

EXTRACTION METHOD OF BRICOLAGE ACTIONS FOR TOURISM DURING COVID-19

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ABSTRACT. *Tourism activities have positive impact on individual's emotions and can improve individual's QOL (Quality of Life). To build sustainable tourism, resilience is required in difficult society such as COVID-19 pandemic era. One of resilience is "Bricolage" described by Levi-Strauss in "La Pensée Sauvage (The Savage Mind)". In this research, we aim to discover Bricolage's activities and how humans express their feelings under COVID-19. We classified Bricolage actions into three types: (type 1) Self-closed Bricolage actions, (type 2) One-directional Bricolage actions and (type 3) Mutual Bricolage actions. We implemented the collecting and analyzing system using tweets data in 2020 with the keyword "Tourism". As a result, keywords of type 1 and type 2 are increasing, especially in conjunction with the first increasing peak of the number of infected people. For keywords of type 3, the increase was linked and was slightly behind in terms of the variation of keywords of type 1 and type 2. In addition, verbs of Bricolage activities were extracted by the 5-gram analysis in terms of the keywords of type 1 and synchronized with the increase trend in the number of infected people. This phenomenon shows social resilience with Bricolage is represented by people during COVID-19.*

Keywords: Bricolage, Tourism, COVID-19, Tweets

1. Introduction. Tourism activities have a positive impact on an individual's emotions due to encountering new cultural exchanges and a magnificent natural environment and can improve an individual's QOL and subjective well-being. Since the end of 2019, COVID-19 has been widespread worldwide and has hit hardly the tourism industry. Previous studies have already discussed new corona viruses such as SARS and MERS and have considered tourism activities in such conditions. However, this COVID-19 pandemic has new features. We should discuss the tourism-related activities during COVID-19 to build sustainable tourism for the future. Sustainability requires resilience meaning the strength of human beings in difficult society such as COVID-19 pandemic era. Individual human resilience could establish social resilience. One of other actions to express "resilience" is "Bricolage" originally described by Levi-Strauss in "La Pensée Sauvage (The Savage Mind)". Levi-Strauss [1] showed the actions with resilience under the unpredictable difficult situations.

Activities of resilience have been systematically described in the past based on the individual analysis results. Even if we systematically analyze the issues of the current unknown changes in the environment such as COVID-19, we could hardly find the effective and appropriate solutions. Bricolage [1], however, is attracting attention as one of the resilience to such unknown changes in the environment. This concept is derived from the French bricoleur, which means to make something to deceive in a jumble of things or to repair it in time. This concept of Bricolage is attracting attention as a direction to respond to unknown changes in the environment. In this study, we considered its application in

the tourism field. We suppose that detecting the Bricolage expression of individual will lead to new activities in the tourism field during COVID-19.

In previous studies, we firstly focused on the conflict between residents and tourists, and presented the one solution using our proposed model [2]. In addition, we have proposed a method for discovering positive activities in the negative environment of over tourism [3]. The motivations of this study are to extract the elements of positive emotions that humans originally possess by analyzing human expressions in large negative environmental changes such as COVID-19. These elements can be regarded as the direction and guideline of activities for the future society. Bricolage is a method of discovering new vitality from tacit knowledge and we believe the extracted positive emotions can be regarded as elements of Bricolage. As the contributions of this research, tacit knowledge is strengthened by accumulating the elements of Bricolage actions and could be automatically found using machine learning to cope with the difficult conditions occurring in the future. We believe that tacit knowledge can be the diverse knowledge for sustainable society.

This paper is structured as follows. After the introduction of the research, the definition of Bricolage and the elements of Bricolage activities are described. In the next section, we propose how to apply the concept of Bricolage to the tourism field. Using the tweets data as experiments, the method of extracting Bricolage activities and the results of analysis are explained, and finally the summary and conclusions are described.

2. Bricolage. The concept of Bricolage was advocated by French cultural anthropologist Levi-Strauss and was published as “The Savage Mind” [1] in 1966. Bricolage was used to distinguish between the scientific thinking of engineers (scientists) and the wild thinking of bricolles (dexterous people). Levi-Strauss pointed “savvy people” practiced various makeshift work in their daily life and responded to the new environment and showed the importance of paying attention to the practice method. Engineers intentionally collect materials for the solution, while bricolles (the main body performing Bricolage) does something using a limited set of tools and materials. This concept of Bricolage is a development of theory in a wide range of fields such as histology and entrepreneurship. In the entrepreneurship domain, Bricolage was introduced by Garud and Karnøe [4] who contrasted it with ‘breakthrough’ and Baker and Nelson [5] who provided evidence from 29 resource-constrained firms. Baker and Nelson defined entrepreneurial Bricolage as “making do by applying combinations of the resources at hand to new problems and opportunities” [5].

In the current COVID-19 pandemic, the response to the “change” of the environment cannot be dealt with by the conventional “knowledge”, “rules”, “customs”, etc. The “unusual” change such as the state of emergency caused the difficulty of continuing life. In addition, the situation is getting worse for the spread of infection. Batat showed how Michelin-starred chefs are becoming social entrepreneurs through developing alternative practices to cope with the situation in COVID-19 while contributing to the collective and individual well-being [6]. In his research [6], he showed that Michelin-starred restaurants implement multilevel response strategies by developing dynamic capabilities while playing a social role through the development of new forms of business practices. The results showed that Michelin-starred chefs adopted social Bricolage entrepreneurial thinking [7] to deal with the extreme situation and use diverse resources and response strategies to tackle social issues and improve the collective and individual well-being.

In this study, we will introduce the perspective of Bricolage and examine the resilience of the tourism considering how humans express under the difficult situation such as COVID-19.

3. Application of the Concept of Bricolage to Tourism.

3.1. Model of Bricolage actions. Bricolage is adopted as the social Bricolage entrepreneurial thinking to conduct “making do with what is at hand” using resource existing around the person under the unpredictable change of environment such as COVID-19. The purpose of this study is to apply the concept of Bricolage to the tourism field in COVID-19, and to extract positive Bricolage activities.

Figure 1 shows the concept of Bricolage applying for tourism field. Tweets with the keyword “tourism” can be thought of as an expression from tourists who are conscious of tourism and people in the tourism industry. We assume a possibility that those actors will use some resources to express positive Bricolage activities. The target of this study is the situation in 2020 in Japan under the circumstances that the number of infected people of COVID-19 changes greatly depending on the month and day. We assume the people could overcome the unpredictable change of environment to expressing the feelings of Bricolage to overcome the COVID-19. This study considers that the increase and decrease in the number of infected people are factors that activate Bricolage activities. Bricolage activities are based on available resources by Bricolage original definition. Focusing solely on resources, however, can be limited to general expressions. In addition, each tweet consists of the multiple sentences presenting the personal feelings. We focus on the positive verb to deal with this condition and extract the word-set around the focused word using n-gram method.

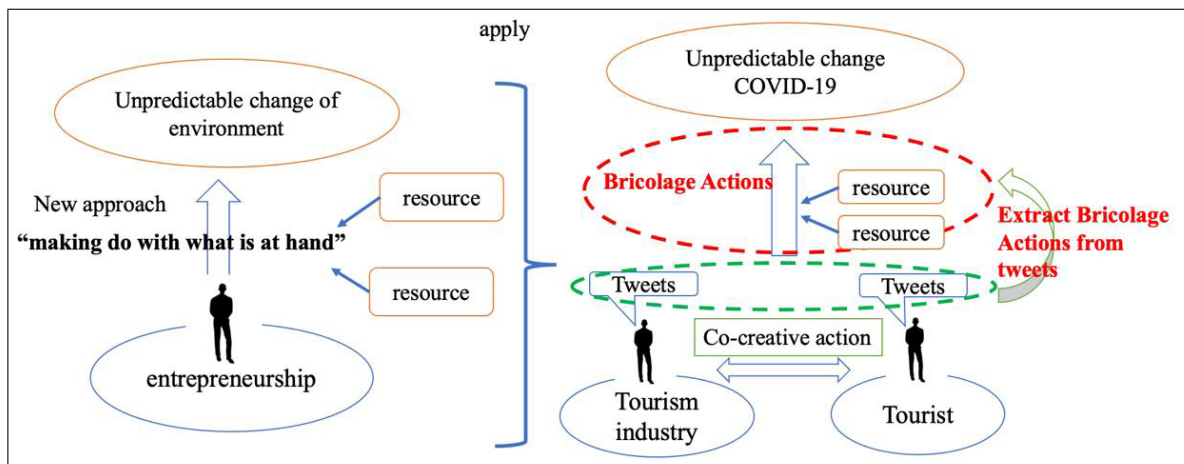


FIGURE 1. Application of the concept of Bricolage to tourism

3.2. Classification of Bricolage actions. In this study, Bricolage activities are classified into three types according to the direction of human activities in Figure 2. Type 1 is self-closed Bricolage actions meaning activate positive activities for oneself. Type 2 represents one-directional Bricolage actions activating Bricolage activities for other people. Type 3 is mutual Bricolage actions, which are activities influencing each other. The characteristic keywords in each type are extracted from positive tweets, and each dataset containing these keywords is constructed and regarded as the reveal of activities with Bricolage actions. In addition, the related words after n-gram analysis centering in each keyword are considered Bricolage expression.

4. Experiments and Results. Figure 3 shows the outline of the experimental data extraction system. We used the Twitter REST API with the keyword “Tourism” to collect data on a regular basis. Since many duplicate data are posted repeatedly in the original data, we compared them with each other to generate a unique data set. In addition, positive and negative tweets were extracted using the Positive and Negative Dictionary, each

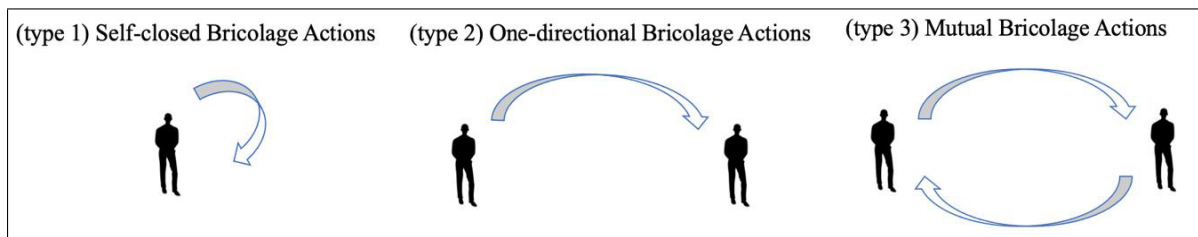


FIGURE 2. Classification of Bricolage actions

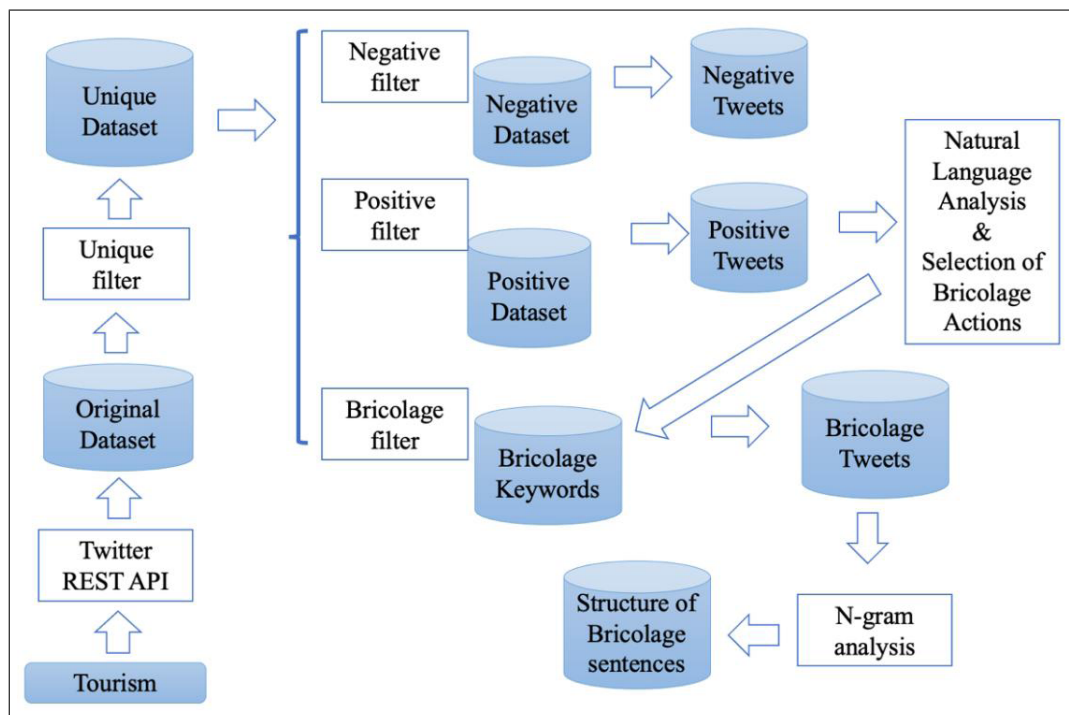


FIGURE 3. Experimental system setup

containing 100 words. Assuming that Bricolage actions are included in positive tweets, we performed natural language analysis and extracted the verbs related to the three types of word proposed above. In addition, the extracted verbs were detected as Bricolage actions and the related Bricolage actions were extracted from the entire tweets by analyzing the sentence structure for the three types of activities by 5-gram.

Table 1 shows the number of tweets in 2020 with “Tourism” as the keyword. Overall, there are 20,637 tweets. In this study, data of social media is collected only for Japanese data. The movement of people is restricted under COVID-19, so we chose the language of the country where the situation can be easily grasped. “観光 (tourism)” in Japanese is selected as the searching keyword. In Japanese, a lot of nouns are constructed by combining multiple nouns, for example, “観光客 (tourist)” is constructed by the “観光 (tourism)” and “客 (guest)”. By selecting the keyword “観光 (tourism)”, we could collect a lot of data related to tourism because the smallest unit is extracted in morphological analysis of natural language analysis.

TABLE 1. The number of tweets with “Tourism” keyword in 2020

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
The number of tweets	1,086	1,461	1,363	1,516	1,293	1,067	1,236	1,720	2,500	2,729	2,640	2,026	20,637

Figure 4 shows the changes in the number of people infected with COVID-19 in Japan in 2020. The first peak increased from early to mid-April. As the result, the first state of emergency was issued on April 7 and continued until May 25. The second peak increased from mid-July and then peaked in early August. It seems that one peak that was formed by the Go-To campaign (travel promotion activity) carried out from July 22 has activated the movement of people. As the third peak, the number of infected people continued to increase gradually from November to the end of the year. Following such a rapid increase, the second state of emergency was issued on January 8, 2021.

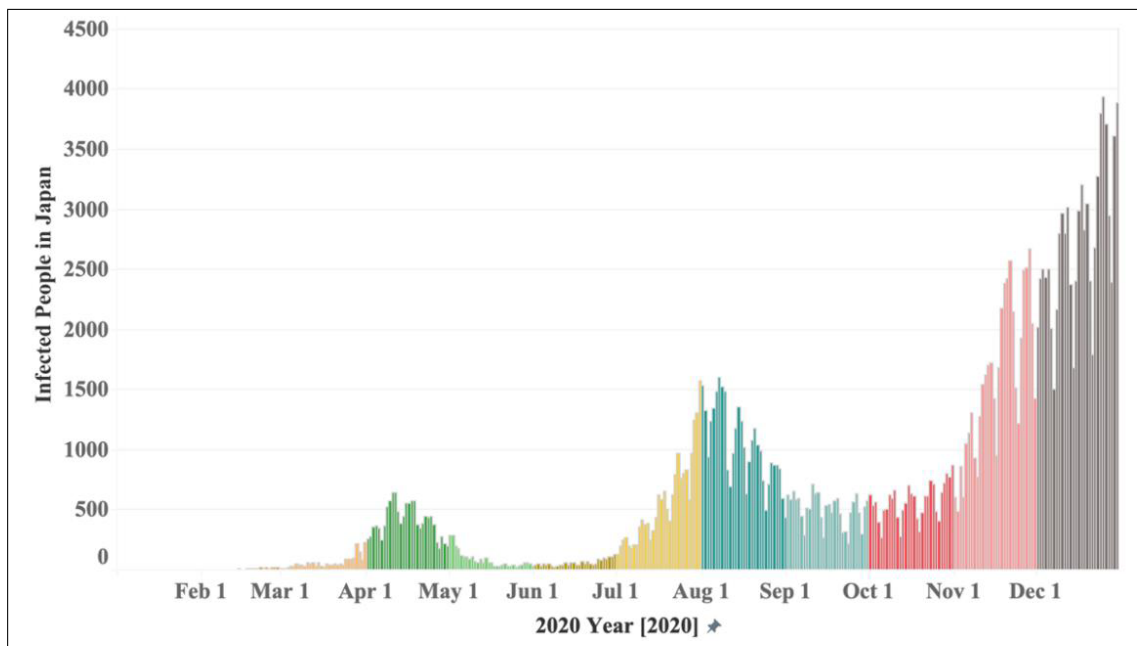


FIGURE 4. The number of infected people of COVID-19 during 2020 in Japan

Figure 5 shows the change in the percentage of positive and negative tweets per all tweets in 2020. Compared to the increase/decrease in the number of infected people of COVID-19, if the number of infected people increases, the number of negative tweets does not increase, but the number of positive tweets increases. Positive tweets are particularly increasing at the stage of reaching the first peak and the second peak. This phenomenon can show that human beings are shifting their emotions in the positive direction, despite the harsh environment. From this result, it can be said that there is a resilience activity such as Bricolage. In addition, positive tweets and negative tweets tend to be opposite movement.

“Make efforts”, “Support” and “Warm up” appearing in positive tweets were extracted as keywords corresponding to the three classified Bricolage activities, and the change in the appearance percentage of those words and the number of infected people of COVID-19 in Japan are compared.

Figure 6 shows the percentage of appearance of three keywords per positive tweets that can be considered as Bricolage actions in positive tweets for each month in 2020. As a result, keywords of type 1 and type 2 are increasing, especially in conjunction with the first peak of the number of infected people. For keywords of type 3, the increase was linked and was slightly behind in terms of the increase of keywords of type 1 and type 2. The trends of increase of each keyword, however, are considered not to be largely affected around the second and third peaks.

Three types of representative words were newly used as filters for the original dataset, and filtered data was gathered for each dataset. Furthermore, nouns, verbs, adjectives, and adverbs were selected, and 5-gram analysis was applied to those datasets.

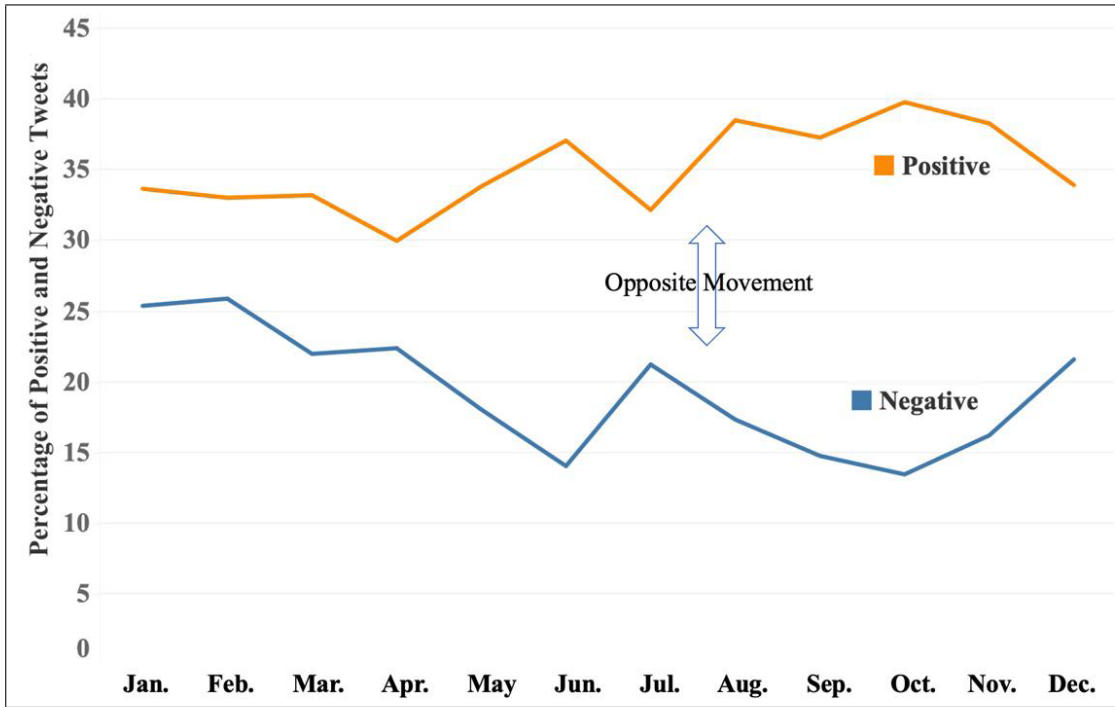


FIGURE 5. Percentage of positive and negative tweets

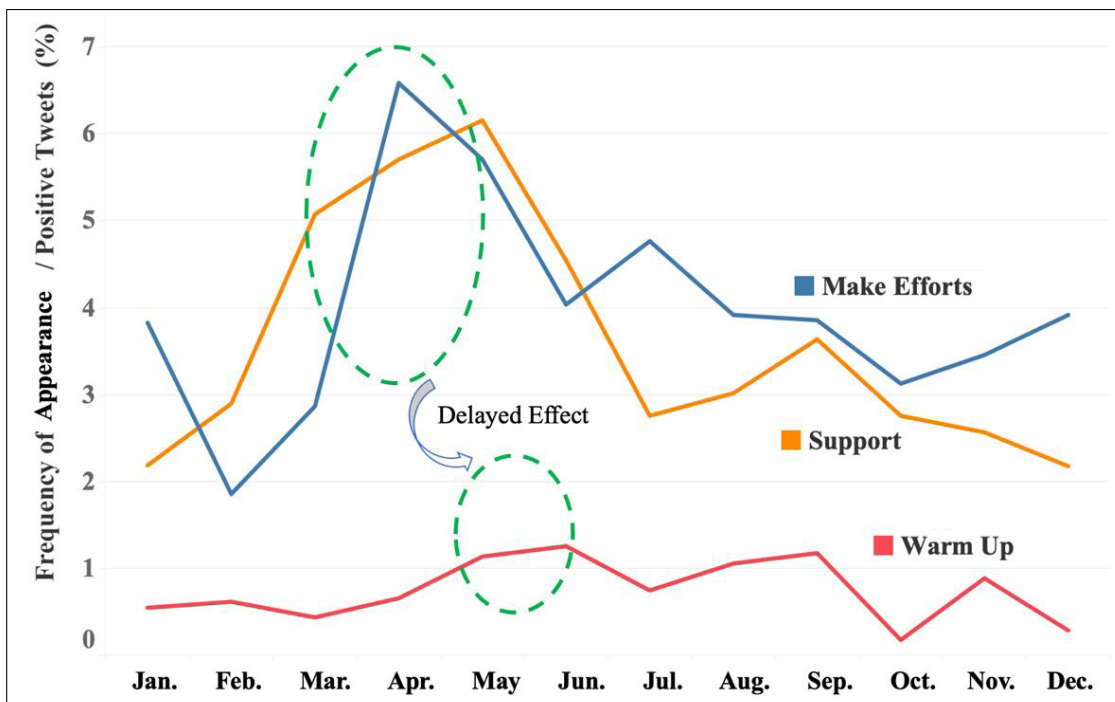


FIGURE 6. Percentage of appearance of each type of keywords

Figure 7 shows the results of 5-gram analysis through parsing for each type of sentence. Since type 1 is an individual’s voluntary activity, Bricolage action could be extracted from the verb, and daily routine works could be extracted from the object. Since type 2 is an act of Bricolage action on an object, terms with attributes such as place name, industry and other people could be extracted as objects. Since type 3 is an act of Bricolage action to the target like type 2, terms with attributes such as place name and industry could be extracted as the object. Furthermore, unlike type 2, we were able to extract collaborative words such as “friends” and “together” in type 3.

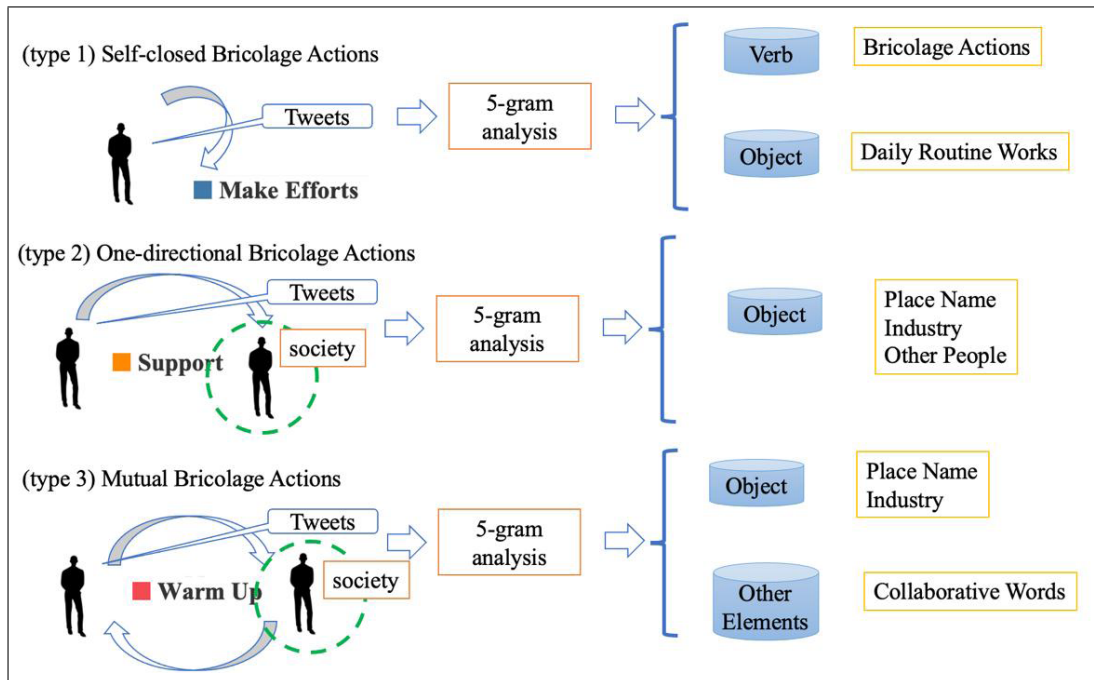


FIGURE 7. Sentence analysis of each type of keywords

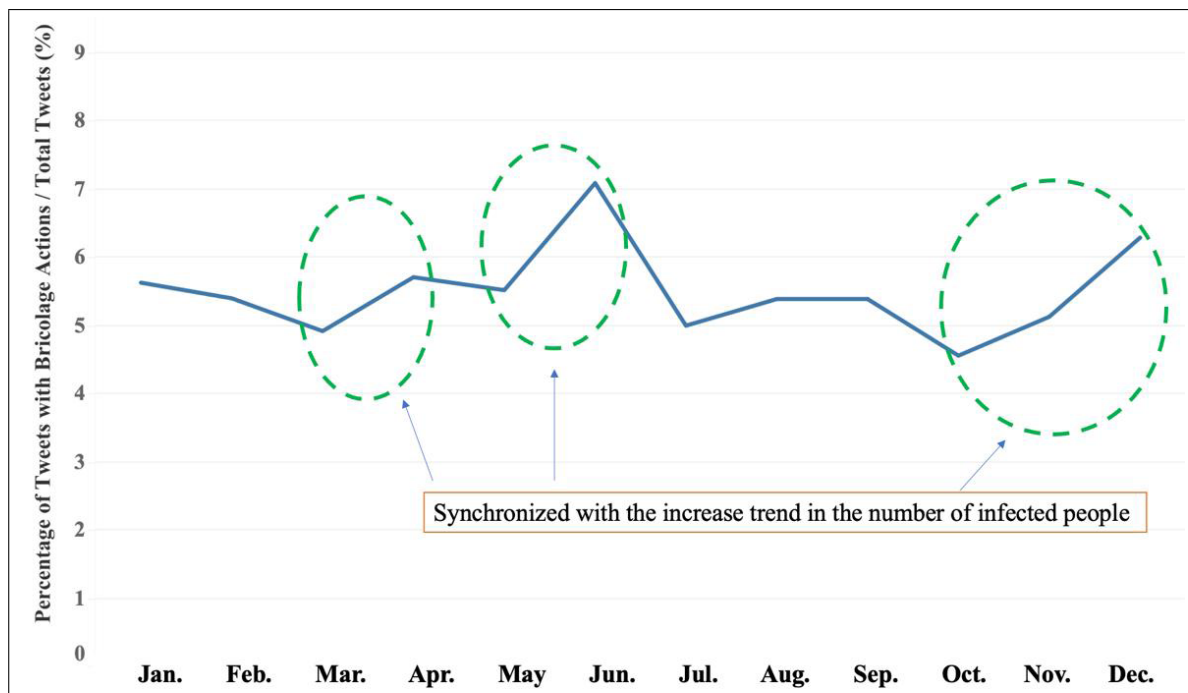


FIGURE 8. Percentage of tweets with Bricolage actions

A 5-gram analysis was applied to the dataset filtered from type 1 keywords, and 10 Bricolage actions were extracted as verbs.

Figure 8 shows the percentage of all tweets that include 10 Bricolage actions. From the figure, it can be judged that the timing of the increase in the percentage and the timing of the increase in the number of infected persons are almost synchronized. We could show individual Bricolage actions appear in response to the increase in infected persons.

5. Conclusions. In this research, we focused on words related to Bricolage enhancing the individual resilience and extracted the Bricolage relating keywords could enhance the positive expression during COVID-19 based on the social media. We classified Bricolage

actions into three types, (type 1) Self-closed Bricolage actions, (type 2) One-directional Bricolage actions and (type 3) Mutual Bricolage actions. “Make efforts”, “Support” and “Warm up” appearing in positive tweets were extracted as keywords corresponding to the three classified Bricolage actions respectively, and the change in the appearance percentage of those words and the number of infected people of COVID-19 in Japan are compared. As a result, keywords of type 1 and type 2 are increasing, especially in conjunction with the first peak of the number of infected people. For keywords of type 3, the increase was linked and was slightly behind in terms of the variation of keywords of type 1 and type 2. In addition, verbs of Bricolage activities were extracted by the 5-gram analysis in terms of the keywords of type 1. These activities were synchronized with the increase trend in the number of infected people. This phenomenon shows social resilience with is represented by people during COVID-19.

In recent years, the concept of Bricolage has attracted attention, and concrete examples of Bricolage activities have been studied in the face of the environmental change. However, a method for automatically extracting the connection of specific elements of Bricolage has not been established. In this study, we have extracted what kind of elements correspond to Bricolage activities. In the future, we believe Bricolage activities would be automatically generated in difficult situations using these elements.

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