Internal Vowel Alternation as a Systematic Phonological Marker in English

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This paper investigates IVA (Internal Vowel Alternation) in Past Tense formation (e.g., "get-got") and Noun Plurals (e.g., "foot-feet") according to the sign-oriented theory of the CS (Columbia School) in general and the theory of PHB (Phonology as Human Behavior) in particular. In Modern English, these IVA forms are called "irregular", and are remnants of former prevalent and productive processes in Old English, that is, *ablaut* gradation in verbs and *i-umlaut* in nouns, which: (1) demonstrate a fundamental morphophonemic regularity, (2) are both systematic and iconic, and (3) distinguish between verbal and nominal vowel alternation systems, thus facilitating their identification, acquisition, and retention.

Keywords: phonology, vowel alternations, irregular Past Tense forms, irregular Noun Plurals

Introduction

This paper presents the analysis of the morphophonemic system of IVA (Internal Vowel Alternation) in both verbal and nominal forms in English in terms of its phonetic representation. Nowadays, these IVA forms are considered to be "irregular" in Past Tense Verb forms and Noun Plurals; however, in Old English, IVA was a prevalent and productive process in both: *ablaut* gradation in the verbal system (e.g., "sing-sang", "get-got") and *i-umlaut* in the nominal system (e.g., "foot-feet", "mouse-mice"). Second, IVA constitutes a system that may still be classified phonologically into subsystems in Modern English as well as in Old English. In this paper, the IVA system and its various subsystems will be examined and classified according to the sign-oriented linguistic theory in general (Saussure, 1959, 1983) and the CS (Columbia School), in particular (Diver, 1975, 1995; Tobin, 1990, 1993, 1994) including the theory PHB (Phonology as Human Behavior) (Diver, 1979, 1993; Davis, 1987, 1989; Tobin, 1997, 2009), which is part of the CS approach. The goal of this paper is to uncover the underlying phonological system of the verbal and nominal forms containing IVA.

Theory and Methodology

The CS sign-oriented or semiotic approach to language proposes the following definition of language: "Language: A system of systems composed of various sub-systems (revolving around the notion of the linguistic sign) which are organized internally and systematically related to each other and used by human beings to communicate" (Tobin, 1990, p. 47).

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That is, the linguistic sign should be the basic theoretical and methodological unit of linguistic analysis that underlies the semiotic approach as originally developed by Ferdinand de Saussure, the "father" of modern linguistics. The linguistic sign presented in Saussure (1983), reflects:

> … A unit where the sound (or signal) in the form of concrete morphological forms of more abstract zero morphology or word order (the *signifiant* or "signifier") is inseparably united with a concept in the form of an invariant meaning (the *signifié* or "signified"). (Tobin, 1990, pp. 40-41)

Following the sign-oriented CS theory, language may be viewed as a symbolic tool which structure is shaped both by its communicative function and by the characteristics of its users (Tobin, 2007a, 2007b, 2009). CS theory—including PHB—explains the behavioral and cognitive characteristics of human beings that are reflected in the creation of sound systems in language. The phonological systems of language are both complex and diverse on the one hand (the communication factor), yet they are sufficiently economical to fulfill the communicative needs of speakers on the other hand (the human factor): i.e., sound systems are exploited in an efficient way and are acquired naturally (Even-Simkin & Tobin, 2011b).

The basic axiom underlying CS-PHB is the synergetic principle that language represents the compromise resulting from the constant struggle between the communication factor (our striving for maximal communication) and the human factor (our propensity to exert minimal effort) (Tobin, 1997). The theory explains how the sound system of language allows for the creation of successful communication in an efficient way and provides as Tobin (2006) put it "an explanation for the distribution within the speech signal: i.e., it tells us why the distribution of phonemes within a language is not random but motivated" (p. 64).

This paper presents a CS-PHB analysis of both the IVA verbal Past Tense systems and the IVA nominal Plural formations in Modern and Old English which demonstrates and explains why the IVA Past Tense and nominal Plural systems as opposed to other systems are called "irregular" in Modern English. This study shows that there are two different phonological processes of the IVA: (1) the *backing process* of various degrees for vowels in verbal Past Tense formation; and (2) the *fronting process* of various degrees for vowels in nominal Plural formation. Thus, it is still possible to distinguish phonologically between the IVA for verbs and nouns in Modern English. Furthermore, these opposed phonological processes do not only distinguish between the verbal and nominal vowel alternation systems but they are also polar and iconic, thus making them easier to identify. There is an iconic *backing* process to represent the transformation of Present to Past Tense (a metaphorical "movement backwards in time") (Even-Simkin, 2005) for verbs opposed to a *fronting* process to represent the addition of other entities in the Plural (a metaphorical "movement forward") (Even-Simkin, 2012) for nouns.

Analysis

The analysis of the morphophonemic system of the IVA in the verbal Past Tense formation and in the nominal Plural formation in English reveals that there are two phonologically polar and iconic processes which distinguish between the two systems:

(1) The remnants of the Plural Old English IVA declension system of nouns comprise only seven nouns in Modern English which undergo the fronting process from singular to plural declension. In this system, there are

three different degrees of the fronting process: "tooth-teeth", "foot-feet", "goose-geese" (/ʊu/ → /Ii/); "man-men", "woman-women" (/æ/ → /e/); and "louse-lice", "mouse-mice" (/au/ → /aI/). Moreover, a diachronic analysis of the IVA nominal Plural formation reveals an additional corpus of nominal IVA forms that follow the "regular" rules of adding the suffix "-s/-es" in Modern English, which originally followed the same *fronting process* of *i-umlaut* in Old English: e.g., *bōc-bēc* ("book-books"), *hōnd-hēnd* ("hand-hands"), *frēōnd-frīēnd/frynd* ("friend-friends"), *fēōnd-fīēnd/fynd* ("foe-foes"), and *brōc-brēc* (OE)/*brēche* (ME) ("breeches, pants, trousers"). Thus, this study of the IVA nominal Plural formation reveals forms in Old English and other Germanic languages as well, consequently supporting the non-arbitrary character of the phonological system in nominal IVA forms.

(2) The verbal IVA forms, as opposed to the nominal IVA forms, display the opposite polar iconic phonological process, i.e., the morphophonemic *backing* process for Past Tense conjugation reflecting a metaphorical "movement backwards" in time. Furthermore, this phonological *backing* process also appears in various degrees: e.g., in verbs like "sling", "slink", "fling", "wring", "swing", "sting", "cling", "win", "hang", and "strike", the IVA is from /I/, /aI/, /æ/ to /ʌ/; in the verbs "speak", "weave", "steal", "heave", "freeze", and "yield", the IVA is from /Ii/ to /əʊ/; and in verbs like "bind", "find", "grind", and "wind", there is another kind of degree of the backing process, namely, from /aI/ to /aʊ/. The similar degrees of the modern IVA backing process can also be found in the IVA verbs of Old English which originally are called "strong" verbs and are also formed by *ablaut gradation* in Old English.

It is worth noting, however, that there is also a small number of the contemporary IVA verbal forms like "hold", "run", "bite", "fall", "slide", "lie", and "come", that do not preserve the *backing* process, but these cases comprise only about 10% of all Modern English IVA verbs. Furthermore, it is also worth pointing out the fact that these 10% of the contemporary non-backing IVA forms followed the *backing* process in Old English. Moreover, in Modern English, there are some additional IVA verbs, e.g., "ring"-"rang/rung", "dig"-"dug", "reeve"-"rove", "stave"-"stove", and "spit"-"spat", that historically do not undergo vowel gradation, that is, they are originally "weak"-ed verbs which become IVA verbs over time. Nevertheless, these "new" IVA verbs also conform to the phonological *backing* process of the IVA found both in Modern and Old English. So, the vast majority (~90%) of the IVA verbs appear to conform to a fixed phonological system just like all (100%) the IVA Noun Plurals. Therefore, both the verbal and nominal IVA systems should not be viewed merely as exceptions to the so-called regular system, but rather as full-fledged and independent systems in their own right.

The English Verbal and Nominal Systems According to CS-PHB Theory

There are at least five different parallel systems of Past Tense formation in verbs and in Plural formation in nouns in Old English which partially have been retained in Modern English as shown in Even-Simkin and Tobin (2011a): (1) Suppletion: "go/went" in verbs, "person/people" in nouns; (2) "Regular": lexical item + apical suffix: Past Tense formation ("-d/-ed") and Plural formation in nouns ("-s/-es"); (3) "-(r)en" suffixation in nouns: "child/children", "ox/oxen"; (4) Syncretism: "put/put" in verbs, "fish/fish" in nouns; and (5) IVA.

Each of these systems can be described according to the synergetic principle underlying CS-PHB theory that language represents the compromise resulting from the constant struggle between the communication factor (our striving for maximal communication) and the human factor (our propensity to exert minimal effort).

Suppletion

In this system, there are two absolutely different lexical items for: Past versus Non-Past conjugation in verbs, like in "go" (non-past)/"went" (past), and Singular versus Plural inflection in nouns, like in "person" (sg.)/"people" (pl.). Following CS-PHB approach, this group is "the worst" in terms of the human factor because of *memory limitations*, since two distinct lexical items have to be learned for the same entity instead of one item. However, this maximal distinction between both lexical items makes this group "the best" in terms of the communication factor, as far as two completely different words cannot be confused or misunderstood.

Moreover, it is worth noting that in Modern English there is also the plural form of "person" (sg.) which is "persons" (pl.) that refers to individuals in a group and *not* to the group itself like in "person" (sg.)/"people" (pl.). There is also the plural form "peoples" as in the "peoples of Africa" referring to a plurality of groups rather than to separate and specific individuals. These examples show the efficiency of the most commonly used subsystem (lexical item + apical suffix) which is customarily called: the "regular" plural declension of nouns that merges in this case with the system of *Suppletion* to create a more refined and specific semantic distinction in plurality.

Lexical Item + Apical Suffix

This system includes the adding of apical suffixes: "-d/ed" in verbs like in "walk" (non-past)/"walked" (past) and "-s/es" in nouns like in "cat" (sg.)/"cats" (pl.). The *lexical item + apical suffix* process has become "the regular rule", i.e., the prevailing system of Past Tense and nominal Plural formation in English. The efficiency of this system may be explained by CS-PHB theory in the following way: (1) The human factor is "the best" due to the addition of an apical suffix since the apex is the easiest active articulator to control (Diver, 1979; Tobin, 1997); and (2) The communication factor is "the best", because the lexical item appears first, preceding the grammatical apical suffix. The burden of communication is the highest in word initial position, while the easiest apical suffix appears in word final position, where the least effort is required, or as it was shown in Tobin (1997) "[i]t is in final position where the burden of communication is at the lowest and the least amount of effort needs to be expended in the synergetic struggle for maximum communication with minimal effort" (p. 161). Therefore, it is not surprising that this system of *lexical item + apical suffix* has not only survived but also has become the dominant and most common system. It is worth pointing out that the phonetic rendering of the apical suffixes /-t, -d/ and/or /-s, -z/ conforms to the voicing value of the final consonant it collocates with, thus facilitating fluent pronunciation, and the syllable suffixes /-Id, -Iz/ occur when the final apical consonant of the Non-Past Tense or Singular lexical item might be misconstrued as an apical Past Tense or Plural marker.

Adding of the Suffix "-(r)en"

This system includes the nouns like "child" (sg)/"children" (pl.), "ox" (sg.)/"oxen" (pl.) and the infinitive forms of the verbs with the suffix "-en" in Old English, as in German and other Germanic languages, that has not been retained in Modern English (where we generally have "to" or zero (Ø) as the infinitive marker). It is also worth pointing out that we have a minimal pair, like historical "brethren" (used for "spiritual brothers") versus modern "brothers" ("used for biological brothers"). Another example of merging two historical systems we can find in a metaphorical anthropomorphic analogy, for example, when we refer to "stupid men" as "stupid oxes" as opposed to "oxen", thus marking a more refined semantic distinction between figurative and literal meaning.

Syncretism

Past/non-past forms in verbs, e.g., "put" (non-past) = "put" (past), "fit" (non-past) = "fit" (past) and the singular/plural forms in nouns, e.g., "deer" (sg.) = "deer" (pl.), "sheep" (sg.) = "sheep" (pl.) are the same. The (+ zero/Ø) suffix implies no effort, thus the human factor is "the best". But, since *Syncretism* does not provide us with any perceptible opposition, the communication factor is "the worst", because it is the least efficient way to distinguish between past versus non-past and plural versus singular forms. In *Syncretism* like in nominal *Suppletion*, once again, we can observe a new merging with the system of *lexical item + apical suffix* which distinguishes between transitive and intransitive uses of verbs to create different messages: e.g., ("My suit fit yesterday" versus "The tailor fitted my suit yesterday") and/or the mass noun "money" versus different "monies" (in the sense of kinds of currencies).

The IVA System

This system includes verbs like "win" (non-past)/ "won" (past) and nouns like "foot" (sg.)/"feet" (pl.). In the IVA system, the human and communication factors are not optimal and are the least efficient. First, the IVA opposition occurs in vowels which provide less clear-cut oppositions than consonants (Tobin, 1997; Even-Simkin & Tobin, 2011a). Second, this IVA opposition appears in the least optimal word medial position as opposed to initially or finally which are more salient, readily discernible, and remembered, as discussed, e.g., in Diver (1993), Tobin (2009), and Even-Simkin and Tobin (2011a). It is worth noting, however, that most IVA forms are monosyllabic, thus facilitating the perception of the least optimal IVA system of oppositions via exploiting a particular word structure (which is the most efficient for this system). Similarly to the other systems, there are also certain verbs, such as: "shine" (non-past) → "shone" (past) or "shined" (past), which have also converged with the most common and efficient system of *lexical item + apical suffix*, thus, once again displaying a similar subtle semantic distinction: e.g., "We dove/dived in the pool yesterday" but only "I skydived/*skydove ten years ago" or "The sun shone/shined yesterday" but only "I shined/*shone my shoes yesterday". Moreover, likewise in the third system, a metaphorical anthropomorphic analogy can be attested in the IVA system, e.g., as documented in a cartoon: "Are you men or mouses?" as opposed to "mice", and "They are dirty louses" as opposed to "lice", or we can refer to "silly girls" as "silly gooses" as opposed to "geese", thus, once more merging two historical systems to mark a particular and more refined semantic distinction between figurative and literal meaning.

Further evidence for the predominance of the *lexical item + apical suffix* system comes from experimental studies of first language acquisition: i.e., adding the suffix "-d/-ed" to verbs and "-s/-es" to nouns in Past Tense verbal and Plural nominal formations of lexical and nonsense items by children (Berko, 1958; Marchman, 1997). As it was previously pointed out, the system of *lexical item + apical suffix* is the most commonly used one since it is the most efficient of the five systems from the perspective of the synergetic mini-max CS-PHB principle representing the compromise in achieving maximal communication with minimal effort (Tobin, 1997; Even-Simkin & Tobin, 2011b). As a result, in Modern English, the IVA and the other so-called irregular systems "are now acquired lexically for frequently used lexical [nominal and verbal] items rather than as grammatical systems" (Tobin, 2006, p. 73). However, it is worth noting that these IVA forms have remained for very important and quotidian lexical verbs and nouns, whereas, in Old English the IVA and other systems are more common, productive, and generally used systems.

Conclusions

This paper proposes the answer to the question: Why should IVA be viewed as a full-fledged classification system? First, the IVA formations appear to be non-random. Second, although this classification system has changed over time, it has overwhelmingly retained and maintained the polar-iconic phonological processes: *backing* for the Past Tense formation of both historical "strong" verbs as well as for historical "weak"-ed verbs (which have entered the IVA system) versus *fronting* for nominal pluralization. Both phonologically opposed processes: *backing* versus *fronting* attest to a consistent morphophonemic regularity, thus reflecting and representing two different syntactic systems in English: verbal and nominal. Following Stemberger's (2001) claim: "Phonology affects syntax, both in grammar (e.g., Rice & Svenonius, 1998; Broadwell, 2000) and in language acquisition (Stemberger & Bernhardt, 1997)" (p. 15). Therefore, it is not by chance that the IVA process in Modern English preserves its phonological features as a classification system for both lexical and grammatical verbal and nominal systems as well as in Old English.

References

Berko, J. (1958). The child's learning of English morphology. *Word, 14,* 150-177.

Broadwell, G. A. (2000). *On the phonological conditioning of clitic placement in Zapotec*. ROA-422.

Davis, J. (1987). A combinatory phonology of Italian. *Columbia University Working Papers in Linguistics, 8,* 1-99.

Davis, J. (1989). How a Columbia linguist does phonology. Paper presented at the *First International Columbia School Conference on Linguistics*, August 24.

Diver, W. (1975). Introduction. *ColumbiaUniversity Working Papers in Linguistics, 2,* 1-20.

Diver, W. (1979). Phonology as human behavior. In D. Aaronson & R. W. Reiber (Eds.), *Psycholinguistic research: Implications and applications* (pp. 161-186). Hillside, N.J.: Lawrence Erlbaum.

Diver, W. (1993). The phonology of the extremes: The correlation of initials and finals. Paper given at the *Third International Columbia School Conference on Linguistics*, Rutgers University, New Brunswick, N.J., October 11.

Diver, W. (1995). The theory. In E. Contini-Morava & B. S. Goldberg (Eds.), *Meaning as explanation: Advances in linguistic sign theory* (pp. 43-114). Berlin: Mouton de Gruyter.

Even-Simkin, E. (2005). The analysis of the phonological alternations in the past tense form of the irregular verbs in English in terms of the theory phonology as human behavior (Unpublished manuscript, Ben-Gurion University of the Negev).

Even-Simkin, E. (2012). Internal vowel alternations in nominal and verbal forms according to the sign-oriented theory and the theory of phonology as human behavior (Ph.D. dissertation, Ben-Gurion University of the Negev).

Even-Simkin, E., & Tobin, Y. (2011a). Internal vowel alternation as classification in nominal and verbal systems according to the theory of phonology as human behavior. In K. Dziubalska-Kołacyk & K. Debowska (Eds.), *On words and sounds*: *A selection of papers from the Fortieth PLM, 2009* (pp. 94-137). Cambridge: Cambridge Scholars Publishing.

Even-Simkin, E., & Tobin, Y. (2011b). Phonological aspects of internal vowel alternation in English. In W.-S. Lee & E. Zee (Eds.), *Proceedings of the 17th international congress of phonetic sciences 17-21 August 2011, Hong Kong* (pp. 647-650). (CD ROM).

Marchman, V. A. (1997). Children's productivity in the English past tense: The role of frequency, phonology, and neighborhood structure. *Cognitive Science, 21*(3), 283-304.

Rice, C., & Svenonius, P. (1998). Prosodic V2 in northern Norwegian. Paper presented at the *17th West Coast Conference on Formal Linguistics*, Vancouver, B.C., February.

Saussure, F. de. (1959). *A course in general linguistics (Cours de linguistique générale)*. Paris: Payot, New York: Philosophical Library.

Saussure, F. de. (1983). *Course in general linguistics [1916]*. C. Bally, A. Sechehaye, & A. Riedlinger (Eds.). (R. Harris translated and annotated). London: Duckworth.

Stemberger, J. P. (2001). *Overtensing within optimality theory*. ROA-477. Retrieved from http://ruccs.rutgers.edu/roa.html

Stemberger, J. P., & Bernhardt, B. H. (1997). Syntactic development limited by phonological development. Paper presented at the *38th Meeting of the Psychonomic Society*, Philadelphia, November.

Tobin, Y. (1990). *Semiotics and linguistics*. London: Longman.

Tobin, Y. (1993). *Aspect in the English verb: Process and result in language*. London: Longman.

Tobin, Y. (1994). *Invariance, markedness and distinctive feature analysis*. Amsterdam: John Benjamins.

Tobin, Y. (1997). *Phonology as human behavior: Theoretical implications and clinical applications*. Durham, N.C.: Duke University Press.

Tobin, Y. (2006). Phonology as human behaviour: Inflectional systems in English. In J. J. Davis, R. J. Gorup, & N. Stern (Eds.), *Advances in functional linguistics: Columbia school beyond its origin* (pp. 63-86). Amsterdam: John Benjamins.

Tobin, Y. (2007a). A semiotic view of signed versus spoken language. *Proceedings of the X-1 International Symposium on Social Communication, Santiagoi of Cuba (Actas-1 del X Simposio Internacional de Comunicacion Social, Santiagoi de Cuba) 2007* (pp. 428-432).

Tobin, Y. (2007b). Arbitrariness versus iconicity in signed and spoken languages. *Proceedings of the Internacional Linguistic Conference (Memorias de la Conferencia Lingüística Internacional), 2007*. The Institute of Linguistics and Literature of Havana (El Instituto de Linguistica y Literatura la Habana), Cuba. (CD ROM).

Tobin, Y. (2009). Phonology as human behavior: Applying theory to the clinic. *Asia-Pacific Journal of Speech, Language and Hearing, 12*(2), 81-100.