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A Quantitative Analysis of Nineteen Japanese Historical Primary School English-as-a-Foreign-Language Textbooks

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Abstract
The authors of this paper aim to quantitatively analyse the features of nineteen Japanese historical primary English textbooks. They focus particularly on their homogeneities and differences. They further compare the features of these textbooks with the historical girls' middle-grade school textbook and the current junior high school textbook. The following were the obtained results. First, the textual correspondence analysis proved capable of differentiating the features of the twenty-six historical or current textbooks in focus. In particular, the bipolar coordinate map indicated that the two dimensions, *difficult (+) vs. easy (-)* axis, and *passage-based (+) vs. dialogue-based (-)* axis, contributed to differentiating between the inter-relationships. Secondly, although Books 2 and 3 of the currently used textbooks proved to be similar to the majority group of the historical textbooks, Book 1 proved to be different from the historical ones, both in the bipolar coordinate analysis and the all-features-based dendrogram analysis. Thirdly, the four volumes of the historical girls' textbook, *Tsuda 1, 2, 3,* and *4*, proved to be similar to the majority of the historical primary school textbooks, both in the bipolar coordinate analysis and the cluster analysis. Finally, for the theoretical implications and practical use of the present study, it was demonstrated that textual correspondence analysis is a powerful tool for quantitative analysis and the evaluation of Japanese EFL textbooks, and that "*difficulty vs. easiness*" and "*passage-based vs. dialogue-based*" were useful viewpoints for EFL teachers and educators in describing and grasping Japanese EFL textbooks.

Keywords: Correspondence analysis, Cluster analysis, English as a foreign language; Japanese English textbooks

Introduction

In 2020, the Japanese formal English language education system changed drastically. In April 2020, a new subject, 'Elementary English,' was introduced in grades 5 and 6 in primary-school education in Japan, with a new elementary English Course of Study (henceforth COS) effected and new elementary English textbooks approved based on the new COS and published (Ministry of Education, Culture, Sports, Science and Technology, 2018a; Ministry of Education, Culture, Sports, Science and Technology, 2018b). In April 2021, the following year, a revised English COS

was deployed for junior high school with a new set of English textbooks (Ministry of Education, Culture, Sports, Science and Technology, 2018c; 2018d).

This drastic remodelling of Japan's EFL education system has made it essential to closely examine and evaluate the newly-introduced English or EFL textbooks for primary, junior, and senior high schools from a broader perspective. From preliminary observation, the new junior high school EFL textbooks have changed drastically. They differ from their historical (primary school textbooks) and traditional counterparts (girls' middle-grade-school textbooks used in the post-WWII period) in philosophy, contents, structure and learning, teaching strategy, etc. Consequently, there is a need to quantitatively analyse and compare past primary school textbooks and the newly-introduced junior high school textbooks since they are generally believed to be homogeneous in terms of the above criteria.

Considering the state of formal English language education in Japan, it is necessary to quantitatively analyse the features of twenty-six Japanese EFL textbooks (nineteen historical primary school textbooks, one set of historical girls' middle-grade-school textbooks (four volumes), and one set of the newly introduced textbooks (three volumes) using textual correspondence analysis (henceforth CA). Prior to using CA, authors have been primarily engaged in the diachronic analysis, both qualitative and quantitative, of Japanese historical EFL textbooks such as in the works of Ozasa and Nakamura (2001), Ozasa (2003), Ozasa and Erikawa (Eds.) (2004), Ozasa (2005), Nakamura and Ozasa (2007), Weir and Ozasa (2007), Weir and Ozasa (Eds.) (2007), Weir and Ozasa (Eds.) (2008), and more.

Evidence from the literature review suggests that the textual CA of Japanese historical EFL textbook studies started in Japan with Sakamoto, Watanabe, and Ozasa (2017). They computed a textual CA using seven Japanese historical or current textbooks. They identified four mentions or categories: *natural vs. drill-centred* texts (Dim 1) and *concise vs. redundant* texts (Dim 2). Watanabe, Asai, and Ozasa (2017) also computed a textual CA using five Japanese historical EFL textbooks and two of their current counterparts, identifying four explaining categories, including *easy vs. difficult* texts (Dim 1) and *story vs. collection* (Dim 2). Both studies demonstrate that textual CA is a valuable statistic tool for analysing and discriminating the Japanese historical EFL textbook corpora.

Honda, Watanabe, and Ozasa (2017) attempted the same type of CA-based multivariate textual analysis using ten Japanese historical or current EFL Book-1 textbooks which specified five dimensions or factors, including *difficult vs. easy* texts (Dim 1) and *drill-centred vs. natural* texts (Dim 2). Its bipolar coordinate CA map representation based on the two major dimensions successfully discriminated and classified the ten textbooks into four groups. Ozasa, Kawamura, Umamoto, and Matsuoka (2018), using another CA-based textual analysis of five Japanese historical or current EFL textbooks, also identified four dimensions, including *natural vs. drill-centred* texts (Dim 1), and *easy vs. difficult* texts (Dim 2).

Honda, Asai, Watanabe, and Ozasa (2018) computed the same type of CA using eighteen Japanese historical or current EFL textbook (Book-1) corpora, identifying seven explaining dimensions, including *difficult vs. easy* texts (Dim 1) and *natural- vs. artificial-sounding* texts (Dim 2). Asai, Honda, Watanabe, and Ozasa (2019) computed the same type of CA using seventeen Japanese historical or current EFL textbooks (Book-3) corpora, identifying seven explaining factors, including *difficult vs. easy* (Dim 1) and *natural- vs. artificial-sounding* texts (Dim 2). Interestingly, the explaining factors of the seventeen Book-3 textbooks in Asai et al. (2019) proved to be the same as those of the Book-1 result in Honda et al. (2018), up to Dim 7.

Following Asai et al. (2019), Honda, Asai, Watanabe, and Ozasa (2019) computed the same type of textual CA under the same scheme using twelve historical and one current EFL textbooks. They identified four dimensions (explaining factors), including *speech-oriented vs. exposition-oriented*

discourse (Dim 1) and *easy vs. difficult texts (Dim 2)*. Also, Asai, Honda, Watanabe, and Ozasa (2020) computed the same type of textual CA, using fifty-five Japanese historical and one current middle-grade EFL textbook, Books 1 – 5. They compared the historical middle-grade textbooks with the historical girls' middle-grade counterparts and current junior and senior high school counterparts. They identified seven dimensions, including *difficult vs. easy* texts (Dim 1) and *artificial- vs. natural-sounding* discourse (Dim 2).

Aim

The authors of this study aim to statistically discriminate and classify nineteen Japanese historical primary school EFL textbooks. Specifically, five sets comprised of four books, one set comprised of three books, one set of their girls' middle-grade counterparts (four books), and one newly-introduced set of three junior-high-school EFL textbooks with three books, making twenty-six books in total. These textbooks are the first English textbooks for primary level written by Japanese authors. The textbooks prior to these textbooks were all written by non-Japanese authors. In essence, these are the first authorised English textbooks in Japan (Ozasa & Erigawa, 2004).

As Table 1 shows, the first three sets of textbooks were published between 1900 and 1903. The Mombusho English Readers for Elementary Schools were published a few years later, and the Tsuda English Readers were published in 1931. We set out the hypothesis that the first three sets of the textbooks share similar features, and that some specific features are shared by all seven sets of the textbooks. The study tries to specify the explaining and discriminating factors and to classify them based on the results of the statistical measurements with the hope that the study would bring about the features mentioned in the hypothesis. Although it is not the main objective, we included one set of current English textbooks for comparison purposes.

In order to achieve the above goals, the following four research questions (henceforth RQs) were established:

(1) How similar or different in content are the twenty-three Japanese historical primary-school and middle-grade girls' school EFL textbooks?
(2) What kinds of dimensions explain the homogeneities or differences among the twenty-six textbooks in focus?
(3) How similar or different are the twenty-three Japanese historical EFL textbooks to or from the currently used Japanese junior high school EFL textbooks?
(4) How similar or different are the nineteen Japanese historical primary-school EFL textbooks to or from the EFL textbooks used by the female students in middle-grade schools pre-WWII?

Table 1 lists the textbooks evaluated in this study.

Table 1

	Title	Published year	Number of books
1	*Shogaku Eogo Kaiwa Tokuhon* [English Conversation Readers]	1903	4
2	*Shogaku Eigo Shin Tokuhon* [Primary School New English Readers]	1902	4
3	*Shogaku Eigo Tokuhon* [Primary School English Readers]	1901	4
4	*Shogaku Eigo Tokuhon* [Primary School English Readers]	1900	4
5	*The Mombusho English Readers for Elementary Schools*	1908-1910	3
6	*Tsuda English Readers*	1931	4
7	*Sunshine English Course*	2021	3

Background of the textbooks

1. *Shogaku Eogo Kaiwa Tokuhon [English Conversation Readers], Primer, 1 – 3* (F. Warrington Eastlake, 1903, Shobido, 4 Vols.) (Henceforth *Eastlake Primer, 1 – 3*.)

2. *Shogaku Eigo Shin Tokuhon [Primary School New English Readers], 1 - 4* (Jukkichi Inoue, 1902, Sanseido, 4 Vols.) (Henceforth *Inoue 1 - 4*.)

3. *Shogaku Eigo Tokuhon [Primary School English Readers], 1 - 4* (Naibu Kanda, 1901, Sanseido, 4 Vols.) (Henceforth *Kanda 1 - 4*.)

4. *Shogaku Eigo Tokuhon [Primary School English Readers], 1- 4* (Yasukichi Miyai, 1900, Kinkodo, 4 Vols.) (Henceforth *Miyai 1 - 4*.)

5. *The Mombusho English Readers for Elementary Schools*, 1 – 3 (Ed. Mombusho [Ministry of Education], 1908 - 1910, Joint Sales Office for Government-designated Textbooks, 3 Vols.) (Henceforth *Mombushobook 1 – 3*.) A government-designated EFL textbook for primary school pupils in pre-WWII days. It is generally suggested that its real author was Eiji Asada (1865 – 1914), Ph. D. (Linguistics, Univ. of Chicago).

6. *Tsuda English Readers, 1 – 4* (Ed. Joshi Eigaku Juku [Girls' English College], 1931, Sanseido, 4 Vols.) (Henceforth *Tsuda 1 – 4*.) This textbook was chosen in the present study for comparative purposes to compare the Japanese historical primary-school EFL textbooks with historical girl-school EFL textbooks. Although this textbook originally consisted of five volumes, Book 1 to Book 5, corresponding to the girls' middle-grade-school system, in the present study, volumes 1 to 4 were selected as a representative of EFL textbooks for girls' middle-grade schools pre-WWII in Japan to achieve the goal of the present analysis.

7. *Sunshine English Course*, 1 – 3 (Ed. Yuji Ushiro, Yoichi Nakashima, Chikako Nishigaki & Seiji Fukazawa, 2021, Kairyudo, 3 Vols.) (Henceforth *Sunshine 1 – 3*.) This set was included in the present study to compare the historical textbooks with those used currently in junior high schools (lower-middle-grade schools) in Japan.

Method

The authors employed two types of statistical measurements: correspondence analysis (henceforth CA) and cluster analysis. CA is a data reduction procedure similar to factor analysis. It describes the relationships among nominal variables (in this study, twenty-six books) while simultaneously describing the relationships between the nominal dimensions for each variable. Its results are often displayed in a two-dimensional graphical map since the first and second dimensions have the highest contribution rate. Ishikawa, Maeda, and Yamazaki (2010) described CA as one of the handiest statistical analyses for categorising textual data (p. 245).

In this study, since there are twenty-six books, CA produces twenty-five dimensions, and the authors have focused on the first two dimensions in light of data repression (Ishikawa, Maeda, & Yamazaki p. 245). The two-dimensional graphical map demonstrates how closely or not the textbooks are related to each other. The authors also evaluated the top ten words in the two-dimension word lists to study what the lists possibly suggest in terms of the various factors contributing to creating each dimension.

Cluster analysis creates clusters of words that are statistically close to each other. It resembles CA in this capacity but differs in that whereas CA's graphical map is made of the first two dimensions, cluster analysis measures the entire dimensions' data and creates a graph called a dendrogram.

Results and Discussion

Basic statistics

APPENDIX 2 shows the basic statistics of the present textual CA, specifically the eigenvalues, correlation coefficients, contribution rates, and cumulative contribution rates of the analysis. As the contribution rates indicate, the twenty-six categorical variants (textbooks) were explained as 20.3% by Dim 1, 12.1% by Dim 2, 8.9% by Dim 3, 7.5% by Dim 4, 7% by Dim 5, 6.5% by Dim 6, 6.5% by Dim 7 and 4.2% by Dim 8, the cumulative contribution rate being 71.40% on Dim 8.

Dimension analysis

Table 2 shows the values of the twenty-six textbooks on Dim 1. As demonstrated in the table, on Dim 1, *Kanda-3* ranks first, followed by *Kanda 4* and *Inoue 4*, while *Eastlake Primer* (-2.201) ranks last on the list. To summarise, the order of the twenty-six textbooks was as follows: *Kanda 3 > Kanda 4 > Inoue 4 > Tsuda 3 > Tsuda 4 > Inoue 3 > Sunshine 3 > Tsuda 2 > Miyai 4 > … > Tsuda 1 > Sunshine 1 > Mombushobook 1 > Eastlake 1 > Inoue 1 > Miyai 2 > Kanda 1 > Miyai 1 > Eastlake Primer.*

The difference in value among the twenty-six textbook variants on Dim 1 could best be explained by the category of *difficult (+) vs. easy (-)* texts. As demonstrated in the following examples, in *Kanda 3* (the highest), *Kanda 4* (the second highest), *Inoue 4* (the third highest), and the other high-scoring ones, all texts sounded rather difficult or high in readability. In contrast, in *Eastlake Primer* (the lowest), *Miyai 1* (the second lowest), and the other low-scoring ones, all texts sounded relatively easy or low in readability.

Table 2

	Dim 1		**Dim 1**		**Dim 1**
Kanda 3	1.426	Mombushobook 3	0.511	Sunshine 1	-0.643
Kanda 4	1.417	Sunshine 2	0.51	Mombushobook 1	-0.7
Inoue 4	1.306	Eastlake 3	0.464	Eastlake 1	-0.703
Tsuda 3	1.215	Kanda 2	0.403	Inoue 1	-0.718
Tsuda 4	1.195	Mombushobook 2	0.241	Miyai 2	-0.817
Inoue 3	0.895	Inoue 2	0.221	Kanda 1	-1.767
Sunshine 3	0.717	Eastlake 2	0.135	Miyai 1	-1.782
Tsuda 2	0.643	Miyai 3	-0.021	Eastlake Primer	-2.201
Miyai 4	0.612	Tsuda 1	-0.205		

For example, when the following two pieces taken from the two contrasting textbooks, *Kanda 3* (the most difficult) and *Eastlake Primer* (the easiest), were compared, it is evident that *Kanda 3* uses more difficult vocabulary and grammar in the texts, so its readability is contrastively higher. In contrast, *Eastlake Primer* favours simpler and easier vocabulary and grammar, making its readability lower. The following sample sentences taken out of both *Kanda 3* and *Eastlake Primer* show how extensively the readability level of the two textbooks differs.

Sample sentences:

> I write to tell you that I am going into the country for a month. There is no time to come and see you, as we are obliged to hurry off to catch the train. I will write now and then, and let you know how I am going on; and as soon as I come back, I will call on you. I am, Dear Taro.
> Sincerely yours, Jiro. (*Kanda 3*, Lesson 2 (The most difficult)

> Is that a hen? Yes, it is. Is this a pen? Yes, it is.
> (*Eastlake Primer*, Lesson 2 (The easiest)

For this reason, this dimension was termed difficult (+) vs. easy texts (-), just as in the results of the preceding analyses by Honda et al. (2017), Honda et al. (2018), Honda et al. (2019), Asai et al. (2019) and Asai et al. (2020). This assessment is also supported by the fact that on this axis, there were upper-grade textbooks such as *Kanda 3*, *Kanda 4,* and *Inoue 4* gathered in the top-ranking area. At the same time, lower-grade textbooks such as *Eastlake Primer*, *Miyai 1,* and *Kanda 1* were gathered in the bottom-ranking area.

It has to be noted in this connection that Fukui (2021a, 2021b, 2021c, 2021d) demonstrated, based on his own mathematic analysis of the textual CA results, that the first dimension in the textual CA was constantly related closely to the difficulty or easiness of the English texts analysed (Fukui, 2021a, 2021b, 2021c, 2021d). Interestingly, this mathematical judgment of Fukui empirically matches the present analysis results and those of many preceding textual CAs computed under a similar scheme (Watanabe et al., 2017, Honda et al., 2017, Honda et al., 2018, Asai et al., 2019, Asai et al., 2020).

Table 3

	Dim 2		**Dim 2**		**Dim 2**
Eastlake Primer	1.328	Tsuda 2	0.181	Mombushobook 3	-0.048
Miyai 1	0.968	Tsuda 1	0.18	Miyai 2	-0.06
Kanda 4	0.496	Kanda 1	0.177	Sunshine 3	-0.087
Inoue 4	0.488	Mombushobook 2	0.101	Eastlake 2	-0.129
Kanda 3	0.431	Eastlake 3	0.067	Eastlake 1	-0.15
Inoue 3	0.348	Miyai 4	0.04	Sunshine 2	-0.359
Tsuda 4	0.341	Kanda 2	0.014	Mombushobook 1	-0.403
Inoue 1	0.279	Inoue 2	0.005	Sunshine 1	-4.786
Tsuda 3	0.223	Miyai 3	-0.024		

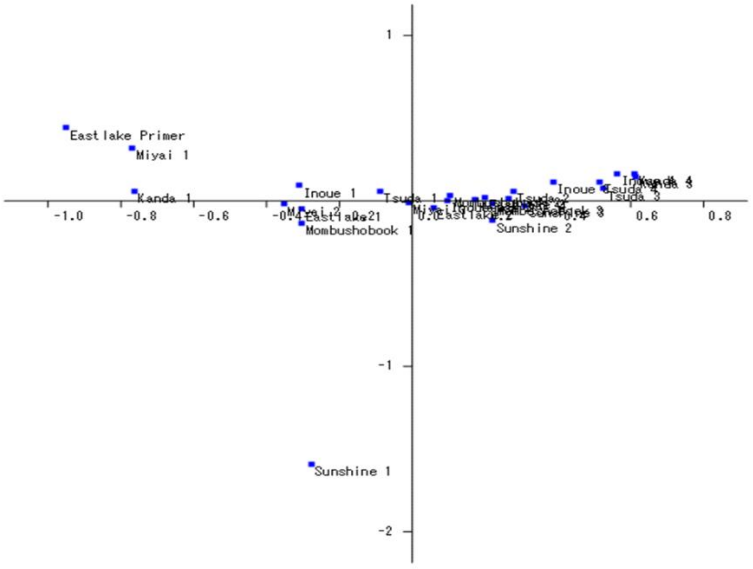
On Dim 2, as it is evident in Table 3, the value was the highest for *Eastlake Primer* (1.328) and the second highest for *Miyai 1* (0.968), while it was the lowest for *Sunshine 1* (-4.786) and the second lowest for *Mombushobook 1* (-0.403), *Inoue 2* being around the zero point (0.005). In decreasing order, the twenty-six textbooks were *Eastlake Primer* > *Miyai 1* > *Kanda 4* > *Inoue 4* > *Kanda 3* > *Inoue 3* > *Tsuda 4* > *Inoue 1* > *Tsuda 3* > … > *Miyai 3* > *Mombushobook 3* > *Miyai 2* > *Sunshine 3* > *Eastlake 2* > *Eastlake 1* > *Sunshine 2* > *Mombushobook 1* > *Sunshine 1*.

The differences between the twenty-six textbook variants on Dim 2 can best be explained by the category of *passage-based (+) vs. dialogue-based (-)* discourse. *Eastlake Primer* (the highest), *Kanda 4* (the third highest), *Inoue 4* (the fourth highest), and the other high-scoring ones all favouring expository passages frequently throughout their texts, without exception, while *Sunshine 1* and *Mombushobook 1*, the two most low-scoring ones, prefer and adopt dialogue-based discourses.

It is worth mentioning that concerning the definition of "passage-based" on Dim 2. Closely examined, the texts of *Eastlake Primer* and *Miyai 1*, the two highest-scoring ones, could not be categorised as "passage-based" in the linguistic sense of the word, since they are not expository passages like those of *Kanda 4*, *Inoue 4*. Arguably, they can be grouped into the passage group as a pseudo-passage in the sense that the texts are not treated as a dialogue between two interlocutors involved in a situation. Instead, they are treated like a monologue of an instructor, sounding like a "Teacher Talk." For this reason, they could and should be categorised as a kind of expository passage or a pseudo-passage, not as a conversation or a dialogue in the true sense of the word. It is also important to note that these textbooks do not adopt a typical dialogue format but a typical passage form or monologue format.

Figure 1 is the graphic representation of the twenty-six textbooks using the bipolar CA method in which the X-axis (horizontal axis) stands for the features of Dim 1, i.e., *difficult (+) vs. easy (-)* texts, covering 20.3% of all features analysed. The Y-axis (vertical axis) shows the features of Dim 2, i.e., *artificial-sounding (+) vs. natural-sounding* discourse (-), covering 12.1%. The bipolar coordinate representation visualises 32.4% of the spatial inter-relationships identified among the twenty-six categorical variants in focus.

Figure 1



This bipolar coordinate CA visualisation reveals several interesting facts concerning the features of each of the twenty-six textbook variants and their mutual inter-relationships. First, it is evident in Figure 1 that there were a great variety of differences observed in terms of difficulty or easiness of the texts of Dim 1 (X-axis, horizontal axis). Meanwhile, there were very few differences observed in terms of the naturalness or artificialness of the texts of Dim 2 (Y-axis, vertical axis), except for three textbooks, *Sunshine 1*, *Eastlake Primer,* and *Miyai 1*. In other words, the feature of difficulty or easiness proved to be a strong differentiator of the Japanese historical EFL texts, while the feature of naturalness or artificialness of the texts proved to be a relatively weaker differentiator.

On the basis of these findings, the twenty-six textbooks could be organised into three groups. First, there were a large number of textbooks (23 textbooks) clustered around the neutral area in terms of naturalness (the zero-point) on the Y-axis (vertical axis), as well as scattered around a wide area of *difficulty or easiness* from +0.8 to -1.0 on the X-axis (horizontal axis) (Cluster A). In decreasing order, they were as follows:

Kanda 3, Kanda 4, Inoue 4, Tsuda 3, Tsuda 4, Inoue 3, Sunshine 3, Tsuda 2, Miyai 4, Mombushobook 3, Sunshine 2, Eastlake 3, Kanda 2, Mombushobook 2, Inoue 2, Eastlake 2, Miyai 3, Tsuda 1, Mombushobook 1, Eastlake 1, Inoue 1, Miyai 2, Kanda 1

The results of the bipolar analysis seem to suggest that the textbooks in focus share a high degree of homogeneity in terms of the difficulty and naturalness of the texts, except for three, i.e., *Eastlake Primer*, *Miyai 1,* and a currently used textbook, *Sunshine 1*. They also seem to suggest that among the twenty-six textbooks in focus, almost all textbooks share a high degree of homogeneity in terms of the difficulty and naturalness of the texts and that this text feature was shared not only by most of the historical primary school EFL textbooks but also by the currently used textbooks, i.e. *Sunshine 2* and *Sunshine 3*.

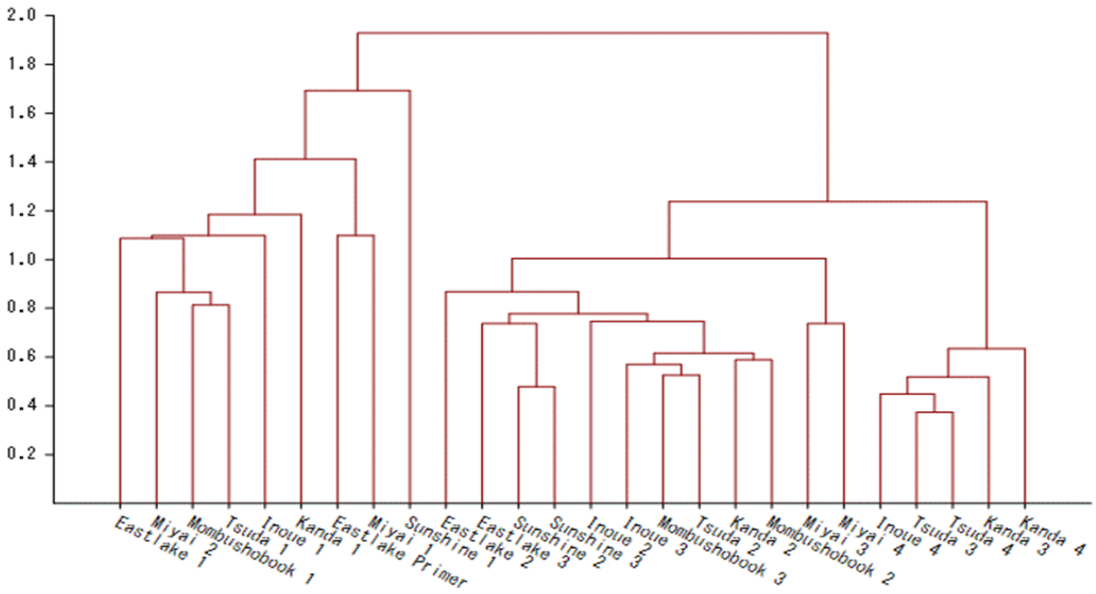
Second, there were two textbooks, *Eastlake Primer* and *Miayi 1*, that were detached from the majority group (Group A) around the area characterised by *artificial-sounding* texts (plus on the *y*-axis) and *easy* texts (minus on the *x*-axis) (Cluster B). These textbooks, one authored by an English native speaker (Eastlake, USA) and the other by a Japanese non-native speaker (Miyai, Japanese), can be regarded as pioneers of a new innovative EFL textbook style that values artificial-sounding, repetitive, and drill-based materials more than natural-sounding, passage- or dialogue-based reader materials. It is interesting to note in this respect that this innovative, drill-based new language teaching style was introduced and developed in a starter textbook for freshmen by two language teachers with completely different backgrounds, one being an American (applied) linguist with a broad international educational background and the other being a graduate of (Tokyo) Imperial University as an English literature major.

Finally, there was only one textbook, isolated from the other two groups, *Sunshine 1*, at the point characterised by *natural-sounding* texts and *neutral* texts in terms of difficulty (Cluster C). This textbook, which is currently being used in lower secondary education (junior high schools) in Japan, was intentionally selected for comparative purposes in the present CA project as a representative of current EFL textbooks. For this reason, it is natural in the sense that it proved to be different from the other two groups, Cluster A and Cluster B.

Cluster Analysis

While the bipolar CA map based on the two major axis or dimensions can graphically display the predominant features of the twenty-six textbooks, it cannot represent all features detected in the present CA analysis. As the cumulative contribution rates indicate in Table 1, the bipolar map only accounts for 32.4% of the whole features, leaving the rest (67.6%) unexplained. To make up for this weakness, another attempt was made to account for all features of the textbooks using a dendrogram-based cluster analysis in which the distances of the twenty-six textbooks were computed based on their eigenvalues in Table 1 (Figure 2). (For further explanation of dendrogram, refer to Asai et al., 2019, p. 42.) In order to check the groups formed in the dendrogram, in which the X-axis (horizontal axis) stands for each textbook in focus and the Y-axis (vertical axis) the distance of textbooks, the whole graph was cut horizontally at the value of 1.6 on the Y-axis., which yielded two major groups, Group A and Group B, and one additional textbook.

Figure 2



Group A, which consisted of the following seventeen textbooks, can be characterised as difficult or relatively high in readability.

> *Kanda 4, Kanda 3, Tsuda 4, Tsuda 3, Inoue 4, Miyai 4, Miyai 3, Mombushobook 2, Kanda 2, Tsuda 2, Mombushobook 3, Inoue 3, Inoue 2, Sunshine 3, Sunshine 2, Eastlake 3, Eastlake 2*

Group B, which consisted of the following eight textbooks, can be characterised, in contrast, as relatively easy or rather low in readability.

> *Eastlake 1, Miyai 2, Mombushobook 1, Tsuda 1, Inoue 1, Kanda 1, Eastlake Primer, Miyai 1*

Finally, there was only one textbook left, identified as a heterogeneous textbook that was not included in either Group A or Group B, *Sunshine 1*. A point must be made concerning the results of the two types of classification, i.e., a two-dimension-coordinates-based classification (Figure 1) and a dendrogram-based classification (Figure 2), in connection with the similarities and differences between the historical textbooks and current ones. As depicted in the above two analyses in Figure 1 and Figure 2, only one currently-used textbook, *Sunshine 1*, proved to be isolated from the rest of the two textbook groups, Cluster A and Cluster B in Figure 1, and Group A and Group B in Figure 2. In contrast, the other two currently-used textbooks, *Sunshine 2* and *Sunshine 3,* proved to be located in the large major group (Cluster A in Figure 1 and Group A in Figure 2) together with most of the historical textbooks used in pre-WWII days.

These facts imply that among the three currently-used textbooks, only *Sunshine 1* was different from the pre-war textbooks. Meanwhile, *Sunshine 2* and *3*, Book 2, and Book 3 of the same textbook set were similar to most of the pre-war ones. The differentiating criterion (feature) of these textbooks was *drill-based, artificial-sounding* vs. *non-drill-based, natural sounding*. The results suggest that conducting a more detailed qualitative analysis of *Sunshine 1 is necessary*, specifically from the viewpoint of natural-sounding vs. artificial-sounding texts.

Answers to the research questions

As the conclusion to this study on textual CA of the Japanese historical primary-school EFL textbooks, the research questions were answered as follows, based on the above interpretation of the analysis results.

(1) How similar or different in content are the twenty-three Japanese historical primary-school and middle-grade school girls' EFL textbooks?

The present textual CA proved capable of quantitatively specifying the homogeneities and heterogeneities of not only the twenty-three textbooks but also the twenty-six textbooks in focus. According to the bipolar coordinate analysis, the twenty-six textbooks were grouped into three groups: Cluster A (a large group comprised of twenty-three textbooks, located around the neutral area in terms of naturalness and around a wide area of *difficulty or easiness* from +0.8 to -1.0 on X-axis), Cluster B (comprised of two textbooks, detached from Cluster A, located around the area characterised by *artificial-sounding* texts and *easy* texts), and Cluster C (only one textbook, located at the point characterised by *natural-sounding* texts and *neutral* texts in terms of difficulty).

(2) What kinds of dimension explain the homogeneities or differences among the twenty-six textbooks in focus?

It was proven that the dimension-explaining factors were (1) *difficult or easy (-)* texts (Dim 1), (2) *passage-based or dialogue-based* discourse (Dim 2), (3) *artificial- or natural-sounding* texts (Dim 3), (4) *non-teacher-dominance or teacher-dominance* (Dim 4), (5) *loosely-controlled or strictly-controlled* texts (Dim 5), (6) *concise or redundant* texts (Dim 6), (7) *connected or disconnected* contents (Dim 7) and (8) *theme-oriented or grammar-oriented* texts (Dim 8).

(3) How similar or different are the twenty-three Japanese historical EFL textbooks to or from the currently used Japanese junior high school EFL textbooks?

Although *Sunshine 2* and *Sunshine 3* proved to be similar to the majority group of the historical textbooks, *Sunshine 1* proved to be different from the historical ones, according to both the bipolar coordinate analysis and cluster analysis.

(4) How similar or different are the nineteen Japanese historical primary-school EFL textbooks to or from the EFL textbooks used by middle-grade students in middle-grade schools pre-WWII?

The nineteen primary-school textbooks proved to be similar to the girls' middle-grade textbooks. Furthermore, the girls' textbooks, *Tsuda 1, 2, 3,* and *4*, proved to be similar to the majority of historical primary-school textbooks in both the bipolar coordinate analysis and dendrogram analysis.

Conclusion, recommendations, limitations, and future research

As in the previous related studies such as Honda et al. (2017), Ozasa et al. (2018), Honda et al. (2018), Asai et al. (2019), Honda et al. (2019), Asai et al. (2020), etc., this study has demonstrated that textual CA managed to discriminate between the twenty-six Japanese EFL textbooks (historical primary-school, historical girls' middle-grade-school EFL textbooks, and their current counterparts) and identify the eight categories or factors that explain each of their dimensions.

The following are recommendations based on the outcome of this study:

1. When qualitatively analysing, classifying, and evaluating English (EFL) textbooks or teaching materials, EFL teachers can make good use of the two viewpoints proposed in the present CA, (1) *difficult or easy* texts, (2) *passage-based or dialogue-based* discourse.

2. Educators and EFL teachers should focus on the features of *difficult or easy* texts and *passage-based or dialogue-based* discourse, two major categories specified in the present textual CA,

since they are the most powerful factors that discriminate the characteristic features of the Japanese English (EFL) textbooks. Specifically, the axis of *difficult or easy* texts can be a powerful discriminator of Japanese EFL textbooks, both historical and current.

These viewpoints, specifically the categories of difficulty or easiness and passage or dialogue, can help EFL teachers grasp the whole picture of the textbooks in focus (Honda et al., 2017; Honda et al., 2018; Asai et al., 2019; Honda et al., 2019; Asai et al., 2020). Concerning the limitations of the present CA and future research, the following should be taken into consideration. It has to be noted that the results of the quantitative CA-based analysis of the twenty-three historical EFL textbooks and three current EFL ones should be re-examined, detailing a qualitative analysis of the same samples from the viewpoint of the eight categories or factors identified in the present CA. Generally, a qualitative confirmation of the results of a quantitative analysis (or vice versa) is an essential process in academia.

Sunshine 1 deserves a detailed qualitative analysis regarding the present results. As summarised earlier in the conclusion of the bipolar and cluster analyses, the current Book 1 textbook, *Sunshine 1*, proved to be isolated from the rest of the two textbook groups. In contrast, the other two current textbooks, *Sunshine 2* and *Sunshine 3,* proved to be located in the same group together with most of the historical textbooks. For this reason, it is essential to engage in a qualitative follow-up analysis of *Sunshine 1*. This issue should be the main focal point of the next series of studies.

It is also important to note that the study is not comprehensive research in any respect. The authors acknowledge that further studies on the subject are necessary to make the findings of the current study conclusive. Qualitative studies which include the background of each set of the textbooks, their target learners' pre-knowledge of English, and their teaching methods should be the next phase of study.

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Appendix

Basic CA Data, 26 Textbooks

Dimension	**Dim 1**	**Dim 2**	**Dim 3**	**Dim 4**	**Dim 5**
Eigenvalue	0.186	0.111	0.082	0.069	0.064
Correlation	0.432	0.333	0.286	0.263	0.253
Contribution rate	0.203	0.121	0.089	0.075	0.07
Cumulative contribution rate	0.203	0.324	0.413	0.488	0.558
Dimension	**Dim 6**	**Dim 7**	**Dim 8**	**Dim 9**	**Dim 10**
Eigenvalue	0.06	0.044	0.038	0.034	0.031
Correlation	0.245	0.21	0.196	0.186	0.175
Contribution rate	0.065	0.048	0.042	0.038	0.033
Cumulative contribution rate	0.624	0.672	0.714	0.751	0.784
Dimension	**Dim 11**	**Dim 12**	**Dim 13**	**Dim 14**	**Dim 15**
Eigenvalue	0.027	0.025	0.023	0.021	0.018
Correlation	0.165	0.159	0.151	0.143	0.133

Contribution rate	0.029	0.027	0.025	0.022	0.019
Cumulative contribution rate	0.814	0.841	0.866	0.889	0.908
Dimension	**Dim 16**	**Dim 17**	**Dim 18**	**Dim 19**	**Dim 20**
Eigenvalue	0.015	0.012	0.011	0.01	0.009
Correlation	0.124	0.11	0.106	0.099	0.093
Contribution rate	0.017	0.013	0.012	0.011	0.009
Cumulative contribution rate	0.925	0.938	0.95	0.961	0.97
Dimension	**Dim 21**	**Dim 22**	**Dim 23**	**Dim 24**	**Dim 25**
Eigenvalue	0.007	0.007	0.006	0.004	0.003
Correlation	0.084	0.081	0.078	0.066	0.057
Contribution rate	0.008	0.007	0.007	0.005	0.004
Cumulative contribution rate	0.978	0.985	0.992	0.996	1