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RISING AND FALLING TONALITY IN SETO MULTIPART SONGS (SOUTH-EAST ESTONIA). THE *KERGÜTÄMINE* TECHNIQUE AND ITS FUNCTIONS

Changing pitch level (tonality) in traditional unaccompanied vocal music is a widespread but little-studied phenomenon (Alekseyev 1986; Ambrazevičius 2014, 2015; Scherbaum & Mzhavanadze 2020). There is a well-known tendency towards gradual upward transposition, but the focus of this paper is the much rarer (maybe even unique) phenomenon of abrupt downward modulations following a gradual rise in pitch regularly practiced in the multipart songs of the Seto (South-East Estonia) and known as *kergütämine* ('relief'). This study is the first attempt to investigate this unusual technique by means of an acoustic and statistical analysis.

The earliest description of *kergütämine*, dating back to 1913, is from the outstanding Finnish musical ethnographer Armas Otto Väisänen:

"In this way, my attention was drawn above all, as I heard their song, to one strange fact: the sudden descent of the pitch several times, that is, consciously, during the song. In Seretsova, this habit, *kergitamine*, was explained as being necessary for long songs (especially in those in connection with games), since for the one who sings *kilõhee*, the higher voice (there is one such singer in the choir) it may be difficult to sing unless the sound is lower. *Kergitamine* is the task of the lead singer; the choir is immediately ready to adapt to the new tone. <…> Sometimes, when it occurs at an appropriate point in a poem, <…>, it has the effect of an art". (Tampere 1934: 70– 71)

Another expert and collector of Seto songs, the Estonian composer Anatoli Garšnek, in his dissertation (1953), explains the meaning and technique of *kergütämine* as follows:

"The lead singer should choose the pitch of the song to be performed and make sure that the choir is comfortable to sing all the time. This is necessary for the reason that the choir usually raises the pitch. When it becomes difficult to sing, the lead singer begins the next strophe of the song lower or, starting in the previous key, reaches a new, lower pitch shortly before the chorus enters again; the singers are very sensitive to such a change and enter quite accurately in terms of intonation. <…> This technique, having emerged out of necessity, has become traditional. We also observed cases when the lead singer used it unnecessarily <…>". (Garšnek 1953: 31)

The fragments cited contain not only descriptions of the technique of *kergütämine* but also some assumptions about its functions. On the base of these and some more recent publications we can identify three main hypotheses: *kergütämine* is (1) a practical necessity to facilitate singing; (2) a semantic and compositional device associated with the verbal text; (3) an ancient custom that should be maintained. The goal of this paper is to test these three hypotheses by means of thorough analysis and to add some new considerations and explanations. The main research material represents the "primary" tradition and is composed of nine songs performed by the choirs of three prominent Seto lead singers, Anne Vabarna (b. 1877), Kreepa Pihlaste (b. 1892), and Veera Pähnapuu (b. 1916) (Table 1). The songs were recorded between 1959 and 1977; among them, there are work, calendric, narrative, and lyrical songs; the length of the performances is between 20 and 84 melostrophes; the biggest number of *kergütämine* cases in one song is 14.

To provide the initial description of this phenomenon I visualize the pitch level of the performances in the diagrams. The diagram on the screen (it is the harvest song performed by Anne Vabarna's choir) clearly shows the cycles of the rises and falls in tonality (Diagram 1). The large downward shifts on the diagram indicate instances of *kergütämine*. In this performance, consisting of 55 melostrophes, Anne Vabarna applied this technique 14 times. The diagram also reveals that, as expected, in all cases the *kergütämine* is preceded by a rise. However, it would not be entirely correct to call these rises "gradual". A very surprising measurement result is a pronounced zigzag contour in the ascending phases. The lower points of the zigzag correspond to the beginning of each melostrophe in the lead singer's part; this means that the lead singer systematically starts each new melostrophe a bit lower than the chorus ends the previous one. We can deduce from this that in addition to what is known in the Seto tradition as *kergütämine*, there is a kind of micro-*kergütämine* at the beginning of each melostrophe, a technique which, interestingly, is mentioned neither by researchers nor by the bearers of tradition. Another pattern that can be seen in this diagram is that immediately after each *kergütämine* the chorus raises the tonality especially quickly.

In the diagrams of the same harvest song performed by the choirs of Pihlaste and Pähnapuu (Diagrams 2,3) we can also see the zigzag pattern in the ascending phases, though, this is not as pronounced as in the performance by Vabarna. The tendency to quickly raise the pitch immediately after *kergütämine* is also present in these two performances (especially in Pähnapuu's one). In Pihlaste's performance, we can also notice a tendency to employ *kergütämine* after melostrophes in which the chorus raises the tonality more sharply than usual.

Testing patterns revealed in the harvest song on other song tunes, we find that each singer and choir has their own preferences and habits. The diagrams also demonstrate how often and with what periodicity the lead singers use *kergütämine*. In all three performances of the harvest song, for example, this technique occurs quite often and at more or less equal intervals – in every 4– 6 melostrophes. There are also songs with rare and/or uneven use of *kergütämine* – for example, the narrative songs performed by Pähnapuu and Vabarna. Generally speaking, it can be noticed that a more frequent and systematic use of *kergütämine* occurs in faster songs or in those that are performed in a more intense manner. In the unhurried and quieter long narrative songs, *kergütämine* occurs more rarely.

I mentioned above three hypotheses about the function of *kergütämine* – the necessity to facilitate singing, a compositional device related to verbal text, and just an old custom. In this paper, I mostly focus on the first hypothesis as opposed to the third one. Regarding the second assumption, I only say that the analysis of the nine songs, conducted with the assistance of the ethnomusicologist and philologist Janika Oras, does not confirm the existence of such correlations. There are no cases where the applications of *kergütämine* coincide with the large caesuras in the poetic text. In some cases, there are coincidences with the mid-level caesura – the beginning of a relatively new topic or direct speech in dialogue. However, the majority of *kergütämine* – more than 40 out of the 66 instances – occur within the so-called parallel groups of text lines, which means that the use of *kergütämine* is not related to the compositional caesuras of the song poetry. It seems highly probable that, at least in the old Seto tradition, *kergütämine* was neither semantic nor a compositional device, though individual cases may occur.

Turning now to the opposition between "practical necessity" and "old custom", it should be remembered that such a necessity would be in any case a quite specific feature since it does not arise in many other musical cultures where the gradual rise of a pitch level occurs. With regard to custom,

it should be borne in mind that at some point this custom came about for reasons which may have been forgotten over time, rethought, or replaced by others. We may also assume that *kergütämine* is both a necessity and a custom, in which case we should seek the relationship between the two factors, comparing the arguments for the relative weight of each. Anything that points to the direct necessity of *kergütämine* weakens the importance of the conventionality of this technique, whereas cases of "unjustified" use of *kergütämine* speak in favour of its function as a mere custom.

The main argument in favour of the practical necessity of *kergütämine* is the unusually high speed of the upward transposition. Let's test this assumption using the results of statistical analysis. In Table 2 several approaches are used to calculate the speed of the pitch rise. If the goal is to find how quickly the tonality rises between two *kergütämine*, it is useful to compare the pitch at the ends of adjacent melostrophes. On this basis, we can calculate how much the pitch level would rise during the whole performance if the lead singer did not use the *kergütämine* technique. However, to reveal the real speed of transposition it is necessary to calculate how much the pitch level rises over the duration of each melostrophe. Based on these calculations, it is possible to estimate how much the tonality would rise to the end of the song if the lead singer employed neither *kergütämine* nor micro-modulations.

The table shows, firstly, the data for the most typical (median) rise between adjacent melostrophes in each song under analysis. Results range between 0.1 and 0.4 semitones, with a mean of 0.23 semitones across the sample set. Raising the tonality at this rate without using the *kergütämine* technique might by the end of the song result in a significant rise in tessitura – from 5.2 to 16.5 semitones, depending on the speed of transposition and the number of melostrophes.

Secondly, the effective rise in tonality during each melostrophe was calculated. The results obtained are even more noteworthy. The median rise during the melostrophe ranges from 0.2 to 0.7 semitones, and the mean for all the songs is 0.39 semitones. The total rise in pitch throughout the song, if the lead singer did not lower the pitch either by *kergütämine* or by micro-modulations, could in this case even be equal to 38.5 semitones (it is the result for the long harvest song of Anne Vabarna's choir). The results for the three lead singers are different, but in any case, it is clear that the pitch shift takes place so rapidly that "countermeasures" are needed.

Since the interval of transposition within the melostrophe can be dependent on its length, the speed of pitch rise in cents per second was calculated to get even more accurate data. These calculations also revealed the great difference between the choirs of the three lead singers, equal to 4.9, 4.1, and 2.6 cents per second respectively. It is interesting to compare these results with the findings of Scherbaum and Mzhavanadze, who observed in the Svan funeral dirges "a strong gradual pitch rise of up to 100 cents per minute" (Scherbaum, Mzhavanadze 2020: 138). The figures for the Seto songs are remarkably greater – 294, 246, and 156 cents per minute respectively for the three choirs. The intriguing question to be answered is why the Seto singers rise the tonality so extremely quickly.

However, let us first answer the other question: which matters more for the use of *kergütämine* – absolute or relative pitch? According to one of the aforementioned hypotheses, the device of *kergütämine* is particularly necessary for the performer of the upper part *killõ*, who would otherwise end up singing in too high a tessitura. The range of the voice is limited for each singer to a certain absolute pitch, approaching which the voice production becomes too intense, and the lead singer should react to this by employing *kergütämine*. To test this hypothesis, I compiled a diagram (Diagram 4), which represents the range of the change in pitch of the modal center.

The diagram shows that the choice of tessitura in the performances analyzed is very wide. Of greatest interest in this diagram is, however, the upper limit of the modulation range, since this should, in theory, determine the need to use *kergütämine*. If we compare all the performances on this basis, then the difference between the upper limits of the pitch level will be about 4.5 semitones. Such a big difference could be explained by differences in the individual vocal capabilities of the singers (especially, the *killõ* singer), assuming that the results across the songs of each choir were similar. However, this explanation is rendered doubtful by the significant difference in pitch level among the performances of the same choirs. In different performances, the lead singer may allow the choir to sing considerably higher or lower, which means that the absolute pitch is not a decisive factor for the use of *kergütämine*.

If the absolute pitch does not determine the use of *kergütämine*, then its reasons should be sought in the relative change of pitch. To estimate this factor, I calculated the relative rise in pitch prior to *kergütämine* and compared it with the interval of the descending modulation (Table 3). As the data in the table reveals, the individual rises before *kergütämine* can be quite different – from 0.8 to 3.4 semitones; a similar situation is with intervals of *kergütämine*. The mean and median values differ less. In general, when averaged across all the songs, a fairly balanced picture emerges: the mean and mediam values for the rise before *kergütämine* are 1.8 and 1.7 semitones; the respective values for *kergütämine* are 1.7 and 1.6 semitones. Thus, the average values for ascent and descent differ only by 0.1 semitones. Since the intervals of the rises tend to be slightly larger than those of *kergütämine,* there is usually a rise in pitch towards the end of the song by the interval slightly less than a whole tone. Such a rise during the whole performance is quite usual in traditional vocal music; the Seto singers, however, achieve this result in a very complex way, by means of numerous larger and smaller ascents and descents in the pitch level.

As for the practical necessity of *kergütämine*, we can conclude that the reason for each particular downward modulation is not so much that the "extreme" pitch reached by the choir actually impedes singing; rather it is a preventive mechanism to lower the tonality after a rise of somewhere between a semitone and a minor third. In another word, for the decision to use *kergütämine* the absolute pitch matters much less than the relative rise in pitch, and the practical necessity of each individual *kergütämine* may be rather weak. However, it is still likely that the general reason for the use of this device is related to a very fast upward transposition in the chorus's section.

To explain the phenomenon of *kergütämine*, two questions need to be answered: on one hand, why the lead singer lowers the pitch level, and, on the other, why the chorus raises it? Researchers have suggested some considerations regarding the first question, but that Seto choirs have a particular tendency to raise tonality has always been taken as a fact, and no explanation for it has been suggested yet. Clearly, the answers to these two questions are interrelated, and it is possible that the key to solving the enigma of *kergütämine* lies in discerning the reasons behind the unusual pitch rise characteristic of Seto multipart singing.

One more important question concerns the relationship between a lead singer and a chorus. When analyzing Seto songs with *kergütämine*, one often gets the impression that during the song there is a constant struggle between the "forces of ascent" and "forces of descent". The former is associated with the chorus and the latter with the lead singer. The lead singer uses two methods to control the rise: one of them is *kergütämine*, and the other is downward micro-modulations at the beginning of melostrophes. *Kergütämine* is a deliberate, generally accepted technique. Downward

micro-modulation is most likely not a completely conscious action since there are no comments about it from the bearers of the tradition. The chorus also has two methods of raising the pitch level: a smaller gradual rise in each melostrophe and a more significant, but also gradual, rise in the melostrophe beginning with *kergütämine*. Although researchers assert that the chorus readily accepts the new tonality proposed by the lead singer, this is only partly true, since it is in the melostrophes with *kergütämine* that the greatest "struggle" to preserve the higher tessitura already achieved occurs.

Such a "confrontation" between the lead singer and the chorus is suggestive – after all, the lead singer's goal should be to help the choir sing in a comfortable tessitura, but the choir seems to resist this help, raising the tonality higher and higher. However, what is if we do not deal here with a confrontation, but, on the contrary, with some kind of cooperation? And what is the goal of this cooperation?

To answer this question, we should assume that in the old Seto tradition, not only the descending modulations of the lead singer but also the raising of the pitch level by the chorus were deliberate techniques designed to achieve a desired aesthetic effect. If this assumption is correct, then the role of *kergütämine* was not to impede the pitch rise but rather to promote it. The singers of the chorus (possibly led by the *killõ*) deliberately raised the tonality, achieving a special brightness and emotionality in the sound, in the knowledge that the lead singer would help them at the right moment with a downward modulation. On the other hand, the lead singer with her *kergütämine* does not so much "save the situation" when it becomes difficult to sing, but on the contrary, stimulates the choir to raise the tonality by giving the chorus "space" for the rise. This could explain the numerous cases where the lead singer apparently modulates unnecessarily.

Assuming this hypothesis to be correct, it follows that in the ancient Seto song tradition, the aesthetic value lay not just in singing with a bright intense timbre, but in the dynamics of timbre and pitch change itself, a kind of pitch and timbre *crescendo*, followed by a pitch and timbre contrast created by an abrupt downward modulation. Such a technique could take on different connotations in different song genres – an increase in the weight of expression in laments or the magical effect in ritual songs, an expression of joy in festive songs, or an additional game element game-game song.

Nowadays the *kergütämine* technique is rarely used and likely has finally lost its original meaning, therefore we can only make assumptions about its initial functions. However, this phenomenon seems to be a very intriguing and important subject for research, since it is extremely rare and obviously very ancient. Finding the origins of this technique could shed light on the origin of the Seto culture itself.

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ცხრილი 1. გაანალიზებული სიმღერების სია.
Table 1. List of songs analysed.

	archival number	year	genre	number of strophes	number of *kergütämine*
Anne Vabarna (1877-1964)	RKM, Mgn. II 321 a	1959	work/game song	69	14
	RKM, Mgn. II 1381 c	1959	harvest song	55	13
	RKM, Mgn. II 1382 b	1959	narrative song	84	6
Kreepa Pihlaste (1892-1968)	RKM, Mgn.II 1632 b	1967	Kadri song	32	8
	RKM, Mgn. II 1633 h	1967	harvest song	25	4
	RKM, Mgn. II 1632 c	1967	fishing song	29	5
Veera Pähnapuu (1916-1989)	RKM, Mgn. II 2351 c	1973	harvest song	20	5
	RKM, Mgn. II 2350 b	1973	narrative song	44	7
	EKRK, Fon. 96 (a14)	1977	lyrical song	26	4

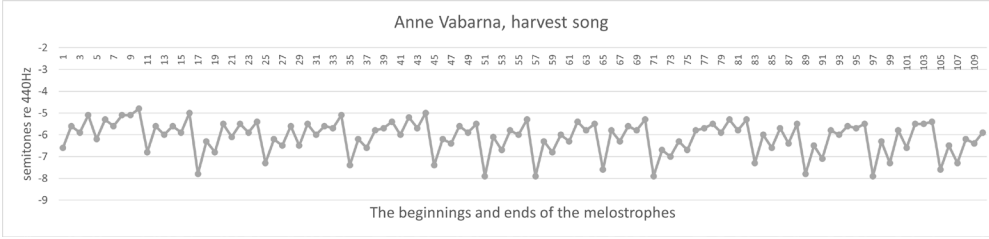
ცხრილი 2. საფეხურის დონის ამაღლება გაანალიზებულ შესრულებაში.
Table 2. The rise in pitch level in the performances analysed.

		Number of strophes	Median rise between the ends of strophes (semitones)	Total rise without *kergütämine* (semitones)	Median rise during one strophe (semitones)	Total rise without any descents (semitones)	Median speed of the rise during one strophe (cents/s)
Anne Vabarna	work/game song	69	0.2	13.8	0.4	27.6	4.2
	harvest song	55	0.3	16.5	0.7	38.5	6.7
	narrative song	84	0.1	8.4	0.3	25.2	3.8
Kreepa Pihlaste	Kadri song	32	0.2	6.4	0.4	12.8	4.9
	harvest song	25	0.4	10	0.5	12.5	4.5
	fishing song	29	0.2	5.8	0.3	8.7	2.9
Veera Pähnapuu	harvest song	20	0.3	6	0.3	6	2.6
	narrative song	44	0.2	8.8	0.2	8.8	2.1
	lyrical song	26	0.2	5.2	0.4	10.4	3.2
Vabarna's songs (mean)			0.2		0.47		4.9
Pihlaste's songs (mean)			0.27		0.4		4.1
Pähnapuu's songs (mean)			0.23		0.3		2.6
All songs (mean)			0.23		0.39		3.9

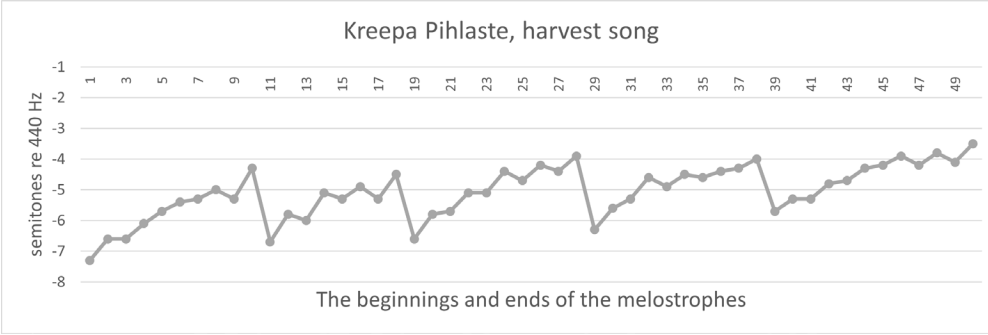
ცხრილი 3. საფეხურის ამაღლება kergütämine-მდე და kergütämine-ს შემდეგ.
Table 3. The rise in pitch before the kergütämine and the descent of the kergütämine.

		Rise before *kergütämine* (semitones)				Interval of *kergütämine* (semitones)			
		min	max	mean	median	min	max	mean	median
Anne Vabarna	work/game song	0.8	2.7	1.6	1.5	1	2.7	1.7	1.5
	harvest song	1.8	2.6	2.2	2.3	1.9	2.8	2.3	2.3
	narrative song	1.1	2.8	1.8	1.9	1.3	2	1.7	2
Kreepa Pihlaste	Kadri song	1.1	2.1	1.5	1.5	0.7	2	1.5	1.6
	harvest song	2.2	3	2.6	2.5	1.7	2.4	2.2	2.3
	fishing song	0.9	1.7	1.2	1.2	1	2.6	1.5	1.3
Veera Pähnapuu	harvest song	1.4	2.2	1.8	1.7	1.2	1.7	1.4	1.3
	narrative song	0.8	3.4	1.6	1.2	0.8	2.3	1.5	1.6
	lyrical song	1.2	2.2	1.8	1.9	1.6	2.3	1.9	1.9
Vabarna's songs		0.8	2.8	1.9	1.9	1	2.8	1.9	2
Pihlaste's songs		0.9	2.1	1.8	1.5	0.7	2.6	1.7	1.6
Pähnapuu's songs		0.8	3.4	1.7	1.7	0.8	2.3	1.6	1.6
All songs		0.8	3.4	1.8	1.7	0.7	2.8	1.7	1.6

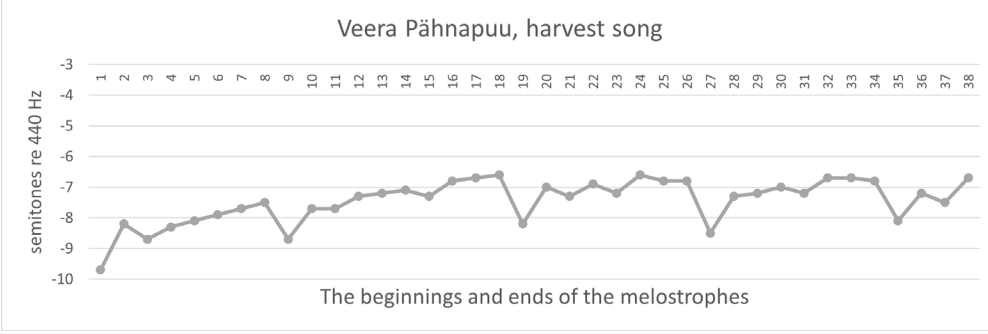
დიაგრამა 1. სიმაღლის დონის ცვლილება შესრულების პროცესში (მოდალური ცენტრის სამაღლე მელოსტროფის დასაწყისსა და დაბოლოებაში), მოსავლის სიმღერას ასრულებს ანა ვაბარნა და მისი გუნდი.
Diagram 1. Change in pitch level during performance (the pitch of the modal centre at the beginning and end of each melostrophe). Harvest song performed by Anne Vabarna and her choir.



დიაგრამა 2. სიმაღლის დონის ცვლილება შესრულების პროცესში (მოდალური ცენტრის სამაღლე მელოსტროფის დასაწყისსა და დაბოლოებაში). მოსავლის სიმღერას ასრულებს კრიიპა პილასტე და მისი გუნდი.
Diagram 2. Change in pitch level during performance (the pitch of the modal centre at the beginning and end of each melostrophe). Harvest song performed by Kreepa Pihlaste and her choir.



დიაგრამა 3. სიმაღლის დონის ცვლილება შესრულების პროცესში (მოდალური ცენტრის სამაღლე მელოსტროფის დასაწყისსა და დაბოლოებაში). მოსავლის სიმღერას ასრულებს ვიირა პანაპუუ.
Diagram 3. Change in pitch level during performance (the pitch of the modal centre at the beginning and end of each melostrophe). Harvest song performed by Veera Pähnapuu and her choir.



დიაგრამა 4. მოდულაციის დიაპაზონი გაანალიზებულ კომპოზიციებში.
Diagram 4. The range of modulation in all songs under analysis.