Utilizing Visual Materials for Introducing the Languages of the World and the World of Language

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1. Introduction: Exhibiting Language and Languages

Language and languages form an integral part of human life. In this sense, it is fitting that the National Museum of Ethnology in Osaka, Japan (hereafter "Minpaku"), which focuses on human culture and society, has housed and maintained language exhibits since its establishment in 1977. Languages, however, unlike objects exhibited in the other galleries of Minpaku, consist of sequences of signals and do not have shapes as solid objects. Therefore, to "exhibit languages" in an ethnology museum can become a challenge in that it is necessary to be creative in departing from the existing exhibition method and coming up with ideas to show linguistic signals and abstract ideas related to the nature of language in a comprehensive fashion. This is likely one of the reasons that few museums have a section for "language exhibits." Minpaku is unique in having one since its foundation.

The first language exhibits at Minpaku included a computer-generated device called "Languages of the World," which was a collection of audio-recording samples of 100 languages of the world and "The Tale of *Momotarō* (Peach Boy)" told in 25 dialects of Japanese. These can be referred to as "collect-and-show" exhibits, for it was a collection of recordings of various languages and dialects of Japanese that were exhibited. In this sense, these exhibits shared the same characteristics as object exhibits have. Until recently, most Japanese people have had limited opportunities to hear or listen to non-Japanese languages, much less to speak and interact with people using one or more of such languages. These exhibits at Minpaku thus fit Minpaku's mission well, which is to provide people with an opportunity to be exposed to various ways of life all over the world, as a form of disseminating research results.

In recent years, however, as the quality and the quantity of information available on various media improved and increased, people have become more exposed on a daily basis to various foreign languages, not only through audio but often video footage, where speakers are seen speaking their language. Fifteen years ago, when visitors to Minpaku were asked how many languages they thought were spoken in the world, the answers were somewhere around the tens. Today, most people respond "a hundred or more" when asked the same question. The change in the general public's knowledge and perception

about languages forces us to re-evaluate the role and value of the language exhibit and how language and languages should be better exhibited. This includes the question of which of the 7,000 languages in the world should be selected and how they should be presented. Special devices are no longer required for shooting and editing video materials, and processing the data is now inexpensive, providing us with a wide range of possibilities. I personally speculate that this is probably part of the reason for the recent increase in the interest in exhibiting languages at other museums and organizations. Recently, Minpaku started to receive inquiries from other museums worldwide about language exhibition.

In this paper, I will introduce how the current language exhibits at Minpaku take advantage of video materials. Examples are taken from the Language Exhibition Gallery (renovated and made open to the public in March 2009) and the Oceania Exhibition Gallery (renovated and made open to the public in March 2010). I initiated the latest renovation of the Language Exhibition Gallery and designed the language exhibit related to Oceanic/Austronesian languages in the Oceania Exhibition Gallery.[1] In section 2, three conceptual categories related to language exhibits are discussed to provide a general categorization of what could go into language exhibits. Specific examples of each category and how video materials are utilized are described in Section 3. Section 4 provides concluding remarks.

2. Three Conceptual Categories of Language Exhibits

The new Language Exhibition Hall, which now carries the title "Languages of the World, the World of Language," reflects the fact that there can be two different aspects to language exhibits. The first half of the title, "Languages of the World," represents the exhibits where languages from many parts of the world and their characteristics are collected and exhibited. It is said that there are around 7,000 languages currently used in the world, of which 300 to 400 are visual (sign) languages while the rest are auditory (spoken) languages. Although it is not possible to cover them all in a single exhibit, there are currently about 200 language samples. The intent behind showing the characteristics of some of these languages is to show the diversity of the world's languages. The second half of the title, "the World of Language," refers to the abstract, internal structures of language that are formed by human cognitive processes and how these processes control the reception and production of language, including how audio and/or visual signals are perceived and processed as linguistic sound units (phonemes) and how such units are combined to be recognized as forms associated with meaning (morphemes). Morphemes are further combined to form sentences, and sentences are interpreted according to the context in which they are used. Language consists of lexicon and rules, and exhibiting such aspects is equally important to exhibiting various languages from all over the world.

In addition to these "core" linguistic exhibits, languages may also be exhibited in various contexts. Because most galleries at Minpaku are organized according to region, a fitting theme for a language exhibit would be "A Language Exhibit in Its Regional Context." This would include how language developed in the historical, cultural, and

social context of each region and what can be inferred about peoples' history and lives by analyzing the languages spoken in the region. In Oceanic studies, it is important to recognize that the genetic relationship of languages has played a significant role in clarifying the migration of humans throughout Oceania. In addition, by looking at the traces of lexical borrowings, ancient trade networks can be recognized. Such are displayed with reference to language in the Oceania Exhibition Gallery.

In what follows, some exhibits at Minpaku representing each of these three categories, namely, the languages of the world (3.1), the world of language (3.2), and languages in their regional context (3.3), will be described.

3. Introducing Visual Materials in Language Exhibits

3.1 Modifying the "Languages of the World Exhibit" by Incorporating Video Data

Most of the language exhibits that were prepared during the founding period and have been maintained at Minpaku are "collect-and-show" exhibits. One of the major modifications to these exhibits in the 2009 renovation was the incorporation of video materials instead of the earlier audio-only exhibits.

One of the major machines in this category, also called "Languages of the World," originally exhibited audio samples of languages from all over the world along with background information on each language (Figures 1a and 1b). One could choose a language on the top screen, then the machine would play the sound of a speaker of the language speaking, followed by a narration explaining where the language is used, by how many people, and the characteristics of the language. There were samples of about 100 languages, including Woleaian, one of the languages spoken in Micronesia. Exhibiting all languages equally, including those that one would typically never be heard, and regardless of whether a language is spoken or signed, can be said to be one the major characteristics of this particular exhibit. This shows that all the languages have the

Figure 1a Old "Languages of the World" machines. A language could be selected by pressing a button, and the speech sound and background information of the language was played.
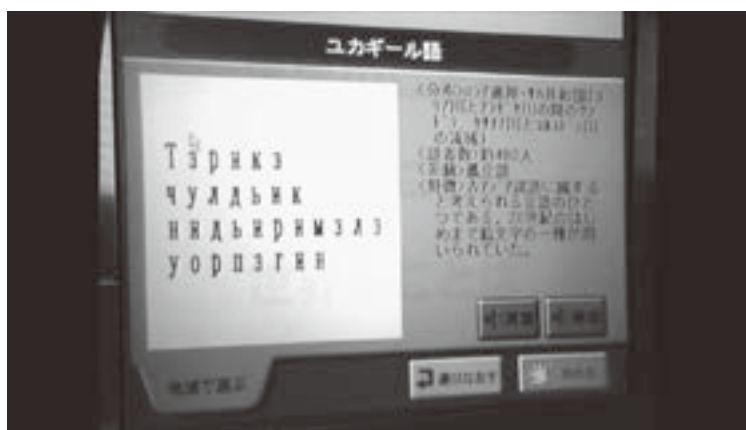
Figure 1b A screen of the old "Languages of the World" machine. The writing system, distribution, number of speakers, genetic affiliation, and typological characteristics of the selected language were displayed and narrated.

same value, whether they are designated as the official language of a country or not, the size of the population, etc. In the 2009 renovation, the advantages of video processing were taken, and samples and information about eight sign languages were added to this exhibit (Figure 2). Recently, there has been a growing recognition that sign languages are natural languages that are linguistically of equal value to spoken languages. It is a scientifically correct step forward that video footage of sign languages is now included in this machine. In the current machine, recently acquired video samples of both signed and spoken languages are included, while the audio-only recordings from old have been maintained.

Figure 2 The top page of the current "Languages of the World" machine. There is a page introducing the background of a language. An audio or video clip of the language sample can be listened to/watched by scrolling to the left, and the writing system of the language can be seen by scrolling to the right. (Source: Minpaku Exhibition Guide p. 78)

3.2 A Visual Aid for the Story Exhibit and Developing Its Sign Language Version

Another example where a visual device is utilized in the "collect-and-show" type is seen in the "Tale of *Momotarō* (Peach Boy)" exhibit. In this exhibit, the beginning part of the

Figure 3 One of the earlier exhibits of the Tale of *Momotarō* (Peach Boy). A dialect was selected by using one of the buttons on the bench, and the story was played. The map is a still image.

story is told in different dialects of Japanese and the old version (Figure 3) consisted only of a map of Japan and audio of story-telling in each dialect. Since it is difficult to follow the language/story told in an unfamiliar dialect, picture boards showing the part of the story being played have been added in the new exhibit (Figure 4). This is an example of utilizing visual materials to aid visitors who are listening to an audio exhibit. This replicates scenes where the language is used for actual communication, as well as when the speaker utilizes non-audio information for context as an aid to comprehension. Even today, when regional dialects are treasured and are heard on TV and the Internet, this exhibit remains one of the most popular in the gallery. Video clips are also utilized to exhibit the same story told in varieties of Japanese Sign Language. Currently, eight are exhibited, and more are on the way (Figure 5).

3.3 Language Structure Exhibit

The "World of Language" exhibit aims to display knowledge related to the structure of language. Language consists of a mode of expression, i.e., sound or visual signals that disappear as they are produced, and abstract knowledge with which a person manipulates a language.[2] Linguistics is a field of science where knowledge about what is processed in the human brain and cognition are investigated. Presenting part of such knowledge, however, requires a type of planning that is different from that of objects, or physical objects. In this section, two parts (of the four) of the exhibit "Let's Play with Voice" will be introduced to represent such planning. The first is about the visualization of speech sounds, and the second is about the processing of speech sounds.

Figure 4   Current "Tale of *Momotarō* (Peach Boy)" exhibit. Four story boards are
highlighted according to the progress of the story as it is told in the
selected language. (Source: National Museum of Ethnology)

3.3.1 Visualizing Speech Sounds

A simple exhibit has been created (Figure 6) where a visitor can speak into a
microphone, and the speech sound becomes visible. One can see a pitch contour, a sound
spectrogram, and the sound wave, which shows that each utterance, in fact, is composed
of physically capturable signals, and one gets the feeling for how such signals can be
analyzed.

3.3.2 Experiencing Visual Sound Processing

In Minpaku's Language Exhibition Gallery, visitors can now experience the McGurk-
MacDonald effect firsthand (Figure 7). This effect is an illusion which takes place when
an auditory sound is presented with the mouth movement of another sound, which shows

Figure 5   A scene from the Japanese Sign Language narration of the "Tale of *Momotarō* (Peach Boy)." Today's easy access for shooting and editing video data expands the ways in which signed languages can be exhibited. (Source: National Museum of Ethnology)
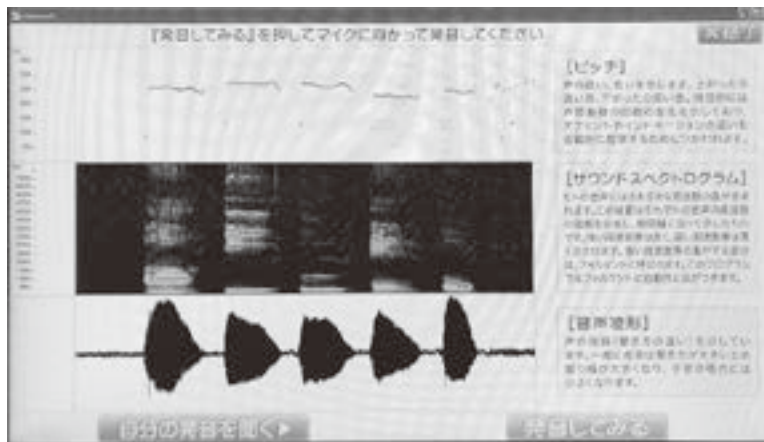

Figure 6   Visualized pronunciation of "a, i, u, e, o" in Japanese. From top to bottom, pitch, sound spectrograms, and sound waves are displayed. (Source: National Museum of Ethnology)

that our brain, when processing the speech sound, combines the audio and visual information with no priority of one over the other, to perceive sounds that a person is hearing. Watching this exhibit, the audience is asked to listen to one of the clips to guess what the sounds are. They are then asked to listen to the same sound with their eyes closed. Completely different sounds are heard depending on whether they have their eyes shut or open. All of these clips show the visual image of one sound being pronounced but with a sound track where another sound is recorded. The sound is perceived differently, for the brain combines the two pieces of information, audio and visual, to interpret what one is hearing. Typically, the demonstration takes place with an auditory "ba" pronunciation
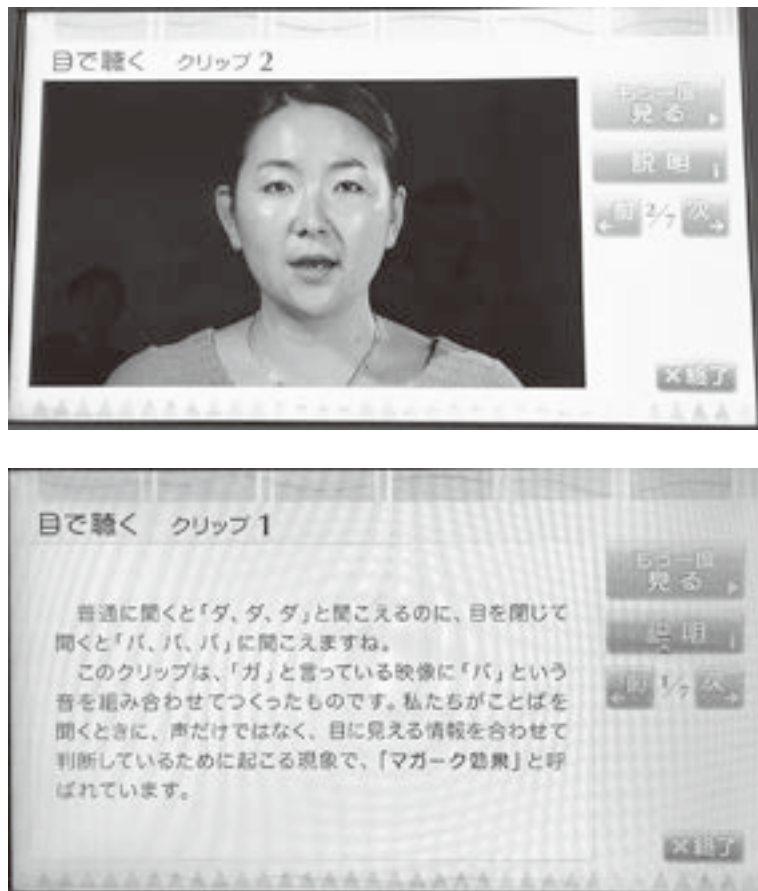
Figure 7 Screen shots of the device where one can experience the McGurk-MacDonald effect firsthand. (Source: National Museum of Ethnology)

with the mouth movements of "ga," which is perceived as "da." In Minpaku's exhibit, seven video clips with six different combinations of such pairs are presented. This shows that spoken language is processed by both visual and auditory information. For many visitors, this is a fun experience possible only in our exhibition hall.

3.4 Languages in Regional Contexts

Languages reflect human activities in prehistory that did not leave any physical remnants of humans. Languages provide information about migration routes and contact relationships. They also reveal social structure and people's perceptions in earlier times. Multiple stories can be told by looking at language, depending on the researcher and depending on the region. For example, in Oceanic studies, the examination of the relationship between languages has made a considerable contribution to the understanding of the prehistory of the region. In the Oceania Exhibition Gallery at Minpaku, the genetic relationship of languages and the human migration route based on language data are exhibited (Figure 8).
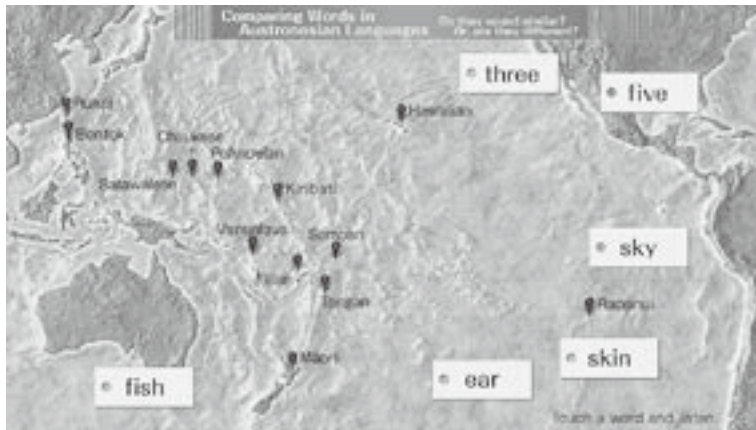
Figure 8   A screen shot of a device where visitors can compare words from 13 Oceanic languages. Video clips are activated when one of the virtual flash cards is touched. (Source: National Museum of Ethnology)

Figure 9   A panel showing the human migration routes of speakers of Austronesian languages in the Pacific. The device at the righthand bottom is the exhibit for comparing the 13 languages (cf. Figure 8).

A device for people to compare languages is also presented (Figure 9).

4. Concluding Remarks

In this paper, several exhibition methods in which visual materials are utilized for exhibiting language and languages have been presented. Recent technological development has made it possible to come up with new methods which supplement already existing exhibits. New subjects, particularly sign language and visual aspects of

spoken language, are now shown in our exhibition hall thanks to the ease in handling visual and video materials. One thing to note as a background to the exhibit is that video data has become easy and inexpensive to handle and develop. This has changed the research of languages itself. Data can now be collected by so-called home video and can be processed on personal computers, which has enabled the study of sign languages to become more accessible. The same can be said about engineering-oriented studies of both spoken and signed languages. As a result, new findings, such as visual signals (gestures) forming part of the grammar or lexicon in a spoken language, are now being reported. As such research continues, the content of the language exhibit is expected to develop further.

Today, as a result of changes in media, transportation methods, and other social aspects, the linguistic environment is rapidly changing everywhere in the world. People's perception of, and knowledge about language and languages, are changing, too. The scientists' role at a research museum is to continuously reevaluate and adjust to people's interest and up-to-date scientific research results. Minpaku, as a museum that has offered a language exhibition for over four decades, is in a position to utilize the latest technology with new media, in order to be innovative, but supported by solid knowledge.

Notes

1) Descriptions of the newly created exhibits appear in Shoji et al. 2010, Yoshioka and Kikusawa 2017, Itoh and Kikusawa 2010. "Behind the scene" stories appear in Kikusawa 2018.

2) It should be noted here that scripts and writing systems are recognized as tools for transcribing languages and not language itself. An earlier exhibit (still displayed) contains a large number of scripts and writing-system related objects, such as knotted numbers from Inca, and pictures of rubbings of various historical inscriptions using different scripts.

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