

This is a self-archived version of an original article. This version may differ from the original in pagination and typographic details.

Author(s): Kukkonen, Tiina Katriina

Title: Ability to Measure and Count in Aleksis Kivi's Seven Brothers

Year: 2021

Version: Published version

Copyright: © Author, 2021

Rights: In Copyright

Rights url: <http://rightsstatements.org/page/InC/1.0/?language=en>

Please cite the original version:

Kukkonen, T. K. (2021). Ability to Measure and Count in Aleksis Kivi's Seven Brothers. In D. Swart, F. Farris, E. Torrence, & C. S. Kaplan (Eds.), *Proceedings of Bridges 2021 : Mathematics, Art, Music, Architecture, Culture* (pp. 233-240). Tessellations Publishing. Bridges Conference Proceedings. <https://archive.bridgesmathart.org/2021/bridges2021-233.html>

Ability to Measure and Count in Aleksis Kivi's *Seven Brothers*

Tiina Katriina Kukkonen

University of Jyväskylä, Finland; tiina.kukkonen@iki.fi

Abstract

The illiterate brothers' elementary ability to measure and count fluently is a striking feature in the Finnish author Aleksis Kivi's *Seven Brothers* (*Seitsemän veljestä*, 1870), a novel that was published before the metric system was introduced in Finland. The seven main characters describe their everyday life and environment and make work-related decisions using numbers, amounts, and measures of distance, area, volume, and weight without hesitation. They are also familiar with some elementary calculations. At the same time, their inability to read arouses desperate anguish in them. I analyze the ways the brothers use numbers and measurements, and the importance of these skills in their life. I also discuss their mathematical skills in relation to those of the narrator.

Introduction

Aleksis Kivi's main work, *Seven Brothers* (*Seitsemän veljestä*, 1870), is one of the early Finnish language novels. It is one of the most widely read and printed Finnish novels both in the original language and in translation. [1]; [7]; [2]; [3]; [4]. Further, this novel brings both old measures and basic counting and measuring abilities into consideration.

The brothers' difficulty of learning to read has received significant scholarly interest and has been a popular theme in research on the novel, see e.g., [8]: 7; [10]: 166–178; [11]: 148–154, 170; [12]: 231–236, 258, 261; [19]: 230–248. Considering the extent of research on the author, it is surprising that the brothers' elementary abilities of knowing numbers, counting and measuring have received little attention. The existence and repetition of the numbers, and their symbolic connotations are mostly researched [10]: 25–42; [19]: 249. Some measures have been noted in the Kivi-glossaries. [4]: 389, 397, 415, 421, 423, 418; [8]: 646, 650, 660; [18]: 30, 51, 55, 58. Only seldom, analysis of quoted numbers and measures connect with some mathematical meaning, as in [20]: 85; [19]: 253, 275. A more systematic research of the use of measures in the novel is still needed. Geometry is outside the scope here, see for example [20]; [6]; [13].

Literature historians have mentioned arithmetic, numbers and measures in relation to Kivi's (Alexis Stenvall) basic arithmetic skills based on his performance at school, and his later private studies for High School exams between 1856–1857. In the latter, his teacher in mathematics was Wilhelm Engelbert Neovius, a docent of pure mathematics at the Imperial Alexander University in Finland. Kivi's late but unfilled interest in learning arithmetic skills in order to become a steward are noted in research, since he expressed this desire in his letters. [21]: 52, 77, 66, 69, 77, 588–590; [6]: 329–332; [9]: 181; [12]: 27; [19]: 106, 184–185; [24]; [1]: letters 50; 51.

I will highlight both the elementary numeracy skills and the measurements used in the novel and discuss the way the brothers understand and use them. They frequently show interest in naming numbers and measures, and sometimes they count. The meanings and the context of the measures in the brothers' lives and in the construction of the novel also warrant additional research. A further question is, how come they have no trouble using mathematics but have enormous difficulties in learning to read? It is as if mathematical and reading abilities are entirely different types of skills. Do the brothers have an innate mathematical skill?

Late Years before the Metric System

Kivi used an arithmetic system based on basic calculation and the measures used in Finland before the introduction of the metric system. The strong humanistic tendency of Finnish literature studies might be

one reason for the limited interest in arithmetic in *Seven Brothers*. Another reason might be the implementation of the standardized, physics-based metric system in 1886–1892 [15]: 163; [17]: 8–9; [22]: 12–13. This took place soon after Kivi’s era, which might have alienated readers from the measures used in *Seven Brothers* that were based on the human body. The metric system was already adopted in 26 continental European countries between 1790–1875. [5]: 3, [15]: 163; 64; [22]: 12–13. Conversion guides between the old measures and the metric system were published to help people adjust to the change [15]; [16]; [5]; [22]. Finnish language conversion tables were published in both booklets [5] and in elementary arithmetic books [17].

The measures predating the metric system were based on the human body and, for example, certain containers. These measures were time- and culture-specific, which provides a challenge for translators [2]; [3]; [4]. For example, alnage was often determined according to the king’s bodily measurements [15]; [22]. Most measures in use in Finland during Kivi’s time were Swedish but some historical ones originating in other countries were also used, and Russian measures complemented the Swedish ones in the 19th century. An ell was originally a Latin “ulna” or a Greek measure [4]: 421. An ell in 19th century Finland was either the 17th-century Rydholm or Stockholm ell that was ca. 0.59 meters, or the Russian ell “arsina”, which was ca. 0.71 meters [5]: 6; [22]: 17. In *Seven Brothers*, Kivi uses mainly Swedish measures, but some old historical and other international measures are also mentioned. There seem to be no Russian measures in the novel beyond a couple of metaphorical uses of “verst”. Kivi also mentions “a Russian verst”, “Venäjän-virsta” in Finnish, in a letter [1]: letter 61. *Seven Brothers* is rich in measures, and they are seldom discussed as measures in Kivi-research.

The narrator and the characters need both numbers and units to measure and count. The Finnish text “mitta ja määrä” refers to both a measure and an amount. [4]: 221; [1]: VIII. When brother Lauri defines both a measure and an amount for a tired man: “A stout (tuoppi, in Finnish) of beer and two jars (korttelia) of liquor’s yeasty yaw of yorsh” [4]: 221; [1]: VIII. This has aroused a note of excessive liquor, which tells of understanding these measures [19]: 275. In this article, roman numbers refer to the *Seven Brother’s* [1]–[4] chapter numbers I–XIV.

Numbers in *Seven Brothers*

The first word of the title, *Seven Brothers*, is a number and there are seven main characters, see [20]: 39; [10]: 25, [23]: 138. The narrator introduces the brothers in order of their age: They are Juhani, {Tuomas, Aapo}, Simeoni, {Timo, Lauri}, Eero, with the twins here in brackets. [1]–[4]: I. The narrator, the brothers themselves, and other characters in the novel repeatedly refer to them as a series of brothers: [1]–[4]: II, V, VIII, IX, XI. They are born between seven years, see for example [10]: 33. In addition, the twins of another seven character family from the Rajamäki area [10]: 14 as well as several pairs of animals highlight the theme of doubles. [1]–[4] The work of the seven brothers displays joint efforts. The narrator, the brothers, and other characters often repeat their number and refer to the brothers’ unity. Seven brothers and various related names such as seven boys, men, bears, bulls, and bullets are repeated throughout the novel. See [10]: 14, 25–42. Nouns and adjectives connected to the number seven describe both their feelings and their situation in life. [1]–[4]

On the most basic level, either the brothers or the narrator describes seven items for the seven brothers. [1] The number of the brothers’ seven similar belongings refers to the number of brothers. For example, they conclude that the church stocks have seven holes, one for each brother that is unable to read. They buy seven ABC-books, they have seven rye breads for food, and they use seven spoons. See [10]; 25–42; [1]–[4]: I, IV, VI, V. Kinnunen has highlighted the numbers found in the novel, e.g., 1, 2, 3, 6, 7, 12, and 40. However, he is not interested in mathematics but in symbolism, mystics, and cultural connotations between the novel and western cultural history [10] : 25–42. Correspondingly, Sihvo compares number 7 in *Seven Brothers* and *The Apocalypse* [19]: 247–251.

Both the narrator and the brothers present simple analogies, equivalencies, and comparisons. The brothers emphasize taking turns equally in their duties. [1]–[4]: I, IV, V, VI, VII, XI. They quite often use

vocabulary and concepts connected to numbers and simple arithmetic. Once, Juhani persuades Simeoni that it would be Simeoni's turn, his "number", to wrestle: "Step up to thy number, Simeoni". [3]: 132; [1]: VI.

The brothers do not use zero as a separate number, however, they speak of emptiness and nothingness. For example, when escaping wolves, Tuomas shouts to his brothers: "Anyone whose gun is empty, load it right now". I: XI; [2]: 143. On another occasion, the hungry Aapo wonders, "What can be made from nothing" [1]: XII; [2]: 260. The narrator and the brothers repeatedly use numbers for counting small quantities from one to some tens and one hundred. Sometimes they refer to great numbers as thousands, hundreds of thousands, or even billions. Some numbers have military connotations, such as a companion, a battalion, and legions, even if the brothers might not know their exact size. They might consider those numbers as synonymous for a great number. [1]–[4] Kinnunen presents that the brothers' illiteracy is connected with their ambiguous knowledge of the world [11]: 169–170. The ambiguity of some great numbers might also connect with the verbal sources as the only source of knowledge.

The brothers seem to understand the concept of infinity, which is used to refer to countless numbers and amounts, the infinity of nature, and on the other hand, overwhelming feelings. For example, Aapo tells a story of a goblin that seduces a maiden. The disguised goblin promises her "treasures and precious jewels without measure". In Finnish, the expression "ilman lukua ja määrää" means 'without number and a definite amount'. [1]: V; [2]: 108. Juhani uses the same expression of the countless wild ducks on a wetland. [1]–[4][1]: VI

Counting and Elementary Arithmetic

Both the narrator and the brothers use simple arithmetic operations to describe the brothers' belongings, to observe environment, and to fantasize. All the brothers use numbers and counts. Counting also occurs in all chapters. In addition, the narrator and several other characters, a local lay member, rural police chief, and old Tinder-Matti (Taula-Matti), use numbers or count. This seems to be a method to observe, group, and name objects. They sometimes sum, and subtract and, less often, multiply and divide. [1]–[4]

The brothers sometimes sum and subtract numbers in their speech. For example, when they feast on Christmas, Juhani asks for the number of dance steps to be increased: "let's have some twenty more leaps of this Jussi-dance" [1]: VI; [2]: 136. Results of their counting are rarely mentioned. Both the narrator and the brothers count the number of their neighbor Viertola's bulls that give the brothers a chase in the forest. At first, they know that there are 40 wild bulls in total. As an example of subtraction, having killed seven bulls, both the narrator and Juhani conclude that there are 33 bulls left to chase and surround them as they escape to a secluded boulder Hiisi Rock, Hiidenkivi. [1]–[4]: VIII–VIII. Further, Juhani concludes that if two bulls were to kill each other, their number would diminish by two. [1]–[4]: VII.

The brothers generally count to solve small problems. They divide seven brothers to different groups. For example, on Hiidenkivi, Aapo suggests that two of the brothers will stand guard while the rest five of them sleep: one on one side and one on the other side of the rock. "[...] let two of us, one on each end, guard their sleeping brothers five", he tells. [4]: 206; [1]: VII. When a character presents them with something arithmetic, the brothers not only understand it but they may even continue the calculation and count together. This differs from many other issues the brothers discuss, argue, and quarrel over. Common understanding means that a brother can use several different units of measurement and his brothers will understand him. [1]–[4]: I–XIV. However, sometimes a brother jokes with numbers so that some of them don't understand it [1]–[4]: XIV; see [19]: 246, 253.

Once, the brothers plan to celebrate their hunting catch with liquor, as their hero, Tinder-Matti had done. A demand of about one third of a liter of liquor for each brother, "kortteli" in Finnish, becomes seven times a third of a liter: "Tuomas: Seven jars, boys!/Juhani: Right you are! One jar each". [4]: 195; [1]: VII. Further, when stuck on Hiidenkivi, Juhani and Tuomas bet on fighting bulls for a third of a liter of liquor, which equals their portions. On another occasion, when the brothers decide to compete in throwing a wooden disk, they form two groups. Juhani thinks how to divide the brothers in two groups. He bothers that "Three on a side would be fairest, but there are seven of us". [2]: 198; [1]: IX. The problem is solved when Lauri decides to wander in the forests instead of joining the game. [1]–[4]: IX. The brothers seem to have

some innate mathematic abilities. However, they have also acquired some mathematical vocabulary. Once, when Juhani and Timo discuss the difficulty of learning to read, Juhani calls the result as a calculation, ”rätinki”, in Finnish. He tells that a clever answer diminishes a year of the time that Timo needs in learning to read. [2]: 249; [1]: XI. Here, he uses the same word that the rural police chief told them slightly earlier. Might he have learned the term from the police? [1]–[4]: XI

When Juhani aims to learn to read ”in two years”, he thinks that Timo’s head is ”twice as hard” as his in comparison. This leads Timo to calculate that Juhani will “just learn [his] ABC Book in two years, and I’ll learn mine in four.” [2]: 249; [1]: XI. This shows that the brothers understand how to multiply with small numbers. On another occasion, Juhani promises to “pay double [--] tithes” for the church in exchange for more time for the brothers to learn to read. [2]: 92; [1]: IV. Usually the brothers multiply by two. This happens, when Aapo tells a story about the housekeeping of two differently behaving farmwives at similar farms. He says that the first wife consumes and fritters away twice as much of everything in her household as the sparing second wife, leading the first farm to gradually diminish. [1]: XII; [4]: 311. Aapo concludes that the first wife would need the yield of two equivalent farms to amass enough wealth to match the other farm. [1]–[4]: XII. In this story, Aapo highlights equality and parity, which are central principles in *Seven Brothers*. To tell the story, he needs to somehow understand the concepts of equation, inequality, and multiplication. Seldom, the brothers present multiplication with slightly bigger numbers, but they do not tell the results of these calculations. This happens for example, when Juhani talks of ten years of punishment for each of the ten souls: ”If I had ten souls, and every one were to be tortured in a spiked barre for ten years, that would be nothing compared to the joy of revenge”. [2]: 94, [1]: IV. In addition, when Juhani, Tuomas and Eero play with a thousand, a thousand for each thousand, and further, a thousand for those thousands, they do not count the results.[2]: 55; [1]: III.

Finnish Units of Measurement in *Seven Brothers*

Both the narrator and the brothers are familiar with a range of units of measurement that were in use in Finland before the adoption of the metric system. They mostly use measures of length and volume and only occasionally those of area and weight. The units used in *Seven Brothers* that are included in the English translations and have metric conversions are included in the tables below. If the same term is both a unit of measurement and has another meaning, only the instances as a unit are counted. For example, inch, ”tuuma” in Finnish, can also mean to think or a thought. And, palm ”kämmen in Finnish”, is used both as a unit of measurement and in reference to hands. [1]–[4] Palm(’s width) is sometimes mentioned as an old measurement unit [15]: 143; [8]: 646. Only Tuomas [1]–[4]: VIII and Lauri [1]–[4]: III use “palm(’s width)”, but they highly exaggerate the measurement and the use is metaphorical. For example a weight, ”punti” in Finnish [1]–[4]: VI, IX, and weighting, ”punnita” in Finnish, [1]–[4]: I, VI, and to have weight, ”painaa” in Finnish [1]–[4]: XIII, have both mathematical and metaphorical meanings.

Both the narrator [1]–[4]; [20]: 85; [23]: 144 and Aapo, when he tells a story, use “pace” to describe distances in and around the brothers’ living environment. Otherwise, characters use “pace” only to mean pacing around. The narrator also describes the distance between two places by “gunshots”, “pyssynkantama” in Finnish, or “a reasonable fairing distance”, “ampumamatka”, in Finnish. [1]: VII, XIV [3]: 165, 329, which might not be a regular unit of measurement. Once in a while, the characters use innovative measurements such as the small pace of a cuckoo [1]–[4]: VII, or exactness of a hair or ”a hair stronger” [2]: 132, “hiuskarvan tarkkuudella/vertaa” in Finnish. [1]–[4]: IV, VI. Juhani is the only one to use “a (Russian) verst”, which is inexact in his speech. The brothers tend to use greater units of measurement inexactly and metaphorically. [1]–[4] In tables 1–4, examples show that the narrator and the characters use arithmetic and measures. Most mathematically exact English translations are used here. Where no exact translation is found, the Finnish original is included in the quote. (Table 1 below)

Table 1: Measures of Length in Seven Brothers. [4]: 421, 423; [5]: 6; [15]:143; [8]: 646; [14]: 43–44; [16]; 4–14; [17]: 40–44; [20]: 85; [22]: 17, 37; [1]; [2]; [3]; [4]

English name ca.	Finnish measure	In Meter system	Number of occasions	Example
Inch	Tuuma	0.025	3 or 4: Narrator 1, Juhani 1 or 2, Aapo 1	Aapo: [--] "Line the fork up with your toes, not an inch this way or that. [--] [2]: 163; [1]: VI Either as a thought or as a measure: Juhani: " [--] not one inch a better boy [--]" [4]: 233; [1]: VIII
Thumb	Peukalo		4: narrator 1, Juhani 1, Timo 1, Eero 1	Narrator: "Simeoni bit of a peace the size of a man's thumb from a loaf of bread" [2]: 305; [1]: XIV Juhani [to Eero]: "You Tom Thumb, you!" [2]: 29; [1]: I
Palm's width	Kämmen/kämmenleveys		2: Tuomas 1, Lauri 1	Tuomas: "Remember our home here's a palm's width [--]" [4]: 214; [1]: VIII
A half foot	Kortteli	0.15	2: Narrator 1, Taula-Matti 1	Narrator: [--] spreading the bright straw cross the floor to about to a span's thickness (noin korttelin paksulta)" [4]: 159; [1]: VI
Alnage	Kyynärä	0.60	4: narrator 1, Juhani 1, Simeoni 1, Taula-Matti 1	Simeoni: "[--] "on a four-foot wide [parin kyynärän leveällä] peace of leather [--]" [2]: 229; [1]: X
Pace	Askel (as a measure)		21: narrator 17, Aapo 2, Tuomas 1 (no any), sexton 1 (no any)	Aapo: "[--] his power to use violence ended nine paces away from the hill [--]" [3]: 111; [1]: V
Fathom	(Syli)/syltää /syllän (as a measure)	1.80	9: Narrator 4, Juhani 2 Taula-Matti 2, Timo 1, sexton 1	Narrator: "Two or three arm-spans from the hut [--]" [4]: 46; [1]: I. Juhani: "[--] My eyes can scarce see a fathom [syltääkään] before me [--]" [3]: 41; [1]: II
Gunshot	Ampumamatka		Narrator 2	Narrator: "[--] Two or three gunshots east [--]" [3]: 329; [1]: XIV"
Verst (from Russian)	Virsta	a bit over 1 km	Juhani: 2	Juhani: "[--] a fearful way to Kourusuo, a wolf's league (suden virsta) [--]" [3]: 163; [1]: VII Juhani: "[--] not so very far from me, not many versts of this [--]" [3]: 301; [1]: XIII.
10 kilometres	Penikulma/peninkulma		3: Juhani 1, Aapo 1, Timo 1	Aapo: "[--] a distant spark, a thousand leagues away (tuhansien penin-kulmien päästä), does this hope gleam to her. [--]" [3]: 133; [1]: V.

Measures of area are rarer in *Seven Brothers*: only the narrator and Aapo use them. They mostly use 'a barrel of land', "tynnörinala" in Finnish, which refers to the area sown with a single barrel of seed, "tynnyri/tynnöri". Aapo notes that half a barrel of grain for each of the six brothers is enough to sow at least three 'barrels of land' [1]–[4]: I. This has been seen as a description of right of domination of the farm [19]: 288. And the narrator describes how the brothers are strong enough for it to only take a few days to harvest tens of 'barrels of land' worth of wood for slashing and burning. [1]–[4]: IX On one occasion, the narrator mentions that Tinder-Matti knows an area covering several quadrats of ten kilometers, "monien peninkulmien avaralta", in Finnish. [1]–[4]: VI, VII (Table 2 below)

Table 2: Measures of Area in Seven Brothers. [22]: 18–19; [5]: 6; [14]: 43–44; [16]; 58–61; [17]: 44–48; [19]: 288; [1]; [2]; [3]

English name ca.	Finnish measure	(ca.)	Number of occasions	Example
Larger than an acre, 0,405 ha.	Tynnyrinäla (tynnörinala)	0.494 ha.	3: Narrator 2, Aapo 1	Aapo "[--] Every year each man will get a half-barrel (puoli tynnöriä) of oats to sow, and we will all have the right to slash-and-burn three acres (kolme tynnörinalaa) for use as a common field. [--]" [2]: 23; [1]: I; compare to "a half-cade" in [4]: 53
Square of ten km	Neliöpenikulma/neliöpeninkulma	km ²	Narrator 1	"forests for many scores of miles (monien peninkulmien avaralta) around his hut" [3]: 156; [1]: VII

Both the narrator and the brothers, excluding Simeoni and Eero, speak of measures of volume. They use volume to measure grain or alcohol, and on rare occasions coffee. [1]–[4]: II, IV, VI, XIV In addition, in the last chapter the narrator recounts Eero measuring goods and paying wages to the servants and farmhands. [1]–[4]: XIV. *Seven Brothers* includes descriptions of “barrels”, “tynnöri” in Finnish, of beer. However, it is unclear whether these beer barrels are exact measures as it is once described as small [1]–[4]: XIII. Presumably, Timo is referring to a specific container when he speaks of a quarter, “nelikkotynnöri”, in Finnish. [1]–[4]: IX. Burden, “taakka” in Finnish, is not an exact measurement in the novel [1]–[4]: I, VI, IX, XI, XII, XIV, however, it has been used as a measurement in Finland [15]: 143. (Table 3 below)

Table 3: *Measures of Volume in Seven Brothers.* [22]: 20–21; [5]: 7; [8]: 660; [16]; 22–50; [17]: 48–52; [1]; [2]; [3]; [4]

English name ca.	Finnish measure	Liters	Number of occasions	Example
A volume of 0,33 liters	Kortteli	0.333	9: narrator 3, Timo 1, Tuomas 2, Juhani 2, Lauri 1	Timo: "For a pint (kortteli) of liquor and a (pari) whispered word in the ear of Ananias Nikula, I'd soon have reams of verse (syllän pituisen laulun) [--]" [2]: 47; [1]: II
Barrel	Tynnyri/ (tynnöri)	165	8: narrator 5 Aapo 1, Juhani 3	Aapo "[--] Every year each man will get a half-barrel (puoli tynnöriä) of oats to sow, and we will all have the right to slash-and-burn three acres (kolme tynnöriä) for use as a common field. [--]" [2]: 23; [1]: I; compare to "a half-cade" in [4]: 53 Aapo: ""Juhani. "[--] I can carry the weight of five barrels (Viisi tynnöriähän) on my back, and Tuomas a bit more [--]" [2]: 133; [1]: VI
Quarter	Nelikko= ¼ tynnyri	41.25	Timo 1 (possibly a thing)	Timo : "[--]t' other [dog] to a bushel cask [nelikkotynnöriin]" [4]: 254
Ca. a pottle/ half a gallon	Kannu	2.617	5: narrator 2, Juhani 3 (+8 unclear)	Narrator: "[--] "a barrel of rye (tynnöri rukiita) and ten canisters of whisky (kymmenen kannua viinaa) on the cart[--]" [2]: 220; [1]: X Juhani. "[--] Empty three cans [kannua kolme] of it into thy mug [--]" [3]: 136; [1]: VI
Stein, Stout [4]	Tuoppi	1.333	9: narrator 2, Juhani 5, Timo 1, Lauri 1	Narrator: Juhani "poured the can [tuopin] of spirits, stirring into it two spans [tuoppia] of gunpowder, one of ground sulphur and a like measure of salt." [3]: 83; [1]: IV Timo: "[--] Master of Viertola will stuff a bottle [tuopin] into our bottoms for nothing, a bottle [tuopin] or two [--]". [3]: 169; [1]: VII
(A cup)	Kuppi (if a measure)		8: narrator 5, Juhani 2, Kaisa 1	Narrator: "[--] with a tankard of beer (oluttuoppi) and a steaming cup of spiked coffee (knorrikuppi) [--]". [2]: 294; [1]: XIII

Measures of weight in *Seven Brothers* are peculiar. The brothers can weigh things, such as bull's meat, although there is no mention of them having any sort of equipment for doing so. They must know weights and have something akin to a scale. They even arrange a competition among themselves where the losing team must each overeat ten pounds that is 4.25 kg of bull's meat in a single day. [1]–[4]: IX. The enormous amount of meat has been interpreted as one of the brothers' heroic feats, see for example [10]: 78.

In addition to weighing objects, the characters also weigh their thoughts. The police chief describes his authority to the brothers: "I weigh'd in, "laskinpa painoni" (in Finnish) on the matter" [4]: 286; [1]: XI and the brothers also weigh both thoughts and strength. For example, Timo weighs the brothers' possibility to stay alive among howling wolves and biting frost and Juhani proposes that they weigh their physical strengths in a game. [1]–[4]: VI (Table 4 below)

Table 4: *Measures of Weight in Seven Brothers.* [4]: 397; 418 [5]: 7; [8]: 650, 660; [22]: 22–24; [16]: 40–50; [17]: 52–54; [1]; [2]; [3]; [4]

English name ca.	Finnish measure	Kg	Number of occasions	Example
Plumb/ plumb bob	Luoti (as a measure)	0.013	Juhani 1	Juhani “[--] you are just an ounce or two (pari luotia) weaker than I am.”[2]: 131; [1]: VI
Pound	Naula	0.425	8: narrator 1, Juhani 6, Eero 1	Narrator: “[--] Juhani, Simeoni and Timo had to swallow a fearful quantity of beef, ten pounds (naulaa) [--]” [3]: 215; [1]: IX
(Talent), Biblical, 10 kg [4])	ca. Leiviskä (a Livonian measure)	8.501	2: Narrator 1, Lauri 1 (+ 2 times of duties)	Lauri: “[--] A dozen boards, twenty pound of iron framing nails”[4]: 222 (Toltti lautoja, leiviskä traaksipiikin rautanauvoja) [--]” [1]: VIII
Plate [4] (money)	Plootu	≤ca. 20 kg	1: Lauri	Lauri’s thought to hit his brothers by heavy plates: “antaa teille oikein aika plootuja otsaan”: [1]: VIII

Conclusions

The novel focuses on the seven main characters who all count small numbers and use units of measure fluently in the beginning. They have interest in numbers and measures. Both the narrator and several of the characters measure and count. The narrator uses measures to locate characters and places in the scenes and landscapes of *Seven Brothers*, and to recount the characters and their force in relation to their antagonists, for example the wild bulls or human characters, see for example [1]–[4]: IV; VII, IX. Occasionally, Aapo tells stories and uses measures the same way as the narrator. [1]–[4]

The illiteracy of the brothers is highlighted as a major deficiency that limits their social status and their rights in the village society, when they escape from the sexton’s school to the forests, see for example [12]: 233–234. Anguish and the sexton’s brutal teaching methods delay the brothers learning for years. Later, Eero teaches his brothers to read [12]: 238. While he teaches, he compares the brothers’ reluctant efforts with eating a repellent porridge substitute, “A, P, C, ummee nälkäpuuroo”, in Finnish. [1]–[4]: XI. At the same time, the brothers use basic calculations fluently. The difference becomes obvious, for example, when Simeoni cannot tell the letters in the ABC-book after a nightmare about reading in chapter X, but Timo recognizes the written number 10, when he laughs at its figure in chapter VI. [1]–[4]. Saarimaa has found a local historical reference for these figures of number 10 [18]: 47.

Simeoni: “[--] ’Tis like the scribbles of Russian or Hebrew to me.” [--]” [4]: 27; [1]: X.

[Tinder-Matti/Matti Amadou]: “[--] how that bloody stump he [the bleeding wolf] was draggin’ behind him was drawing’ tens in the sand.”/Timo: ”Tens? Like the number? [--] He hee! [--]” [4]: 191; [1]: VI.

When their speech is not metaphorical, the brothers seem to use small units of measurement correctly. Some rare units, such as “a palm” or “a thumb”, and sizeable units are mostly used metaphorically. Sometimes a unit of measurement might be a part of a phrase that the brothers have learned. Despite this, plenty of cases that show how the brothers measure and count. [1]–[4]: I–XIV. The novel includes about 20 different measurements of length, area, volume, and weight that were widely used in Finland before the introduction of the metric system. The novel also introduces possibly new, intuitively understandable measurements such as the waist size of an ant [1]–[4]: XII, to make the idea understandable to other characters and the reader. All 14 chapters include numbers and measures. Most of the numbers are small, but the range reaches from “empty” to billions. The range of typical measurements reaches from an inch to ten kilometers or from a plumb bob to “leiviskä” in Finnish, a measure of over eight kilograms, or even to infinite, “summaton” in Finnish, weight. [1]–[4]: I–XIV

The brothers’ arithmetic and measuring ability is not questioned or argued in the novel, but it is sometimes it is joked with. The brothers use elementary arithmetic effortlessly and one of them may pick up a

calculation where another one has left off. Lastly, one of the brothers, Eero, uses mathematics to gain extra income. [1]–[4]: I–XIV

The brothers' fluent basic mathematical skills seem to have not received direct attention in either *Seven Brothers* or the Kivi-research, which is in striking contrast with the attention their slow development in reading skills has received. In this novel, basic reading skills are not a prerequisite for mathematical skills, and arithmetic skills do not help the brothers learn how to read. The differences of learning mathematical thinking and reading in *Seven Brothers* warrant future research. [1]–[4]: I–XIV

References

- [1] Aleksis Kivi korpus. SKS. <https://korp.csc.fi>, 2013. S. Katajamäki, O. Kokko & E. Kela (Eds.). The database does not include page numbers.
- [2] A. Kivi. *Seven Brothers*. Richard Impola (Transl.). Aspasia Classics in Finnish Literature. Series ed. Börje Vähämäki. Aspasia Books, 2010.
- [3] A. Kivi. *Seven Brothers. A Novel*. Alex Matson (Transl.). Tammi, 1959.
- [4] A. Kivi. *The Brothers Seven. A tale*. Douglas Robinson (Transl.). Zeta Books, 2017.
- [5] O. Dannholm. *Suomen Mitat ja painot helposti ymmärrettävillä laskutuloksilla*. O. Dannholm, J. Simeliuksen perillisten kirjapaino, 1891.
- [6] P. Elo. *Aleksis Kiven persoonallisuus*. WSOY, 1950.
- [7] Finnish literature in translation. Finnish Literature Society. <http://dbgw.finlit.fi/kaannokset/index.php?lang=ENG>, 1.2.2021.
- [8] S. Katajamäki. *Seitsemän veljestä ja opas sen lukemiseen*. SKS, 2020.
- [9] T. Keskisarja. *Saapasnahka-torni. Aleksis Kiven elämäkertomus*. Siltala, 2018.
- [10] A. Kinnunen. *Tuli, aurinko ja Seitsemän veljestä*. Tietolipas 106. SKS, 1987/1973.
- [11] A. Kinnunen. *Seitsemän veljestä ja lukemisen juonet*. WSOY, 2002.
- [12] V. A. Koskenniemi. *Aleksis Kivi*. WSOY, 1934.
- [13] T. Kukkonen. Circular Forms in Aleksis Kivi's Texts. In *Bridges Conference Proceedings*, Jyväskylä, Finland, Aug. 9–13, 2016, pp. 255–262. E. Torrence, B. Torrence, C. H. Séquin, D. McKenna, K. Fenyvesi, & R. Sarhangi (Eds.) Phoenix: Tesselations Publishing. <http://archive.bridgesmathart.org/2016/bridges2016-255.pdf>
- [14] C. M. Lagerhamn & E. J. Blom (Transl.). *Wiiwanto- ja mitanto-oppi: sunnuntai-, maanviljelys-, ja käsityökoulujen tarpeiksi*. SKS, 1854.
- [15] T. Perhoniemi. *Mitan muunnelmia. Miten määritämme maailmaa, ihmistä ja tietoa*. Vastapaino, 2014.
- [16] *Portmonä-Metertabeller*. C. W. K. Gleerups förlag, Berlinska Boktryckeriet, 1889.
- [17] A. Ramsay. *Metri-järjestelmä. Esimerkeillä selitettynä. Käsikirja kouluja ja itseoppimista varten*. Translated by R. Forstén. 2. print. Weiling-Göös, 1887.
- [18] E. A. Saarimaa. *Selityksiä Aleksis Kiven teoksiin*. Tietolipas 32. SKS, 1964.
- [19] H. Sihvo. *Elävä Kivi. Aleksis Kivi aikanansa*. SKS, 2002.
- [20] V. Tarkiainen. *Aleksis Kiven "Seitsemän veljestä"*. Kirjallinen tutkimus. WSOY, 1910.
- [21] V. Tarkiainen. *Aleksis Kivi. Elämä ja teokset*. WSOY, 1915.
- [22] J. Grönros, A. Hyvönen, P. Järvi, J. Kostet & S. Väärä. *Tiima, tiu, tynnyri. Miten ennen mitattiin*. Näyttelyesite 32. Turun maakuntamuseo. 2004.
- [23] L. Valkama. Kuusi ja seitsemän veljestä. *Sananjalka* vol 12, 1970, pp. 133–147.
- [24] *Ylioppilasmatrikkeli*. [Ylioppilasmatrikkeli.helsinki.fi](http://ylioppilasmatrikkeli.helsinki.fi), Vilhelm Engelbert Neovius. (read. 9.5.2021)