Second Language Acquisition and Machine Translation

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青山ライフ出版

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Acknowledgements

This work was supported by JSPS KAKENHI Grant Number 19K13268. I would like to thank my students for participating in the current study and am grateful to Mr. Jerre Bush for kindly offering to check my English. I also would like to extend my gratitude to the staff of Jobu university for doing various tasks involved in the procedure of applying for the research grant. Finally, I would like to show my deepest gratitude to Professor Tom Gally for giving me a chance to initiate this study and to my family for their continuous support and devotion.

1. Introduction

Several years ago, when I was a graduate student, my supervisor said to me, “Machine translation (MT) has improved significantly since the neural network system was introduced into Google Translate in 2016, so we don’t have to worry about its low quality anymore.” At that time, I had serious doubts about his words because during the 1990s, as a high school and university student studying English, I had sometimes tried using MT, and every time I had done so, I had always felt severely disappointed about its quality.

After hearing my supervisor’s words above, and having doubted his words, I tried translating a Japanese letter into English using Google Translate and was shocked to see how perfect its translation was, and my feeling at that time would be endorsed by the results of many empirical studies later. I was also shocked to see how “practical” the words and expressions used in the translation were as they were apparently different from those that I had learned in junior and senior high school. I felt I could learn a lot from this method of translation at that time. A few years later, I decided to utilize the advantages of MT while teaching English to my Japanese university students. I asked them to translate a Japanese letter, which I had written myself, into English using Google Translate, and then translate another letter with similar contents into English while referring to the Google Translate translation. This activity was very similar to the research procedure adopted in the current study. Students’ answers to a questionnaire about this style of learning English as a foreign language (EFL) writing showed that their affective responses were generally positive. Furthermore, many of the words and expressions which they used in this practice seemed very “practical” to me. In other words, they used words that they most likely would never have used without the help of MT. I remember that at that time I began to feel that MT may be able

to facilitate Japanese university students' learning of EFL in some way.

There has been an ongoing dispute over the relationship between MT and second/foreign language learning, particularly among practitioners. The predominant standpoint has been that MT can potentially interfere with learning, and there still seems to be a lot of support for this view. Considering the phenomenon mentioned above, however, I think that this standpoint should be challenged by further research and debate. I think that there should be ways in which MT can facilitate second/foreign language acquisition. Therefore, upon receiving a research grant from the Japanese government, I have taken this opportunity to investigate the relationship between the use of MT and second/foreign language acquisition: namely, how the former can or cannot facilitate the latter.

2. Literature review

Areas which have been discussed in second language acquisition theories so far and are considered to be related to the use of MT, seem to be twofold: the role of the first language and input. In this section, theories which center on these two areas will be briefly discussed. Next, empirical studies, which have been undertaken regarding the relationship between the utilization of MT and second/foreign language learning, will be reviewed in relation to the insight which was gained through the above-mentioned second language acquisition theories.

2.1. The role of the first language

The role of the first language is considered more crucial to foreign language learning than to second language learning. In general, a learner's first language is often used to teach them a foreign language, and it even becomes a "habit" to use the first language while learning the foreign language. Second language learners, on the other hand, often learn the target language in a natural setting with little or no intervention of their first language, which is thought to reduce the extent to which it can influence or interfere with the learning process. Thus, it may be said that the first language is involved in the process of learning any foreign language. However, the advent of MT is thought to have caused a change in the relationship between second/foreign language learning and using the first language. Particularly in the case of foreign language learning, MT can save learners the time and effort required to think in their first language, though the extent to which it can do so may depend on the situation and the individual. In other words, the process of thinking in the first language, which is considered to

be inevitably involved in any foreign language learning, can be omitted from the process of learning foreign languages. Thus, it is not learners, but the "machine" who thinks about how to translate the first language into the foreign language. This phenomenon of "role-switching," which has gradually become more common with the use of foreign languages, has the potential to drastically influence and change people's attitude toward foreign language learning. However, before investigating how it does so specifically, I would like to give a brief outline of the role the first language has been considered to play in second language acquisition theories.

The period when second language acquisition had not yet gained independent status as an academic field was described by Ellis as follows:

> Up to the end of the 1960s, views of language learning were derived from a theory of learning in general. There were few studies of SLA based on the actual language that learners produced, and few attempts to examine the process of SLA empirically before this. The dominant school in psychology, which informed most discussions of language learning, was behaviourism. (Ellis, 1985, p. 20)

Behaviorism is the type of psychology that considered human behavior as a response caused by a certain stimulus and explained that a habit was formed by associating a particular response with a particular stimulus. As a stimulus takes place frequently and a response is caused each time, the association will become stronger and the response will, therefore, become automatic. It is expected that a habit formed in this way will interfere with a person's learning of new habits. This habit-formation process was applied to second language acquisition. That is, the previous learning (or the knowledge of the first language) can get in the way of new learning (or acquiring the knowledge of a second language). Thus, errors are considered to occur when learners try to transfer their knowledge from their first language into their second language production. In order to avoid making errors, the "proactive inhibition" (Ellis, 1985, p. 22) should be overcome. This behaviorist view of errors in second language acquisition triggered various

attempts that have been made to predict when they would happen. Among them, the most famous attempt was the Contrastive Analysis Hypothesis, which assumed that, by comparing the first and target languages, their differences could be identified and utilized to predict potential errors and, therefore, evaluate how difficult the target language would be to learn.

The Contrastive Analysis Hypothesis, however, was widely criticized. The criticism was basically twofold: psychological and linguistic. From the former point of view, there was no theoretical evidence to indicate that the more different a target language is from the first language, the more difficult it is to learn. In fact, Lee (1968) reported that when he had learned a foreign language, he had experienced little transfer from his first language because they were "too" different. Moreover, it is not necessarily the case that "difficulty" leads to "errors." Generally, if learners feel a target language is very different from their first language and, therefore, find it difficult to learn, they may try to produce it more carefully. On the other hand, if the two languages are similar, learners tend to pay less attention to what they produce. "Avoidance" is also one of the crucial issues in discussing differences between a target language and the first language. Schachter (1974) compared East Asian (e.g., Chinese and Japanese) students' and Middle Eastern (e.g., Persian and Arabic) students' English production task performances and found that the former made fewer errors than the latter. She speculated that behind this phenomenon was Chinese and Japanese students' tendency to avoid using grammatical features which they thought were difficult to learn, in this case, relative clauses, because their native languages do not have such grammatical features. Finally, she argued that differences between one's target language and first language may provide a means by which to predict the degree to which learners avoided using the target language, but not exactly how difficult it was for them to learn.

The linguistic tenet of the Contrastive Analysis Hypothesis had also been challenged. In this hypothesis, the "translation equivalence" was considered very crucial when comparing two languages: that is, one needs to be completely translatable to the other. Moreover, in order to confirm that two languages are translationally equivalent, they need to be proven to perform similar

communicative functions as well as share structural similarities. However, it can be said that English and French, for example, do not always perform similar communicative functions or share structural similarities, though both belong to the same language family: the Indo-European family of languages. The same can be applied, and undoubtedly more so, to two languages which do not belong to the same family language, e.g., English and Japanese, etc. In this respect, a pragmatic feature of the Contrastive Analysis Hypothesis had also been raising skepticism.

This pragmatic point of view, however, originated in Lado's *Linguistics Across Cultures* (1957), where many pragmatic issues involved in comparing cultural differences were discussed in a comprehensive way. Sajavaara (1981) did not doubt the validity of the Contrastive Analysis Hypothesis per se but indicated that a problem existed in the way that the comparison was conducted. Lado argued that in the process of comparison, pragmatic issues continued being neglected, but should have deserved more attention. Ellis (1985) stated that these proposals raised the following questions: "to what extent are the communicative parameters of language universal or language-specific? If they are language-specific, to what extent are the rules of language use transferable from the first to the second language?" (Ellis, 1985, p. 38). Ellis (1985) also referred to another issue: the same communicative functions are realized differently between languages. Different languages often use different styles of making a polite request. For example, "Could you help me, please?" in English and "O-tetsudai itadake masu ka（お手伝い頂けますか）" in Japanese are thought to deliver the same message, but their syntactic forms, etc. are very different. Taking advantage of Li and Thompson's (1976) framework, Schachter and Rutherford (1979) classified languages into two types: topic-prominent and subject-prominent. In the former type of languages, which includes Mandarin, etc., the contextual discourse-function plays a crucial role, whereas in the latter type, which includes English, etc., the grammatical subject-predicate relation is a key component. According to Schachter and Rutherford, in order to convey the same message, they employ different formal styles in the following respects: (1) In surface coding (a topic is always coded and often occurs in sentence-initial position in the topic-prominent languages); (2) In expression of voice (a passive voice is sometimes seen in the subject-prominent