**The Phoneme and Word Phonology in SFL revised**

Paul Tench

Cardiff University

The principal function of phonology is to provide each discrete unit in the lexicogrammar of a language with distinctive acoustic forms. Each lexicogrammatical unit has to have its own form in order to be distinguished from all other units in a system. Phonology provides those forms. Phonology is not simply an inventory of phonemes that operates in a given language, but it is a set of systems that functions at all levels of the lexicogrammar. SFL has achieved a high degree of sophistication in specifying the phonological systems that operate with clauses and sentences (that is, intonation), but has largely neglected the description of systems that operate at other, lower, ranks in the lexicogrammatical hierarchy. This chapter seeks to contribute to redressing that imbalance by looking specifically at those systems that operate at the level of words.

Without phonology there can be no lexicogrammar. Words are identified by their phonological form so that they can be distinguished from all the others. As distinct forms, they are stored in the mental lexicon, and thus are capable of being listed paradigmatically, as potential items in a system. Words thus have both meaning and form, *signifiés* and *signifiants* as de Saussure referred to this duality. Each distinctive form, or *signifiant*, is composed of phonetic material, which is the physical basis for the other main function of phonology, which is to provide the means for speaking a language.

It will be objected that not all the *signifiants* of a language might in fact be uniquely distinctive, as in English *right*, *write*, *rite*, *wright*, but that is largely a matter of historical accident: [rɪçt], [ʋritǝ], [ritǝ], [ʋrɪçt] all eventually became [ɹaɪt] through various historical processes. Secondly, it will be objected that lexicogrammatical items can also be conveyed non-phonologically, by orthography; however, most writing systems in the world are based on replications of phonology, eg either directly as in alphabets and syllabaries, or indirectly as in Braille, Morse code, semaphore, etc. It is also true that some writing systems are not based on phonology at all, but on lexis, such as Chinese characters (‘ideographs’), numbers, and icons used in visual displays on computers, washing instructions on clothing, etc; but in all such cases, the written forms were preceded culturally and psycholinguistically by oral forms. ‘Rebus’ writing is a hybrid system, mixing phonologically and non-phonologically based systems, eg in texting *before* as *b4*. Apart from ideographs and icons, it remains true to say that lexicogrammatical items in any language are directly or indirectly realizations of the phonology of that language.

Phonology is, therefore, an integral part of language. Phonology is the systemic organization of phonetic material for all the distinctive units of lexicogrammar. The phonology of a language is the systemic organization of phonetic material peculiar to that language; thus each language has its own specific categories, inventories and patterns of sound. Phonology can, consequently, be examined in general terms that are valid for all languages, and indeed, particular phonological universals can be identified. All language theories should, therefore, accommodate phonology, and in doing so, each phonological theory reflects the dominant characteristics of an over-arching theory of language. SFL has its own major principles and priorities which get reflected in its theory of phonology.

**HISTORICAL PERSPECTIVES**

Systemic phonology is most closely associated with Halliday, although it grew out of an earlier approach to phonology developed by J R Firth and the so-called Prosodic Phonologists at the School of Oriental and African Studies at London in the 1930s to the 1960s. A succinct summary of the distinctives of their Prosodic Analysis is found in Tench (1992: 8):

Prosodic Analysis is a non-universalist approach to the description of the phonology of a language that highlights the syntagmatic as well as the paradigmatic dimensions of the phonic material, in terms of structures and systems and is prepared to recognize different systems appropriate to different components of the language and to reflect grammatical categories wherever necessary, in such a way as to conform as fully, appropriately and elegantly as possible to a general linguistic theory.

Prosodic Analysis eschewed a universalist goal, as Systemic Phonology does today. The phonology of each language is to be described in terms of its own set of units, features and categories. Although there are general universal features in all languages, eg all languages have vowels, consonants, syllables, etc, and languages that have three vowels all maintain the principle of maximum discrimination so that they ‘choose’ /i, ɑ, u/, etc, each language displays categories, inventories and patterns that are unique to itself.

Prosodic Analysis, furthermore, was not primarily concerned with written transcription conventions or a strictly linear presentation of the phonetic material; it sought to draw as much attention to sequential features of the sound of utterances as to the paradigmatic. Sequential features stretched beyond single segments and were called ‘prosodies’; examples include nasalization through a whole or part of a syllable, vowel harmony, palatalization through a whole or part of a word, lexical tone, intonational tone over a whole clause or utterance. These ‘prosodies’ were also known as ‘plurisegmental’ features.

Systems represent small sets of choices, eg all the strong vowels that appear in stressed syllables, or all the vowels that appear only in unstressed syllables, as in the case of English. But systems may vary according to position in a structure; for example, there is one system of consonants that operates at the onset of a syllable in English, but a different system that operates at its coda: there is a different set of choices in final position since /ɲ/ becomes available in final position but it is not available in initial position; on the other hand /h, j, w/ (and /ɹ/ in non-rhotic accents) are not available in final position, but are in initial position. This ‘polysystemic’ principle extends in delicacy to other possibilities at the onset: if the syllable has two initial consonants, then the first consonant belongs to a much smaller system and the second consonant likewise. (Note that in a triconsonantal onset in English, the obligatory /s/ does not form a system as there is no choice at that point of structure.) Similar, delicate, systems operate at the coda.

There was also no ‘compartmentalization’ of units in Prosodic Analysis. In other traditions, reference to units across phonology, grammar and lexis was strictly forbidden; the units of phonology, grammar and lexis were tightly ‘compartmentalized’. But in Prosodic Analysis, phonological description was directly related to grammatical units like words, phrases and clauses. There might even be a separate phonology for nouns and pronouns in a language, for example, and separate phonologies for ‘native’ and ‘loan’ words.

Halliday developed the notion of a hierarchy of phonological units, such that in English ‘tone groups’ consisted of ‘feet’, which consisted of ‘syllables’, which consisted of ‘phonemes’ (Halliday 1961; Halliday, McIntosh & Strevens 1964: 25-7) and, conversely, that phonemes had various functions in syllables, which had various functions in feet, which had various functions in tone groups (Halliday 1967: 12-5). This ‘structure-function’ relationship was not apparent in the earlier model; the units in Prosodic Analysis were simply domains in which prosodies operated. Each language would need to be described in terms of its own phonological hierarchy, which might not be parallel to that of English. The case is made below for such a difference in the phonological hierarchy of a language called Etkywan.

Tench (1976) also suggested an extension of the structure of the hierarchy with double ranks to capture the structure and function of phonemes in clusters, of syllable sequences in rhythm groups, and of intonation unit sequences in intonation groups; he also suggested an extension to the ranks of the hierarchy to embrace phonological paragraphs (‘paratones’), exchanges and discourse; in this respect, he was indebted to Pike’s larger perspective on phonological hierarchy (see Pike 1967).

Halliday also developed the notion of system networks in phonology. System networks are graphic displays of the choices available in the phonology of a language, the conditions under which the choices are made and the degrees of delicacy of those choices. He produced whole, comprehensive, displays for all the intonation systems of English (Halliday 1967; see the Appendices), and syllable finals of standard Chinese (Halliday 1992), as did Young for the consonant cluster systems of English (Young 1992).

It has to be conceded, however, that within the seventy year tradition of SFL, relatively little attention has been paid to the systemic phonology of words. The phonological hierarchy is presented in Berry (1977), but without much explication at the level of words; more appears in Butler (1985), but fuller descriptions appear in Tench (1992) in a range of languages including English, Mandarin Chinese, Welsh, Arabic, Telegu and the Australian language, Gooniyandi. Tench (2014) was an attempt to produce a more comprehensive description of the phonological structure of monomorphemic words in English, and then Tench (2024) produced the most comprehensive survey of English word phonology, including polymorphemic words, phonotactics, simplifications and allophonic variations. In the same volume, he attempted a full scale description of German, Welsh and Tera word phonology, the latter being a Chadic language spoken in Nigeria and altogether different from Indo-European languages. Also, Matthiessen (2021) displayed system networks for the syllables and phonemes of Akan (Ghana).

Most attention has been given to the level of intonation, principally because in intonation the semantic functional dimension is prominent, which has been the bedrock of SFL, and also because as much attention is paid to spoken discourse as to written. Intonation systems appear regularly in all SFL descriptions of English, and intonation description and theory have readily been advanced (Tench 1990, 1996, 1997; Halliday & Greaves 2008). The Discourse Intonation approach of Brazil and the Birmingham School of linguists is basically an adaptation of Halliday’s systemic-functional approach (Brazil 1975, 1978, 1997; Brazil, Coulthard & Johns 1980; O’Grady 2010). Halliday’s influence may also be seen in Wells’s description of English intonation (Wells 2006).

Phonology is viewed as the formal aspect of the acoustic image (*signifiant*) of linguistic units (*signifiés*); thus words and morphemes constitute phonological units as well as grammatical and semantic units. This is the case for other units as well: rhythm units are acoustic images of phrases/groups and clauses, and intonation provides systems at the level of clause, sentence and discourse. (Phonetics is the phonic substance that ‘articulates’ the phonological units and systems in actual instances of spoken language.) A phoneme is the minimal unit of phonology; it provides a distinctive unit in sequences for the identification of individual basic lexicogrammatical units, ie words and morphemes. It has a contrastive function, distinguishing lexicogrammatical units that would otherwise be identical, eg *light* /laɪt/ and *right* /raɪt/; and *light* /laɪt/ and *plight* /plaɪt/.

**CURRENT CONTRIBUTION: NETWORKS FOR WORD PHONOLOGY**

System in word phonology is not like system in lexicogrammar or intonation, a set of options from which a speaker chooses to create meaning; system in phonology at the level of word (and also at the level of groups/phrases) is rather the specifications of what the speakers of a language recognize as having been established in, or ‘selected’ by, the language to represent its words.

A full statement of the phonology of words of any language would ideally include statements about

* a prosodic unit embracing a word
* the permissible features of suprasegmental marking,
* the permissible kinds of structure in a syllable,
* the inventory of phonemes at the nucleus of the syllable and at the margin (or margins, in the case of closed syllables),
* their permissible phonotactic distribution
* their allophonic distribution and
* any systematic form of simplification (assimilation, etc).

**Prosodic unit**

The formal prosodic unit for English is the foot, which can be extended by one of more subordinate feet. The foot is identified by a primary stress, and any subordinate foot by a secondary stress. The unit for the placement of the primary or secondary stress is the syllable; as such, they are known as strong. Any other syllable without any degree of stress is known as weak. The structure and phonetic details of the foot vary from language to language as a comparison with German and Welsh will show (Tench 2024).

There is, however, a very different prosodic unit for words in other languages. It is not based on stress, but on timing or weight of syllables. Syllables are either light or heavy; light syllables typically contain a short vowel in an open syllable (with no following consonant), whereas a heavy syllable contains a long vowel or any vowel with a following consonant. Tera, the Chadic language mentioned above, is such a language. The prosodic unit for a lexical word is a ‘weight’ ie a heavy syllable: a word must have a minimum of one long vowel or a vowel with a following consonant or two syllables with short vowels; a basic word may contain, as a rule, up to four syllables. Grammatical words may only consist of one light syllable.

Here we will attempt to describe as fully as possible the phonology of basic words of another African language, Etkywan [ɛtkɥa͂:], a Jukunoid Benue-Congo language spoken in the south of Taraba State, Nigeria as it is spelt in *Ethnologue* (ISO 639-3 ich); an alternative spelling is Etkwen but it is known as Ichen [iʧɛn] (hence the *Ethnologue* code) in Hausa, the regional language of wider communication (Ichen 2014). Reference will also be made to English as a language more familiar to the reader and a number of contrasts will become apparent.

English is a foot language while Etkywan is a weight language like Tera. In Etkywan’s case, weight follows the characteristics of Tera but there is no contrastive function of vowel length. Lexical words may consist of single syllables with a vowel not marked as long, but the vowel is in fact phonetically long and therefore constitutes a heavy syllable.

Secondly, the suprasegmental features of syllables; in the case of English, this means the degrees of word stress: primary, secondary and no stress. In the case of Etkywan, it means the pitch of syllables, ie a lexical tone system.

Thirdly, the structure of syllables; English has closed as well as open syllables and certain permissibilities of consonant clusters; on the other hand, Etkywan has only open syllables and a very different set of permissible clusters at syllable onset.

Fourthly, the actual inventory of phonemes at the nucleus of the syllable and at margins; in the case of Etkywan, there is only the onset margin. And fifthly, and only briefly in the present description of Etkywan, some allophonic variation, whereas for English there is an abundance of information. The hierarchy of systems can be displayed as follows:

{ foot { weight

{ word stress { (lexical) tone

{ syllable structure: open/closed { syllable structure: open

{ phonemes { phonemes

{ allophonic variation { allophonic variation

*(the vertical brace brackets show where a single large brace bracket should appear)*

Fig. 1 The system hierarchies of English (left) and Etkywan (right)

In English, there are words like <a.bra.ca.da.bra> and <mul.li.ga.taw.ny> with five syllables (< and > indicate orthographic representation, and . indicates syllable breaks.)

– clearly, words borrowed from elsewhere, but from an English language point of view, without internal morphemic boundaries; similarly, place names of non-English origin like Ystalyfera /ʌ.stə.lə.vɛə.ɹə/ from Wales.

Words with four syllables are not very common in either language, just 1.3% in Etkywan: <a.de.de.re> (kind of tree); <a.dgyen.ta.hwi>*fire finch*; <a.la.kwa.bin> (kind of vegetable); <e.bwi.fə.zən> *blind*; <e.tso.tso.ro> *toad*. Words with three syllables are more common (approximately 13.1%): <a.gwa.gwa> *goose*; <a.kpe.te> *tray*; <bi.ya.zon> *bear* (animal); <shin.ge.re> *singlet*. Words with two syllables form approximately 40.2% of the total: <a.cha> *net*; <bi.tin> *trousers*; <cha.shən> *back* (of the body). Finally, monosyllabic words constitute 45.3%: <a> *in, on, at*; <ban> *to lean on*; <chin> *waist; fly* (insect); <sə> *mat*.

**Suprasegmental marking**

The suprasegmental feature of Etkywan syllables is tone. Rhythmical timing appears to be syllabic, unlike the (alleged) stress timing of English. However, each syllable is marked by tone – register tone, rather than contour tone: either high, mid or low. There are abundant illustrations of tone contrasts particularly in monosyllabic words. (á = high tone; a (unmarked) = mid tone; à = low tone.)

<bá> *to write, to follow, roof*

<ba> *to thresh,* (kind of tree)

<bà> *to burn, to stick/gum*

<bgé> *cooked, miserly*

<bge> *dog, to slice* (something) *off*

<bgè> *fresh* (leaves)

Similar contrasts occur with each vowel; this is also the case for Etkywan nasal vowels. In disyllabic words, there is a high tendency for both syllables to carry the same tone, 86% of the total number in the mini-dictionary:

<átá> *house*

<ata> *under*

<àtà> *father*

<ébá> *dove*

<eba> *pancreas*

<èbà> *small hoe, scrounger*

However, there does also appear to be some freedom for each syllable to be accompanied by any of the three tones (14%):

<éhwí> *lower part of the back*  [high + high]

<ehwi> *assistance* [mid + mid]

<ehwí> *thin string made from palm fronds*  [mid + high]

<ehwì> *bundle of grass* [mid + low]

<gúkpèn> *leopard* [high + low]

In words of three syllables, there appears to be the same kind of preponderance of identical tones:

<ásúkú> *storage sacks*

<atafan> (kind of yam)

<èfìkà> *hog*

<adedere> (kind of tree)

but

<ádgyéntahwi> *fire finch* [high + high + mid + mid]

The network for tones and tone patterns for mono- and poly-syllabic words might be displayed as follows:

 ┌── one ――――――――――――┐

 ├── two ─┐ ┌ identical tones ┐ | ┌ high

syllable─┼── three ─┼ ─┤ ├ tone ┼ mid

 └── four ─┘ └ different tones ┘ └ low

*please repair this fig; the upper system ‘one’ should be linked to the ’tone’ system*

 Fig. 2 A system network of lexical tone patterns in Etkywan words

Contrast this network with the equivalent at the same level in the phonological hierarchy for English (Tench 2014, 2024), where the stress patterns are more complicated and numerous ('s = primary stress; ˌs = secondary stress; and w = unstressed; . = syllable boundary).

 ┌ 1 ─ 's *cat*, etc

 │ ┌ 's.w *canter*, etc

├ 2 ┼ w.'s *contain*, etc

│ ├ 's.ˌs *protein*, etc

│ └ ˌs.'s *canteen*, etc

 │

 │ ┌ 's.w.w *benefit*, etc

 │ ├ 's.w,ˌs *appetite*, etc

 ├ 3 ┼ ˌs.'s.w *angina*, etc

 │ ├ ˌs.w.'s *kangaroo*, etc

syllable ───┤ ├ w.'s.w *eleven*, etc

 │ └ w.'s.ˌs *potato*, etc

 │

 │ ┌'s.w.ˌs.w *caterpillar*, *cataclysm*, etc

│├ w.'s.w.w *shenanigans*, *apostrophe*, *catastrophe*,etc

 ├4 ┼w.'s.w.ˌs *apocalypse*, etc

 │ ├ ˌs.w.'s.w *Hallelujah*, *aspidistra, Abednego*, *Madagascar*, etc

 │ └ ˌs.w.w.'s *catamaran*, *hullabaloo*

 │

 │ ┌ ˌs.w.s'.w.w *hippopotamus*, *Devanagari*

 └5 ┤

 └ ˌs.w.w.'s.w *abracadabra*, *Ystalyfera*

 Fig. 3 A system network of lexical stress patterns in English

**Syllable structure**

The Etkywan syllable structure system is much simpler than that of English for three main reasons. Firstly, it does not feature closed syllables; every syllable ends in a vowel. (In the orthographic transcriptions above, final –*n* represents a nasalized vowel; see below.) Secondly, English admits clusters of up to three consonants in the onset system whereas Etkywan allows only up to two, even though the orthography might suggest otherwise because various modifications are represented by letters. Both languages allow zero onset, but the Etkywan system is severely limited. Thirdly, Etkywan does not distinguish between strong and weak syllables. Their distinction between high, mid and low tones does not appear to have any effect on syllable structure in the way that the features of ‘strong’ and ‘weak’ have on English; see the network below with 25 forms (from Tench 2014, 2024):

 ┌V *awe*

 ├CV *law*

 ┌open ┼CCV *flaw/floor*

 │ └CCCV *straw*

 │ ┌VC *ill*

 │ ├CVC *sit*

 │ ├CCVC *slit*

 ┌strong ───┤ ├CCCVC *split*

 │ └closed┼VCC *ask*

 │ ├CVCC *task*

 │ ├CCVCC *flask*

 │ ├CCCVCC *splint*

 │ ├CVCCC *waltz*

 │ └CCVCCC *glimpse*

Syllable ───┤

structure │

│ ┌V *a*.long /ə/

│ ├CV *la*.ment /lə/

│ ┌open ┼CCV *fla*.mingo /flə/

│ │ └CCCV *scle*.rosis /sklə/

 └weak ────┤

 │ ┌C litt*.le* /l̩

 │ ├VC tick.*et* /ɪt/

 │ ├CVC pub.*lic* /lɪk/

└closed┼CCVC cul.*prit* /prɪt/

 ├VCC pli.*ant* /ənt/

 ├CVCC li.*cence* /səns/

 └CCVCC in.*stance* /stəns/

Fig. 4 A system network of syllable structures in English

In Etkywan, the onset may be zero. Note that the orthographical representations above (and below) show nasalization of a vowel by a following <n>, eg <atafan> = /atafã/; *Etkywan* = /etkywa͂/.

The onset may otherwise have a single consonant or a double consonant cluster: C, CC. The initial consonant may be pre-nasalized: nC, nCC. Pre-nasalization in Etkywan is a brief nasal articulation before a plosive, that is non-syllabic, ie it does not constitute a separate syllable, because it does not carry tone. In addition, the onset may be palatalized: Cy, CCy; or labialized: Cw, CCw; or both: Cyw. A single labialized consonant may also be pre-nasalized: nCw.

The full inventory of consonants appears below (**Syllable onsets**). The plain double consonant clusters maintain a consistent voice feature and are restricted to taking either /k/ or /ɡ/ as the second item following /f/, /t/, /b/ and /d/: /fk/, /tk/, /bɡ/ and /dɡ/.

Pre-nasalization is widespread: as [ᵐ] before labials /p, b, bɡ, f/, as [n] before /t, d, ts, tʃ, tk, s, ʃ/, and as [ᵑ] before /k, ɡ/; it also occurs with a few cases of labialization: [ᵐbw], [ndwe], [ᵑɡwa]. Labialization also affects the following consonants: /p, b, t, d, k, ɡ, kp, ts, tʃ, dʒ, m, f, s, ʃ/ and consonant clusters: /bɡ, dɡ, fk, tk/. Palatalization, spelt <y>, affects far fewer consonants, mainly labials: /p, b, ʍ, f, v, m/ and the consonant clusters / bɡ, dɡ/. A combination of modifications also occurs occasionally, spelt <yw>

Examples of all the permitted onsets follow, in their orthographic representation:

V a *in, on, at*; a.bé *they*

 è.bí *turtle*

 o *you* (sg)

CV bə *black, to cross legs*

 fè *close, compact*

 nó *to mix*

CC bgo *to ask, beg*

 fken *to shine*, kind of tree

 e.tken *to stand*

nC mba [ᵐba:] *to labour*

 nda [nda:] *to seek*

 ngge [ᵑɡe] *with*

nCC mbga [ᵐbga;] *children*

Cy byo *ugly*

 vyi *cold*

mya *fast*

CCy bgya *flute*

dgyen *stomach*

 é.dgyán *to love*

Cw bwe *to do*

 jwèn *rabbit, hare*

 shwa *neck*

CCw bgwá *plenty*

 fkwa *to roast*

tkwa *sweet; saliva*

nCw mbwá [ᵐbwá;] *to give birth*

 ndwe [ndwe;] *four*

nggwa [ᵑɡwa;] *to be wide*

Cyw Etkywan [ɛ.tkɥa͂:]

In contrast to the 25 forms in the English syllable structure system, Etkywan has just these 11 forms, which can be displayed in the network below. The Etkywan network specifies that there is a simultaneous ‘choice’ between onset consonants and systems of pre-nasalization, labialization and palatalization, which themselves can be either positive or negative, and in one case, double (pre-nasalization and labialization).

 ┌ #

 { ┼ C

 { └ CC

 { ┌ yes

 { ┌ pre-nasalization ┤│

Syllable ────── { {│ └ no

structure { {│ ┌ yes ┐

 { ── {┼ labialization ┤ **⸠** labio-palatalization

 {│ └ no │

 {│ ┌ yes ┘

 └ palatalization ┤

 └ no

*(the vertical brace brackets show where a single large brace bracket should appear please tidy up the lines)*

Fig. 5 A system network of syllable structures in Etkywan

**Syllable nucleus**

Etkywan has an inventory of 11 vowels. Six are oral: /i, e, ǝ, a, u, o/; five are nasalized: /ĩ, e͂, ǝ͂, a͂, o͂/, /u/ having no nasalized equivalent. All vowels take the full tone system.

There are three vowel systems: one set of vowels operates word-initially; another set operates word-medially; and the third set word-finally.

The word-initial system contains three items: /a, e, o/. /a/ alone, as we have seen, can constitute two words: <a> as a locative preposition (*at, in, on*) or as a grammatical marker of the future tense. It also occurs as the first syllable of many words. /e/ does not stand alone, but it does occur as the first syllable of many words. /o/ alone, as we have also seen, constitutes the pronoun *you* (sg), but otherwise it does not lead any other word. The other vowels can neither stand alone, nor lead any word.

All the oral vowels occur medially and finally. The nasalized vowels occur only finally; their orthographic representation is with following <n>, as noted above; this is common to other Jukunoid Benue-Congo languages in Taraba State, and other major languages in Nigeria, eg Yoruba (see Dunstan 1969: 167). When <n> occurs word-medially it is interpreted either as consonant /n/ or as pre-nasalization before a consonant. In the word <tkwen> *yam*, <n> signals nasalization of the preceding vowel (/e͂/); in <ano> *what?*, it is the consonant /n/; and in <ando> *spinach*, it is interpreted as prenasalization of /d/: [a. ndo].

The three Etkywan vowel systems can be displayed in the following networks:

 ┌ e ┌ i ┌ i

vowel ┼ a ├ e ├ e

 └ o vowel ┼ a ├ a

 ├ ə ├ ə

 ├ o ├ o

 └ u vowel ┼ u

 ├ ĩ

 ├ e͂

 ├ a͂

 ├ ə͂

 └ o͂

word-initial word-medial word-final

system system system

*Please make sure that all the lines join up*

Fig 6 The three vowel systems of Etkywan

Contrast this network of 11 vowels with that of English with its separate systems of strong/weak syllables, closed and open syllables and long/short vowels and a total inventory of 23 vowels and three syllabic consonants (Tench 2014, 2024):

 ┌in open syllables ──┐

 │ ├ long vowels: iː, ɑː, ɔː, uː, ɜː, eɪ, ǝʊ, aɪ,

 ┌strong ┤ ┌┘ aʊ, ɔɪ, ɪǝ, ɛǝ, (ʊǝ)

 │ └in closed syllables ┤

 │ └ short vowels: ɪ, ɛ, ɒ, ʊ, ʌ

syllable peak─┤ ┌in open syllables ┌ i, u, m̩ | | ┤

│ │ └ ┐

└weak ┤ ├ əl̩n̩

 │ ┌ ┘

 └in closed syllables ┤

 └ ɪʊ

*Please make sure that all the lines join up*

Fig. 7 A system network of syllable peaks in English

**Syllable onsets**

Etkywan has open syllables only. The onset may be zero, as with words with initial /a,e/ and the word <o>. The onset may be a single consonant or a double consonant cluster; they may be modified with prenasalization, labialization, palatalization, or a combination of them. The single consonant system is: /p, t, k, kp, b, d, ɡ, ts, tʃ, dʒ, f, s, ʃ, h, v, z, y, ʍ, w, m, n, ɲ, ŋ, l, r/, with examples following (/kp/ is a single consonant with double articulation):

/p/ <pe> *to close*

/t/ <te> *medicine, guinea fowl*

/k/ <kǝ> *to reproduce*

/kp/ <kpé> *tomorrow*

/b/ <be> *they*

/d/ <dá> *dream*

/ɡ/ <ge> *he/she, him/her*

/ts/ <tsen> *laughter*

/tʃ/ <chá> *torn*

/dʒ/ <jé> *across the river*

/f/ <fè> *close, compact*

/s/ <sé> *to press*

/ʃ/ <shin> *to plant*

/h/ <hi> grammatical marker of past tense

/v/ <vǝn> *to throw*

/z/ <zǝ> *place*

/j/ <ye> *those*

/ʍ/ <hwe> *fool*

/w/ <wá> *to farm*

/m/ <me> *breast*

/n/ <ne> *big*

/ɲ/ <nyé/ *to cross a river*

/ŋ/ <ngá> *to be dry*

/l/ <lá> *to jump*

/r/ <ra> *not*

Note that both /l/ and /r/ occur very infrequently, but they do contrast with each other.

The network of Etkywan onset systems is, of course, identical to the network of syllable structures.

**Phoneme features**

To show a network of the features of the vowel system, the more familiar system of English strong vowels is presented here first (Tench 2014, 2024). (A separate system is necessary for the weak vowels of English; see below.) The incidental advantage of this display is that it not only separates the two systems, strong and weak, but also separates within the strong vowel system short vowels with their particular phonological constraint in distribution from long vowels. Also, the display integrates diphthongs with monophthongs into one single strong vowel system. The brackets around ʊə are intended to indicate that not all SESP (RP) speakers have this vowel in their speech, it being replaced either by /ɔ:/, as in *poor* /pɔ:/, or by /u:+ə/, as in *dour* /'du:ə/.

The design of the network is intended to show the three most relevant systems of tongue height, tongue backness and quantity, with their realizations.



Fig. 8 A system network of the strong vowels of Southern England Standard Pronunciation

The network for weak vowels is very much simpler, with no system for quantity and much reduced systems for tongue height and backness. The system for closed syllables is shown below left, and that for open syllables below right:



Fig. 9 A system network of the weak vowels of Southern England Standard Pronunciation

On the other hand, Etkywan, as noted above, has only an inventory of 11 vowels, six oral and five nasal. The six oral vowels consist of three close vowels: /i, ǝ, u/, and three non-close /e, a, u/; /ǝ/ is actually a close central vowel [ɨ], but is spelt <ǝ> in common with many languages in the Middle Belt and North of Nigeria. /e, o/ have mid height; /a/ is open.

The five nasalized vowels have the equivalent phonetic qualities as their oral counterparts, thus /ǝ͂/ is phonetically [ɨ͂]. They are all spelt with a following <n>: <in, en, ǝn, an, on>.

The Etkywan system is obviously much simpler than English, with only 11 items and without the distinctions between long and short, monophthongs and diphthongs, closing and centring, and fronting and backing. The tongue height system is also simpler.

 ┌ close ───┐───┐ ─────┐

 { tongue height ───┤ │ │ │

 { └‘open’ ─────┐───┐──┐ │

quality { { ┌ front ───┐─┐ │ │ │

 { { tongue backness ── ┼ central ───────┐─┐ │

 { └ back ────────────┐─┐

 {

velic { ┌ oral ──────── i e ǝ a o u

position{ ┤

 └ nasalized ──────── i͂ e͂ ǝ͂ a͂ o͂

*(the vertical brace brackets show where a single large brace bracket should appear)*

Fig. 10 A system network of the vowels of Etkywan

The inventory of English consonants is, likewise, presented first as being more familiar. The classification criteria are presented in a system network for syllable-initial consonants as below (Tench 2014, 2024); that for syllable-final consonants would require the addition of ŋ‘nasal velar flat’, and also the deletion of /h/ and the ‘articulator’ row ‘glottal’, and also the ‘manner’ row ‘approximant’.



Fig. 11 A system network of the syllable-initial consonants of Southern England Standard Pronunciation

The incidental advantages of this display over traditional consonant charts include the close link between affricates and both fricatives and plosives, the close link between nasals and both plosives (in points of articulation) and approximants (as ‘fellow’ sonorants), the labelling of grooved articulations and the close links between them, and the avoidance of redundant ‘cells’ for voicelessness for sonorants. (There is, however, a redundant voiced ‘cell’ accompanying /h/.) The brackets around ʒ indicate its marginal status in the syllable-initial system; brackets would not be required in the network for the syllable-final system.

The inventory of Etkywan consonants is shown as follows:

 ┌fricatives ─── ┌vl f s ʃ ʍ h

 │ └vd v z

 ┌obstruents ―― stricture ┼affricates─── ┌vl ts tʃ

 │ │ └vd dʒ

 │ └plosives ─── ┌vl p t k kp

{manner ──── ┤ └vd b d ɡ

{ │

{ │ ┌nasals ────────── m n ɲ ŋ

{ └sonorants ─── ┤ ┌approximants ─ j w

{ └oral ─ ┼lateral ───── l

{ └trill ───── r

{

{ ┌labial ┌bilabial ─────┘

{ │ └labiodental ──────┘

{ ├apical ┌───── flat ─────────┘

{articulator ─── ┤ └───── grooved ───────────┘

 ├dorsal ┌palatal ─┌grooved ─────────────┘

 │ │ └flat ────────────────┘

 │ └velar ──┌plain ──────────────────┘

 │ └labial-velar ────────────────────┘

 └glottal ───────────────────────┘

*(the vertical brace brackets show where a single large brace bracket should appear)*

Fig. 12 A system network of the consonants of Etkywan

As in the English consonant network, the close link between both fricatives and plosives is shown, as is also the close link between nasals and plosives/affricates (in points of articulation) and other sonorants. Again, there are no redundant voiceless cells with the sonorants. It may be surprising, and even counter-intuitive, to separate /w/ and /ʍ/ quite considerably, but as it happens, /ʍ/ acts like the other fricatives in taking palatalization, whereas /w/ does not. Their similarity in articulation is nevertheless shown explicitly.

A number of asymmetries show up: there is no voiced counterpart to either /ʃ/ or /ts/, whereas there is for /tʃ/. There is also no voiced counterpart to the double articulation /kp/. On the other hand, there is no voiceless counterpart to /j/, as there is for /w/. Finally, there is no nasal counterpart to /kp/, as there is for all the other points of articulation for plosives and affricates.

**Allophones**

It is frequently maintained that *allophonic variation* does not belong to phonology as such, but rather to phonetics. It is maintained that because allophones do not have the contrastive function of phonemes, they do not constitute a lower order in the phonological hierarchy. However, SFL follows Firthian Prosodic Analysis, noting that allophonic features of phonemes vary according to the specifications of a given language. For instance, English and French both have a phoneme that is symbolized as /p/, but although they have much in common (‘bilabial’, ‘voiceless’, ‘fortis’, ‘plosive’, and a number of contrastive and distributional characteristics) they have nevertheless quite a different set of allophones: English /p/ is most often ‘aspirated’ whereas the French /p/ is not; English /p/ has glottal reinforcement in some environments whereas the French does not. The word phonology of a language must, therefore, also specify what allophonic variation is permissible; it is as if a language has selected certain phonetic realizations for its phonemes, and not others which another language might have selected. So having specified that within the permitted consonant inventory English has /p/, we can then specify what allophonic variation is permitted; this amounts to specifying what forms the phonetic realization of /p/ may take. See Tench (2024) for an initial attempt to draw up networks for the allophonic variations of English /p/ and /b/.

Here is an example of how an allophonic network might look for Etkywan /j/. It is a ‘normal’ approximant with clear voicing in initial and intervocalic position, but when it acts as palatalization of consonants, it takes on a noticeable degree of friction. Voiceless friction is rather like [ʃ]orɕ; this accounts for the spelling of Ekywan, with a purported palatalization of /k/: /ky/; this would yield phonetically [kʃ] or [kɕ] and is probably responsible for the Hausa rendering of the language name as *Ichen* [itʃen].

Voiced friction is like fricative [ɉ]: byo (*ugly*) [bɉo]. The system network for /j/ might be presented as follows, with square brackets [ ] containing an allophonic transcription:

 ┌ vl\_C → [ʃ, ɕ]

/j/ → ┼ vd\_C → [ɉ]

 └ elsewhere → [j]

Fig. 13 A system network for the allophones of Etkywan /j/

**CONCLUSION AND FUTURE DIRECTIONS**

What has been presented above is a simple and straightforward attempt at adapting the practical principles of system network design to phonological systems at the level of monomorphemic words in English and Etkywan. They have purposely been presented as ‘surface’ structures to be as readily comprehensible as possible. A comprehensive treatment of word phonology is presented in Tench (2024) with descriptions of English, German, Welsh and Tera, with sections on phonotactics, simplification processes and allophonic realizations, and in the case of Tera a tentative description of ideophones, which represent in sound various moods, actions, shapes as well as physical sounds.

**Cultural associations**

Ideophones are culture specific, as are all kinds of onomatopoeia. It has to be conceded that the vast majority of words in a language maintain an arbitrary association between *signifié* and *signifiant*, such that there is absolutely no symbolic association between the notion of ‘cat’ and the sequence of sounds transcribed as /kat/ in English. But there is obviously a linguistic attempt to replicate the sound of a cat with the sound sequence /miˈaʊ/, usually spelt as <meow>. Animal sounds and other natural sounds like the blowing of the wind as *whoosh*, the ‘creaking’ of doors and the ‘rattling’ of windows, etc are reproduced as closely as possible to the phonological units of English.

Beside such onomatopoeia, or ‘primary sound symbolism’, there is a ‘secondary sound symbolism’, or phonaesthetics, which associates certain phonemes not with physical sounds, but with qualities. The vowels /iː, ɪ/ often seem to refer to notions of smallness in size, movement, time, sound and sense: consider *pip*, *pinch*, *minute* /ˈmɪnɪt/, *ping, piffle.* But the relationship is by no means absolute, ie it is not a purely phonological phenomenon: consider *small* with the vowel /ɔː/, *minute* /ˌmaɪˈnjuːt/, and with the said vowel, *big*! Nevertheless, this cultural association is reflected in recent coinages like *zip*, *blip*, *kitsch* and *niche*. There appears to be a readiness, at least in British culture, to render the notions of smallness with the vowels /i:, ɪ/. There also appears a readiness to associate other vowels with other notions. A separate ‘lexicophonological’ system network might be constructed, which could extend to the association of certain vowel preferences and syllable structures that distinguish femininity and masculinity in personal names: why *Chloe* sounds feminine and *Butch* does not.

Another dimension to cultural associations is what might be called permissible poetic forms. What constitutes rhyme/rime, alliteration, rhythm, etc is peculiar to a culture and its language. Rhyming schemes in Welsh poetry, for instance, seem to be more complex than those in English.

**Variation**

System networks that identify historical processes might be envisaged. Certainly, networks for other accents of English need to be produced, in their own right and for contrastive purposes. Equally, in the great applied linguistics enterprise, networks in phonological ‘interlanguage’. Tench (2003) published a study which highlighted the polysystemic principle of Systemic Phonology which shows how Korean learners of English had consistently greater difficulty in producing intelligible renditions of final consonants than initial; this seems to be because Korean has a much simpler coda system than its onset system.

**Other languages**

Perhaps the biggest need in the immediate future is the presentation of system networks in the phonology of other languages besides English, German, Welsh, Tera and Etkywan, in order to produce a more rigorous set of procedures.

In the whole theoretical and applied linguistics enterprise, the primary role of the linguist is to present full and adequate accounts of the nature of language in general and of languages in particular (Halliday et al 1964: x-xi) in all their complexity. Descriptions of different languages allow comparison and contrast, which brings vital information to the attention of linguists, teachers, textbook writers and other language professionals, and also to others who are involved in related matters politically, administratively, academically, commercially, socially, therapeutically, forensically, technically, etc.

Systemic Phonology has been developed as a more structured theory than the original Prosodic Analysis and has been defined as follows, based on that original definition (Tench 1992: 15, with original italics, but with innovative terms in bold):

Systemic Phonology is a *non-universalist* approach to the description of the phonology of a language that highlights the *syntagmatic* as well as the *paradigmatic* dimensions of the phonic material, in terms of *structures of* ***hierarchically*** ranked units and *systems* displayed in ***networks*** and is prepared to recognize *different systems* appropriate to different components of the language and to reflect *grammatical* categories wherever necessary, in such a way as to conform as fully, appropriately and elegantly as possible to a *general linguistic theory.*

**References**

Berry, M. (1977). *An introduction to systemic linguistics 2: Levels and links.* London: Batsford.

Brazil, D. C. (1975). *Discourse intonation.* Birmingham, UK: English Language Research.

Brazil, D. C. (1978). *Discourse intonation II.* Birmingham, UK: English Language Research.

Brazil, D. C. (1997). *The communicative value of intonation in English.* Cambridge: Cambridge University Press.

Brazil, D. C, Coulthard, M & Johns, C (1980) *Discourse intonation and language teaching.* London: Longman.

Butler, C. S. (1985). *Systemic linguistics: Theory and applications.* London: Batsford.

Dunstan, E (Ed.) (1969). *Twelve Nigerian Languages.* London: Longmans.

Halliday, M. A. K. (1961). Categories of the theory of grammar. *Word, 17*, 241-292.

Halliday, M. A. K. (1967). *Intonation and grammar in British English.* The Hague, NL: Mouton.

Halliday, M. A. K. (1992). A systemic interpretation of Peking syllable finals. In Tench (1992).

Halliday, M. A. K. & Greaves, W. S. (2008). *Intonation in the grammar of English.* London: Equinox.

Halliday, M. A. K., McIntosh, A. & Strevens, P (1964). *The linguistic sciences and language teaching.* London: Longmans.

Ichen Language Team (2014) *Ba we Ka Hwi Ichen* (Writing and Reading Ichen language). Zing, Taraba, Nigeria

Matthiessen, C.M.I.M. 2021. Systemic Functional Linguistics Part 1: The collected works of Christian M.I.M. Matthiessen Vol 1 (edited by K. Teurya, C. Wu and D. Slade). Sheffield: Equinox

O’Grady, G. (2010) *A grammar of spoken English discourse.* London: Continuum.

Pike, K.L (1967) *Language in relation to a unified theory of the structure of human behavior.* 2nd revised ed. The Hague: Mouton.

Tench, P. (1976) Double ranks in a phonological hierarchy. *Journal of Linguistics*, 12:1-20

Tench, P. (1990). *The role of intonation in English discourse.* Frankfurt aM: Peter Lang.

Tench, P. (ed.). (1992). *Studies in systemic phonology*. London: Pinter.

Tench, P. (1996). *The intonation systems of English.* London: Cassell.

Tench, P. (1997). The fall and rise of the level tone in English. *Functions of Language, 4*, 1-22.

Tench, P. (2003). Non-native speakers’ misperceptions of English vowels and consonants: Evidence from Korean adults in UK. *International Review of Applied Linguistics, 41*: 145-173.

Tench, P. (2014) Towards a Systemic Presentation of the Word Phonology of English. In Bowcher, W. & Smith, B. (Eds.) (see below)

Tench, P. (2024). *Word Phonology in a Systemic Functional Linguistic Framework.* Sheffield: Equinox.

Wells, J. C. (2000). *Longman pronunciation dictionary.* Harlow, UK: Longman.

Wells, J. C. (2006). *English intonation: An introduction.* Cambridge: Cambridge University Press.

WeSay (2012). *WeSay Etkywan dictionary.* Unpublished.

Young, D. (1992). English consonant clusters: A systemic approach. In Tench (1992).

**Suggested readings**

Bowcher, W. & Smith, B. (Eds.) (2014) *Systemic phonology. Recent studies in English.* Sheffield: Equinox.

Halliday, M. A. K. (1994) *An introduction to functional grammar.* 2nd ed*.* London: Edward Arnold.

Palmer, F. R. (Ed.) (1970). *Prosodic Analysis*. London: Oxford University Press.

Tench, P. (Ed.) (1992). *Studies in systemic phonology.* London: Pinter.

Tench, P. (2024). *Word Phonology in a Systemic Functional Linguistic Framework.* Sheffield: Equinox.