

# Visualization of Syntactic Structure Changes in Learning of English-Japanese Translation

Muhammad Asyraaf BIN MD TAKIYUDIN<sup>\*1</sup>, Mayu FUJITA<sup>\*1</sup>, Yusuke HAYASHI<sup>\*1</sup>, Tsukasa HIRASHIMA<sup>\*1</sup>  
<sup>\*1</sup>Graduate School of Engineering Hiroshima University  
 Email: b170334@hiroshima-u.ac.jp

Abstract : The differences in way to signal grammatical meaning (syntactic rules) in English and Japanese can cause difficulty in foreign language learning. English sentence is governed by word order, while Japanese sentence is governed by function words(particles). This study attempts to visualize these differences by designing a contrastive linguistic-based step by step translation from English to Japanese Exercise System to support foreign language learning. The results from preliminary experiment conducted on 15 3<sup>rd</sup> grade high school students suggested that this exercise system was useful.

Keywords : Foreign Language Learning, Contrastive Linguistic, English to Japanese Translation, Syntax, Syntactic Structure Changes

## 1. Introduction

Second language acquisition (SLA) and first language acquisition is different, and first language may be one of the greatest factors in SLA. Differences in syntactic rules between Japanese and English can cause difficulty in SLA. Most of language learning do not compare native language and language to be learnt. Therefore, this study attempts to design contrastive linguistic-based exercise system to support SLA by visualizing differences in syntactic rules by using English to Japanese translation model.

## 2. Second Language Acquisition and Contrastive Linguistics

First language acquisition is the process where a child learns his/her first language. Second language acquisition is the process of learning another language after the native language has been acquired. Influence from the first language is called transfer. Similarities between two languages will cause no difficulties or it is called as positive transfer while distinction between two languages cause interference or it is called as negative transfer.

Contrastive linguistics is a practice oriented linguistic approach that seeks to describe the differences and similarities between a pair of languages by comparing them. Modern contrastive linguistics proposed to show in what ways how two respective languages are different to solve practical problems such as to assists interference errors in second language acquisition. Comparison between two languages can be done by comparing their pronunciation, grammatical structure, vocabulary, writing and cultural behavior. In grammatical structure, there are variety of devices can be used to signal grammatical meaning such as word order, inflection, correlation of forms, function words, intonation, stress and pauses.

There are a few major differences between Japanese and English, but most learners do not notice the syntactic rules differences between these two languages that may cause difficulty. The role of each word in English sentence determined by word order while in Japanese

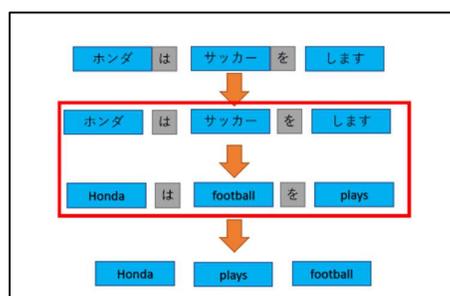
sentence the role determined by function words(particles) such as “は”, “を”. In this research, an exercise that are based upon a scientific description of language to be learned, carefully compared with a parallel description of the native language of the learner designed to support foreign language learning.

## 3. English to Japanese Conversion Model

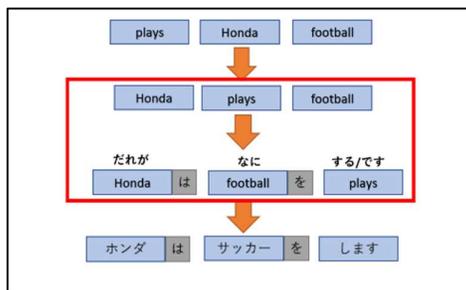
English to Japanese conversion model is a step by step conversion model from English to Japanese. Learner builds English sentence, rearrange the English words, and replace English words with Japanese words to make a Japanese sentence.

### 3.1 Comparison with Step by Step Japanese to English Conversion Model

In previous research, Step by Step Japanese to English Conversion Model was implemented[7]. The main difference between this model and the model implemented in this research is the process where learner capture the meaning of original text to generate text in the target language as shown in Figure 1.



(a) Step by Step Japanese to English Conversion Model (previous research)



(b)Step by Step English to Japanese Conversion Model (this research)

Figure 1: Model comparison

#### 4. Design and Development of Exercise System

A step by step English to Japanese translation exercise system where learner build Japanese sentence from English words was developed in this research which is implement step by step English to Japanese conversion model. English sentences used in this system is limited to action verb pattern sentences. There are some constraints in this system which is there are no modifiers in English sentences and each element must consists only one word.

In this exercise system, there are 3 steps to English sentence to Japanese sentence. For the first step, learner build an English sentence by rearranging words given. In the second step, learner rearrange words according to provided guide as shown in Figure 2. This is the part where learner could notice how the sentence structure changes due to syntactic rule differences between English and Japanese. The provided guide is based on how function words work in Japanese sentence. In the last step, learner replace English words with Japanese words by clicking a button.

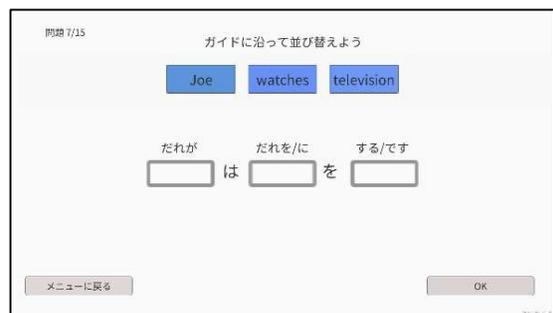


Figure 2: Rearrange English words according to provided guide

#### 5. Preliminary Experiment

A preliminary experiment was conducted on 15 3rd grade of high school students to confirm whether this system is useful. Questionnaire, pre-test and post-test was used as data acquisition method in this experiment. Before using the system, students were explained about Japanese to English conversion model, then they were divided into two groups, group A and group B to take a pre-test. After that, they started using the system within 10 minutes. After finished using the system they were requested to take a post test.

Result from questionnaire suggests that 93% of the students evaluated “it is easy to understand how to use this exercise system” as a positive evaluation, 80% of the students evaluated “It was easy to translate English sentences into Japanese sentences by using this system”, “No system malfunctions occurred while using this system” as a positive evaluation which means this system is useful without any trouble. 80% of the students agreed that they could notice the differences of syntactic rules between English and Japanese while using this system. Results from pre-test and post suggest that there is only slight of improvement on students’ score after using this system.

#### 6. Conclusion and Future Work

Contrastive linguistic approach-based English to Japanese translation exercise system was designed to improve second language learning by visualizing syntactic structure changes using step by step translation model from English to Japanese. Results from preliminary experiment show this system is useful. For future work, some system improvements will be done, and an experiment will be conducted to confirm learning effect using the system.

#### References

- (1) Wolfgang Butzkamm. “We only learn language once. The role of the mother tongue in FL classrooms: death of a dogma”. In: Language learning journal 28.1 (2003), pp. 29-39.
- (2) Volker Gast. “Contrastive linguistics: Theories and methods”. In: Dictionaries of Linguistics and Communication Science: Linguistic theory and methodology. Berlin: Mouton de Gruyter (2012).
- (3) Robert Lado. Linguistics across cultures: Applied linguistics for language teachers. Univ of Michigan Pr, 1957.
- (4) Richard Webb. Japanese Sentence Structure: The Ultimate Beginner’s Guide. Nov. 2020. url: <https://8020japanese.com/japanese-sentence-structure/>.
- (5) ] Wikipedia. Contrastive linguistics | Wikipedia, The Free Encyclopedia. <http://en.wikipedia.org/w/index.php?title=Contrastive%20linguistics&oldid=825933651>. [Online; accessed 20-October-2020].2020.
- (6) WANG Zhanming. “Review of the Influence of L1 in L2 Acquisition”. In: Studies in Literature and Language 9.2 (2014), pp. 57-60.
- (7) Mayu Fujita. “Design and development of English translation learning support system as stepwise structural conversion for 5 sentence patterns”.2020