility, especially with regard to weak forms and function words, which were claimed to be problematic for Arab students [3] and foreign learners in general [4]   . Finally, several educational reforms have been implemented in the last thirty years since the first investigation. These reforms have led to the reduction in the use of French as a vehicular language in elementary and secondary schools where modern Standard Arabic has become the major language of instructions.

The objectives of this investigation are a) to replicate the investigation referred to above, but under more controlled experimental conditions, b) to test students with different levels of proficiency to find out if mastery of English stress patterns improves with more instruction, c) to see if the first foreign language, French still remains a source of transfer and c) to find out if stressing of weak forms affects intelligibility.

2.   Method.

2.1. Word Stress

2.1.1. Data

Seventeen English/French cognates were chosen to find out if the subjects continue to assign French stress to English words presumably because of graphic similarity. In these test words, care was taken to exclude words which normally receive stress on the final syllable in English. So the test contained words such as " balance" and "justice" with initial stress , or "material" with medial stress, but no words such as "garage" are included. All of these words are normally stressed on the final syllable in French.

Nine basic English words such as "narrow" or "endless" with no similarity with French were used to see if the learners applied TA stress rules which are sensitive to syllabic quantity as described in the introduction. Care was also taken here to avoid words like "insist" or "better" with a syllabic structure that is likely to lead to correct English stress if transfer from TA takes place.

To make sure that the subjects were not familiar with all

the test words, 10 additional nonsense but possible English words such as "mithin" or "sciembitic" were also used. These words were pronounced by native speakers of English to determine the location of stress before they were included in the test.

All the test items were included in the carrier sentence "say the word …….again" then read by each one of the subjects described in the next paragraph. The recording took place in the language laboratory when available, otherwise in a quiet room.

2.1.2. Subjects

Three groups of students, intermediate, upper-intermediate and advanced participated in the test and were chosen as follows: a) 32 students selected at random from two different high schools in the city of Tunis. They have been studying English for 3 years and French for 8 years at the time of the test . b) 32 high school students who have been studying English for 4 years and French for 9 or 10 years . c) 32 university students majoring in English who have completed the second year.

2.2. Weak forms

2.2.1. Data

Fifteen English sentences containing function words were used. In some of the sentences, the strong (stressed) form of the function word should be used while in others, it is the weak form (unstressed) that is appropriate. For example, in the sentences : " the speaker asked for questions" and "she is going to fast", "for" in the first sentence and "to" in the second should both be weak . If the strong form is produced, a different meaning is obtained. After recording the 15 sentences in the laboratory, six sentences that are potentially ambiguous were selected from the recording and included in another tape for a listening test.

2.2.2. Subjects.

The same 32 university students who participated in the previous experiment on word stress were used as subjects in this test. Furthermore, 13 adult native speakers of British English were each asked to listen to the 32 recordings and, for each sentence tick on a sheet of paper prepared for them the meaning they understood.

3.   Results and Interpretation

The identification of stressed syllables was carried out by listening to the recording. After making sure that both authors made the same judgement as to the stressed syllable, the second author [5] completed the data analysis crosschecking with the first author when problematic case arise.

A one-tailed Wilcoxen Matched-Pairs Signed-Ranks Test shows that interference from French in the assignment of stress to English/cognates is significant at the .01 level. Table I. below shows the number of French stress patterns -as opposed to other stress patterns- assigned to

the 17 English/French cognates by the 32   students representing the intermediate level.   Note that the percentage of French stress occurrences is a little lower (61%) than the 66% reported by Ghazali [2] for a similar population. However, despite the fact that French has lost considerable grounds in the Tunisian school system since the first investigation took place, its impact is still felt here. This interference may confirm the notion of transfer of training where the learning of a first foreign language may influence the learning of another foreign language at a later stage. The influence in the present case may be beneficial at the lexico-semantic level, but it seems to have adverse effects on the learning of English stress patterns.

	French stress	Other stresses
Number of observations	331	213
Percentages	60.85%	39.15%

Table I. Number and percentages of French-induced stress pattern as opposed to other stress patterns

Interference from TA also proved to be significant at the .01 level, using the Wilcoxen test. The same group of intermediate students were found to use TA stress rules in the pronunciation of 14 basic English words in almost 80% of the cases as illustrated in table 2. Other stresses include either correct English stress placements or incorrect stressing of other syllables.

	TA stress	Other stresses
Number of observations	358	90
Percentages	79.91%	20.09%

Table 2. Number and percentages of TA-induced stress as opposed to other stress patterns

These results also confirm the findings of Ghazali [2] where 66% of the basic English test words received TA stress. In Our experiment, words such as "until" received incorrect initial stress in 100% of the cases, the nonsense words "mithin" received initial stress in 96% percent of the cases and "upset" was stressed on the initial syllable in 87% of he occurrences. These words seem to be perceived by the subjects as ending in a light syllable CVC which calls for stressing the penultimate syllable according to TA stress rules. Similarly, the words "backward" and " stopping", for example, received final

stress in 96% and 66% of the time respectively. Here, the subjects seem to be interpreting the final CVCC syllable in each word as heavy. These results may constitute evidence for the role of interference from the native language in foreign language learning at the supra-segmental level, and suggest that contrastive analysis remains a useful tool in building hypotheses about possible areas of difficulty that may be encountered in the learning process.

Note, however, that the number of misplaced stresses is inversely proportional to the level of proficiency. As students became more and more advanced they made fewer stress erros with respect to both English/French cognates and basic English words. A Chi-square procedure was used to test the relationship between students level (intermediate, upper-intermediate and advanced) and the type of stress rules they use. The test proved to be highly significant (p< .001). Table 3 shows the decrease in the number of errors as students became more and more advanced.

	Intermediate	Upper-intermediate	Advanced
French Stress	331	237	53
TA stress	358	244	238
English stress	229	381	667

Table 3. Number of correct stresses and TA and French-induced stressing by level of instruction .

The table also shows that interference from French rapidly decreases at the advanced level. However, interference from TA, the native language, decreases from intermediate to upper intermediate, then remains almost the same throughout the advanced level. It may be surprising that 93% of university students majoring in English continue to produce the word "until" with initial stress. However, similar cases of fossilization with respect to stress placement are common even among teachers of English who may be responsible for spreading a form of Tunisian English along the lines of Tunisian French.

We will now turn to the use of weak forms where only the performance of the group comprised of the advanced students was measured. We will report the results of the production test, before giving an account of how the sentences containing these function words are understood by native speakers of English.

The results show that the students stressed function words in sentences where they should be unstressed (weak forms) in 92.5% of the cases. The speech behaviour of these subjects indicates that they are unable to use the appropriate unstressed weak forms where needed. Despite regular practice drills during both the first and second year in the use of these forms, along with other supra-segmental features, students have not come to grips with the importance of these sound patterns for both natural English rhythm and meaning.

As stated earlier, in 6 of the test sentences the weak form has to be necessarily used otherwise the sentences will have a different meaning. In this experiment, the native speakers who listened to the recordings understood the wrong meaning in 94.38% of the time. In other words, relying on auditory input alone, communication was successful in only 5.62% of the cases , which shows the devastating effects of the use of improper speech rhythm on intelligibility. For example, the sentence "the speaker asked for questions" was perceived by native speakers of English as "the speaker asked four question" simply because the subjects used the stress form of "for" instead of the weak one. The sentence "she is going to fast" was understood as " she is going too fast" , again because of the use of the strong form of "to". In the sentence "I know that cheese was expensive" the native listeners understood "that particular kind of cheese is expensive.

4. CONCLUSIONS

Most of the experiments performed in this investigation were intended to test hypotheses formulated on the basis of the observed verbal behaviour of Tunisian students learning English. The hypotheses were then refined following a detailed contrastive analysis of English, French and TA word stress patterns and their general rhythmic structures.

Contrastive analysis has proven to be useful in predicting problematic areas concerning stress assignment for most words. Cases of negative transfer did occur in both English/cognates and when English words were parsed according to TA syllabic structure. Predictions, however, were usually correct for words with no more than three syllables. There are, however, cases of longer words, where students assigned stress in an unpredictable way. There were words where stress fell on syllables which were not expected to be stressed. For example, the word "locomotive" sometimes received stress on the antepenultimate syllable which corresponds to none of the correct stressing patterns in the 3 languages. Being an English/French cognate, one would expect a final stress like in French, if not, a penultimate stress would be a logical candidate, because in addition of being the correct English stress, it also satisfies TA stress placement rules. Students seem to find the foot structure of long words, especially words with which they are not familiar such as "locomotive" difficult to parse.

The same problem was encountered with the word "development". This word is well known to students of all levels, yet , it typically receives stress on the penultimate syllable when pronounced by our subjects. While the

correct stress in English is on the antepenultimate syllable, this word receives final stress in French. Should TA stress rules be applied, it should also receive stress on the final syllable since its rhyme would normally be interpreted as heavy VCC like "product" and "haven't to which our subjects regularly assign incorrect final stress. .

We have yet to find out if, in case of uncertainty, students are following specific mental algorithms in assigning stress to these long words , or if they are placing stress somewhat at random.   These problems are mainly encountered with intermediate students.

While interference from the first foreign language , French seemed to decrease with more exposure to English, the influence of the native language, TA remained almost constant. From our experience, more instruction is not likely to overcome the impact of the mother tongue with respect to prosodic structures. Only exposure to English in real life context may produce that effect.

By far, the factor that seemed to be most detrimental to intelligibility is the (over)stressing of weak forms. It has been argued that the non-use of weak forms leads to the pronunciation of unnatural and foreign like speech but does not endanger intelligibility [6]. Our experiment show that, in the absence of media other than speech, intelligibility may be severely undermined when weak forms are not used properly.

It has been reported in the literature that English and Arabic are both perceived as stress-timed languages ([7], [8]), which in theory would make them more like one another   in terms of rhythmic structure than any one of them would be like Japanese , a mora-timed language. Research (in progress) [9] comparing speech rhythm in TA to rhythm in English when the latter is produced by both speakers of TA and native speaker of English did not come to the same conclusions. This study, based on the traditional method of measuring   inter-stress intervals, syllable and foot durations seems to suggest that native English rhythm is stress-timed while TA rhythm is rather syllable-timed. But when highly proficient Tunisians speak English, their rhythm also tends to become stress-timed. We know, however, that we cannot compare results based on perception to those dependent on measurements from the acoustic signal. Rhythm remains essentially a perceptual phenomenon.

 Recent work [10] on speech rhythm variation in various Arabic dialects shows that North African Arabic, including TA, is more stress-timed than Middle Eastern varieties. This is again a study based on measurements from the acoustic signal, but the typology relies on cues other than inter-stress intervals [11]. Unlike the Arabic dialects of the middle East, North African Arabic permits initial consonant clusters and reduced vowels, that is phonological patterns reminiscent of those found in English.

While stress patterns are responsible for most of the rhythmic structure, word stress rules of English and Arabic are quite different. In TA, stress is totally dependent on syllable quantity and therefore predictable.

English word stress is sensitive to a host of interrelated factors including, moraic structure, lexical effects, syntactic category, whether the word is monomorphemic or polymorphemic etc., which increases the perplexity of foreign learner. With respect to weak forms, a great deal of what is expressed in English using function words is realized in TA in the form of clitics. These clitics , along with their host, form   a prosodic word to which only one primary stress is assigned. It may thus be the case that when reading English, the learner will consider every graphic word such as "for" or "to" as an independent entity eligible for stress regardless of its role in the phonological utterance.

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