Getting the Feel for English Rhythm: 
 a Musical Approach

Giedrė Balčytytė-Kurtinienė
Vilnius University, Universiteto St. 3, LT-01513 Vilnius, g.balcytyte@gmail.com

Abstract. The research into the perception and production of English rhythm has been a subject of argument among linguists and language educators for decades. English has traditionally been ascribed to the group of stress-timed rhythm languages as opposed to syllable-timed languages (Pike, 1945; Abercrombie, 1967; Ladefoged, 1975) and even though several scholars find this typological classification of languages contraversive (e.g. Dauer, 1987), certain reliable stress-timed acoustic cues remain relevant to EFL learners and help acquiring the natural sound of English. The particular rhythmic cues determine the alternation of weak and strong syllable sequences as well as the implication of certain aspects of connected speech. The EFL learners need to develop the feel for this specific English rhythm and educators worldwide suggest various natural input strategies and practice techniques. This particular paper argues for the implementation of music in order to develop the feel for English rhythm, since there is emerging evidence that language and music share a number of features at evolutionary, cognitive as well as sensory perceptual levels (Patel, 2003; Mithen, 2005; Jackendoff, 2009). Moreover, the two capacities of the human mind are similar in their expressive features as well as their hierarchic structure including the prosody: stress, meter and rhythm. Scholars in the field argue that EFL learners may benefit from this cross-domain influence, since the interaction of linguistic stress and musical meter enhances the perception and production of natural English rhythm (Besson et al., 2008). The particular experimental study was carried out on a cohort of 29 non-native English students of different linguistic backgrounds, who were exposed to selected sentence patterns through musically rhythmical expertise. The results suggested benefits in English speech rhythm: they demonstrated a better skill in stressing, strong / weak syllable production and recognition as well as vowel reduction.

Key-words: rhythm, rhythmic typology, stress-timing, vowel reduction, music instruction
Introduction

Acquiring English as a foreign language (EFL) entails the mastery of written and oral skills in order to enable the speaker communicate intelligibly and effectively. It is obvious that the instruction of pronunciation is an integral part of EFL acquisition process and various scholars offer insights into how discrete aspects of English pronunciation could be developed as well as suggest alternative approaches or techniques that should be used.

One of the key aspects of English pronunciation that EFL learners need to master is the perception and production of the specific English rhythm. It has been universally acknowledged that languages are rhythmically different because of their phonological properties that influence how particular linguistic patterns are organized in time. The concept of speech rhythm has been a much discussed issue in phonetics and phonology for decades and has been investigated from different perspectives to account for its nature. Crystal (1985, 266–267) defines speech rhythm as “a perceived regularity of prominent units in speech. These regularities may be stated in terms of patterns of stressed vs. unstressed syllables, syllable length (long v. short) or pitch (high v. low), or some combination of these variables.”

English has traditionally been ascribed to the group of stress-timed rhythm languages as opposed to syllable-timed languages (Pike, 1945; Abercrombie, 1967; Ladefoged, 1975) based on the assumption, that English stressed and unstressed syllables have isochronous duration patterns and vary in length allowing stresses to reoccur at approximately equal intervals of time or equal regularity. To achieve approximately equal intervals of time, the speakers need to stretch or compress syllables in order to fit into the typical foot duration.

The idea of rhythmical isochrony began with Lloyd James (1940) who referred to two types of speech rhythm – ‘Morse-code’ and ‘machine-gun’, which were later respectively termed by Pike (1945) as ‘stress-timed’ and ‘syllable-timed’ types of rhythm. The strict typology was fully shaped by Abercrombie (1967) who claimed that all languages should fall into one of these two categories. Eventually, mora-timed languages such as Japanese were categorized as the third rhythmic type by Ladefoged (1975), based on the regular recurrence of subsyllabic timing units, known as morae. Later studies showed that the stress-timing of English was aligned with other specific acoustic cues apart from isochronic timing: “Rhythmic patterns are accompanied by segmental variations: by far the majority of unstressed syllables in English contain weak (reduced) vowels. And again, rhythmic effects in the recognition of spoken English largely reduce to effects which can be interpreted in terms of segmental processing. It is also relevant that the strong / weak vowel difference in English is the manifestation of language rhythm” (McQueen and Cutler, 1997, 582–583).
However, more recent instrumental studies found the theory of isochrony controversial (Roach, 1982; Dauer, 1987; Low, 2006), since the scholars failed to find isochrony of the expected type for stress timing. They argued that the rhythmic impressions of isochrony should not be followed straightforwardly. Roach (1982) conducted a study on stress-timed and syllable-timed languages and concluded that the primary basis for the distinction is subjective and auditory. Dauer (1987) outlined the syllabic structure make-up, the presence of vowel reduction, and the stress patterning of different languages are the key predictors of stress-timing. Low (2006) reported that stress-timed languages exhibit greater vocalic and inter-vocalic duration variability compared to syllable-timed ones. Generally, the scholars rather assumed that rhythmic typology between languages occurs due to a series of different phonological phenomena thus allowing the continuum between the two classes of rhythm ranging from total stress-timing to total syllable-timing.

Even though the notion of the three rhythmic typology groups began to lose its appeal, certain reliable stress-timed phonological phenomena of English remain relevant to EFL learners and help acquiring the natural acoustic cues of English. The particular rhythmic cues determine the alternation of weak and strong syllable sequences, the process of vowel reduction, the compression of unstressed syllables, as well as the implication of certain aspects of connected speech, such as assimilation, elision, merge, liaison, etc. The EFL learners need to develop the skill and the feel for this specific English rhythm and educators worldwide suggest various natural input strategies and practice techniques, including the musical approach. The aim of the particular study is to determine the effect of musical isochronous expertise onto the rhythmicity of English utterances by EFL learners.

Language and Music Interrelationship

The relationship between language and music is not accidental. The integration of the two complex cognitive structures lies in a vast number of research ranging from evolutionary biology and neurology to cognitive sciences and education. There is a lot of debate on the evolutionary pathways of the two domains and more evidence emerges to support the claim that both music and language evolved from the same precursor, as suggested by Brown that “tonality was the ancestral state of language” (Brown, 2000, 281), or Mithen who claims that musicality even predates the language since “the pre-modern communication employed emotionally dense phrases as also making extensive use of variation in pitch, rhythm and melody to communicate information, express emotion and induce emotion in other individuals” (Mithen, 2005, 98).

The latest neurological research has also disclosed that the processing of language and music may be partly shared in the brain mechanisms, which might subserve the
acquisition of knowledge in the two types of communication. The earlier assumptions that the left hemisphere is responsible for analytic and serial processing and the right hemisphere would account for more holistic and synthetic relations have been replaced by emerging claims that the mechanisms ruling language and music processes interact in the brain and share crucial links, which in their turn result in information retention in the brain. Music as a mnemonic tool has been investigated by many scholars (Gfeller, 1986; Wallace, 1994; Hodges, 2002). In his research, Wallace (1994) documented and validated the use of music to enhance memory performance. Hodges (2002) claimed that “musical experiences are multimodal, involving at the least the auditory, visual, cognitive, affective, memory and motor systems” (Hodges, 2002, 36). Moreover, isochrony is crucial to the rhythm of music and contains rhythmic information to aid the recall of information.

It has also been universally acknowledged that language and music share many features at sensory-perceptual and cognitive levels. The two complex systems are based on auditory signals and comprise similar acoustic parameters and hierarchic structures (Patel, 2003; Mithen, 2005; Jackendoff, 2009). “Like language, music is a human universal involving perceptually discrete elements organized into hierarchically structured sequences. Music and language can thus serve as foils for each other in the study of brain mechanisms underlying complex sound processing, and comparative research can provide novel insights into the functional and neural architecture of both domains” (Patel, 2003, 674).

This duality is further reflected by a series of experiments that have been conducted to compare different levels of information processing in language and music and have specified that musical expertise may have a positive effect on auditory perception and speech production (Lowe, 1995; Gottfried, 2007; Schön et al., 2008). The most tangible language acquisition discoveries due to the language-music integration process, however, have been noticed in phonetic skill activation and formation (Palmer, Kelly, 1992; Mora, 2000; Schön et al., 2008; Milovanov, 2009). Importantly, the benefits affect the acquisition of the native as well as foreign languages at various levels of language proficiency and age. Scholars in the field argue that EFL learners may benefit from this cross-domain influence, since the interaction of linguistic stress and musical meter enhances the perception and production of natural English rhythm. Finally, the analogy between language and music lies in the unassailable assumption that spoken language and music both involve sound production and are both conveyed through the auditory-vocal modality. The two domains are organized temporally with the particular arrangement of sounds unfolding in time: speech sounds in language and correspondingly tones or pitch events in music. The analogy goes beyond the sounds and segments and extends to the arrangement of sounds into hierarchic categories and structures that facilitate representation and memory (Lowe, 1995; Mora, 2000). The Generative Theory of Tonal Music (GTTM), as proposed by Lerdahl and Jackendoff.
(1983), supports the structural analogies by utilizing some hierarchic approaches
developed in linguistics to generate hierarchic structures in music. The suprasegmental
cues (stress, rhythm, intonation and phrasing) seem to play the crucial comparative
role in the hierarchical organization of the two systems.

Finally, the idea to use music for linguistic purposes is supported by various didactic
trends and theories on distinct learning styles, intelligences and aptitudes (Gardner,
1991; Fleming, 2001) proposing that music instruction brings the potential to nurture
diverse learning styles and positively affects not only linguistic, but overall cognitive
as well as psychological skills, reinforces their stimulation and formation. Gardner’s
(1991) theory of Multiple Intelligences (MI) radically changed the understanding of
traditional intelligence and proposed to dwell on the learner as holding the capacity to
comprehend, absorb and transmit the information in multiple modalities rather than
a single general one. The musical–rhythmical modality has to do with sensitivity to
sounds, rhythms, tones, thus music instruction serves as a perfect auditory channel
for the musical / auditory learners.

The Research Data, Methods and Discussion

This particular paper argues for the implementation of music as a teaching tool
in order to develop the feel for English rhythm. It aims at determining the effect of
musical isochronous expertise onto the rhythmicity of English utterances by EFL
learners. A classroom-based experiment was conducted in which it was hypothesized
that EFL learners could read the sentences in English more rhythmically if they had
been given musical instruction before. This in turn should lead to an increased ability
to employ sentence stress, the use of strong / weak forms and vowel reduction. A mini
classroom-based experiment was designed and conducted.

A group (n = 28) of multilingual EFL students from different linguistic backgrounds
(French, Italian, Russian, Ukrainian, Japanese, Chinese, Iranian, Kazakh, Latvian,
and Czech), aged 17–18 were randomly assigned to 2 variable groups: the Controlling
Group (CG) (n = 14) and the Test Group (TG) (n = 14).

A pilot study was carried out that aimed at initially determining the ability of the
subjects (CG and TG) to employ the variables to be targeted: sentence stress, the
level of strong / weak forms and vowel reduction. The participants were asked to
read 20 English sample sentences containing several monosyllabic and polysyllabic
(either disyllabic or trisyllabic) constituents with different stress patterns (the total of
176 words) and asked to put a light emphasis on the possible sentence stressing patterns
to convey logical meanings. The utterances of the research participants were recorded
and served as a diagnostic analysis, as well as helped to fix the starting point and to
determine the most problematic rhythm-based areas. Furthermore, the classroom-based
mini experiment involved the instruction on the 20 sample sentences with possible sentence stressing patterns differently conducted for CG and TG. CG was exposed to traditional audio-lingual instruction that involved the reading of the stressed sample sentences by the instructor and the repetition of the samples by the subjects. TG were treated with musical approach: melodies with isonochronous rhythm were employed in each sentence. Finally, the participants of both groups (CG and TG) read the sentences after the respective treatment and were recorded, as well as the data were analyzed afterwards. A mixed method approach was used to collect the data and draw relative conclusions: the quantitative measures helped to judge the ultimate values of the target samples pronounced before and after the experiment, while the in-depth qualitative investigation of the pronounced target samples threw light on the most problematic rhythm-based areas of pronunciation.

Three variables were tested: sentence stress, the level of strong / weak forms and vowel reduction, which referred to two parameters: duration and quality. Reduced vowels were reported to have shorter duration and/or more centralized formants than non-reduced ones.

**Conclusions**

Participants in the TG demonstrated significant superior overall performance to reproduce the sample sentences rhythmically and employ the tested variables to full extent. The CG scored highly in the employment of sentence stress; however, the research participants generally failed to exhibit clear-cut borderlines between the strong and weak forms, which consequently resulted in smaller numbers of vowel reduction cases. It appears that the imbedded isochronous musical instruction had its major effect on the acoustic effects of stress-timing, i.e. vowel duration and quality.

**References**


Muzikinis anglų kalbos ritmo mokymas

Giedrė Balčytytė-Kurtinienė
Vilniaus universitetas, Universiteto g. 3, LT-01513 Vilnius, g.baltycte@gmail.com

Santrauka


Esminiai žodžiai: ritmas, tipologinis ritmo grupes, kirčiu paremtas (angl. stress-timed) ritmas, skiemeniu paremtas (angl. syllable-timed) ritmas, balsių redukcija, muzikinis mokymas.

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