The Numbering of the Tractatus Is a Tree, and the Citations of This Corpus Are Not

— each of the 526 propositions comments on exactly one proposition above it (519 edges = 526 vertices − 7 roots), and the deeper the proposition the longer it is (the main propositions average 10.857143 words, the deepest five-digit ones 48.285714); the 1033 papers of this corpus cite 4.121007 papers each on average, and only 0.196515 of them cite exactly one — the separator is whether a text comments on one text or on several — [Paper 1035]

Yuuki YAMAGISHI (山岸 勇輝)
Yamagishi Complexity Torus Lab, Japan
September 2026

— *From thinking to syncing.* —

Abstract

The propositions of the Tractatus carry the numbers 1 to 7 with decimal branches, and the footnote to proposition 1 says that the decimals indicate logical importance and that n.1, n.2 are comments on n.This paper counts that numbering as a tree, measures the number and length of propositions at each depth, and sets the result beside the citation network of this corpus.No new theorem or law is claimed, and the content of the Tractatus is not entered. First, and this is the core. The numbering of the Tractatus is a tree——reading the numbers from the Gutenberg edition, English and German agree on 526 propositions; the main propositions are the 7 from 1 to 7, and the counts by depth (digits after the point) are 25 at one digit, 124 at two, 245 at three, 118 at four and 7 at five. Each of the 519 propositions other than the main ones has exactly one parent, the first existing number obtained by dropping trailing digits (474 by one digit, 39 by two, 6 by three), so there are 519 edges = 526 vertices − 7 roots, a tree. There are 358 leaves, 168 propositions with children, 3.089286 children per parent, and the most children, 14, belong to proposition 4 (Section 2). **Second, the deeper the proposition, the longer——the mean number of words in Ogden's English rises monotonically from 10.857143 at depth 0 (the main propositions) through 25.72, 33.427419, 41.061224 and 42.872881 to 48.285714 at depth 5. The total is 20321 words, the shortest proposition has 4 words, the longest is 6.341 with 259, and the seven main propositions have 8, 12, 9, 6, 16, 16 and 9** (Section 3). **Third, the citations of this corpus are not a tree——for the 1033 papers up to number 1034, the number of self-citations in the bibliography (excluding self-loops) averages 4.121007, with median 4 and maximum 41 (Paper 100); 13 papers cite none, 203 (0.196515) cite exactly one, and 817 (0.790900) cite two or more. The 4257 edges exceed the 1033 vertices, and since a tree has edges = vertices − roots, this is no tree** (Section 4). **Fourth, edges per vertex differ by a factor of four——0.986692 for the Tractatus against 4.121007 for the corpus. One proposition hangs from one proposition; one paper is tied to four on average** (Section 4). **Fifth, the footnote on numbering holds as far as word counts can test it——the "importance" it speaks of cannot be measured, but the monotone relation that propositions with fewer digits are shorter holds across the 526. The longest, 6.341, is the simile of the net; the shortest has 4 words** (Section 3). **Sixth, the separator is whether a text comments on one text or on several——on one, and it is a tree without back references or mutual citation; on several, and it is a network in which, as Paper 1000 counted for chains of citations, one paper is tied to several papers** (Section 5). **Keywords**: Tractatus Logico-Philosophicus, numbering tree, citation network, out-degree, depth and length, census.

Scope of this paper (scope note): **No new theorem or law is claimed——the numbering scheme of the Tractatus (the footnote to proposition 1, 1922), the Gutenberg edition (Ogden's translation with the German), and that a tree has as many edges as vertices minus roots are all known.The content of the Tractatus is not entered——the truth of the propositions and the philosophical meaning of the numbering are not judged; only numbers and word counts are counted."Importance" is not claimed to be measured——the logical importance the footnote speaks of is not a word count. Words are counted in Ogden's English, and the German is used only to check the numbers; another translation would give other counts.The corpus values are fixed at the time of writing——out-degrees are counted from the bibliographies of the Japanese .tex files up to number 1034 and frozen in a saved copy; they move as papers are added.Citations are counted from bibliographies only——papers merely named in the body are not counted, and the self-citing lines (the papers numbered 1 and 2) are excluded. In the current files the paper numbered 1 cites 5 papers and the paper numbered 2 cites 2.Relation to earlier papers**: **Paper 1000 showed that cited papers came closer and that chains of citations reached four links——here the number of edges per paper in that network is counted and set against a tree.Paper 900 and Paper 800 counted how sentences citing earlier papers are written and set conventions ——here only the counts are seen, not the wording.Paper 100 counted the crossing of royal roads——here it is counted that that paper cites the most, 41, in the corpus.**What is added is **counting the numbering of the Tractatus as a tree and checking edges = vertices − roots**, **giving the monotone relation between depth and word count**, **giving the distribution of out-degrees of the corpus frozen at the time of writing**, and **setting the two side by side by edges per vertex**.

1. Notation and the Question

Setting: **for a proposition number $n.\,a_1a_2\cdots a_k$ of the Tractatus, let the depth be the number k of digits after the point, and let the parent be the first existing number obtained by dropping trailing digits (for example the parent of 4.0312 is 4.031, and that of 4.01 is 4).For this corpus, let the out-degree of each paper up to number 1034 be the number of self-citations [Paper N] in its bibliography, excluding itself.**

Question: **is the numbering of the Tractatus a tree? Are the citations of this corpus a tree? How far apart are the two?**

2. The Tree of the Tractatus

Computation 2.1: **reading the numbers from the Gutenberg edition (English and German), both give 526, the sets agree and there are no duplicates. The main propositions are the 7 from 1 to 7, the first being 1 and the last 7.**

depth	0	1	2	3	4	5
propositions	7	25	124	245	118	7

Each of the 519 propositions other than the main ones has one parent; the digits dropped to find it are one for 474, two for 39 and three for 6. The 519 edges equal 526 vertices minus 7 roots. There are 358 leaves and 168 propositions with children, 3.089286 children per parent, and the main propositions have 2, 8, 11, 14, 8, 10 and 0 children, the most being the 14 of proposition 4.

> **Observation 2.2**
>
> this is the core. The numbering of the Tractatus is a tree.Every proposition comments on exactly one proposition above it, with no back reference and no mutual comment——that is why edges = vertices − roots holds.

3. Depth and Length

Computation 3.1: in Ogden's English, the words from each number to the next were counted (footnotes removed by matching braces). Proposition 1 has 8 words and proposition 7 has 9.

depth	0	1	2	3	4	5
mean words	10.857143	25.72	33.427419	41.061224	42.872881	48.285714

The total is 20321 words, the shortest proposition has 4 words, the longest is 6.341 with 259, and the seven main propositions have 8, 12, 9, 6, 16, 16 and 9.

> **Observation 3.2**
>
> the deeper the proposition, the longer.The "logical importance" of the footnote cannot be measured, but the monotone relation that fewer digits means fewer words holds——the longest, 6.341, is the simile of the net, and the shortest main proposition, 4, has 6 words.

4. The Network of This Corpus

Computation 4.1: for the 1033 papers up to number 1034, the out-degree averages 4.121007, with median 4 and maximum 41 (Paper 100); 13 papers have 0, 203 (0.196515) have exactly 1, 817 (0.790900) have 2 or more, and the total number of edges is 4257. In the current files the paper numbered 1 cites 5 papers and the paper numbered 2 cites 2.

Observation 4.2

the citations of this corpus are not a tree.The 4257 edges exceed the 1033 vertices, and edges per vertex are 4.121007, four times the 0.986692 of the Tractatus——the chains of citations that Paper 1000 counted can reach four links because one paper is tied to several.

5. The Separator and What Is Not Said

Observation 5.1

the separator is whether a text comments on one text or on several.On one, and it is a tree with fewer edges than vertices and no back reference or mutual citation; on several, and it is a network with more edges than vertices——the conventions on writing sentences that cite earlier papers, which Paper 800 and Paper 900 counted, are needed only on the side of the network.

Observation 5.2

what is not said.Neither the truth of the propositions nor the philosophical meaning of the numbering is entered——the word counts are of Ogden's English and change with the translation, and the corpus out-degrees are a copy frozen at the time of writing that moves as papers are added.

6. Census and Closing

1. **propositions 526, roots 7, edges 519, by depth 25, 124, 245, 118, 7** (Computation 2.1): **the core.**
2. **digits to the parent 474, 39, 6, leaves 358, with children 168, children per parent 3.089286, most 14** (Computation 2.1): **a tree.**
3. **mean words from 10.857143 to 48.285714, total 20321, longest 259 words** (Computation 3.1): **deeper is longer.**
4. **corpus of 1033 papers, mean out-degree 4.121007, maximum 41, exactly one 203 (0.196515), two or more 817 (0.790900), edges 4257** (Computation 4.1): **a network.**
5. **edges per vertex 0.986692 against 4.121007** (Computation 4.1): **a factor of four.**
6. **one or several** (Observation 5.1): **the separator; Paper 1000, Paper 900, Paper 800 and Paper 100.**

Closing: **The numbering of the Tractatus is a tree, and the citations of this corpus are not.Each of the 526 propositions comments on exactly one proposition above it, 519 edges = 526 vertices − 7 roots, and the deeper the proposition the longer it is (the main propositions average 10.857143 words, the five-digit ones 48.285714). The 1033 papers of this corpus cite 4.121007 papers each on average, only 0.196515 cite exactly one, and the 4257 edges exceed the vertices——edges per vertex are 0.986692 against 4.121007.The separator is whether a text comments on one text or on several.Placed among the earlier papers——Paper 1000 showed that chains of citations reached four links, Paper 900 and Paper 800 how sentences citing earlier papers are written, and Paper 100 the crossing of royal roads. Here that network was set beside a tree and counted by its edges.To be honest——not one word of what the Tractatus says has been counted.**

References

1. Wittgenstein, L. (1922). *Tractatus Logico-Philosophicus* (C. K. Ogden, Trans.). Kegan Paul.
2. Yamagishi, Y. (2026). *The Crossing of Royal Roads* [Paper 100]. Zenodo. 10.5281/zenodo.21758864
3. Yamagishi, Y. (2026). *The Eight Hundredth Census: Whether a Seat Citation Took the Seat Is Known Unread Only When It Says So* [Paper 800]. Zenodo. 10.5281/zenodo.22805383
4. Yamagishi, Y. (2026). *The Nine Hundredth Census: What Told Whether There Was a Seat Was Not "Placed Beside" but the Word "Scope Note"* [Paper 900]. Zenodo. 10.5281/zenodo.22805412
5. Yamagishi, Y. (2026). *The Thousandth Census: Seats Came Closer, and the One Missed Occupant Had Sat Before Seats Were Named* [Paper 1000]. Zenodo. 10.5281/zenodo.22813757

— *From thinking to syncing.* —

Yuuki YAMAGISHI (山岸 勇輝)

© 2026 Yamagishi Complexity Torus Lab, Japan · Licensed under Creative Commons Attribution 4.0 International (CC BY 4.0)