The Principle of Linguistic Economy and Emphasis in English

Hideo KOBAYASHI
University of Hyogo

Abstract

This paper recognizes "The old idea of sound patterns being the outcome of a competition between the demands of the speaker and the hearer − maximizing articulatory ease vs. the distinctiveness of contrast" (Côté, 2000, p. 154) and indicates that linguistic economy applies to primary stress shift for emphasis in certain English words. The speaker's expressive need sometimes motivates the process of stress shift for emphasis cross-linguistically, which is also referred to as "climax" (Bolinger, 1978, p. 486; Bolinger, 1980, p. 42). As a result of climax, the addressee can grasp messages more clearly and precisely than otherwise; however, climax causes the speaker to expend more time and effort in producing intended effects as such. Our survey findings show eight hitherto unrecorded words that can undergo the target shift as a marker of emphasis as in *awesóme* and *horrór*, resulting in alteration in the vowel and rhythmic patterning (henceforth, a vowel in bold attracts the primary stress). This study addresses the potential room for formal research into phonological rules that allow the target shift.

1. Introduction

The history of linguistics indicates the avoidance of excessive syllables and words in normal speech. Whitney (1868, p. 28) has believed that the essence of linguistic economy[1] lies in making "things easy to our organs of speech, to economize time and effort in the work of expression." Although linguists in the 18th and 19th centuries did not formulate a formal theory regarding economical use of articulatory effort, they were wise enough to observe its propensity in speech. The connotation of the word *economy* has been metaphorically used in linguistic disciplines such as phonology, Optimality Theory (henceforth, OT) (Prince & Smolensky, 1993/2004), and syntax and pragmatics (Haraguchi, 1994). In this respect, this study gives an account of the Principle of Linguistic Economy (henceforth, PLE) in the phonology of English, sharply focusing on "stress shift" (de Lacy, 2002, p. 59) for emphasis through a survey, as in the mapping of *máybe* → *maybé* (Bolinger, 1978).

The research into emphasis in spoken language requires us to study PLE as a phonological

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[1] As early as the 1800s, Collyer (1735) and White (1761) among others were already aware of *economy* in the language system.

requirement because making emphasis usually causes the articulatory organs to be physically more active than otherwise. For example, the speaker vibrates his/her vocal chords more actively in order to make an emphatic pitch than otherwise. However, this is not always true since humans also have expressive needs to make emphasis in whispers (Coleman, 1914). PLE is satisfied under normal pronunciation whereas it is violated under emphatic pronunciation, except for emphasis in whispers. Making emphasis in whispery voices does not require the articulatory organs to be physically more active than under normal pronunciation (Pittman, 1987).

This study is structured as follows. Section 2 reviews PLE from the historical perspectives. Section 3 addresses a representative emphatic phenomenon where PLE is violated in phonetics. Section 4 deals with stress shift for emphasis where violation of PLE arises in phonology, and involves a survey and discussions. Section 5 concludes the study.

2.   Who is Linguistic Economy Intended for?

Before starting to meet the purpose of this study, it may be worth asking ourselves "Who is linguistic economy intended for?" The linguistic literature has examined the question from two different angles: the addressee's viewpoint and the speaker's. Let us begin to explore them in turn. Herbert Spencer (1820-1903) may not be the first to examine the principle of economy in the language system, but he is probably one of the first in history to do so in depth in *The Philosophy of the Style* (1852). He sees language as "an apparatus of symbols for the conveyance of thought" (1852, section 4), stressing the importance of reducing mental burden on the addressee's part in the interpretation of an utterance the speaker is conveying to him/her.

Jespersen (1949) has criticized Spencer (1852)'s approach which only examines economy of attention and says nothing about economy on the speaker's part. Instead, he suggests that "The best is what with a minimum of effort on the part of the speaker produces a maximum of effect in the hearer" (Jespersen, 1949, p. 6). This suggestion leads Zipf (1949) to investigate linguistic economy from both the addressee's and speaker's viewpoints. He considers the least effort as the equivalent to the least average rate of probable work and defines it in general terms:

> …a person in solving his immediate problems will view these against the background of his probable future problems, as estimated by himself. Moreover he will strive to solve his problems in such a way as to minimize the total work that he must expend in solving both his immediate problems and his probable future problems. This in turn means that the person will strive to minimize the probable average rate of his work expenditure over time (Zipf, 1949, p. 1).

Accordingly, Zipf (1949, p. vii) described the principle of least effort as "the primary principle that governs our entire individual and collective behavior of all sorts, including our

behavior of our language." He has theorized that both the speaker and the addressee are inclined to minimize their efforts in communication. The speaker usually chooses the fewest words in order to communicate "rich messages" (Xiao, 2008, p. 34). On the other hand, the addressee expects the speaker to be clear and precise, which usually requires the speaker to use a larger amount of information units to make himself/herself understood in a given context (Xiao, 2008). The speaker emphasizes a word or phrase in order to get its meaning across to the addressee more clearly than usual. This is the core function of emphasis (Setling, 1994). This assumption helps predict that emphatic pronunciations require more articulatory efforts to be made violating PLE than under normal circumstances.

Spencer (1852) and Zipf (1949) approach PLE from different angles. The former sees the importance of achieving economy in terms of reducing addressee's mental energy, whereas the latter highlights the importance of saving on speaker's articulatory energy. In this respect, we can hypothesize that linguistic economy is best achieved when both addressee's mental energy and speaker's articulatory energy are optimally economized, in accordance with Jespersen (1949). Côté (2000, p. 154) also endorsed "The old idea of sound patterns being the outcome of a competition between the demands of the speaker and the hearer – maximizing articulatory ease vs. the distinctiveness of contrast."

These arguments add one inevitably important perspective to linguistic studies of sound patterns, or patterns of sound change such as epenthesis, deletion or stress shift among others; that is, a sound change could occur in circumstances where the speaker strikes a balance between the need of easing the articulatory burdens and that of clarifying his/her own message for the benefits of the addressee. Making emphasis helps a message stand out from the rest of the information so that the addressee can distinguish what is more important and what is less important, thus allowing the addressee to comprehend the message with ease. Making emphasis is one of the forces that trigger sound change, as illustrated in the following.

3. Principle of Linguistic Economy in Phonetics and Accent

As noted in the preceding section, the speaker often wishes to use the least articulatory effort to communicate "rich messages" (Xiao, 2008, p. 34) to the addressee. However, the speaker intensifies the meaning of a word and a phrase by adding stronger stress to the nucleus syllable when he/she wants to satisfy his/her expressive needs in the everyday world. This helps create the linguistic concept which is interpreted as emphasis (Setling, 1994). When emphasis occurs in English in general, the speaker uses more articulatory energy than usual, often resulting in accent. Accent is the phonetic manifestation of stress that is an abstract property of a word (van Zanten & van Heuven, 1998), in terms of greater pitch range, loudness and longer duration of the segment (Cruttenden, 2008). To see this, let us observe the following utterances 1-1a-d (See 1-1, Bolinger, 1980). The present author leaves aside the pragmatic meaning of each utterance with accent.

The analysis of utterance 1-1a shows that the back vowel /ɔ/ in *awfully* is receiving a high pitch range and being lengthened (Bolinger, 1980). The analysis of utterance 1-1b also indicates that the syllable that contains the approximant as a coda is going through the same acoustic process. The approximant has a [+continuant] feature (Chomsky & Halle, 1968) and could lengthen under emphasis.

(1-1) a.   aw:: fu   c.   god::

    I'm   It was so

              ly   sorry!   awfully bad!

      b.   ter::   d.   slight::

    He was   It was

            ribly tactless!   ly worn!

(Bolinger, 1980, pp. 46-47)

However, the analysis of utterances 1-1c and d gives us different dimensions of emphatic pronunciation because implosives occur as allophones in the emphatic articulation of bilabial plosives (Ladefoged, 2001). The allophones are defined as "The variants of the phonemes that occur in detailed phonetic transcriptions" (Ladefoged, 2001, p. 37). The implosive [ɗ] must occur as an allophone of the regular [d] in *god-awfully* while [t::] (extra-lengthening) may occur as an allophone of the regular [t] in *slightly* depending on the rate of speech in a particular context. The target word as well as [t] is slowly pronounced under emphatic pronunciation so that [t::] (extra-lengthening) will arise. This lengthening phenomenon is marked in that /t/ has the [-continuant] feature.

4.   Principle of Linguistic Economy in Phonology and Stress Shift

4.1 Past Studies

Phonologically, PLE decrees that the amount of time and effort on the speaker's part should be minimized in the communication of the messages to the addressee (Leech, 1983). However, PLE cannot always be respected because the full satisfaction of linguistic economy sometimes causes the messages to be unintelligible, increasing attentive energy on the addressee's part (Leech, 1983). So, in practice, the speaker must strike a balance between sparing the amount of time and effort in the articulation and keeping up intelligibility of the message to the addressee. When the speaker wishes to emphasize a point of some interest to the addressee, he/she expends more time and effort than usual. As stated in section 1, this clearly violates PLE in phonology. When the

speaker speaks normally, he/she respects PLE. This relation is translated into the *EFFORT constraint in OT, which holds emphasis back (Tanaka, 2009). When *EFFORT ranks as a superordinate constraint, the phonology of the target language causes the speaker to observe PLE. Yet, every once in a while when the speaker wishes to emphasize, the constraint is outranked as subordinate.

The speaker impresses on the addressee by adding a "degree of thrust, power, positiveness, and zing" (Bolinger, 1978, p. 486) to the utterance. This is called "climax[2]" (Bolinger, 1978, p. 485; Bolinger, 1980, p. 42). In order to cause the phenomenon, stress shift takes place at the right edge or towards the right edge of the word as in examples 1-2 (See 1-2). For English, word primary stress is usually indicated in the dictionary, but it could shift under emphatic pronunciation. When this happens, the syllable that is otherwise without primary stress will be accented. The following 10 words are all published data in past studies:

(1-2) <u>Normal</u>   <u>After Stress Shift</u>
1. **á**bsolutely → absol**ú**tely (Bolinger, 1986)
2. **ó**rdinarily → ordin**á**rily (Kenyon & Knott, 1953)
3. r**á**ther → rath**é**r (Bolinger, 1986)
4. enth**ú**siasm → enthusi**á**sm (Bolinger, 1978)
5. g**ó**lly → goll**ée** (Bolinger, 1980)
6. c**á**nnot → cann**ó**t (Bolinger, 1980)
7. **é**lsewhere → elsewh**é**re (Bolinger, 1978)
8. n**é**cessarily → necess**á**rily (Kenyon & Knott, 1953)
9. p**ó**sitively → posit**í**vely (Kenyon & Knott, 1953)
10. **í**nfluence → infl**ú**ence (Bronstein, 1960)

In order to assign primary stress to the syllable nucleus that would otherwise lack accent, the speaker de-stresses the syllable of a word. Otherwise, stress clash occurs in certain words such as *r*á*th*é*r*, *g*ó*ll*é*e*, *é*lsewh*é*re*, and *í*nfl*ú*ence* among others, resulting in violation of *CLASH in OT. This constraint means that "No stressed syllables are adjacent" (Kager, 1999, p. 165). De-stressing and shifting the stressed syllable causes a change in rhythmic patterns, too. For example, the word *máybe* under normal pronunciation adopts the trochaic rhythm whereas *maybé* under emphatic pronunciation switches to the iambic pattern. In this respect, it can be hypothesized that the speaker uses more articulatory efforts than usual, resulting in violation of *EFFORT during the process of shifting stress. At the same time, stress shift for emphasis helps the

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[2] Climax has also been reported in Chichewa, German, Javanese, Spanish, Sudanese and Tagalog among others (Bolinger, 1980). So, we can observe that stress shift for emphasis is a cross-linguistic phenomenon.

addressee comprehend the intention of the speaker more clearly than otherwise.

The emphatic phenomena in 1-2 deserve attention in the phonology of English and in OT. This is because the target phenomena have not been much studied since the last work of Bolinger came out in the 1980s. The constraint *EFFORT has not been widely recognized either, due to paucity of studies of emphasis in OT. These circumstances justify the present author in regarding the *EFFORT constraint as a tool to both explain the mechanism of emphasis-caused primary stress shifts in English and allow the reevaluation of past studies for new insights.

4.2 Survey
4.2.1　Method

The survey investigates a range of English words that may undergo the process of stress shift for emphasis to add such words to hitherto known words and examine them in the wider perspectives in phonology and in OT in the future. Six words that have two stress patterns were randomly chosen from *Oxford advanced learner's dictionary* (2010) and presented to nine native speakers of English (henceforth, NES) on a sheet of paper with three questions in 2014: (Ⅰ) whether or not they stress the syllable normally in the word as indicated in the dictionary, (Ⅱ) whether they shift stress for emphasis in the words and (Ⅲ) what words they shift stress for emphasis in other than the target words and is thus open-ended. The six words are *applícable*, *clandéstine*, *extraórdinarily*, *fórmidable*, *irréfutable* and *vóluntarily* under normal pronunciation. The NES in this study were working as English language teachers in Hyogo or Osaka, as of January 2014: three Americans, two British and Canadians respectively and one New Zealander and Australian respectively. The present author individually presented the sheet of paper with the questions to each participant because they were working at different schools.

After the survey, the direction of stress shift was examined to see if it was set from the vowel of high sonority to the lower sonority within a word. The sonority scale of vowels used in this study is from Parker (2002, p. 236); that is, "low vowel > mid vowel > high vowel > [ə]." The sonority of a sound is defined as "its loudness, relative to that of other sounds with the same length, stress, and pitch" (Ladefoged, 2001, p. 227). The main goal of the survey was not to find out about actual frequencies of stress shift for emphasis in the words among a large number of NES, but to confirm the occurrence of the phenomenon in the words selected as a linguistic tendency in the words selected so that later, further phonological studies may be made. This investigative limitation is made predominantly because "actual frequencies are usually influenced by non-grammatical factors, which leads to deviations with respect to what is expected from the constraint system alone" (Côté, 2000, p. 182).

4.2.2　Research Findings

The results of the survey indicate that broadly speaking, stress shift for emphasis occurs in all the test words despite the fact that there may be idiolects or dialectal differences in its occurrence. The present author leaves aside these potential variations among the participants, let alone what leads to the variations. Côté (2000, p. 181) showed that "Variation has been a neglected area of phonological theory." In fact, variation is often investigated in the sociolinguistics domain. To account for the two questions, (Ⅰ) and (Ⅱ), Table 1 shows how many participants out of nine shift stress for emphasis in each word and how many do not (See Table 1). The heading *occurrence* in Table 1 indicates the number of participants who shift stress for emphasis whereas *non-occurrence* shows the number of participants who do not shift stress for emphasis. The participants who stated that they do not shift stress for emphasis in the target words apply the same stress pattern for emphasis as they do under normal circumstances, as in *applícable* (See Table 1).

Table 1

Occurrence of Stress Shift for Emphasis in English

Normal　　　After Stress Shift	Occurrence	Non-occurrence
1.　applícable　→　ápplicable	4	5
2.　clandéstine　→　clándestine	3	6
3.　extraórdinarily　→　extraordinárily	2	7
4.　fórmidable　→　formídable	7	2
5.　irréfutable　→　irrefútable	4	5
6.　vóluntarily　→　voluntárily	6	3

Note. The stressed syllable is indicated by the acute accent in each word.

As for the third question (Ⅲ), the findings show that stress can shift for emphasis in the following eight words: *awesóme*, *ambivalént*, *cordíally*, *horrór*, *neighborhóod*, *reálly*, *névertheless*, and *fántastic*. For the sake of exposition, the present author classifies the eight words into two groups depending on the direction in which primary stress moves for emphasis. Primary stress moves in the right direction as in *awesóme*, *ambivalént*, *cordíally*, *horrór*, *neighborhóod* and *reálly*. By contrast, the target shift can occur in the left direction in words such as *névertheless* and *fántastic*. The research indicates that the directionality of stress shift for emphasis is two way, a finding not previously noted in phonology literature. The present author has not cross-questioned the participants of the investigation to determine actual frequencies of stress shift for emphasis in the eight words. However, although limited in scope, the investigation described clearly indicates certain phonological rules embedded in the minds of native speakers of English - rules that allow them to shift stress for emphasis in the target 14 words (six words in Table 1 and eight words that

the findings show). The nature of these phonological rules is a potential research subject that needs to be formally addressed.

4.2.3 Discussion

This section categorizes types of stress shift among 24 words addressed in subsections 4.1 and 4.2.2 (See the list of words in subsection 4.1 and italicized words in 4.2.2), according to the sonority to which primary stress is attracted, and discusses its implications in phonology. Regarding such attraction, de Lacy (2002, p. 1) stated that "stress will seek out high sonority segments, ignoring lower sonority ones."

The analyses show five patterns of stress shift for emphasis among the target words. First, stress shift for emphasis causes primary stress to be assigned in the syllable that contains schwa in *áwesome* [ɔː.səm], *ambívalent* [æm.bɪv.əl.ənt], *applícable* [ə.plɪk.əbl], *hórror* [hɒr.ər], *réally* [rɪə.li] and *ráther* [ræ.ðər]. In phonology of world languages including English, schwa is a reduced vowel that is not stressed at all (Hammond, 1999). Schwa is the least sonorant vowel, too (Parker, 2002). So, it can be argued that this type of stress shift for emphasis is considered as highly marked. What the survey shows is that stress shift for emphasis causes schwa to change its features, as in the mapping of *applícable* [ə.plɪk.əbl] → *ápplicable* [æp.lɪk.əbl] (resyllabification also takes place in the first two syllables) (See Jones, 2003, p. 30). The lax vowel [æ] forms a closed syllable in the emphatic form.

Second, primary stress oscillates between the vowels of the same sonority regardless of the occurrence of stress shift for emphasis, as in the mapping of *fantástic* [fæn.tæs.tɪk] → *fántastic* [fæn.tæs.tɪk] (where the low vowel receives stress) and *cánnot* [kæn.ɒt] → *cannót* [kə.nɑːt] (where featural change and re-syllabification occur across the syllables.) (See Jones, 2003, p. 81). This tendency is also observed in *neverthelés* [nev.ə.ðə.les] → *névertheless*, *élsewhere* [els.weər] → *elsewhére*, *ínfluence* [ɪn.flu.ens] → *inflúence* and *nécessarily* [nes.ə.ser.əl.i] → *necessárily*. Third, stress shift for emphasis causes primary stress to shift from either a mid vowel or a high vowel to a low vowel, as in *clandéstine* [klæn.des.tɪn] → *clándestine*, *enthúsiasm* [en.θuː.zi.æz.əm] → *enthusiásm*, *extraórdinarily* [ɪk.strɔː.dən.er.əl.i] → *extraordinárily* and *órdinarily* [ɔː.dən.er.əl.i] → *ordinárily*. The suffix -*asm* comes to receive primary stress in case of *enthusiásm*. The fourth pattern of stress shift for emphasis is seen in the mapping of *vóluntarily* [vɒ.lən.trə.li] → *voluntárily* [vɑː.lən.te.rəl.i], where primary stress moves from a low vowel to a mid vowel after stress shift for emphasis. The penultimate syllable -*tari* [trə] under normal pronunciation has bi-consonantal onsets, but when pronounced emphjatically, a mid-vowel inserted in the onsets, creating a CV syllable as in -*tá* [te] (*Oxford advanced learner's dictionary*, 2010, p. 1724).

Lastly, the rest of the target words come to have primary stress assigned in the high vowel, as in *ábsolutely* [æb.sə.luːt.li] → *absolútely*, *irréfutable* [ɪ.ref.jə.tə.bl] → *irrefútable*,

néighborhood [neɪ.bə.hʊd] → *neighborhóod*, *pósitively* [pɒz.ə.tɪv.li] → *positívely*, *córdially* [kɔ:.di.əli] → *cordíally*, *fórmidable* [fɔ:.mɪ.də.bl̩] → *formídable*, and *gólly* [gɑ:.li] → *gollée*. The high vowel is less marked than the low vowel in that the lower the vowel becomes the higher its sonority becomes. The lower vowel requires more articulatory energy than the high vowel because the former involves lowering the jaw during the sound production. A featural change takes place, as in the mapping of *gólly* [gɑ:.li] → *gollée* [gɑ.li:] (where the final vowel is lengthening) and *irréfutable* [ɪ.ref.jə.tə.bl̩] → *irrefútable* [ɪr.ɪ.fju:.tə.bl̩] (where the ante-penultimate syllable switches schwa to [u:] and the vowel in the second syllable switches [e] to [ɪ]). The stressed syllable after stress shift for emphasis also is resyllabified, as in the mapping of *irréfutable* [ɪ.ref.jə.tə.bl̩] → *irrefútable* [ɪr.ɪ.fju:.tə.bl̩] (where the ante-penultimate syllable gains another onset consonant and the sequence of the first three syllables are resyllabified) and *fórmidable* [fɔ:.mɪ.də.bl̩] → *formídable* [fɔ:.mɪd.əbl] (where the ante-penultimate syllable gains the coda consonant).

The research indicates that there must be phonological rules that help us predict the featural change in the vowel of certain words as well as the resyllabification of the syllable that comes to receive stress. Often, stress shift for emphasis causes a change in rhythmic pattern. By now, it is clear that the sonority of a vowel is not the only contributing factor to account for stress shift for emphasis; that is, a high sonority vowel does not necessarily trigger stress shift for emphasis, even schwa undergoes featural change and has stress assigned, as in *ráther* [ræ.ðər] → *rathér* (Bolinger, 1986) under emphatic pronunciation. Future work needs to address the issues at hand in phonology.

4.2.4   Limitation

The present author received an insightful comment about stress shift for emphasis in English from one anonymous reviewer with the 12th Old World Conference in Phonology. The comment goes as follows; "The author claims that the stress shift occurs for reasons of emphasis, but it is not explained when this occurs. It would be nice to see at least an example sentence that illustrates the context in which the stress shift occurs, although a more thorough investigation would also be interesting to see" (anonymous reviewer, November 1, 2014). The spirit of this comment remains relevant in the present study, so that the present author should have to look for a concrete context in which stress shift for emphasis takes place as a marker of emphasis in specific words that this study dissects. In this respect, past studies such as Bolinger (1978) and Kenyon & Knott (1953) are the least helpful in defining the ""emphatic" context in which they occur (e.g. example sentences)" (anonymous reviewer, November 1, 2014). All of the listed words in 1-2 show up in past studies without the emphatic context in which the target shift takes place (See 1-2).

5. Ending Remarks

In the preceding, we first noted that Spencer (1852) stressed the importance of linguistic economy in lightening the burden of the addressee in grasping messages. This addressee-sided approach is rejected by Jespersen (1949) who has argued that linguistic economy should be considered from the addressee's and the speaker's perspectives. This line of analysis is followed by Zipf (1949), who has theorized that both the speaker and the addressee are inclined to minimize their efforts in communication to achieve the least effort in the language system. This communicative minimization of effort results in the least average rate of probable work in the future.

Another point of view, noted by Leech (1983) among others, shows that through natural inertia speakers tend to minimize their speech but realize, at the same time, that the addressee expects them to express their thoughts or feelings clearly and precisely. This need for precision in communication sometimes requires the speaker to expend more articulatory energy than usual. We saw that making such emphasis triggers violation of *EFFORT on the side of the speaker, as in "climax" (Bolinger, 1978, p. 486; Bolinger, 1980, p. 42), but noted that emphasis helps the addressee reduce the burden of comprehending the intention of the speaker.

We then investigated what Bolinger (1978) among others noted: certain English words that undergo emphasis also undergo alternation in the vowel, resyllabification of the syllable that comes to receive stress, and change in rhythmic patterning. As noted in Section 4, our findings show that eight hitherto uninvestigated English words, such as *áwesome* and *nevertheléss*, could undergo the target shift as a marker of emphasis, as in *awesóme* and *névertheless*. Making emphasis is certainly a phenomenon associated with these phonological, structural, and rhythmic changes. Issues relating to linguistic economy and emphasis arising from such changes need to be theoretically extended in future works. And an emphatic context in which the target shift takes place needs to be identified.

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