

**Information Accessibility for Kanji:
A Pilot Project for Academic Translation and Learning**

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Abstract

This essay considers difference among transmission means and showed that braille users might have trouble accessing Japanese texts containing abstract terms, usually containing many Kanji, a unique writing system in Japan. Therefore, we considered characteristics of Kanji for learning and making information more accessible.

Keywords: Japanese Kanji, Information Accessibility, Reading Literacy

1-1. Characteristics of Japanese writing

Information accessibility has long been discussed in Japan. However, there are few studies that consider the difficulties related to Kanji, a writing system in Japan. The Japanese language has three separate writing systems: Hiragana, Katakana, and Kanji. The Hiragana and Katakana versions are phonograms that correspond to each syllable in Japanese. Kanji is an ideogram where each character has its own meaning. With Kanji, writers can choose most suitable Kanji character. Kanji that is used in texts has a vital role in determining the direction of the entire text.

This is reflected in the ways in which the word “disability” may be written. For example, "disability" is "shogai" in Japanese, and it has various written forms: 障害, しょう害, 障碍, and しょうがい, all meaning "disability." There are various patterns for writing the word "shogai" because each writer interprets the word in a different way.

The way in which “disability” is written can also dialogue with the framework through which it is understood. The medical model of disability views disability as a defect or pathology and places the responsibility of overcoming disability on individuals through medical intervention or sheer willpower. On the other hand, the socio-political model of disability views disability as a part of diversity and believes that society has a responsibility to help disabled people by reducing physical and structural barriers. Written in Kanji, "shogai" means obstruction or hindrance. As such, some people believe that writing it in Kanji is careless, especially when considering these models. Therefore, some believe writing the word in Hiragana is better because using expressions such as "obstruct," or "hindrance" can be directly avoided.

On the other hand, some people choose to use Kanji for the word because they think it

accurately reflects that there are barriers, not solely for people with disabilities, but for society in general. Such people believe that they should highlight the existence of such barriers in society by using Kanji. Formal discussions regarding the more suitable way of writing "shogai" were held in the Japanese cabinet (Council to Promote Reform of the System for Persons with Disabilities, 2010). Ultimately, the choice of writing depends on the writer. The different ways of writing "shogai" are not merely a superficial preference; instead it may reflect the writer's perspective on disability.

1-2. Pitfalls of information accessibility in Japan

With this in mind, these distinctions in Japanese writing become especially important to understand in academic contexts. In higher educational institutions, students must read academic texts carefully for deeper understanding and for critical analysis. Universities deal with Japanese language texts containing many Kanji characters that express abstract concepts. Students with disabilities handle texts in a suitable format, e.g., in braille or speech format for students with visual disabilities, and those with hearing disabilities may use notetaking or interpret text from sign language services (Jasso, 2019). However, based on the discussion mentioned above, unique Japanese characteristics regarding Kanji use can create difficulties for students with disabilities.

For example, Japanese braille does not distinguish between the three Japanese writing systems of Kanji, Hiragana, and Katakana. Therefore, braille users sometimes refer to translators' annotations. The speech format also does not display how sentences are written, and the listener cannot distinguish between the three Japanese writing systems. Generally, braille users and listeners of the speech format interpret homonyms based precisely on the context. However, when the text contains homonyms with the same sound and meaning but a slightly different nuance, they face difficulties in understanding, and this sometimes can even

lead to mistakes and misinterpretation. Moreover, although there are annotations, some points affecting the writing style in academic texts are overlooked in annotations because they require knowledge of academic details.

With this in mind, Japanese sign language (JSL) is becoming the choice for students with hearing disabilities for information accessibility (Sasaki, 2019). However, it is a unique language, and is very different from the Japanese language. The main features of sign language are liquidity and flexibility; sign language users express themselves appropriately through the community group, generations, and localities (Sakata et al., 2008). These characteristics are inherent in oral communication, but could probably become ambiguous for expressing a concept; therefore, as sign language is unique for people with hearing disabilities, precise information accessibility is an important concern. Sign language tends to express something concretely by performing the process to convey the meaning. However, academic concepts are often abstract, and students learn the meaning of each interpretation; that is, academic concepts must have space for discussion because there are various ways of interpreting and understanding them.

2. Empirical study for assessing qualitative differences in transmission

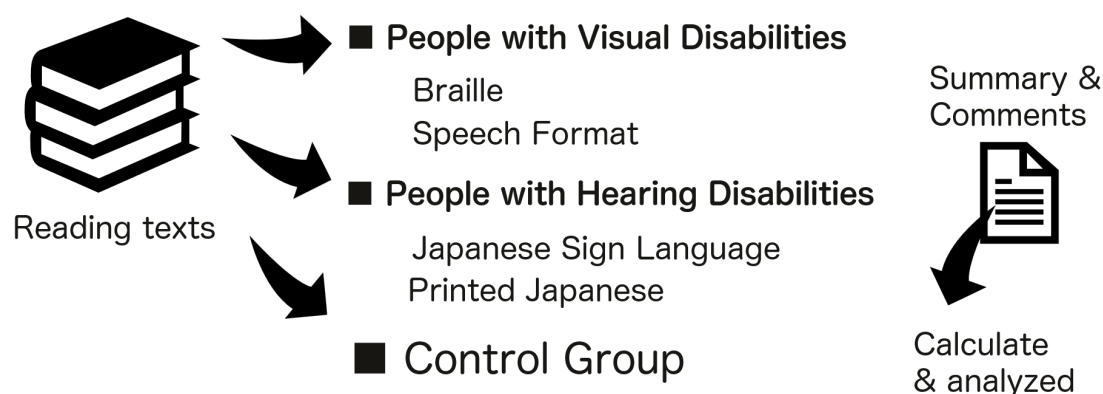
2-1. The RARA Project

We focused on the qualitative differences in transmission through various formats—braille, speech, and sign language in providing information accessibility that require modifying text into suitable formats for students with disabilities in universities (Matsuzaki, Hamamatsu & Shibata, 2020). The RARA was designed as a longitudinal postal study, and the target participants comprised of persons with visual and hearing disabilities, and a control

group. The RARA project prepared six reading texts containing three texts each of basic interpersonal communicative skills (BICS) and cognitive academic language proficiency (CALP). The six reading texts fall into these two categories, which are associated with the challenges of acquiring second language skills. Cummins (1984) explained the difference between CALP and BICS using two terms: cognitive and context. He argued that learners need a certain type of knowledge to read and understand complex texts. He asserted that BICS is “context-embedded” and “cognitively undemanding” (Cummins, 1984). Students’ literacy evolves from BICS to CALP as they move through school, and students in universities often deal with texts requiring CALP skills.

Figure 1

The Flowchart of the Process of RARA Project



The RARA project selected the following texts containing CALP: first, a few paragraphs from “Plastic Words: The tyranny of a Modular Language,” by Uwe Pörksen, a German linguist, and translated in 2007; second, text from “Big data-- Citizenship-Rated Society: Independent of the People with Disabilities and for our ‘True Stories,’” by Kuniomi Shibata, a Japanese researcher specializes in assistive technology, especially focusing on

information technology for persons with disabilities; and the final text is “On the Government of the Living: Lectures at the College De France 1979–1980” by Michel Foucault.

Similarly, the following are three texts for BICS: first, “Heritage” by Michio Hoshino in 2002, a wildlife and nature photographer and essayist; his central active field was in Alaska, USA. Second, “A trip to Joshu Yujuku Onsen,” by Tsuge Yoshiharu, an essayist and cartoonist. And thirdly, a prologue section of the book titled “Memorizing Body” written by Asa Ito, a researcher specializing in aesthetics with a particular focus on the aesthetic experiences of people with disabilities. These are texts for university discussion seminars in universities.

Each text was distributed: the braille format was sent by post, the speech format was made available on YouTube or in MP3 format, and the sign language format was made available on YouTube. The braille format was translated by an experienced translator from a braille translating circle. After receiving the texts, the respondents summarized and commented on each text before returning them to the researchers. Based on the grades score for each response, we calculated and analyzed their final scores. First, we compared the primary analysis of RARA with the results of text from BICS and CALP for the transmission of each format of information. Generally, the score for BICS is presumed to be higher than that of CALP, regardless of the transmission format. Next, we performed content analysis based on respondents’ summaries and comments.

2-2. Results of the RARA Project

(1) The case of participants with visual disabilities: braille and speech formats

The RARA project showed that braille users tend to have trouble reading when

accessing text containing elements of CALP (Matsuzaki & Shibata, 2022). In fact, braille users read and interpreted the content of BICS better than the control group, although their tendency to understand CALP was lower than the control group. Such outcomes mean that braille users may have difficulty describing the CALP content, and we assumed that Kanji influenced reading accessibility for some people with disabilities. This study analyzes and discusses comments from respondents with visual disabilities who read braille or texts in speech format.

The comments from respondents with visual disabilities showed the difficulty level in reading, especially when they encountered synonyms and unfamiliar words. For example, Foucault's use of the word "truth" is awkward because when the text is translated into Japanese, it is expressed as "真," pronounced as "shin," which can make readers imagine some other words that have different meanings but the same pronunciation. Words containing "shin" have various Kanji forms; "神" meaning "god," and 心 meaning "heart," and "芯" meaning "core." Each "shin" word is a common word used in daily life. However, even if the general word is written without Kanji, it becomes difficult to understand the text. People with visual disabilities interpret words through their context; however, this case written by Foucault is complex because every word containing "shin" is inferred as natural from the context, and subsequently it is difficult to judge which is the most suitable.

Similarly, unfamiliar words may also pose difficulty. Such unfamiliar words may include "Zhima Credit" or "Sesame Credit," a private credit scoring and loyalty program system developed in China. Another case of a strange word is "alethourges," an abstract concept, which means "manifestation of the truth," as explained by Michael Foucault. Most participants, including people with visual disabilities, were unfamiliar with such words. However, participants with visual disabilities found such words difficult to read. At the same

time, these words are not essential for creating summaries because they are not at the core of each text; therefore, participants in the control group seemed to be able to read the text without understanding these particular words, as these words would not interfere with their reading.

The difference in responses to unfamiliar words between the braille and speech format group and the control group seems to be derived from transmission. For readers, visibility is a critical feature of written text. Walter Ong (1982–1991) explains how the transition from orality to literacy restructures culture and human consciousness, and written text enables readers to review previous sentences quickly.

The braille format is tactile printing, but the complexity of expressing Japanese braille requires more space for articulating sentences. In addition, braille does not distinguish between writing systems in Japanese and does not have any abbreviations. Therefore, to express Japanese text in braille much more paper is required. Moreover, braille users' tactile and perceptual abilities and skills are critical to understanding the braille sentences. Such characteristics of braille make readers with visual disabilities take a long time in picking up and reviewing some specific words in previous sentences. The speech format is also difficult to review because it is not visible. As a result, participants reading the speech format must listen repeatedly to the text. Furthermore, when the text contains CAPS, it is more abstract, and the logic is difficult to grasp. However, participants with visual disabilities must have time for reviewing, which interrupts their smooth reading and grasp of logic.

For solving these difficulties, participants with visual disabilities pointed out that texts need many more annotations in Kanji. The braille format used in this project was prepared using the experience of a braille translator, who mentioned the importance of annotations by translators as the method to read difficult text. However, the translator also

mentioned the risk factors involved in frequent annotations, specifically to comprehend complex reading. This study suggests that more information about Kanji is required when the text tends to contain a greater number of CALP factors.

(2) The case of participants with hearing disabilities: sign language format

Since August 2021, the RARA project has successfully recruited participants with hearing disabilities; so far, there have been four applications, but the responses are yet to be returned. Although most people with hearing disabilities are assumed to have the ability to read Japanese written text, a few scholars mentioned the importance of information accessibility in translating Japanese into JSL for people with hearing disabilities (Hatano, 2019). Indeed, some practice has been reported about integrating descriptions of exhibits and other museum services into sign language to facilitate information accessibility for people with hearing disabilities (Egusa et al., 2015).

We considered the outcomes observed in preparing the sign language format, which shows some characteristics derived from it. The RARA project prepared each video translated into JSL, which is a language system that can express situations explicitly. For example, the verb “to eat” is expressed more concretely in JSL than in Japanese. This is because JSL describes how to eat something (e.g., with chopsticks, fingers, a spoon). In addition, JSL should include more detailed descriptions of the action because it needs details to express information concretely, and this is the unique aspect of JSL (Sakata, Yano & Yoneyama, 2008).

However, this characteristic was the factor underlying certain difficulties in some word translations. "Dialectical tension" in the text of “Plastic Words: The tyranny of a

Modular Language” by Uwe Pörksen is a typical example of difficulties, and it is too abstract to explain concretely. A deaf JSL translator was puzzled about how to express it.

Furthermore, texts translated into JSL must guarantee space to discuss essential topics for readers' understanding. This implies that the translator must keep the word abstract to avoid inferring from the translator's interpretation. Finally, the translator decided to use Kanji for translating into JSL. This translation by referring to Kanji has been observed in the works of other translators in this project. Translating by referring to Kanji is the best way to express the meaning of each Kanji. As the Kanji writing system is an ideogram, an abstract word is informed by expressing which Kanji character is used in the word, instead of explaining it based on translator interpretation.

2-3. A summary of the RARA Project

The RARA project, focusing on possible differences in the comprehensibility of information transmission among braille, speech format, and sign language, showed that braille users face difficulty in reading when accessing texts containing elements of CALP. Braille users read and interpreted the content of BICS better than the control group, although their understanding of CALP was lower than the control group. This outcome showed that it may be difficult to describe CALP content in braille, and we assume that Kanji influenced the reading accessibility of some people with disabilities.

Kanji cannot be used to express braille text and the speech format; therefore, people with visual disabilities have to spend more time interpreting the meaning of words, homophones, or unknown words. Although annotation is a powerful tool for understanding text, it requires readers to know Kanji.

In the sign language format, translators must focus on making nonbiased translation, especially texts used in an academic context. This is because students can build their understanding by considering the meaning of words and concepts. For many translators, referring to Kanji is the way of translating abstract words and concepts. This implies that users of sign language also need to know Kanji.

3. Discussion and conclusion

3-1. The importance of learning Kanji

Kanji is essential for information accessibility in Japan, especially in higher educational institutions, as students must understand the specific variations in Kanji use. Furthermore, when people with disabilities express their opinion, they must have knowledge of Kanji. With the development of information and communication technology, people with or without disabilities can use various tools for expressing their opinions. For example, people with visual disabilities can construct Japanese sentences containing some writing systems through voice recognition software and a computer keyboard that suits their physical condition. Even if people with visual disabilities do not see Kanji, they must recognize Kanji characters that are suitable for them to communicate. Likewise, people with hearing disabilities must also understand Kanji.

As a rich heritage, Japanese literature contains Kanji characters, including some difficult ones, and readers must read the texts patiently to benefit from them. Learning Kanji can help ensure access to learning by reading. Authors and writers choose their preferred writing style for a better expression, and readers imagine and consider authors' and writers'

intentions in writing. We should not deprive readers of such a process.

3-2. Kanji learning for students with disabilities

Ancient Japan did not have its own writing system. Kanji is a unique writing system that was imported from China more than 3300 years ago, and after reaching Japan about 1600 years ago, it has given rise to various pronunciations. A fascinating feature of Kanji is that some letters are created by combining basic Kanji ideograms. Primary school children learn simple and basic Kanji in their early grades, most of which is driven by nature. Generally, many Kanji letters contain other simple basic Kanji, and each element influences both meaning and pronunciation.

However, Kanji learning has not considered the background or origin of Kanji. As part of the curriculum, Japanese elementary and junior high school students learn more than 2000 Kanji characters. They usually focus on efficiently memorizing forms and orders rather than understanding the background of Kanji (Michimura, 2010.) Students with visual disabilities learn simple primary Kanji forms in school by touching tactile objects. The tactile objects have limited variations, and students learn the patterns of Kanji idioms by repeatedly reading sentences. This style is not a match for people with disabilities as some dislike Kanji because it is complex and burdensome. For students with disabilities, Kanji learning may pose some limitations. For example, students with hearing disabilities may struggle to grasp the pronunciation of Kanji, and often cannot use a dictionary for referring to the various meanings.

Moreover, the COVID-19 pandemic has exaggerated the pattern of memorizing Kanji because learning only involved practice and submitting it as homework assignments. As a result, most children missed the opportunity to learn and understand stories about the

origin of Kanji and ended up memorizing Kanji to score well on quizzes. Furthermore, this has led to some children, with or without disabilities, to dislike Kanji learning.

3-3. Future work through Kanji learning

The current practice of Kanji learning focuses on the origin of Kanji formation. The creation of Kanji may be compared to cooking. As in cooking, where flavor and texture are both essential for relishing the food, in Kanji learning, flavor refers to the meaning of Kanji, and texture refers to its pronunciation; therefore, both are required in the learning process. Moreover, as it is crucial in cooking to learn the essentials of the presentation of food, it is important to place individual elements in a particular space and order in Kanji, as it denotes a form of Kanji.

Memorizing or learning by rote is based on the concept that children must learn to read and write Kanji; however, memorization does not refer to why or how Kanji is formed or pronounced in specific ways. Understanding the background and origin of Kanji provides a significant advantage in grasping more detailed information. “Kanji cooking” can be an alternative way to learning Kanji, possibly by motivating learners.

Our Kanji learning project is attempting to create another tangible learning alternative through a 3D Kanji block puzzle for more enjoyable “Kanji cooking.” In addition, we are also planning a few Kanji learning programs for children with disabilities and expect to launch them shortly. In the Kanji learning programs, we plan to conduct observations and interviews with children, thereby contributing to better information accessibility for both elementary and junior school children and university students.

References


- Council to Promote Reform of the System for Persons with Disabilities (2010). “*Shōgai*” no *hyōki ni kansuru kentō kekka ni tsuite* – [Result about consideration of notation of “disability”]. Cabinet office.
- Egusa, R., Hoshina, H., Namatame, M., Ogawa Y., Kobayashi, M., Terano, T., & Inagaki, S. (2015). National survey on the information accessibility of the exhibitions in science museums. *Japan Society for Science Education Research Report*, 29(6), 43–46.
https://doi.org/10.14935/jsrer.29.6_43
- Foucault, M., Hirose, K., trans. (2015). *Seija tachi no Tochi College De France Kogi 1979-1980 Nendo* – [On the Government of the Living: Lectures at the College De France 1979-1980] Tokyo: Chikuma-Shobo, 11-12. (Graham Burchell, trans., 2016.) Picador.
- Hatano, M. (Chair). (2019 Feb 2). *Gakujutsu shuppan no accessibility wo kangaeru -shoseki no shuwa honyaku no jissenn kara-* [Considering the Accessibility of Academic Publishing: From the Practice of Sign Language Translation of Books] Symposium conducted at the meeting of Faculty of Library Information and Media Science, University of Tsukuba.
- Hoshino, M. (2002). *Nagai Tabi no Tojō* - [On the way of a long journey]. Bungei shun-ju.
- Japanese Student Services Organization. (2019). *The Handbook of Reasonable Accommodation*. The Earth Kyoikusha.
- Matsuzaki, Y., Hamamatsu, W. & Shibata, K. (2020). *Reasonable accommodation and information accessibility by various formats: The difference between braille, sign*

language, and speech format. 2020 Pacific Rim International Conference on Disability & Diversity Proceedings.

- Matsuzaki, Y. & Shibata, K. (2022). Reasonable accommodation and information accessibility for students with disabilities in Japanese higher education. In *Diversity and Inclusion in Japan* (pp. 119-135). Routledge.
- Michimura, S. (2010). *Kuchi de iereba Kanji wa Kakeru! Mōgakkō kara hassin shita Kanji gakushū-hō* - [You can write Kanji if you know how to write it! Kanji learning method from a blind school]. Shogaku-kan.
- Ito, A. (2019). *Prologue: Kyukyoku no local rule* – [Prologue: Extreme local rule], *Kioku suru Karada* – [A Body to Memorize]. Shunju-sya.
- Porksen, U. (2007). *Plastic words: The language of an international dictatorship* (Kasuya, K Trans: Tokyo: Fuziwara Shoten.). Stuttgart: Klett-Cotta (original work published 1988).
- Sakata, K., Yano, K., Yoneyama, A. (2008). *Odoroki no shuwa “Pa” “Po” honyaku*— [Fantastic sign language “Pa” “Po” translation]. Seiko-sya.
- Shibata, K. (2019). *Big Data Citizenship-Rated Society: Shogai-sha no jiritsu to watashitachi no “Shinjitsu no monogatari”* - [Big data-- Citizenship-Rated Society: independent of the people with disabilities and for our "true stories", Gendai shiso – [La revue de la pensée d'aujourd'hui] 47(6), 76-77.
- Sasaki, G. (Chair). (2019 July 28). *Kōtō kyōiku kikan ni okeru shuwa tsūyaku shien-shuwa tsūyaku ga motome rareru riyū to jitsugen ni muketa kadai* – [Support for Sign Language Interpretation in Higher Education Institution: Reasons for Sign Language Interpretation and Issues for Realization] Symposium conducted at the meeting of

Platform Higher Education and Disability, Research Center for Advanced Science and Technology the University of Tokyo.

Tsuge, Y. (1995). *Joshu Yujuku Onsen no Tabi* – [A Trip to Joshu Yujuku Onsen]. Shincho bunko.

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