

## **Prosodic clashes between music and language – challenges of corpus-use and openness in the study of song texts**

In my talk I will discuss the relationship between linguistic and musical rhythm, focusing on the digital methods used in their study and on questions related to open science that arise respectively. This ongoing corpus research examines the correlation between linguistic and musical segment length in songs, more precisely on instances where the language adapts prosodically to the rhythmic frame provided by pre-existing music. The question is to what extent can clashes, by which I mean instances of non-conformity between linguistic and musical segment length, be acceptable in song lyrics, and what other prosodic features, such as stress, may influence their occurrence.

Addressing these issues with a corpus-based approach leads to questions of retrieving information from complicated corpora which combine two media (music and language), and the openness and accessibility of music sources. In this abstract I will first describe my research premises in section 1, and discuss in section 2 my corpus methods and their challenges vis-à-vis the digital humanities and open science.

### **1. Research setting**

The natural starting point for the comparison of music and language is the shared interface between western art music and metric language: the isochronic pulse, which consists of rhythmically prominent elements occurring at regular intervals. My study aims to approach this interface by both qualitative and statistical methods.

The study is based on a self-collected song corpus in Finnish, a language where syllable length has a versatile relationship with stress (cf. Hakulinen et al 2004). Primary stress in Finnish is weight-insensitive and always falls on the first syllable of a word, and syllables of any length, long or short, can be stressed or unstressed. Finnish sound segment length is also phonemic, that is, it creates distinctions of meaning. Syllable length in Finnish is therefore of particular interest in a study of musical segment length, because length deviations play an evident role in language perception.

Music and text can be turned into a composition in a number of ways, but my study focuses on the situations in which language is most dependent on music. Usually there are three alternative orders in which music and language can be combined into songs: First, text and music

may be written simultaneously and influence the musical and linguistic choices of the writer at the same time (Language  $\leftrightarrow$  Music). Secondly, text can precede the music, as when composers compose a piece to existing poetry (Language  $\rightarrow$  Music). And finally, the melody may exist first, as when new versions of songs are created by translating or otherwise rewriting them to familiar tunes (Music  $\rightarrow$  Language).

My research is concerned with this third relationship, because it poses the strongest constraints on the language user. The language (text) must conform to the music's already existing rhythmic frame that is in many respects inflexible, and in such cases, it is difficult to vary the rhythmic elements of the text, because the musical space restricts the rhythmic tools available for the language user. This in turn may lead to non-neutral linguistic output. Thus, the crucial question arises: How does language adapt its rhythm to music?

A crucial presupposition when problematising the relationship between a musical form and the text written to it is the notion that a song is not poetry per se (I will return to this conception in section 2). The conventions of Western art music allow for a far greater range of length distinctions than language: the syllable lengths usually fall into binary categories (e.g. short and long syllables), whereas in music notes can be elongated infinitely. A translated song in which all rhythmic restrictions come from the music may follow the lines of poetic traditions, but must deviate from them if the limits of space within music do not allow for full flexibility. It is therefore an intermediate form of verbal art.

## **2. The statistical corpus method, and challenges regarding digital humanities and open science**

My corpus contains songs that clearly represent the order of music being created before the text and providing the rhythmic frame of the song. The pilot corpus consists of 15 songs and approximately 1500 prosodically annotated syllables of song texts in Finnish, translated or otherwise adapted, or written to instrumental or traditional music. The genres include chansons, drinking songs, Christmas songs and hymns, which originate from different eras and have originally been written in different languages, including English, French, German, Swedish, and Italian.

I will analyse the data by statistical methods in the R environment. The song texts are annotated in a table syllable by syllable, where one row represents a datapoint (one note/syllable) in one column; and other columns contain metadata about the songs and musical and linguistic prosodic variables, including stress, segment length in musical beats for notes and moras for syllables, and sonority features of the segments.

The moraic length of the syllables will be compared with the length of the respective notes (musical length and stress). The most basic instance of a clash between segment lengths is the instance where a short syllable ((C)V in Finnish) falls on a long note (i.e. a longer note than a basic half-beat). Both theoretical considerations and empirical data will be used in the eventual analysis to determine which length values create the clearest cases of prosodic clashes, and if sonority and stress play a role as well.

The corpus-based approach to language and music raises problematic questions. First of these is, of course, if useful music-linguistic corpora can be found at all at the present. Existent written and spoken corpora of the major European languages contain millions of words, often annotated to a great linguistic detail (cf. Korp of Kielipankki for Finnish ([korp.csc.fi](http://korp.csc.fi)), which offers detailed contextual, morphological and syntactic analysis). For music as well, digital music scores can be found “in a huge number” (Ponce de León et al. 2008:560). Corpora of song texts with both linguistic and musical information seem to be more difficult to find.

One problem of music linguistic studies is related to the more restricted openness and shareability of sources than that of written or spoken language. The copyright questions of art are in general a more sensitive issue than for instance those of newspaper articles or internet conversations, and the reluctance of the owners of song texts and melodies may have made it difficult to create open corpora of contemporary music.

But even with ownership problems aside (such as with older or traditional music), building a music-linguistic corpus remains a difficult task to comply. A truly useful corpus of music for linguistic purposes would include metadata and annotation of both media, both language and music. Thus even an automatically analysed metric corpus of poetry, like Anatoli Starostin’s Treton for metrical analysis of Russian poems (Pilshcikov & Starostin 2011) or the rhythmic Metricalizer for determining meter by stress patterns in German poems (Bobenhausen 2011) does not answer to the questions of rhythm of a song text, which exists in a extra-linguistic medium, music, altogether. Vocal music is metrical in the isochronic sense, but it is not metrical in the strict sense of poetic conventions, which are based on linguistic rules. Automated analysis of a song text without its music notation does not tell anything about its real metrical structure.

On a technical level, a set of tools that is necessary for researchers of music are the tools for quick visualization of music passages (notation tools, sound recognition). Such software can be found and used freely in the internet and are useful for depiction purposes. Mining of information from music requires more effort, but has been done in various projects for instance for melody

information retrieval (Ponce de León et al. 2008), or metrical detection of notes (Temperley 2001). But again, these tools seem to rarely combine linguistic and musical meter simultaneously.

By raising these questions I hope to bring attention to the challenges of studying texts in the musical domain, that is, not simply music or poetry separately. The crux of the issue is that for the linguistic analysis of song texts we need actual textual data where the musical domain appears as annotated metadata. Means exist to analyse text automatically, and to analyse musical patterns with sound recognition or otherwise, but to combine the two raises the analysis to a more complicated level. When the issues of effective analysis are solved, it will enable to increase the size and amount of linguistic song corpora.

## Literature

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