

The Intimate Timbres of the Kantele: Materiality, Touch and Cultural Memory

Kastinen, Arja

Folk Music Department, Sibelius Academy, The University of the Arts Helsinki, Finland

arja@temps.fi

The Finnish–Karelian kantele instruments are part of the Baltic psaltery family – a group of instruments found among Baltic, Finnic, and Slavic peoples of Northeastern Europe. The instrument exhibits regional specificities that reflect the history and culture of the areas in which it flourished. The unknown origin of this presumably at least thousand-year-old instrument has long puzzled and fascinated scholars, as its unique shape and distinctive acoustic qualities set it apart from the psalteries of medieval Europe and Asia. Since the nineteenth century, the Baltic psaltery has been developed into numerous models – with national characteristics – to meet the needs of changing musical cultures. (Temkin 2004; Haas 2001.)

This presentation focuses on the acoustic properties and cultural features of the nineteenth-century Finnish–Karelian carved kantele, as well as one of its successors at the turning point in the instrument’s development at the beginning of the twentieth century. From a musician’s perspective, the intimate, multidimensional timbre of early kantele models emerges as an entanglement of materiality, embodied performance, and cultural memory, produced through the interaction of structural design, wood species, string material, specific tunings, and historically informed playing techniques.

The example of a carved kantele is a replica of a Finnish–Karelian southern model, hollowed out from the top with a separate top plate fastened with nails. (The northern model is hollowed out from below and has no bottom plate.) It has twelve brass strings. The body is made of pine, and the top plate is made of spruce. The replica was made by Rauno Nieminen. The original instrument was built in the nineteenth century in Suistamo, Border Karelia, and was purchased for the Perniö Museum in South-West Finland in 1906 from the Karelian runosinger and kantele player Iivana Šemeikka.



The other instrument is a slightly modified version of a steel-string kantele that was purchased for the National Museum of Finland in 1916 in Korpiselkä, Border Karelia. It is made of several pieces of wood, has bracing under the top plate, features a rounded end instead of the *ponsi* found in carved kanteles, has its strings attached to pins instead of a metal bar, and is equipped with metal tuning pegs. The sides and bottom are made of pine, and the top plate is made of spruce. Support plates under the tuning pegs and

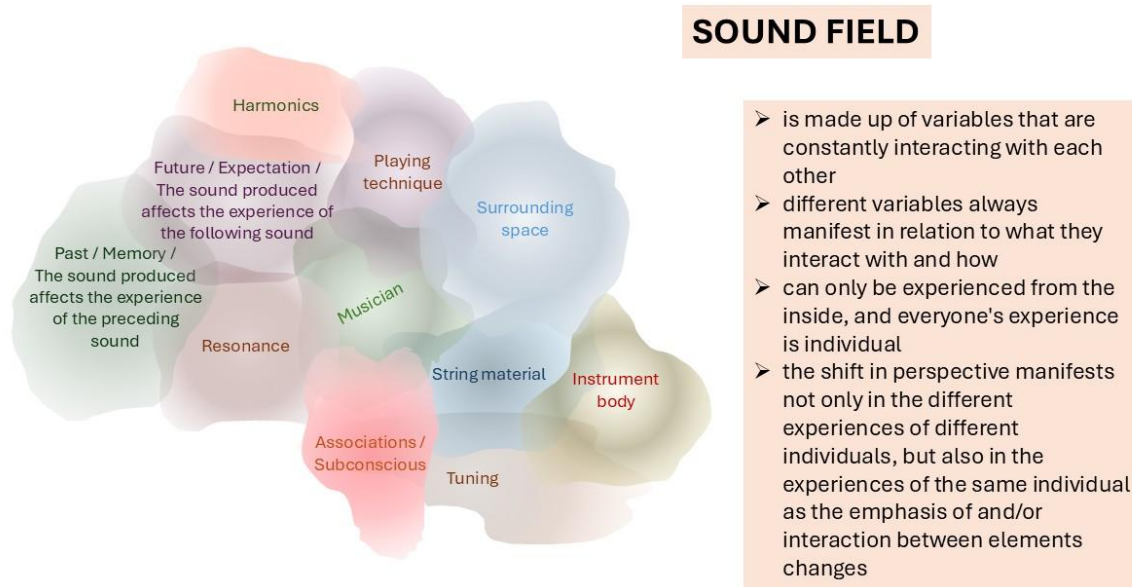
the pins are made of maple. It represents the change in musical culture at the turn of the twentieth century. The kantele was made by Keijo Säteri in 1992.



The acoustic investigations of the kantele have demonstrated several nonlinear behaviours of the instrument (Erkut et al., 2002; Karjalainen et al., 1993; Tahvanainen 2023; Tahvanainen & Hochmuth 2024). Henna Tahvanainen and Mathis Hochmuth (2024) list five of them as follows:

1. The inharmonicity of the strings, related to their tension and material – the inharmonicity of the string partials varies and does not appear to follow a clear trend.
2. Because there is no bridge beneath the strings, and because of their knotted termination at the other end, the different polarisations of the transverse string vibration result in different speaking lengths and consequently in beating – the beating effects of the string partials increase with the vertical plucking angle.
3. The pluck causes the string to be slightly longer in vibration than at rest, which leads to pitch glides.
4. The transverse, longitudinal, and torsional vibrations can couple at the string termination points, producing a strong second harmonic in the kantele – contrary to linear theory, in traditional small kanteles a pluck at the node of a vibrational mode does not prevent the corresponding harmonic from sounding.
5. The string vibration exhibits losses mainly due to air viscosity and internal friction, as well as terminal losses, resulting in different decay times for different partials.

To ensure repeatability in acoustic investigations, the string can be excited mechanically with a wire while the other strings are damped. From a musician's perspective, however, the timbre of a Finnish–Karelian carved kantele is approached differently: the behaviour of an individual string and its coupling with the soundbox becomes meaningful only through its interaction with the full set of variables that create the sound field – the foundation of ancient Finnish–Karelian kantele music. The musician's view of the sound field can be illustrated, for example, as follows:



The historical plucking technique and tunings documented in ethnographic sources and early recordings are closely tied to the musical aesthetics of the Finnish–Karelian runosong culture (– more information at Kastinen 2026: <https://www.temps.fi/en/research/kantele-of-the-runosong-culture-and-the-dialogue-of-creativity/>). Because the strings are plucked upward and rarely stopped, they resonate freely with the sound box and structural components, producing a multidimensional sound field. By altering the plucking technique, the musician varies the timbre of this sound field, and the music unfolds as a long continuum of constant variation that can lead the musician into a trance-like state. This phenomenon was later described by the folk music researcher Armas Otto Väisänen as *quiet exaltation*, while the musicians themselves referred to this improvised music as *playing their inner power*.

The human touch, with its conscious and unconscious modifications in strength, choice of plucking finger, finger angle, and plucking point, for example, is one of the variables within the sound field. In other words, human fingers are seen as part of the instrument and thus the human touch is one of the components constructing the timbre. Even small changes in these parameters can produce distinct timbral shifts. In acoustic research this can be seen as a hindrance to reliable analysis, but from the perspective of the instrument's musical background, embedded in its cultural history, it is regarded as an essential element of the timbre.

Because of the instrument's intimate, close-range sonic character, such nuances become especially meaningful for the musician. The resonance, with its varying harmonics, slowly grows through the sympathetic vibration of the open strings. The structural components of the instrument's body contribute their own vibrational modes to the sound, and thus the resulting sound field is far more complex than merely the notes produced by the individual strings. The old plucking technique, the tactile negotiation of strings, and the instrument's resonant behaviour all act as agents in the unfolding of the music. In addition, resonance functions both as an acoustic phenomenon and as a conceptual tool, revealing how each sound carries traces of previous gestures and how improvisation becomes a dialogue between intention, materiality, and memory.

During the late nineteenth and early twentieth centuries, the string material in carved kanteles changed from the previously common copper alloys to steel, which altered the timbre dramatically. Brass-string kanteles were tuned lower, and their string tension was lower as well, which also results in a different touch. Because kantele players often made their own instruments, the individual variation in shape, size, and structural solutions is wide among the museum instruments. This means that each instrument had its unique timbre. In addition, by varying the tuning, musicians could adjust the sound field to match their mood.

Although these two example instruments can offer only a narrow glimpse into the sonic world of the old Finnish–Karelian kanteles, they nevertheless allow the dramatic shift from brass-string carved kanteles to larger steel-string kanteles to be demonstrated. The sounding qualities of the historical kantele replicas carry traces of past musical worlds. Combining these with historical information on playing technique, tuning solutions, musical aesthetics, and practice-based experimentation has led me to the obvious conclusion that there is no exact answer to the question: “What did the old kantele sound like?” Just as the kantele’s sound field exists in a state of constant variation, the music itself has changed along with the personalities of the players and their unique instruments in different places and times. Music is the result of a complex interplay between the human body and mind, the instrument, the acoustic environment, the surrounding space, history, and resonance. Thus, to find a musical connection with the ancient Finnish–Karelian kantele, one must find one’s own way into the deeply personal *inner-power improvisation*.

With these two instruments, I will demonstrate how the old plucking technique, combined with the tuning method based on fifths and octaves, creates the sound field, and how its timbral structure varies with changes in touch. The remarkable timbral contrast between the carved brass-string kantele and the more modern steel-string instrument also becomes evident.

References

- Erkut, C., Karjalainen, M., Huang, P. & Välimäki, V. (2002). Acoustical analysis and model-based sound synthesis of the kantele. *The Journal of the Acoustical Society of America*, vol. 112, no. 4, 1681–1691.
- Haas, A. (2001). Intercultural Contact and the Evolution of the Baltic Psaltery. *Journal of Baltic Studies*, Volume XXXII (3), 209–250.
- Karjalainen, M., Backman, J. & Pölkki, J. (1993). Analysis, Modeling, and Real-time Sound Synthesis of the Kantele, A Traditional Finnish String Instrument. In *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing ICASSP’93*, Vol. 1 (pp. 229–232).
- Kastinen, A. (2026). *Kantele of the Runosong Culture and the Dialogue of Creativity*. Accessed 14 May 2026 at <https://www.temps.fi/en/research/kantele-of-the-runosong-culture-and-the-dialogue-of-creativity/>
- Tahvanainen, H. (2023). *On the acoustics of the concert kantele*. Conference paper. Stockholm Musical Acoustics Conference 2023.
- Tahvanainen, H. & Hochmuth, M (2024). Measurements on the effect of vertical plucking angle of the kantele string. In *INTER-NOISE and NOISE-CON Congress and Conference Proceedings 270*(2) (pp. 9473–9478).
- Tëmkin, I. (2004). Evolution of the Baltic psaltery: a case for phyloorganology? *Galpin Society Journal*. 57, 219-230.