INTRODUCTION

On March 11, 2011, a magnitude 9.0 earthquake occurred off the Pacific coast of the Tohoku region of Japan. This earthquake triggered a tsunami which inundated the eastern seaboard of Tohoku, caused widespread destruction of coastal communities, and also led to a nuclear crisis which culminated with the confirmed meltdown of three reactors at the Fukushima Daiichi nuclear power plant.

During and after this triple disaster, people living in Japan began to seek disaster-related information in order to stay abreast of the situation and to make decisions on their post-disaster action. However, there emerged a growing disparity between Japanese and foreigners residing in Japan regarding their perception of the post-earthquake situation. While Japanese people in general continued life as usual, foreign communities reacted much differently, with many foreigners relocating within Japan or leaving the country altogether. This difference in post-disaster action may have been affected by the disparity between information obtained from domestic sources and that which was obtained from overseas sources.

The possible effect of this information disparity on the post-disaster action of foreigners living in Japan has led to questions regarding disaster information gathering behavior after the Tohoku Earthquake and how improving disaster information dissemination may reduce negative post-disaster issues such as the broad evacuation of foreigners from Japan. Therefore, in order to improve disaster information dissemination after future disasters, a survey was conducted which examined the disaster information gathering behavior of people living in the Kanto region of Japan at the time of the 2011 Tohoku Earthquake. In this paper, the results of the survey are presented focusing specifically on foreign students, with the objective of understanding the differences in foreign students’ disaster information gathering behavior considering their post-disaster action.

SURVEY METHODOLOGY

Survey design & distribution

Data on disaster information gathering behavior were collected using an online survey. This survey was provided in nine different languages (Japanese, English, Chinese, Korean, Portuguese, Nepalese, French, Thai, Vietnamese), and the contents were designed to clarify respondents’ information gathering activities, their information-related difficulties and their post-disaster actions. The survey was distributed via two methods: first, through social and professional contacts of the authors; and second, through direct requests for cooperation with various entities such as business communities, universities, embassies, and so forth. Responses were gathered for two weeks beginning roughly 10 weeks after the earthquake occurred.

Sample characteristics

The survey received a total of 1357 responses, of which foreign students made up 32.2% (N = 437). The distribution of foreign students by country is shown in Figure 1, with the largest number of students from China, Thailand, South Korea, and Vietnam. 48.3% of the respondents were male and 51.3% female (no response = 0.4%), and 77.1% were 20-29 years old (no response = 0.7%, 10-19 = 1.6%, 30-39 = 20.6%). The Japanese and English language ability of respondents is shown in Figure 2.

POST-DISASTER ACTION

Foreign students’ post-disaster actions were evaluated by
whether they remained in the Kanto region, relocated from the Kanto region or left Japan. As shown in Figure 3, it can be seen that more than two-thirds of the respondents chose to relocate (N = 100) or leave entirely (N = 198), whereas less than one-third chose to remain (N = 139).

The reasons for the post-disaster action are shown in Figure 4 by whether the respondents chose to remain, relocate, or leave. For foreign students who chose to remain in the Kanto region, “personal decision” was the most-cited reason; however, for those who relocated or left, “family request” was cited the most. In addition, “job obligation” and “unable to leave” were the second most-cited reasons for those who remained, whereas “personal decision” was the second most-cited reason for those who relocated or left.

The usefulness of disaster information for making the choice to remain, relocate or leave is shown in Figure 5. Nearly 90% of foreign students who remained in the Kanto region said that disaster information was either somewhat or very useful for their decision, compared to 68% and 75.3% for those who relocated or left, respectively. The percentage of respondents who said disaster information was not useful was fairly similar regardless of post-disaster action.

**DISASTER INFORMATION GATHERING BEHAVIOR**

**Most- and least-trusted information sources**

The distributions of most- and least-trusted information sources for foreign students are shown in Figure 6 by their post-disaster action. For most-trusted sources, the number of responses for overseas sources increased from remained to relocated to left; conversely, the number of responses for Japanese (domestic) sources decreased in the same order. In other words, those foreign students who remained in the Kanto region or relocated within Japan trusted domestic sources more than overseas sources, whereas those who left trusted overseas sources more than domestic sources. For those who remained and relocated, Japanese news sources and the Japanese government were the most trusted sources of information; for those who left, overseas news sources and international organizations were the most trusted.

For least-trusted sources, the opposite of the above trend could be observed – that is, the number of responses for domestic sources generally increased and the number of responses for overseas sources decreased in the order of remained, relocated, and left. Those foreign students who remained or relocated appeared to distrust overseas sources more than those who left Japan and also distrusted overseas sources more than domestic sources (excluding TEPCO as a
domestic source), whereas those who left Japan overwhelmingly distrusted domestic sources relative to overseas sources. Foreign students who remained in the Kanto region or relocated to another area of Japan distrusted overseas news sources and TEPCO the most, whereas those who left Japan distrusted TEPCO and the Japanese government the most.

Utilized media & language

The distributions of utilized media and language for foreign students are shown in Figure 7. When comparing the utilized media for a given language, very little difference can be seen between the foreign students considering their post-disaster action. Respondents who utilized Japanese language media tended to turn to television, followed by traditional internet media (websites, information portals, etc.), regardless of what their post-disaster action was; however, when utilizing the English language, they turned to traditional internet media the most, followed by television and social media (social networking sites, blogs, etc.); and when utilizing other languages, they turned to inter-personal communication (face-to-face, telephone, etc.) and traditional internet media.

However, when comparing the utilized language by post-disaster action (comparing “n” values), it can be seen that foreign students who remained in the Kanto region primarily utilized Japanese-language media (n = 315), followed by English (n = 223) and other languages (n = 169). Foreign students who chose to relocate, however, primarily used English-language media (n = 236), whereas those who left Japan used both Japanese (n = 444) and other language (n = 446) media the most.

Information importance

The importance of information over time is shown in Figure 8. When comparing important information for a given time period, once again little difference could be seen between foreign students considering their post-disaster actions. For the first day, information on the safety of family, friends, etc. was the most important, followed by transportation systems and earthquake and tsunami damage, regardless of the post-disaster action. By the first week, the most important information had become radiation level and risk, followed by food and water supply, and this trend continued for the second week as well. The trend for overall information importance (comparing “n” values) was also similar regardless of post-disaster action: the total number of responses peaked at the first week, then dropped below the first day’s level for the second week.
Information difficulties

Figure 9 shows what information was unavailable, unclear, or hard to understand over time. Similar to results for the importance of information over time, there was little difference between foreign students considering their post-disaster action when comparing the information for a given time period. For the first day, the most difficulty appeared to be had with information on the safety of family, friends, etc. and radiation level and risk. Difficulties related to radiation level and risk grew from the first day to the first week, and government response became the second most-difficult information, and these two remained the information types with the most difficulty for the second week as well.

Also similar to the results for the importance of information over time, the trend for overall information difficulties (comparing “n” values) did not differ greatly depending on the post-disaster action. However, in this case the information difficulties generally tended to decrease over time from the first day to the second week.

The reasons why this information was unavailable, unclear, or hard to understand for foreign students are given in Figure 10. It can be seen that, again, there is little difference considering the post-disaster action. Confusion caused by conflicting or differing information was the top reason cited by respondents, followed by inability to access information due to mobile congestion, power outage, etc. and inability to understand information due to a lack of language comprehension.

Figure 11 shows what media and language were utilized when clarifying information difficulties. There is little difference between foreign students considering their post-disaster action in the utilized media when looking at a given language. For Japanese language, television and traditional internet media were the most utilized media; for English language, the most utilized were traditional internet media, social media, and television; and for other languages, traditional internet media and inter-personal communication were the most utilized. These results are similar to the results of the media used for acquiring disaster information, as was introduced in Figure 7.

When comparing the utilized language by post-disaster action (comparing “n” values), it can be seen that foreign students who remained in the Kanto region primarily turned to Japanese (n = 192) and English (n = 190) media, those who relocated used English (n = 174) the most, and foreign students who left Japan utilized media in other languages (n = 309) the most. Unlike the results of the media used for acquiring disaster information, foreign students who left Japan turned much less to Japanese media for clarifying their information problems than they did.
for their disaster information acquisition.

**DISCUSSION**

**Disaster information gathering behavior**

When examining the disaster information gathering behavior of foreign students based upon their post-disaster action – that is, whether they chose to remain in the Kanto region, relocate to another part of Japan, or leave Japan entirely – only a few differences emerged. First was the difference between most- and least-trusted sources. It was found that those who remained in the Kanto region or relocated within Japan trusted domestic sources more than overseas sources and distrusted overseas sources more than domestic sources; conversely, those who left trusted overseas sources more than domestic ones and distrusted domestic sources more than overseas sources. Furthermore, although all groups distrusted TEPCO more than other sources, foreign students who left Japan tended to distrust TEPCO more than those who remained or relocated. However, as this survey did not evaluate the reason why a specific information source was trusted or distrusted, it is difficult to make connections between sources and post-disaster action beyond the results found here.

The second difference was in the language used for acquiring disaster information. While there was not a large difference in the types of media used, those who remained in Kanto tended to utilize Japanese-language media the most, whereas those who relocated primarily used English-language media and those who left used both Japanese and other-language media. To examine whether this difference was caused by a difference in language ability, the Japanese and English language abilities were examined considering the post-disaster action. It can be seen in Figure 12 that those who remained in the Kanto region did not have a significantly higher level of Japanese ability; however, those who relocated to another area of Japan did appear to have higher English ability. Foreign students who left Japan had similar language abilities as students who remained in the Kanto region.

The third difference between foreign students considering their post-disaster action was the language utilized for clarifying information problems. Again, although there was not a large difference by the type of media utilized, students who remained in the Kanto area primarily used Japanese-language media, those who relocated utilized English-language media, and those who left Japan turned to other language media. However, as was illustrated in Figure 12, the language abilities of the three groups did not differ greatly, except for the high English ability of the foreign students who chose to relocate within Japan. This seems to indicate that the difference in post-disaster action may not have been directly related to or affected by the language utilized for acquiring disaster information.

**Post-disaster action**

Perhaps the most significant difference between the three groups was not their disaster information gathering behavior, but rather the reason for their post-disaster action. Those who chose to relocate or leave Japan entirely strongly indicated that they made their decision as a result of a family request. In order to verify whether this trend could be observed for foreigners as a whole or just for foreign students, an additional analysis of non-student foreigners focusing on their reasons for post-disaster action was conducted. Figure 13 shows the comparison between non-student foreigners and foreign students, and it can be seen that, although “family request” was a bigger reason for those who relocated or left than for those who remained in the Kanto region, the trend was not as pronounced as it was for foreign students. Furthermore, it can be seen that reasons such as “job obligation” (for those who remained) and “concern for the young” (for those who relocated or left) were much more...
strongly cited by non-students than by students. It is not unreasonable to assume that foreign students’ families were relying primarily upon the information disseminated in their own country and that, furthermore, that information may not have been the same across different countries. This raises the question of whether the post-disaster response of students was different by country. Additional analysis given in Figure 14 clearly shows that there was a large difference in response between the students from the four countries with the most foreign students. Roughly 70% of the students from China and around 80% of the students from Thailand and South Korea chose to either relocate or leave; in the cases of Thailand and South Korea, those who outright left Japan made up more than 70%. However, in stark contrast to the other three countries, more than 65% of the students from Vietnam chose to remain in the Kanto area.

To better understand the reason for the discrepancy between the post-disaster actions of the foreign students in the above four countries, the reasons for the post-disaster action were examined by country (Figure 15). It can be clearly seen that, for all countries, “family request” was a strong factor with regards to the decision to relocate or leave. In the case of Thailand, South Korea, and Vietnam, however, the sample sizes for those who relocated (and left, in the case of Vietnam) were very small, as most respondents either mostly left (Thailand and South Korea) or remained (Vietnam). For foreign students from Vietnam who chose to remain, “personal decision” was the most-cited reason, followed by “unable to leave” and “job obligation.” This response is similar to the case of Chinese foreign students who elected to remain in the Kanto region as well. When comparing the cases of foreign students who decided to leave Japan, “family request” appeared to be a much stronger factor for students from China and Thailand, whereas South Korean students cited “personal decision” and “family request” roughly the same.

From these results, it’s clear that there were a variety of factors which led to foreign students’ decision to remained in the Kanto region, relocate to another area of Japan, or leave Japan entirely. As “family request” was strongly cited by those who relocated or left, disaster information dissemination not only in Japan but also in overseas countries may have a large effect on the post-disaster decision making of foreign students inside Japan. However, as was shown here, students from different countries exhibited widely different post-disaster actions. Further research focusing on foreign students should therefore consider not only the relationship between foreign students in Japan and disaster information dissemination in their home countries, but also the difference in how information on Japanese disasters is disseminated between foreign countries.

**CONCLUSION**

In this paper, the disaster information gathering behavior of foreign students was examined considering their action after the Tohoku Earthquake. It was found that foreign students’ disaster information gathering behavior was similar regardless of their post-disaster action with the exception of three cases: their most- and least-trusted information sources, their utilized language for acquiring disaster information, and their utilized language for clarifying information difficulties. In the case of the utilized language, additional analysis found that the differences in utilized languages may not be related to the actual language abilities of the foreign students, with the exception of students who chose to relocate within Japan, whose English ability was much higher than the other groups of foreign students.

Perhaps the most significant difference between foreign students who remained, relocated, or left was the reason for their post-disaster action. The request of students’ families...
appeared to be a strong contributing factor for those who relocated or left Japan, implying that the disaster information disseminated in overseas countries may have indirectly affected foreign students in Japan. The response of foreign students was not the same when examining different countries, however, as it was found that while students from some countries, such as Thailand or South Korea, overwhelmingly relocated, students from Vietnam overwhelmingly remained in the Kanto region. Therefore, it will be necessary to consider the effect of overseas news and the difference between news in overseas countries in order to better understand the factors affecting the post-disaster action of foreign students.

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