THE BEHAVIOUR OF STRESS PATTERN ON ENGLISH WORDS ENDING IN *-IC*

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ABSTRACT

This study was carried out to observe the word stress pattern on English words ending in *–IC*. It was aimed at confirming a phenomenon that there is a regular stress pattern on the group of English words above—that is the majority of those words always receive a primary stress on the penultimate syllable of the words. The background why this sort of stress pattern is worth studying is that the patterns of stress on English words are very much arbitrary so that it is quite difficult to pronounce English words with proper stress pattern. Whereas, mistakes in assigning stress on English words may cause differences in meanings which are not desired by the speaker. The type of method used in this study is inventory and descriptive. The findings of this research indicate that out of 2388 words inventorized from Macquarie Dictionary, 2361 (99%) of English words ending in *–IC* must be stressed on the penultimate syllable, while only 27 (0.01%) of this type of words displays a deviating stress pattern. The result of this research is quite useful for: firstly, learners of English who want to have a good degree of English pronunciation, and secondly, teachers of English in guiding their students to be able to give proper and accurate stress on English words in general and English words ending in –IC in particular. To prove whether or not students as well teachers of English, especially students of English in English Departments, have made use of the result of this research in their pronunciation, it is suggested that a research on pronunciation be conducted.

Key words: stress, penultimate, syllable

INTRODUCTION

Based on my previous experience both as a learner and then as a teacher of English as a foreign language I found out some interesting phenomena of English stress. As a learner, I found it difficult to gain control of and, as a teacher, I found it hard to teach. This is due to the fact that stress which is one of the suprasegmental phonemes of the English language to a great extent performs quite capriciously. This means that there is no reason of knowing why a certain word receives the primary stress on first syllable and another word on the second or on n-syllable. The arbitrariness of these stress patterns engenders a great deal of trouble to students as well as to teachers of English as a foreign language. However, upon closer observation, there seems to be certain groups of words whose stress pattern is to some degree predictable, i.e. the stress pattern of words ending in **-ic**. If the predictability of this specific stress pattern can be justifiably determined, learning to pronounce these English words will be a lot more facilitated. This will in turn save foreign language learners of English from unnecessary ones of remembering how to stress groups of words ending in **–ic.**

If someone is learning English in which one of his intentions is to be able to speak, it is inevitable for him that he has to deal with

English pronunciation. In order to be able to pronounce English words, one is not only demanded to master the phonological system of English, but one must also be able to assign the correct pattern of stress on the syllable of each word. Failing to recognise and apply correct English stress patterns, one will meet a lot of difficulties in communicating in English. Consequently, communication breakdown will often occur in one's verbal interaction. The reason is that different stress on the same word sometimes brings about difference in meaning. For example, the word '*object*' with the stress on the first syllable '*object* (a noun) means 'something or a certain property', while '*object*' with the stress on the second syllable *ob*'*ject* (a verb) means 'have an objection'.

To be able to determine stress on the correct syllable is not at all an easy job for beginners who are learning English and it is even still difficult for those who have been studying English for quite some time. This is because stress in most English words as has been mentioned earlier behaves arbitrarily (Ramelan, 1985) and therefore assigning stress on English words cannot be predicted. More often than not, English words which are derived from the same root display their stress on different syllables. Let's take the word root *'admire'* as a simple example:

ad 'mire	(a verb)
admi 'ration	(a noun)
'admirable	(an adjective)
admira 'bility	(a noun)

(Hornby, OALDCE, 1974)

From the example above, it is obvious that English stress pattern varies whimsically so that learners of English in turn get confused and at the same time they find a great deal of difficulty in assigning English stress pattern on the words they have to pronounce. It is precisely this particular fact that I have been observing on my students who are learning to pronounce English words.

As a matter of fact, the difficulty of English students in particular and English learners in general can be slighlty lessened because facts show that not all English words have arbitrary stress patttern. As far as my experience in learning and teaching English is concerned, there are several groups of English words whose stress pattern can be predicted. One of those groups of words is the group which has an **–ic** ending (specific, terrific, automatic, etc.). Consultation with dictionaries gives us a guidance that all words belonging to that group receive the primary stress on the penultimate syllabe (second syllable from behind). Therefore, the words mentioned above will be stressed as follows: ***spe'cific, ter'rific****,* and ***auto'matic.*** However, thorough empirical proof on this fact is not available yet. It is precisely the absence of this empirical data that serves as the background of this present investigation.

Based on a tentative observation, it is assumed that the majority of English words ending in –ic always receive the strong stress on the penultimate syllable. This assumption needs to be empirically proved by asking the following research questions: (1) Is it true that the majority of the English words ending in –ic is always stressed penultimately? (2) How much is exactly the percentage of its deviation if the answer to the first question is 'Yes'? (3) Which English words ending in –ic deviate from the predicted pattern?

The aims of this small-scale research are threefold; they are: to confirm the assumption that the majority of words ending in –ic are always stressed penultimately; to confirm that irregularity of the above-mentioned pattern exists; and to show the proportion in percentage between the number of words having the predicted pattern and that having the deviating pattern.

The findings of this study will be very beneficial to: (1) teachers and lecturers of English in guiding their students in pronouncing English words ending in –ic, especially in stressing the words, and (2) learners of English in their effort to be able to predict intelligently the stress of the words ending in -ic so that unnecessary hesitation resulting in faulty pronunciation can be avoided or at least reduced.

LITERARY REVIEW

Due to the fact that this particular observation is something new, in the sense that there has never been any investigation of similar sort, references are therefore lacking. However, since this study has something to do with one of the suprasegmental features, mainly `stress', I would like to refer to Fudge, Clark & Yallop and Ramelan for the concepts of stress and syllabicity. I would also particularly refer to Fudge who has introduced some points relevant to my assumption.

There is probably not much I can quote from these four people but hopefully their ideas or concepts will throw light to the tract I am following.

Stress and syllable are two distinct features but they are closely related to each other and one cannot dispense with the other if either one is brought to attention. The two should exist complementarily. Therefore, in this review I shall first of all seek the information of what stress and syllable really are. And after that Fudge's work concerning word-stress pattern especially the one underlying my investigation will be referred to.

Stress

According to Fudge (1984: p. 1), stress means 'the singling out of one phonological element within another, longer, phonological element.' Ramelan (1985) states that 'by stress it is meant the degree of lowness or loudness a syllable is pronounced so as to give it prominence.' There are three kinds of stress: strong/primary stress, medium/secondary stress, and weak/tertiary stress. Stress can be word or sentence stress but in this study I will mostly deal with word stress.

The way of indicating the above-mentioned three kinds of stress varies from one phonetician to another and from one dictionary to another. For example,

	strong stress	**medium stress**	**weak stress**
Fudge	encyclo **'pe**dia	en **ˌcy**clopedia	**en**cy**clo**pe**dia** (no marking)
Ramelan	encyclo**pé**dia	en**cỳ**clopedia	**en**cy**clo**pe**dia**

			(no marking)
Macquarie	encyclo **'pe**dia	en **ˌcy**clopedia	**en**cy**clo**pe**dia**
Dictionary			(no marking)

In the example above, both Fudge and Macquarie Dictionary have a great deal in common in marking the three kinds of stress. For strong stress, they indicate it by putting the stress mark above and in front of the stressed syllable. While for the medium stress, they indicate it by putting the stress mark below and in front of the stressed syllable. Unlike Fudge and Macquarie Dictionary, Ramelan (1985), similar to Hocket (1956), marks the strong and medium stress differently. He indicates the medium stress by putting the stress mark right on top of the stressed syllable and the stress mark slants to the left. While for the strong stress, he also indicates it by putting the stress mark right on top of the syllable being stressed, but the stress mark slants to the right this time.

However, for the weak/tertiary stress the three people totally have something in common. In the example above, the weak stress falls on the syllables **en-**, **-clo-** and **-dia**. The three persons indicate the weak stress pattern by not putting any mark at all on the weakly stressed syllables.

Of course, there may still be many other different ways in representing stress in transcription. Later in this report, I will, however, adopt any one of them which I think most practical and convenient to me.

Syllable

Following Ramelan (1985), a syllable is defined as any vocalic unit within a word which is pronounced with a single impulse of breath. Clark & Yallop (1990: p. 103) state that a syllable commonly consists of a vocalic peak which may be accompanied by a consonantal onset or coda. In harmony with Clark & Yallop, Fudge makes three distinctions of syllables; they are: a vowel portion which occupies the peak of a syllable, a string of consonants occurring before the peak called onset of the syllable, and a string of consonants occurring after the peak called coda of the syllable.

As mentioned earlier, stress and syllable are interrelated. Clark & Yallop emphasise this interrelationship by stating:

> If we want to explain patterns of English stress, for example, we must recognize syllables as relevant units. Stress is a relative property and it must be defined over syllables--we hear a syllable as stressed because it stands out against something which counts as unstressed. In other words, a syllable is not stressed or unstressed in absolute terms, but is more stressed or less stressed than a neighbouring syllable or some other point of reference (1990: p. 94).

From the clear concept of stress and syllable mentioned above together with their interrelationship, we will be able to identify syllable boundary with which we can determine the position where the stress has to be marked when a word appears in orthographic as well as phonetic representation.

Stress pattern on -ic final words

Fudge has made some detailed description of word-stress patterns including that of the

words ending in -ic. He has described the stress patterns which confirm the assumption I put forward in the introduction. Moreover, he has also listed some -ic final words with antepenultimate stress pattern. Below is the list of the words, introduced by Fudge, which deviate from the predicted pattern:

'agaric	**'Catholic**	**'nucleic**
'Arabic	**'choleric**	**'politic**
a 'rithmetic	**'heretic**	**'rhetoric**
'arsenic	**'lunatic**	**'turmeric**

As far as I am concerned, Fudge's list becomes a useful reference to my observation. Words of this type are very important, for later in the analysis of the data they can be used as material of comparison with the result brought about by my investigation. Later, we will also be able to know whether Fudge's list is already exhausted or whether there are still other words of similar stress pattern which he has not inventorised. If the number of words increases, our knowledge about the characteristics of -ic final words will certainly be enriched.

RESEARCH METHODOLOGY

Procedure of Data Collection

The data serving as the object of analysis of this investigation are all English words ending in –ic. These words were collected by means of inventorising all the words above. The procedure was as follows: first, reading all the entries and headwords present in the Macquarie Dictionary (Delbridge, et al., 1990) from letter A up to Z, then identifying every word having –ic ending, and finally listing all these words in alphabetical order. The inventory of these words was then reported in the appendix of this study report.

Based on the list of words whose stress signs have been marked (for example, sym'bolic), the percentage of the words ending in –ic can be determined and descriptive analysis of the words can also be done. And then by using the list of the deviating words introduced by Fudge (1984), a comparative analysis can be carried out.

Criteria of Determining the Words

As the business of this study merely deals with words--specifically the identification of their stress pattern, willy-nilly this kind of data can only be obtained from a dictionary which provides phonetic transcription together with stress marks for each of its word entries. Because of this, for a practical purpose, I choose the Macquarie Dictionary as the source of data input.

In listing the observed words, I have to set up a number of criteria:

(1) As has been mentioned previously, the words collected should end with -ic. In a certain case, -ics final words are also included.
(2) The ending of the word, be it -ic or –ics, must be pronounced [- k] or [- ks].
(3) The words collected must be entries or sub-entries of the dictionary whose phonetic transcriptions are given.
(4) The words should consist of at least two syllables. The reason why one-syllabled words are not included is that they do not

display the relative stress pattern because they are all content words. As content words, though they only consist of one syllable they must, as a rule, receive a primary stress when they occur in isolation.

(5) Any words failing to fulfil the above-stated criteria fall out of consideration.

Analysis of the Data

From the number of words with the predicted stress pattern and the one with the deviating stress pattern which are collected and reported in the appendix, percentages can be derived. And together with Fudge's list of words, a comparison can be made.

Convention of Stress Marking

Since stress is inseparable from pronunciation, talking about stress inevitably relates us to how words are pronounced. When the pronunciation of a word is transcribed orthographically a problem sometimes arises. The problem is probably due to the fact that word spelling or orthographic representation in English does not match its pronunciation. To mark the stress of a word, we have to know the syllables of the word. To know the syllables of a word, we cannot always rely on the orthographic appearance of the word. Relying only on orthographic writing in judging the syllables can be misleading. For example, if we happen to come across a certain word like **'plagiaristic'**, we can easily fall prey of a wrong judgment in regarding this word as having 5 syllables--**pla-gi-a-ris-tic**, for in fact its pronunciation is [**pℓel dʒə 'rls tlk**]. Thus it only has 4 syllables. Therefore, it will be a lot easier if we put a stress mark within phonetic symbols, but in my case providing phonetic transcription of hundred or maybe thousands of words will be beyond my capacity.

To avoid tremendous difficulty in providing phonetic transcription for my data, I will have to be content to resort to orthographic writing. And to avoid the trouble of stress marking, again a certain convention should be made. Before assigning the stress mark of a certain word, I always have to refer to its phonetic transcription in the dictionary; for example, given the words **totemistic** and **antarctic**, I will place the stress like this **totem 'istic** not **tote 'mistic**, **ant 'arctic** not **an 'tarctic**, for respectively they are phonetically written [toʊ **t**Əm 'ls tlk] and [ænt 'a:ktlk]. In the examples above the stress mark is placed before the stressed syllable and above the line, or it is commonly called a superscript which indicates a primary stress. When the stressed syllable contains double letters, the stress mark is put between the two letters; for ex., **er'ratic**. Sometimes a really difficult case appears, such as the word **exotic**. In phonetic transcription, the stress marking poses no problem for it can be easily marked [lg'zↃtlk]. For words of this type the stress mark is placed before the vowel bearing the primary stress, so the above word is written **ex'otic**.

So far the marking convention I have talked about concerns itself only with the primary stress. As I anticipate that secondary stress might be involved in the data analysis, the same convention still holds, that is by putting the stress mark before and below the stressed syllable or stressed vowel. Only the mark now becomes a subscript; it is placed under the line, for example,

ˌdolichoce'phalicˌadenylic 'acid

Obviously, this stress marking convention is completely in keeping with the one used in *Macquarie Dictionary* (1990) and *Advanced Learner's Dictionary of Current English* (Hornby, 1974), as well as Jones (1970), on which my investigation is based. The difference is that this marking is assigned to orthographic writing instead of phonetic representation.

DATA ANALYSIS AND RESULT OF THE STUDY

Quite unexpectedly, a number of interesting findings are shown after the completion of the data gathering. The things brought about after the data collection are as follows:

Total Number of the Words

Word counting of the words beginning from the letter A up to Z produces the sum of 2361. Of course, I have to readily admit that this number is by no means exhaustive nor completely accurate. There are in fact far more words the dictionary exhibits. This fact is due to two possible reasons. First, there are quite a number of words in the category of sub-entries which do not show their phonetic transcription from which the stress mark can be determined. Second, since I did the word compilation manually, human errors do occur. In addition, it is quite understandable that the sum of 2361 words do not really represent the total number of the words in circulation since a different dictionary certainly covers a different number of word entries. Apart from that, the nature of the words itself, like content words in general, is constantly self-expanding. If a new word of -**ic** ending is created, it will, by analogy, be grouped into the words of the prevailing number; for example,

progressive---progressi'vistic

Percentage of the Two Word Groups

Of the 2361 words listed in the data collection, quite a small number deviate from the predicted pattern. Altogether there are 27 words. Below are those 27 words.

'agaric	'chivalric	'modernistic
'Arabic	cli'macteric	'politic
a'rithmetic	'fluoric	'rhetoric
'arsenic	'heretic	'semiacoustic
'turmeric	Anglo-'Catholic*	'bishopric
'lunatic	arch'bisopric*	'Catholic
'micro(')physics	'cerebric	'macro(')physics*
geo'politics*	'choleric	'philharmonic
un'politic*	'pachalic	'inorganic

In terms of percentage, the words with the irregular stress pattern account only 0.01% of the total number inventorised. Among these 27 words, the ones with asterisks are reduplicated words with the addition or substitution of certain prefixes. Therefore,

there are in fact only 22 words (0.009%) which deviate from the pattern. It is worth adding here that 4 of the above 27 words, mainly **agaric**, **philharmonic**, **macrophysics**, **microphysics** have double stress pattern, so they can either be pronounced:

'agaric	or	a'garic
'philharmonic	or	philhar'monic
'macrophysics	or	macro'physics
'microphysics	or	micro'physics

It is also necessary to mention here that quite a great number of the words with the predicted stress pattern are excessively reduplicating. Some of the repeatedly reduplicated two final syllables are **-clinic**, **-centric**, **-cyclic**, **-graphic**, **-gogic**, **-trophic**, and still many others too numerous to mention one by one.

My original intention was to make a separate account between the pure **-ic** final words and the reduplicating ones, but since it turned out that the reduplicated two final syllables are too many, finally I have to abandon my plan for in so doing it will end up in tremendous impracticality and confusion in the counting activity.

Now in comparison with Fudge's list concerning the words with antepenultimate stress pattern, the result of this observation shows a great difference. Here, there are three times as many words as Fudge's has listed. In the 27 words I listed above, there is one word whose stress pattern deviates completely from both the penultimate and antepenultimate stress pattern, for this word is stressed on the fourth syllable preceding the **-ic**. The word is '**modernistic**.

However, Fudge also includes the word **nucleic** in his list but I do not. The explanation is this. In the Macquarie Dictionary, the word **nucleic** does not occur in loose contact, but it stands in combination with the word **acid** forming a phrasal noun **nu ˌcleic 'acid**. I do not even include this word in the appendix for fear of making a mistake. If I had done so, I would certainly have wrongly treated this word as being stressed penultimately: **nu 'cleic** instead of **nu ˌcleic**.

Additional Findings of the Study

The things below are in fact not part of the objectives of this study, but I consider it quite unwise not to discuss or at least show them in this report. When the words occur in isolation the stress patterns are fixed; 99.99% of the words are stressed penultimately, while only 0.01% or 0.009% are stressed differently.

However, when the words occur in combination with other words or when they function as modifiers, some interesting phenomena come up. Their stress patterns behave capriciously. Below are the phenomena worthy of being brought up to attention.

Loss of primary stress when they modify nouns

arctic 'circle
atomic 'age
actinic 'rays
acrylic 'acid
academic 'freedom

always fall on the first syllable, for example:

volumetric a 'nalysis
organic di 'sease
synthetic ge 'ometry
synoptic meteo 'rology
lunatic 'soup
electric 'field

Change of primary stress into secondary one when they modify nouns

a ˌtomic 'mass

ˌBasic 'English

ˌcystic fi 'brosis

cya ˌnuric 'acid

Retention of primary stress though they modify nouns

'civic centre
'ethnic group
'garlic bread
'turmeric paper

probabi 'listic maˌchine

Ptolo 'maic ˌsystem

Change of primary stress into the preceding syllable when they modify nouns

'zymotic desease
'linguistic atlas
'aphotic region
'tympanic bone

Loss of primary stress and the appearance of the secondary one on different syllable when they modify nouns

ˌacademic 'year

ˌarithmetic 'mean

Words consisting of more than three syllables, especially compound ones perform secondary as well as primary stresses.

ˌanticli 'mactic

ˌbiosyn 'thetic

ˌvario 'litic

ˌxenoge 'netic

Syllabic Performance of the Words

In terms of syllabic performance of the words, this data analysis displays very interesting figures. As we have known the shortest words consist of two syllables. It is found out here that the longest word consists of 9 syllables. Four-syllabled words rank highest in number (963 words) while nine-syllabled word collects only one word: **e**ˌ**lectroen**ˌ**cephalo** '**graphic**. For more information on number of syllables, see the appendix. I have made notes concerning the characteristic of stress patterns assigned to the observed words together with the existing deviations especially when they occur in phrasal combinations functioning as modifiers. However, this is as far as I go, for at this stage I cannot provide any explanation as to why they do behave like that.

CONCLUSION

Based on the data analysis in the preceding paragraph some conclusions can be made. First, 27 (0.011%) words ending in **-ic** deviate from the predicted stress pattern; the penultimate syllable. Secondly, outside of that deviation the assumption put forward in the introduction is confirmed because 2234 (99.99%) words are stressed penultimately. These two stress patterns hold when the

words occur in isolation. Thirdly, when the words occur in combination with other words forming phrasal nouns, the stress pattern varies and becomes highly unpredictable. Fourthly, the percentage of the words with the deviating stress pattern tends to get smaller or at least remain constant, whereas that of the predicted pattern tends to become higher. The reason behind this is that quite a few number of words ending in -**ic** are not counted for failing to meet the criteria of data collection; a lot of the words are redundantly reduplicating; and moreover, newly coined words may appear at any time adding up the superiority in number of the words with the predicted stress pattern. Finally, among the inventorised words the highest number (963 words) are held by four-syllabled words and the longest word is only one which consists of nine syllables.

In order to obtain information of whether or not students of English, especially students of English Departments, have been able to pronounce –IC ending English words in compliance with the way demonstrated by the findings of this research, it is to be suggested here that a research on pronunciation be conducted.

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