

A preliminary study of impressions on photo and video sceneries by Japanese and foreign tourists for virtual tourism

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Abstract

As an alternative to live tourism, the pandemic crisis has given rise to virtual tourism. Virtual tourism content can vary from viewing scenery in still images (photo), moving images (video), or in 3D, to experiencing virtual reality travel. This study investigated Japanese and foreign tourist perceptions of Japanese photo and video sceneries. A questionnaire focused on five different scenery categories (traditional, floral, sea views, ocean waves, and fauna) was conducted on 112 subjects (87 Japanese and 25 foreigners). The questionnaire asked participants to view the photo and video sceneries and give their impressions using 10 paired adjectives and a 7-point semantic differential scale. It was found that the Japanese participants gave a greater number of positive responses for the video sceneries than for the photo sceneries in all categories, and except for fauna, the foreign participants gave a greater number of positive responses to the photo sceneries in all categories. This study highlighted the perceptual differences between Japanese and non-Japanese tourists (Asian tourists in particular) toward Japanese photo and video sceneries. These study results could be used as a reference to create targeted virtual tourism content.

Keywords

tourist perceptions, still image, moving image, nature scenery, virtual tourism

1. Introduction

The Covid-19 pandemic has affected business in many industries, especially the tourism industry [Ohe, 2020] because the global travel ban forced the tourism industry to shut down. Some countries have even restricted internal travel to prevent the spread of Covid-19. Because the tourism industry crisis is expected to continue for a long time and take a longer time to revive [Ohe, 2020], many tourism organizations have shifted their focus to promoting tourism online and providing virtual tourism services, which allows people to explore a tourist spot without actually visiting.

Some virtual tourism sites use photos, videos, and 3D content. While virtual tourism is not new, since the Covid-19 pandemic halted all tourism business, virtual tourism regained attention in 2020 because it allowed people to travel without having to visit, which saved them time and money. Most important, however, is that virtual tourism is safe as people do not need to worry about their health.

Some people still doubt the quality of the virtual tourism experience [Zhang et al., 2022; Kim et al., 2020], but on-site travel and virtual travel experiences should not be compared as they are completely different tourism models. However, to meet the desire to travel, virtual travel could be a good alternative. Therefore, this study investigated tourist perceptions of some scenery content: the still image (photo) and the moving image (video). The study results could be a reference for the development of targeted virtual tourism content.

2. Virtual tourism

Virtual tourism uses virtual technologies, such as photos or videos, based on real tourism sceneries. Virtual technology has been widely used in tourism marketing [Zhang et al., 2022; Tavakoli and Mura, 2015; Lin et al., 2020]. To assess the value of virtual tourism experiences, studies have been conducted to determine the influencing factors, for which various research methods have been used, such as questionnaires and interviews before, during, and after the travel experience [Bafadhah, 2021; Lu and Xu, 2021]. Virtual tourism's main strength has been its low cost, but because of the global pandemic, virtual tourism is now seen as safer than traveling.

A virtual tourism approach was used in 2015 in Japan in Bibai, Hokkaido, to attract foreign tourists to the area, for which a mobile application was developed that gave users a panoramic 360-degree view of Japanese tourist sites [Bibai City, 2015]. In 2018, All Nippon Airways (ANA) collaborated with virtual reality (VR) creators to develop a virtual tourism platform [ANA Holdings, 2018] that allowed people to travel to popular spots in Tokyo, Japan. However, virtual tourism did not receive much attention at that time because there was little demand [Zhang et al., 2022; Jung and Dieck, 2017].

Because of the heavy marketing for the 2020 Tokyo Olympics, Japan became a popular travel destination [JTB Tourism Research & Consulting, 2021; Murakami et al., 2021]. However, the Covid-19 pandemic forced the Olympics to be held in 2021 and mostly without spectators. However, when the situation improves, tourists will return to Japan [Murakami et al., 2021]. Therefore, virtual tourism could be a solution for people thirsty for travel.

Virtual tourism has therefore become more popular since

2020. For example, the Advanced Imaging Technology Research Center and Ninnaji Temple collaborated to develop a VR experience for people to explore Japan during the pandemic, which has received positive responses from Japanese and foreign users [Advanced Imaging Technology Research Center, 2020].

Significant research has been conducted on virtual tourism content development [Zhang *et al.*, 2022; Yung *et al.*, 2021; Bravo *et al.*, 2021]. However, as content preferences vary for Japanese and foreign tourists, this study examined the Japanese and foreign tourist perceptions of certain tourism content for the further reference for virtual tourism.

3. Experimental design

The content evaluated in this study was focused on Japanese tourism sceneries in two different formats: still images (photo) and moving images (video). The recruited participants viewed the scenery photos and videos and then gave their thoughts about the content in questionnaires based on adjectival impressions.

3.1 Type of sceneries

The sceneries were mostly based on nature, primarily because previous studies have found that natural sceneries induce a high interest in tourist intentions to visit the place [Murakami *et al.*, 2021; Yamamoto, 2016]. Five Japanese sceneries (traditional, flora, sea views, ocean waves, and fauna) were selected, with each category comprising two sceneries in two formats: a photo and a video. Therefore, 10 sceneries (stimuli) were prepared in a photo and a video respectively for this study. The traditional Japanese sceneries were a photo and video of scenes at a temple, the flora sceneries were focused on plants or flowers, the sea view sceneries were photos and videos of the sea, and the ocean wave sceneries were detailed views of waves, the fauna sceneries were focused on animals. The sample sceneries for each category are shown in Figure 1.

3.2 Subjects

There were 112 participants (87 Japanese nationalities and 25 foreign nationalities) engaged in this study, who ranged in age from 15 to 59 years. Because the study sought to determine whether there were different Japanese and foreign perceptions, the participants were separated into two groups for the data analysis. The foreign participants were from China ($N = 18$), Malaysia ($N = 5$), South Korea ($N = 1$), and Sri Lanka ($N = 1$). The foreign participants were all from Asian countries where we believed that Japan is a very popular tourism destination among these countries especially China based on the percentage of foreign tourists in Japan as shown in Figures 2 and 3 [JTB Tourism Research & Consulting, 2021]. Also, all foreigner subjects have ever visited Japan before and most of them are either international students or staying in Japan for a while. In addition, we created Table 1 to show the distribution of the age group of participants. The results of this study reflect



Figure 1: Five sceneries used in the study

more from those in 20 to 29 years old, which were around 60 % of the Japanese participants, while 88 % for foreigner participants. In particular, foreigner participants were mainly from Asian countries especially from China.

3.3 Questionnaire

The participant questionnaire comprised 10 semantic differential (SD) scales that required participants to give their impressions of the photo and video for scenery content in adjectival form. The questionnaire was created based on previous study by Murakami *et al.* [2021]. The questionnaire items are shown in Figure 4.

3.4 Procedure

Participants viewed a total of 20 stimuli for 12 seconds each [Matsumoto *et al.*, 2012; Murakami *et al.*, 2021] which consisted of 10 photos and 10 videos from the five scenery categories and gave their impressions immediately after viewing each stimulus using the questionnaire. The stimuli were showed on

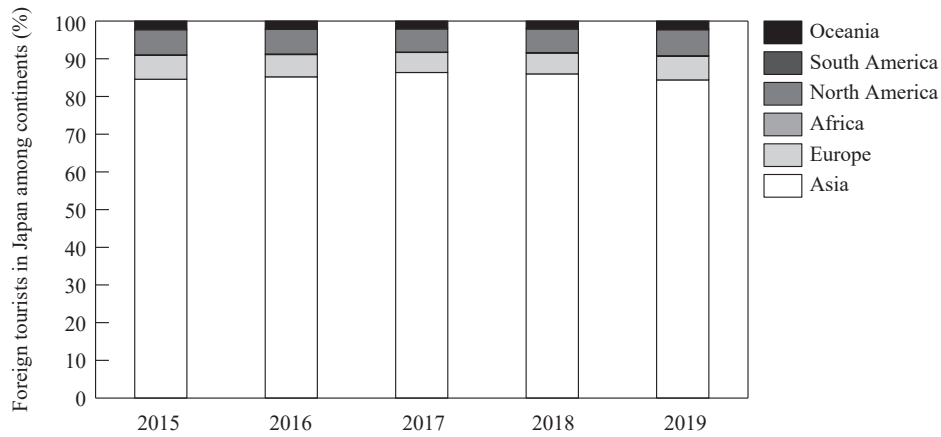


Figure 2: Percentage of foreign tourists in Japan among continents

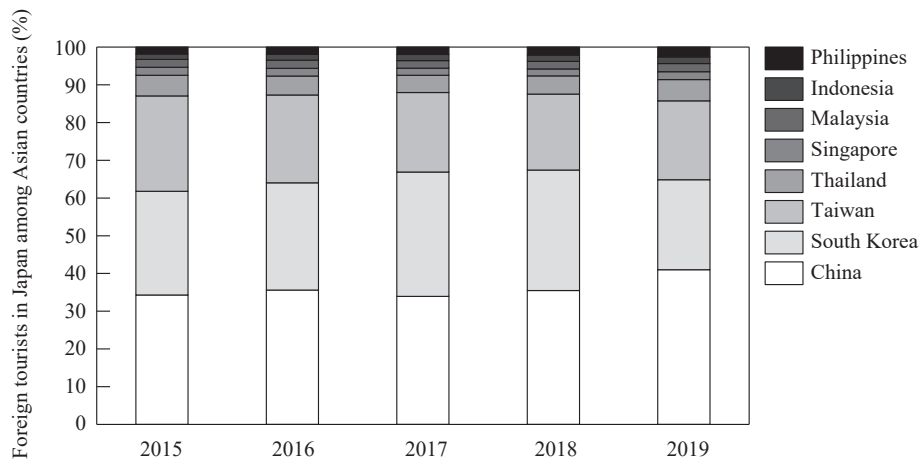


Figure 3: Percentage of foreign tourists in Japan among Asian countries

Table 1: Age group distribution of the participants

Age Group	Japanese N = 87	Foreigner N = 25	China N = 18	Malaysia N = 5	South Korea N = 1	Sri Lanka N = 1
15-19	2 (2 %)					
20-29	52 (60 %)	22 (88 %)	18 (100 %)	3 (60 %)	1 (100 %)	
30-39	21 (24 %)	2 (8 %)		2 (40 %)		
40-49	11 (13%)	1 (4%)				1 (100 %)
50-59	1 (1 %)					

the screen of personal computers for the comparison of photo and video sceneries. The procedure was as follows:

- Viewing photo stimulus 1 for 12 seconds
- Selecting an impression adjective on the questionnaire for photo stimulus 1
- Repeating steps 1 and 2 for photo stimuli 2 to 10*
- Providing demographic information
- Viewing video stimulus 1 for 12 seconds
- Selecting an impression adjective on the questionnaire for

video stimulus 1

- Repeating steps 5 and 6 for video stimuli 2 to 10 *

* The 10 stimuli shown to each participant were in random order for both the photo and video formats.

4. Results

The data from the Japanese and foreign participants were separated to determine whether there were any differences in the perceptions in each scenery category. As the focus was on the positive impressions of the content, only five of the 10 im-

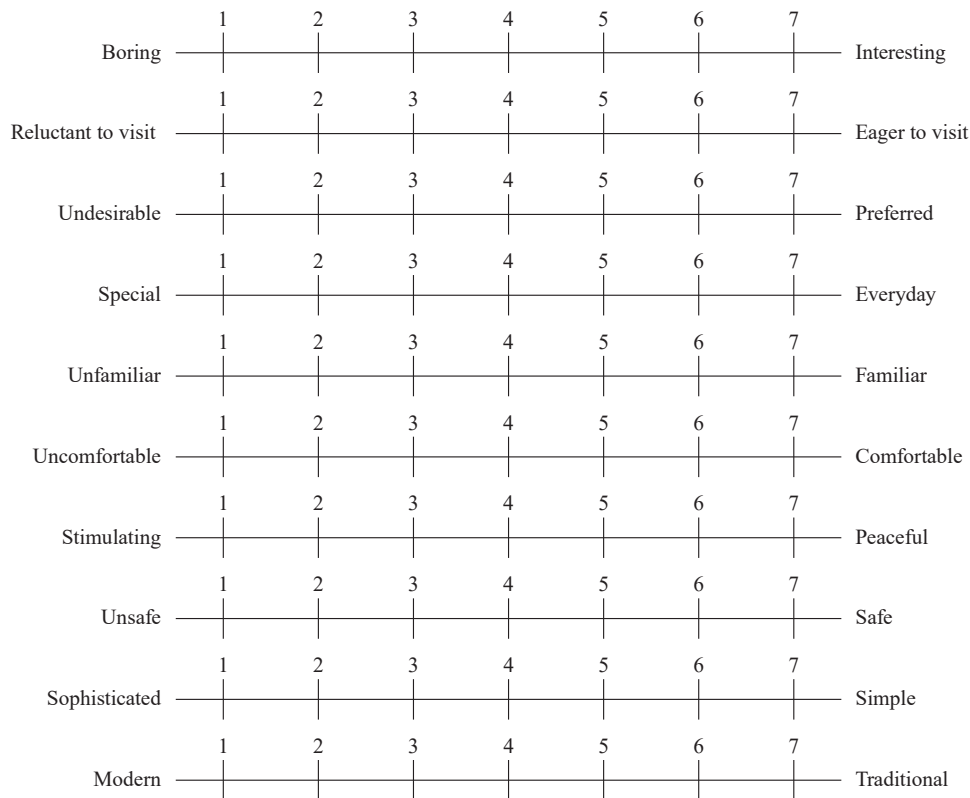


Figure 4: Questionnaire items used in the study

pression adjectives on the questionnaire were analyzed because they classified the negative-positive traits, as shown below:

- Boring–interesting
- Reluctant to visit–eager to visit
- Undesirable–preferred
- Uncomfortable–comfortable
- Unsafe–safe

The positive impression adjectives were interesting, eager to visit, preferred, comfortable, and safe, while the negative adjectives were boring, reluctant to visit, undesirable, uncomfortable, and unsafe. The photo and video results for these five adjectives were also assessed using a *t*-test to determine the significant differences.

Figure 5 shows the questionnaire results for the five impression adjectives for each nature scenery category. A *t*-test ($\alpha = 0.05$) was conducted for each impression adjective to compare whether the photo and video gave the more positive impression. It was found that the Japanese participants gave more positive impressions for the video sceneries, and except for the fauna category, the foreign participants gave more positive responses for the photo sceneries.

In the traditional scenery category (Figure 5 (a)), the foreign participants had clear preferences for the photo content over the video content, finding them more comfortable and safe compared to the videos. However, the Japanese participants expressed an opposite view, finding the traditional video scen-

eries more comfortable, safe, and interesting than the photos.

Figure 5 (b) shows the impression adjectives results for the flora scenery category. The same tendency was observed—that is, the foreign participants gave more positive responses to the photo content than the video content; however, no significant differences were found. Overall, except for ‘undesirable–preferred’ adjective, the Japanese participants again were found to give more positive responses to the video flora scenery content. Significant differences were observed, with the Japanese participants claiming the flora video scenery content was more interesting and safer, and incited a desire to visit than the photo flora scenery content.

Figure 5 (c) shows the results for the sea view scenery content for which similar results to the flora category were found. The foreign participants gave more positive impressions for the photo scenery content and except for one adjective, the Japanese participants gave more positive impressions for the video scenery content. The only difference with the flora category was that there were significant differences in the impression adjectives in both groups. The foreign participants found the photo scenery content more interesting and were more eager to visit the place compared to the video scenery content. However, the Japanese participants found the sea view video scenery content safer than the photo scenery content.

Figure 5 (d) shows the comparison results for both groups for the photo and video ocean wave scenery content. The foreign participants had more positive impressions from the photo scenery content, while the Japanese participants had more

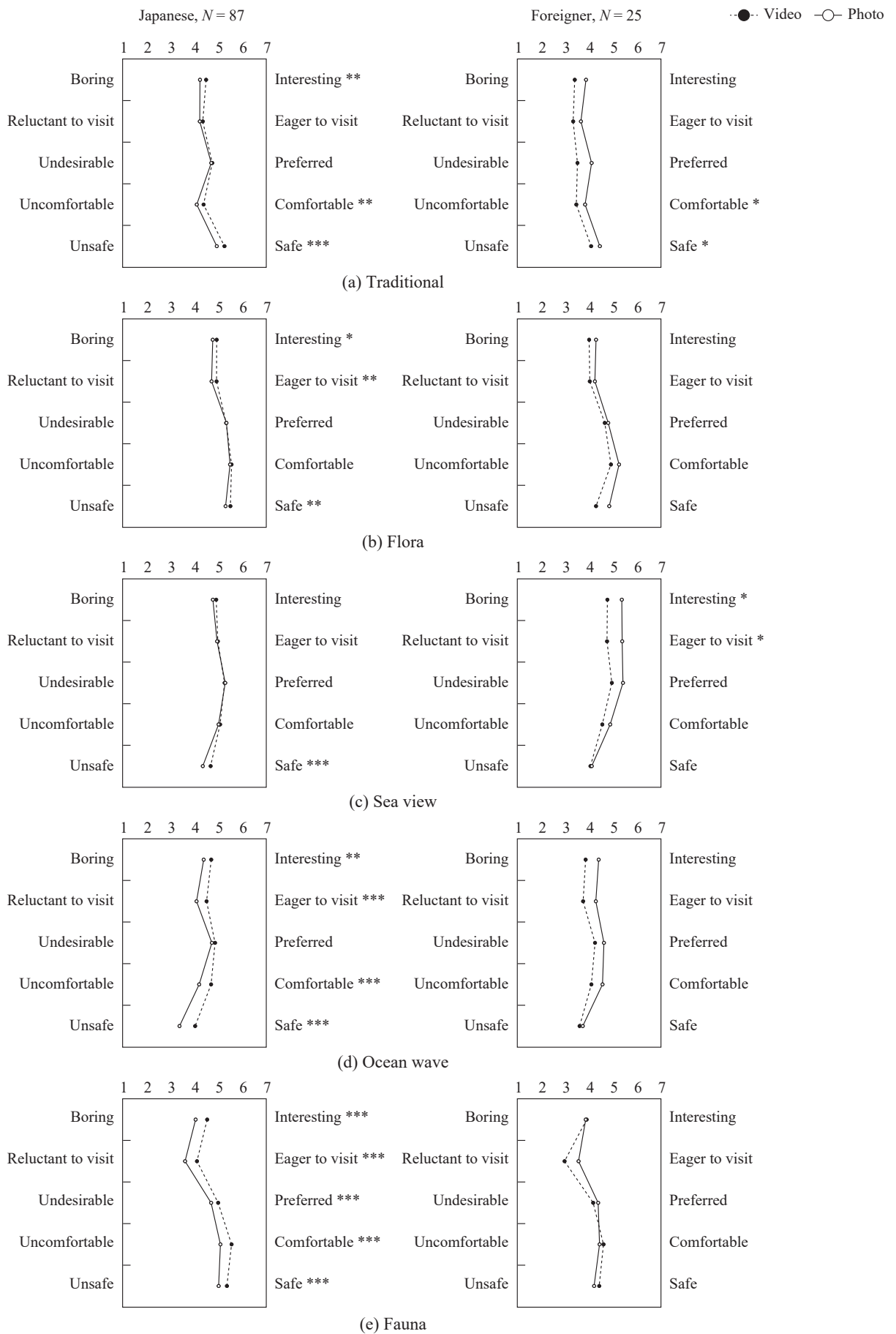


Figure 5: Impression adjective results for the Japanese (left) and foreign (right) participants between the video and photo scenery content

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

positive impressions from the video scenery content. However, a significant difference was only observed in the results for the Japanese participants, who found it is more interesting, more comfortable, and safer and incited a desire to visit the place when viewing the ocean wave in a video than in a photo.

Figure 5 (e) shows the impression adjective results for the fauna category scenery content. The Japanese participants had more positive responses when viewing the video scenery content than the photo scenery content, with all five adjectives showing significant differences. Interestingly, the foreign participants also had more positive perceptions of the fauna scenery video content than the photo scenery content for three out of the five impression adjectives.

5. Conclusion

Virtual tourism has received greater attention in recent years owing to the Covid-19 pandemic travel bans. This study investigated the possibilities for virtual tourism content perceptions of Japanese and foreign participants. The photos and videos for five categories of scenery content were compared and analyzed using five impression adjectives to determine the more positive perceptions.

The Japanese participants were found to have more positive perceptions of the video scenery content in all categories, and except for the fauna category, the foreign participants were found to give more positive responses when viewing the photo scenery content. There were slightly different results for each scenery content category in both groups. Also, as we mentioned in section 3.2 that all foreigner participants have ever visited Japan prior to this study and most of them are either international students or staying in Japan for a while, they might have viewed the sceneries used in this study in person same as the Japanese participants. However, even so, the study still revealed different results between the two groups of participants. Therefore, it was concluded that there were variances in the Japanese and foreign participant perceptions of the scenery photos and videos. Moreover, as we mentioned, foreigner participants were mainly from Asian countries especially from China, this result could be applied to tourists especially Chinese tourists. Thus, it may be more effective to attract foreigners to tourism activities in Japan using photo content, which takes less cost and time to develop.

It is important to analyze tourist perceptions to attract them to visit. When the specific tourist characteristics are known, tourism organizations can better plan targeted promotions. Therefore, the results of this study could be used as a reference for the development of virtual video, photo, and VR tourism content, which could also assist the tourism industry recover after the pandemic.

Future studies will include a greater number of foreign participants, which will focus on certain nationality to compare the results with the Japanese participants. In this study, there were only a small number of foreign participants, which made it difficult to compare the results with the Japanese participants.

In addition, it is also important to consider foreign participants' experience in visiting Japan, since it could affect the study's results. Since this photo and video comparison study was conducted on personal computers, for the next step, we would like to extend this study to by using VR for virtual tourism in the future.

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