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BETWEEN ORAL AND WRITTEN: THE CREATION OF A VISUALISATION AND DIGITAL TEACHING TOOL FOR SETO MULTI-PART SINGING

Our paper explores the visual interpretation possibilities of the oral multi-part musical system known as Seto *leelo*, alongside the challenges encountered during the creation and testing of a digital learning tool for *leelo*. To explain the need for such a tool, we will examine the current developments within the Seto song tradition. Following this, we will present an overview of the alternative notation system we developed, along with the digital learning tool built upon it. Finally, based on user feedback, we will reflect on the opportunities and risks associated with the system, considering both its musical implications and broader ethical and social dimensions.

Reasons for creating the visualisation and digital teaching tool

Seto multipart singing (Seto *leelo*) is a distinctive subtradition of the Finnic oral runosong tradition (an ancient singing tradition also referred to as Kalevala-metric song or runic song). Seto *leelo* has been predominantly transmitted orally until recent times and was included in the UNESCO Representative List of the Intangible Cultural Heritage of Humanity in 2009 (Seto Leelo, 2008). Throughout the 20th and 21st centuries, Seto leelo, much like other surviving traditional music cultures, has undergone significant changes impacting all its "classical" folk song characteristics: lively oral transmission, variation, anonymity, a conservative and preserving attitude, extra-musical functions, and locality. However, modernity has given new meanings to traditional song, making it a viable cultural phenomenon.

One of the problems with Seto leelo today is the decline of the older, most authentic singing style. Amid various changes, two key elements of this older style must be highlighted, as they have nearly receded from consistent performance practice:

1) One-three-semitone scale, a very rare and archaic musical system consisting of only one- and three-semitone intervals (more precisely, of intervals close to one and three semitones; see Pärtlas, 2014, 2020). The longest form of the scale is comprised of six scale notes, and its intervallic structure can be expressed in semitones as 1-3-1-3-1 (in transcription D-Eb-F#-G-A#-B, Example 1a). This scale fundamentally differs from the music that forms the main listening experience of today's Seto singers.

2) The heterophonic melodic variability of the main voice part *torrõ*. Nowadays, it is common for all singers to sing exactly the same, unchanging melody. This simplifies the polyphonic texture and has a noticeable effect on the sound of the song.

In the 21st century, a movement to revive the older style has emerged within the Seto musical community: through the work of ethnomusicologists, singers have become aware of the older style and many want to practice it. Singers who did not grow up with the older style cannot intuitively imitate it, as was traditionally the case. For instance, in contemporary interpretations, the one-three-semitone scale is transformed into a diatonic scale that feels more familiar to the singers. When trying to vary the main voice part, traditional rules of harmony can be disregarded, leading to the creation of unconventional harmonies. For this reason, Seto singers have enlisted the help of ethnomusicologists to learn the older style. Janika Oras, who has been teaching the older style of singing in the Seto *leelo* community for nearly two decades, has repeatedly observed that the use of visualisation is an effective method for learning. Visualisation is especially useful in explaining the *leelo* musical system, as its complexities are difficult to convey through oral explanation alone.

In written cultures, visualisation serves as a natural tool for analyzing and remembering music. Throughout history, various forms of musical notation have been developed, with Western staff notation emerging as the most common. However, there are two key reasons why Western notation is not the most appropriate method for teaching the older style of singing in the Seto community:

1) The staff notation system, primarily designed for Western art music, is not entirely suited for traditional music from other cultures. In the case of the Seto one-three-semitone scale, its incompatibility with Western notation becomes evident. Because this system is based on the diatonic scale, transcribing the Seto one-three-semitone mode necessitates the use of non-standard key signatures, making the notations challenging to read—even for professional musicians (Example 1a). Moreover, Western notation complicates the perception of the simple and logical structure of the one-three-semitone scale.

2) Western music notation requires a certain level of musical education and the ability to read notation, which is often absent among Seto singers.

Seto alternative notation and digital teaching tool

As part of the artistic research project 'Teaching Seto Polyphonic Singing with the Help of an Alternative Musical Notation,' the authors of this paper have presented a novel solution for visualising Seto song melodies. We developed original music notation software, which has been published as a separate platform (https://www.folklore.ee/setonoot) and on the Seto Singing Heritage website (https://laul.setomaa.ee/en), including the sub-page Leelo School (https://laul.setomaa.ee/leelokool), with visualisations also available on the

sub-page for archival recordings (https://laul.setomaa.ee/kuula-ja-laula). The decision to develop original software was preceded by extensive experimentation with various existing notation programs. These programs, which are primarily designed for Western music, would have required significant modifications and their use in unintended ways to align with our objectives. Relying on existing software would have been overly complex and inadequate for incorporating all the intended functionalities.

The visual appearance and the main functionalities of the new notation software are presented in Example 1b.

1) In the one-three-semitone scale, the six notes are arranged on a three-line staff, placed either on or between the lines. The interval between the notes on the lines is a major third. An intermediate note is positioned closer to the line with which it forms a semitone. This arrangement visually demonstrates that, in the one-three-semitone scale, narrow intervals (semitones) and wide intervals (three-semitones) alternate regularly—an aspect not reflected in Western notation. As harmonic sonorities consist of notes spaced every other note, all the notes that sound together are positioned either on the lines or between the lines. The choice of a three-line staff is based on the observation that singers without musical literacy tend to prefer a smaller number of lines.

The rhythm is not indicated separately; instead, note lengths are distinguished solely by the distance between the notes. The simple, repetitive rhythmic patterns of the songs are understood by listening to the original performance and are often already familiar to the singers.

A significant part of Seto songs use anhemitonic and diatonic types of musical scales. While the Western notation system adequately represents these scales, they are also included in our notation system. This is especially beneficial for singers unfamiliar with musical notation.

2) Since the exact distances between the scale notes vary, the software allows changing the pitch of each scale note in cents throughout the song as well as for individual notes. Naturally, the question arises as to whether the non-standard tuning and intervals inherent in non-tempered music could or should be taught at all, especially to non-professional singers. However, certain microtonal "deviations" from the tempered scale are systemic in Seto songs, and it makes sense to take them into account. More generally, the use of the option to vary pitch microtonally in the software can help avoid overly precise tempered tuning while singing.

3) The notation of another key feature of the Seto old style—the variation of the main textural part, *torrõ*—has been addressed by writing out the different variants of the part across the entire melostrophe. This allows them to be listened to both individually and in combination, by muting and unmuting specific parts.

The drawback of this solution is that it does not fully explain the principle of variation. Traditional singers appear to compose their individual parts by combining segments of the

melody line—using different variations in different sections. Evidence from experiments indicates that beginners, at least initially, prefer to sing through the entire part first, rather than combining elements right away. When singers become more experienced, they can independently use the technique of combining segments, relying either on the full tune transcription or their memory.

4) The software allows playback of archival recordings and created notations. For the created notations, users can adjust the pitch level and tempo, as well as select playback sounds or instruments (e.g., piano, flute, etc.). Additionally, users can choose specific melody sections for repeated playback.

Oral and written: harmony or disharmony?

This section analyses the preliminary singer feedback on two key aspects:

(1) the advantages and disadvantages of alternative notation in mastering the older performance style;

(2) the ethical and social considerations of introducing a written learning method into the oral tradition.

1) Mastering the older performance style

Advantages

Based on the teacher's experience, adopting a new learning method allows singers to achieve a sound closely resembling traditional performance in a relatively short time. This is particularly effective when some singers in the group have prior experience with alternative notation and/or good musical skills. As expected, prior musical training supports the acquisition of alternative notation by helping singers control their voice and adapt its movement to the scheme.

The advantages of the alternative notation highlighted by the learners show that the notation serves its purpose: it aids in understanding the system of harmonic sonorities, varying the main part (*torrõ*), constructing the upper accompaniment part (*killõ*), and recalling the individual parts as needed. The creative possibilities of using the notation system were highlighted by the learners: the visuals make it possible to create new variations of the *torrõ* part and to experiment musically. It was particularly encouraging to hear from a singer with average musical ability, who had no training in Western notation, that the use of alternative notation was helping her to begin distinguishing vocal parts on her own while listening to the archive recording—she has developed analytical listening skills.

Disadvantages and solutions

One notable disadvantage is the tendency of some learners to 'get stuck on the note,' relying on it even when it is unnecessary. Additionally, the software's steady rhythm does not capture the varying syllable and note lengths of traditional singing, which are more aligned with the natural patterns of speech. - Furthermore, schematic notation falls short in representing the full range of variations found in live singing recordings—such as shifting intonation, random melodic changes, and pitch variations. At the same time, the "straight" and stable sounds produced by the software can offer an advantage: some singers have pointed out that understanding a melody becomes easier because the part played by the computer is clearer than when sung.

Listening to the original performance (recording), both before and during the learning process, serves as the primary solution to avoiding these potential shortcomings. In any case, the visuals should be considered an additional aid to aural learning, helping learners understand the system, become aware of the possibilities of variation, and recall and practice the parts individually.

2) Ethical and social conciderations

The use of musical notation for the music of oral cultures has been regarded as a colonizing and elitist practice, one that reifies and essentializes processes characteristic of orality (e.g., Marian-Bălaşa, 2005). However, in the context of written cultures, notation should be viewed as both a natural and creative tool (Schuiling, 2019).

Disadvantages and solutions

Alternative notation requires time and effort to become familiar with, which may initially discourage beginners. Some may fear failure and hesitate to invest the necessary effort. Additionally, the natural tendency to compare oneself to others can amplify these concerns, as individuals bring varied experiences and abilities to the learning process.

One of the balancing factors in this learning process is shared feedback. More experienced users often support newcomers by acknowledging that the system initially felt unfamiliar and incomprehensible to them as well, but over time they gradually became comfortable with it.

The oral tradition is characterized by the immediacy of musical communication, spontaneity, and creativity. It is the immediate pleasure of participation, the absence of control ("I can sing as I sing"), and the ability to acquire something without conscious learning, along with the shared emotional sense of identity, well-being, belonging, and security, that draw people from literary culture to the oral tradition.

In teaching the system, it is crucial to occasionally 'let go' of a controlled and effortful learning environment, allowing singing to fulfill its essential social functions. Conscious (individual) learning can serve as a supporting practice alongside live singing together.

Advantages

From a broader perspective, the acquisition of new knowledge and skills is inherently a source of enjoyment. According to the theory of neuroscientist and psychobiologist Jaak Panksepp, it activates the SEEKING system, a fundamental emotional process in the brain. The SEEKING system energizes cognitive processes, stimulates all creative aspects of an individual, and serves as a significant producer of dopamine (Panksepp, 1998). It is evident that singers who are more rational in their thinking and who prefer an informed approach gain the most benefit from the alternative notation and the associated software. Those who are more intuitive in their approach may not utilize our software at all or may only listen to a single variant of their part. Nevertheless, they are influenced by the singing of their more conscious co-singers.

Summary

Visualization serves as an important aid in mastering the system of Seto multi-part oral singing. However, Western notation is not ideally suited for this purpose, and most learners of the tradition are unfamiliar with it. The alternative notation developed by the authors of this paper, along with a digital teaching tool, enhances comprehension of the system and supports the learning of the traditional singing style. Still, it is essential to maintain a reasonable balance between written and oral learning methods to fully grasp the nuances of the musical style. Equally important is leaving sufficient room in the learning process for the type of communication unique to the oral singing culture, which fulfills the social and emotional needs of the singers.

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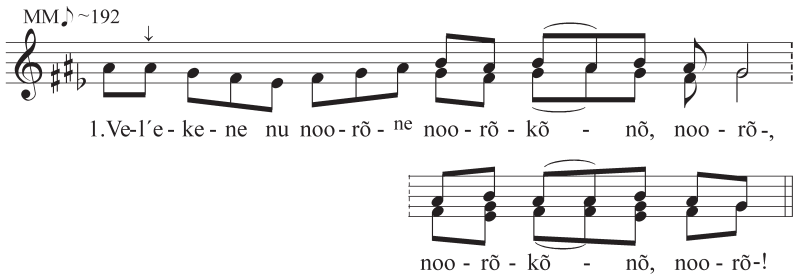
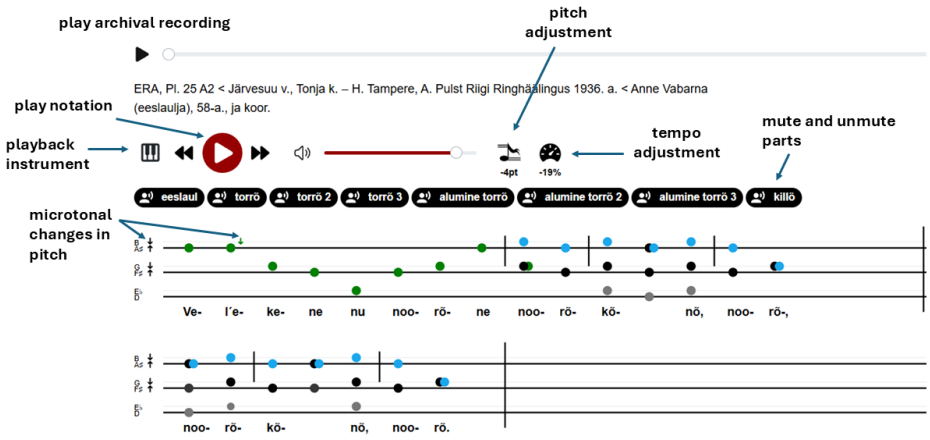
მაგალითი 1 (ა, ბ)**.** სეტოს ტრადიციული საქორწილო სიმღერა *(hähkämine)* დასავლური (ა) და ალტერნატიული (ბ) ნოტაციით, შესრულებული ციფრული სასწავლო პროგრამით (მომხმარებლის შეხედულება). ისარი მეორე ნოტის გვერდით აღნიშნავს მიკრო-ცვლილებას (ამ შემთხვევაში - 50 ცენტით), უკან გადახვევის სიმაღლე დაწეულია (6 ნახევარტონით G4-ს ქვემოთ) და ტემპი შენელებულია. ლურჯი ნოტები აღნიშნავენ killõ ნაწილს, ნაცრისფერი ნოტები მიეკუთვნება მხოლოდ ე.წ. „ქვედა *torrõ*"-ს ნაწილს - განსაკუთრებულ მელოდიურ ვარიანტებს, რომლებსაც ერთი ან ორი *torrõ* მომღერალი მღერის გუნდში.
თავდაპირველი ხმოვანი ჩანაწერი: ანნე ვარბანა (Anne Vabarna) (წამყვანი მომღერალი) და გუნდი, სოფელი ტონ'ა, იარვესუს მუნიციპალიტეტი (Ton´a village, Järvesuu municipality). შემგროვებლები ჰ. ტამპერე, ა. პულსტი, ესტონეთის ლიტერატურული მუზეუმის ესტონური ფოლკლორის არქივი: ERA, Pl. 25 A2. Collectors H. Tampere, A. Pulst 1936. Estonian Folklore Archives of the Estonian Literary Museum: ERA, Pl. 25 A2. https://www.folklore.ee/pubte/eraamat/rahvamuusika/en/051-Ehi-veli

Example 1 (a, b). Seto traditional wedding song (*hähkämine*) in (a) Western and (b) alternative notation, written with Digital Teaching Software (user's view). The arrow next to the second note marks a micro-alteration (in this case -50 cents), while the arrows in front of the lines signify a microtonal alteration of the scale degree throughout the song. The pitch of the playback is lowered (by 4 semitones below G4), and the tempo is slowed down. Blue notes indicate the upper, *killõ* part, black notes the main, *torrõ* part, and grey notes are specific to the so-called 'lower *torrõ'*—a part performed by one or two *torrõ* singers using lower notes.
Original sound recording: Anne Vabarna (lead singer) and choir, Ton´a village, Järvesuu municipality. Collectors H. Tampere, A. Pulst 1936. Estonian Folklore Archives of the Estonian Literary Museum: ERA, Pl. 25 A2. https://www.folklore.ee/setonoot/scores/85




play archival recording
pitch adjustment
ERA, Pl. 25 A2 < Järvesuu v., Tonja k. – H. Tampere, A. Pulst Riigi Ringhäälingus 1936. a. < Anne Vabarna (eeslaulja), 58-a., ja koor.
play notation
playback instrument
-4pt
-19%
tempo adjustment
mute and unmute parts
eeslaul
torrõ
torrõ 2
torrõ 3
alumine torrõ
alumine torrõ 2
alumine torrõ 3
killõ
microtonal changes in pitch
Ve- l´e- ke- ne nu noo- rõ- ne noo- rõ- kõ- nõ, noo- rõ-,
noo- rõ- kõ- nõ, noo- rõ.