

Does the L1⁺ Approach Derived from Syntactic Priming Research Facilitate Sentence Production for Japanese English Learners?

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Abstract

This study empirically investigates whether the L1⁺ approach will facilitate learners' English sentence productions by comparing the performance of students with two varying proficiency levels. L1⁺ is a bridge language where Japanese words are placed in English word order. Twenty-eight Japanese female university students participated in ninety-minute weekly training for fifteen weeks, with six interview tests in total. The sample was divided into a high and low group according to the total number of sentences produced in the six interviews. The analysis indicated the following five findings: 1. high group significantly improved in sentence production, compared to the low group ($p < .01$), 2. The improvement of the high group's performance was observed in sequential interviews ($p < .01$) but, 3. the low group's performance depicted no significant sequential changes from the first to the fifth interviews, 4. the final exam scores of the high group were significantly higher than those of low group, 5. only the high group significantly improved self-efficacy through this study. The results suggest that the reason for no significant gain observed in the low group is due to their reliance on internal factors, such as self-efficacy, towards learning English, in contrast to the intervention proposed.

Keywords: holistic approach, syntactic priming, cross-language syntactic priming, sentence production, L1⁺, oral proficiency

1. Introduction

A key factor in conveying a message in the second language (L2) is to acquire proficiency to produce sentences in the target language. This study investigates whether the holistic approach based on findings in syntactic priming studies will facilitate learners' English sentence productions by comparing the performance of students with two different proficiency levels. The holistic approach applied in this study had two distinctive features: the generation of new sentences using models provided in a bridge language (L1⁺), and interaction with peers. The concept of L1⁺ is developed for this study, based on the cross-language syntactic priming research findings. As the name suggests, L1⁺ is a bridge language between learners'

first language (Japanese) and the target language (English), where Japanese words are placed in English word order. The following section will provide a concept of the theoretical background of the holistic approach applied in this study.

2. Literature Review

2.1 Language transfer

The term language transfer implies that the knowledge of the first language (L1) impacts the acquisition of the second language (L2) in both positive and negative ways. Therefore, if aspects of L1 are similar to L2, acquisition of those aspects in L2 might be facilitated (positive transfer), and if the aspects are different from those of L2, acquisition of those aspects might be affected (negative transfer) (Selinker, 1972). Moreover, past research findings signify that L2 learners struggle to learn unknown aspects of L2, which does not exist in L1 (Gabriele, 2009).

2.2 Syntactic differences between Japanese and English language

The differences in syntactic structures between English and Japanese language are one of the affective factors that delay the proficiency development of Japanese English learners. Syntax between the Japanese and English language differs in several ways. One of the significant syntactic differences between Japanese and English language is word order. Japanese is a so-called “SOV” language where verbs are placed at the end of sentences. Conversely, English is “SVO” language, where verbs are usually placed right after the subject of the sentence. Also, the Japanese language can omit the argument of the verbs almost in any context; on the other hand, the English language cannot (Chang, 2009). For example, an English sentence, “I gave it to you a month ago.” can be stated as “gave a month ago” in Japanese since referents are apparent in the context. Furthermore, the word order of referents is quite flexible in the Japanese language. The Japanese language can accept to switch the subject and the object since it uses particles in front of nouns to indicate the syntactical role in a sentence. The English sentence, “ I gave it to you a month ago.” can be stated in Japanese as, “I (wa) /a month ago(ni) /you (ni)/ it (wo) gave/.,” “you (ni) / I (wa) /a month ago (ni)/it (wo)/ gave,.” Such differences in word order between English and Japanese language can delay the proficiency development of Japanese English learners.

2.3 Syntactic Priming Studies in ELT

Syntactic priming has recently been attracting the attention of ELT (English Language

Teaching) professionals to improve learners' grammar skills, such as word order. Structural priming refers to the tendency of speakers to produce a syntactic structure that appeared in a recent discourse (Bock, 1986). For example, if a person hears, "I sent chocolate to Mr. Chen" in a conversation, the person who hears the utterance tends to use the same syntactic structure, such as "I showed a picture to him" instead of saying "I showed him a picture", even though there is no association between these two sentences. Syntactic priming is so robust that it appears not only in laboratory settings but also in daily life situations (Corley, & Scheepers, 2002).

Studies on Japanese English learners (Nakagawa, Morishita & Yokokawa, 2013) indicated syntactic priming effects differ depending on their proficiency levels. According to Nakagawa et al. (2013), the syntactic priming rate was highest in the intermediate learners but not of novice learners.

2.4 Differences in Grammatical Encoding Process between Intermediate and Novice learners

Grammatical encoding is a part of the speech production process and is responsible for the lexical selection and syntactic structure construction (Bock & Levelt, 1994; Nakagawa et al., 2013). Nakagawa et al. (2013) argue that non-syntactic priming observed for novice level occurred because learners have difficulty in completing the lexical selection process before syntactic structure construction. In other words, novice learners have difficulty in selecting or translating words into the target language as they consume so many attentional resources for lexical selection that none are available for syntactic structure constructions.

The illustration of the grammatical encoding process was made based on Bock and Levelt (1994) and Nakagawa et al. (2013). First, speakers generate their message, followed by the lexical selection process. After that, they go through the positioning process to determine the word order. According to Nakagawa et al. (2013), since the lexical process is not automatic, novice learners overconsume attention resources for lower-level processing. Hence, not many attention resources are left for positioning processing (decisions of word order), denoting why syntactic priming does not occur. Instead, in the case of intermediate learners, their lexical selection process is automatic, and they have enough attentional resources left for the positional process. That is why syntactic priming occurs for them.

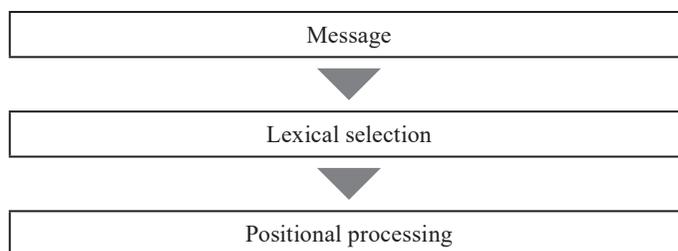


Figure 1. *Grammatical encoding process (Based on Bock and Levelt (1994) and Nakagawa, Morishita, & Yokokawa (2013))*

2.5 Issues in Past Research

The reasons for unobserved priming effects for low-level learners are not only because of the consumption of attentional resources for lexical selection but also because of the difficulty of the tasks. The task that Nakagawa et al. (2013) applied was a combination meant to be read aloud as a prime (which triggers the priming effect in the successive task as a target) and picture description task as a target. In the task, participants first read aloud the L2 sentences shown on screen on their own, and then on the next screen, they looked at the pictures regulated by two conditions, keyword condition (verbs and noun) in L2 and without a keyword condition, and described the picture. Notably, in picture description tasks, students need to understand the situation in the picture first and derive a message, then go through the grammatical coding process in L2. Low-level students might have used up their attentional resources in understanding the situation and creating a message for the picture before the grammatical coding process in L2 with no reference in L1. They might have had difficulty reading aloud the prime sentences before the picture description task in the target language since everything was written in L2. Therefore, to facilitate low-level learners' sentence production, the development of simpler tasks is necessary.

2.6 Research findings in Cross-language syntactic priming studies in ELT

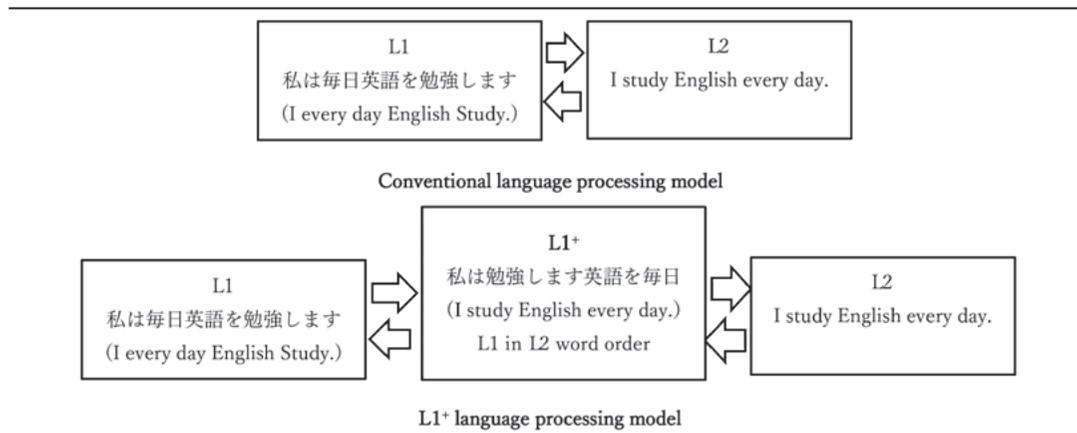
SLA (Second Language Acquisition) researchers have investigated not only syntactic priming in one language but also cross-language syntactic priming, which is syntactic priming that occurs between one language and another, and found that cross-language syntactic priming effect occurs between L1 and L2 (Vasilyeva, Waterfall, Gámez, Gómez, Bowers, & Shimpi, 2010; Bernolet, Hartsuiker, & Pickering, 2007; Hartsuiker, Pickering, & Veltkamp, 2004). Furthermore, Hartsuiker et al. (2004) investigated whether cross-language syntactic priming occurs among Spanish-English bilinguals. The participants were asked to describe cards in dialogue games in both languages. This research revealed that participants

who listened to a sentence in Spanish (L1) tend to use the same types of sentence structures in English (L2) to describe the next card. Primarily, the English passive voice was used more frequently after listening to passive voice in Spanish.

As described above, the significant findings in cross-language syntactic priming suggest that a shared syntax between L2 and L1 facilitates learning or use of the syntactic structure. In other words, if the word order or syntactic concept of L1 language is similar to the target L2 language, it facilitates learning of the structure of the target language. At the same time, the prime sentence will be in L1, not in L2, so that the burden for learners' decoding process will be reduced.

2.7 What is the L1⁺ Language?

Based on the past findings in cross-language syntactic priming, this study tries to utilize L1⁺ language, which is a bridge language between L1 and the target language, to facilitate the use or learning of the target structure in L2. The concept of L1⁺ language in Japanese and English language is described in figure 2.



*Inside the parenthesis indicates the direct English translation of Japanese words.

Figure 2. *Conventional language model and L1⁺ language processing model*

In conventional language processing, cross-language syntactic priming cannot be expected to occur since the word order between Japanese and English languages is different. On the other hand, in the L1⁺ language model, through the insertion of L1⁺ language, Japanese is converted into the English words seamlessly, allowing cross-language syntactic priming to occur. Through exposure to L1⁺ language before the target language as a prime, the use of the target structure is facilitated. In the earlier discussion on syntactic priming between L1

and L2 of Japanese English learners, Nakagawa et al. (2013) indicated the syntactic priming method between Japanese and English language facilitated the use of the target structures among intermediate learners (B1 level) than novice learners (A1 and A2 level). Since the L1+ language processing model provides the prime in L1, it will reduce the cognitive load for lexical processing of the prime and can direct learners to focus on positioning processing to facilitate sentence productions.

2.8 Holistic Approach applied in this study

The motive for this study is not only to confirm the effectiveness of the L1+ language processing model but also is to investigate a holistic approach to facilitate novice Japanese English learners' speaking proficiency based on syntactic priming research findings. In order to facilitate learners' output, it is necessary to implement other techniques proved useful in the past. Table 1 provides other significant findings in syntactic priming research, utilized in this study.

Table 1. *Major findings of syntactic priming applied in this study*

Comprehension effect	“Syntactic priming occurs not only during production but also during comprehension” (Nitschke, Kidd, & Serratrice, 2010).
Cumulative effect	“Long-term cumulative structural priming persists for (at least) one week” (Kaschak, Kutta, & Schatschneider, 2011).
Modality difference effect	“Syntactic priming persists in written and spoken dialogue” (Hartsuiker, Bernolet, Schoonbaert, Speybroeck, & Vanderelst, 2008).
Peer interaction effect	“Collaborative syntactic priming activities provide models of target structures and elicit production of those structures with a variety of lexical items, but do not require that learners provide each other with feedback, produce modified output, or discuss language form” (Trofimovich & McDonough, 2011, p. 132).

Based on those findings in Table 1, this study will utilize the techniques to strengthen the effectiveness of cross-language syntactic priming. The details will be described in the Method section.

2.9 Self-Efficacy Questionnaire

Additionally, this study tries to investigate the states of students' internal factors, utilizing English Self-efficacy Questionnaire (ESE) developed by Matsunuma (2006). Self-efficacy is confidence regarding whether given tasks can successfully be achieved, and it is said to influence human development and learning (Bandura, 1977). This study investigates whether self-efficacy in English studies impacts the improvement of oral proficiency through this study as well.

3. The Objective of this Study

This study investigates whether a holistic approach based on syntactic priming research findings in psycholinguistics will facilitate learners' sentence productions in the target language by comparing the performance of learners with two different proficiency levels and their self-efficacy states.

4. Method

4.1 Participants

Twenty-eight female Japanese students (aged between 19 and 21 years) participated in this study. All participants were Japanese with no experience of studying overseas. The participants were taking the author's English-speaking class, which mainly targets improving speaking skills and is part of the requirement for their graduation. This study was conducted as part of class activities during a fifteen-week course between April 2018 and August 2018.

4.2 Materials

4.2.1 Textbook. This study employs the book entitled “Intuitive Grammar English Training: 100 Topics” by Nakayama, Schnickel, Bulach, and Yamauchi (2017) as the core material. This textbook consists of one hundred topics from daily life to academics, and each topic has two sets of three different levels of questions from A1 to B1 level on the CEFR scale. The model answer is provided in the L1+ language (Japanese in English word order), and the English answer is provided below the L1+ answer. Sample answers are provided in Table 2.

Table 2. *Sample answers of Nakayama et al. (2017)*

1.	私は I	本当に really	好きだ like	カジュアルな casual	ファッション。 fashion.				
2.	時 When	私 I	着る wear	この 服装 this outfit,	私 感じる I feel	リラックスしている。 relaxed.			
3.	全て All	の of	その the	水 water	私たち we	使う use	だろう would	だ be	リサイクルされる。 recycled.

4.2.2 Self-efficacy Questionnaire. The English self-efficacy Questionnaire developed by Matsunuma (2006) was administered as a pretest and posttest. It consisted of eight items with a five-point Likert scale. Participants were asked to select 1 for “not at all agree” and 5 for

“strongly agree” for each item.

4.2.3 Interview Test Materials. Two kinds of interview tests are used for this study. One is weekly check quizzes, which consist of one set of questions from a chapter of the textbook, which was assigned for practice at home. One set had three different questions from A1 to B1 level. Five different sets were prepared and administered in five different sessions. The other interview test was the final exam test. It consisted of the six chapters of the textbook used in class. It had a total of eighteen questions.

4.3 Preparation

Based on the past research findings (Traxler & Tooley, 2008; Hartsuiker et al., 2008), this study tries to ask participants not only to repeat the model answers on the textbook but ask them to write down their answers based on the model answers provided in each chapter. Participants were asked to read and prepare their answers for the assigned chapters before class every week. The one-week assignment consisted of five chapters and had fifteen questions in total. Moreover, to facilitate cumulative effects by Kaschak, Kutta, & Schatschneider, 2011, participants were asked to practice questions and answers with their peers for seventy minutes in every class.

4.4 Procedure in classroom

Based on the findings of Trofimovich & McDonough (2011), this study incorporated peer practice to facilitate interaction effects. Therefore, the procedure had three phases: assignment check, peer practice, and interview test with the instructor. A summary of the procedure is provided in Table 3. The procedure repeated from the second week of lessons to the thirteenth week of lessons. The first lesson was orientation, and the last two sessions were used for the final exam.

Table 3. *Procedure*

1. Assignment check
2. Peer practice
3. Interview Quiz (5 times in 15 weeks)

4.4.1 Assignment check. First, the instructor checked participants’ assignments for that week, including answering questions of the students regarding the assignment.

4.4.2 English self-efficacy questionnaire. Students were asked to participate in the English self-efficacy questionnaire in the first week of the lessons as a pretest. The instructor explained the purpose of the questionnaire and that participation is optional and does not affect their grades if they do not wish to participate. The questionnaire was administered in the thirteenth week as a posttest but changed the orders of the items to prevent repetition effects.

4.4.3 Peer practice. After the preparation phase, each student was asked to sit with a peer and practice the chapter assigned by the instructor. The students asked and answered the questions with their peers. This one session lasts for five minutes; then, students were asked to move onto the next chapter and practice asking and answering questions. Since students were asked five chapters for each lesson, one cycle lasts fifteen minutes. After one cycle, students were asked to change their peers and followed the same procedure described above. The instructor went around the classroom during the sessions to make sure every student participated in the training. Students participated in approximately five cycles per lesson.

4.4.4 Two-minute interview test. Every student was asked to sit for two-minute interview tests on the second, the third, the fifth, the seventh, and the tenth class, five times in total during the lessons. Students were asked to answer questions based on the chapter assigned during the previous lessons. The instructor chose which chapter to ask for based on the previous assignments.

4.4.5 Final interview test. In the lessons of weeks 14 and 15, the final interview test was conducted by the instructor. Each student sat for the five-minute interview test. The instructor chose questions from chapters that students practiced in previous lessons. The instructor made an arrangement deterring students to contact them before and after the interviews so that each student had an equal opportunity to attempt the exam.

4.5 Scoring for interview tests: Clause Count Method

The objective of the interviews was to measure the improvement of sentence production. To measure students' frequencies of sentence production, the instructor used the clause count method, where the instructor listened to the students' utterances and counted the number of grammatically correct clauses in those utterances during the interviews. One correct clause was given one point.

5. Results

Table 4. Comparison of interview results between the groups

		HG (N=14)	LG (N=14)	<i>p</i>
Interview 1	<i>Mean</i>	5.57	5.93	<i>n.s.</i>
	<i>SD</i>	2.17	1.69	
Interview 2	<i>Mean</i>	8.86	6.93	*
	<i>SD</i>	1.96	1.21	
Interview 3	<i>Mean</i>	9.86	7.07	**
	<i>SD</i>	2.07	1.49	
Interview 4	<i>Mean</i>	10.29	7.43	**
	<i>SD</i>	2.53	2.71	
Interview 5	<i>Mean</i>	11.29	7.36	**
	<i>SD</i>	1.64	1.50	
Final Exam	<i>Mean</i>	28.57	24.38	**
	<i>SD</i>	5.35	4.94	
Total	<i>Mean</i>	77.29	57.29	
	<i>SD</i>	8.85	6.33	

*: $p < 0.05$, **: $p < 0.01$

5.1 The results and analysis of interview tests.

The results of the interview tests are shown in Table 4. According to the total performance in the interview tests, the sample was divided into two groups according to the median score (67.0). The students with higher scores than the median score were placed in the high group (HG) ($M=77.29$, $SD=8.85$), and students with lower scores were placed in the low group (LG) ($M=57.29$, $SD=6.33$) for further analysis. Two-tailed Multivariate Analysis (MANOVA) was run on the interview results as an internal variable and the group as an external variable to see if there is a significant gain in the number of sentences produced among the five interviews between the two groups. The results indicated that the main effect of the interview test and the group were significant, respectively ($F(4, 66)=18.01$, $p < .001$; $F(1, 47)=25.04$, $p < .01$). The interaction between both groups (HG and LG) and the internal factor (interview results) were also significant ($F(4, 66)=6.02$, $p < .01$). Since the interaction was significant, further analysis of differences in performances between groups and within groups was conducted as follows.

First, the analysis between groups was directed. The simple main effect of the groups

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were all significant except for the first interview ($F(1, 47)= 0.24, p=0.63$ for the first interview; $F(1, 47)=6.85, p<.05$ for the second interview; $F(1, 47)=14.30, p<.01$ for the third interview; $F(1, 47)=15.04, p<.01$ for the fourth interview; $F(1, 47)=28.43, p<.01$ for the fifth interview. As Table 4 shows, the analysis indicated that there were no significant differences in performance of the first interviews between HG and LG, but the performances in all the other interview tests of HG were significantly higher than those of LG.

Then, an investigation was conducted to determine whether there were improvements in the successive interviews within the groups. The main effect of the interviews within the groups was only significant for the HG group ($F(4, 66) =22.34, p<.01$) but not LG group ($F(4, 66) =1.69, p=.16$). Further analysis on HG group showed that the performances between the first interview ($M=5.57, SD=2.18$) and all the other four ($M=8.86, SD=1.96$ for the second interview, $M=9.86, SD=2.07$ for the third interview, $M=10.29, SD=2.53$ for the fourth interview, and $M=11.29, SD=1.64$ for the fifth interview respectively) were significant ($p<.01$). The performances between the second ($M=8.86, SD=1.96$), the fourth ($M=10.29, SD=2.53$), and the fifth ($M=11.29, SD=1.64$) were significant ($p<.01, p<.01$) but not between the second ($M=8.86, SD=1.96$) and the third ($M=9.86, SD=2.07$) ($p=.21$). The performances between the third ($M=9.86, SD=2.07$) and the fifth ($M=11.29, SD=1.64$) were significant ($p<.05$) but not between the third ($M=9.86, SD=2.07$) and the fourth ($M=10.29, SD=2.53$) ($p=.89$), or between the fourth ($M=10.29, SD=2.53$) and the fifth ($M=11.29, SD=1.64$) ($p=.21$). Figure 3 shows the performances of the interview tests of the two groups.

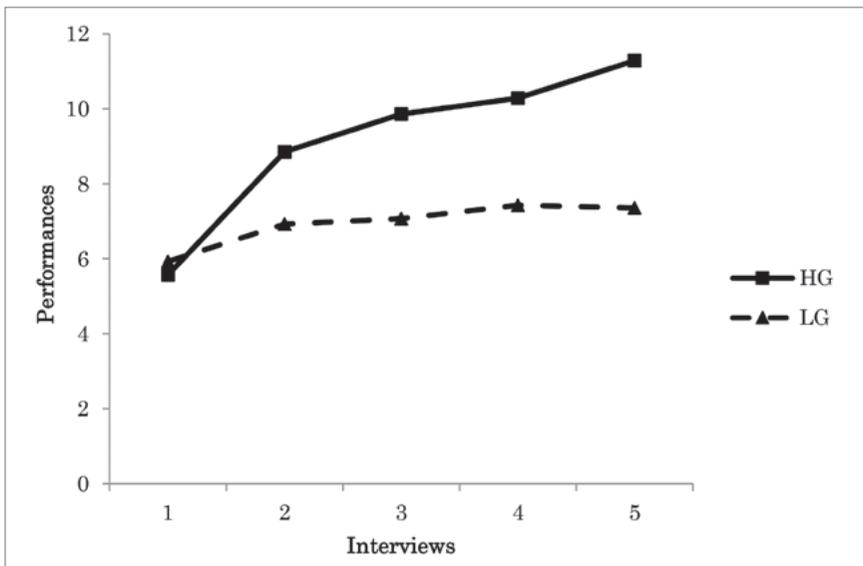


Figure 3. The performances of the interview tests between HG and LG

Finally, the results of the final interview tests were compared between High and Low groups. The unpaired *t*-test results showed that the scores in the High group ($M=31.43$, $SD=5.35$) were significantly higher than those of low group ($M=23.07$, $SD=5.06$) ($t(26)=4.30$, $p<.01$). The result is shown in Table 4. The statistical analysis of the interview test results showed that even though there were no significant differences between HG and LG in performance in the first interview, only the HG group's performance holistically improved along the course.

5.2 The results and analysis of ESE.

The following are the results of ESE questionnaire results, as shown in Table 5. Before further statistical analysis, the reliability of the scale was determined. Cronbach's alpha was .97, which proved reliable for further analysis. An Analysis of Covariance (ANCOVA) was run as a covariate for the pre-ESE results, with the post-results set as an objective variable and group as an external factor to see if there was a significant difference between the pretest and the posttest results between the groups. The results showed that group and pretest were both significant ($F(1, 27) = 13.45$, $p < .01$; $F(1, 27) = 88.32$, $p < .001$). There were significant differences in self-efficacy states at the first sessions between HG ($M=18.07$, $SD=4.92$) and LG ($M=15.93$, $SD=3.39$). Further analysis showed that only HG ($M=21.50$, $SD=4.55$) improved the self-efficacy along with the courses, but not LG ($M=16.64$, $SD=3.99$) ($p < .01$).

Table 5. Results of ESE questionnaire

	HG		LG	
	Pre	Post	Pre	Post
<i>N</i>	14	14	14	14
<i>Mean</i>	18.07	21.50	15.93	16.64
<i>SD</i>	4.92	4.55	3.39	3.99

5.3 Summary

The analysis of interview tests and ESE suggest that the holistic approach applied in this study based on the L1⁺ approach and syntactic priming research findings is effective in facilitating sentence productions among Japanese English learners, especially college students with high efficacy state for learning English.

6. Discussion

This study investigated whether the holistic approach based on findings in syntactic priming research facilitates Japanese English learners' sentence productions. This study utilized a bridge language between Japanese and English by placing Japanese in English word order called L1⁺ language, and adopted the tasks to facilitate the target sentence productions, based on the studies of Traxler & Tooley (2008); Kaschak et al. (2011); Hartsuiker et al. (2008), and Trofimovich & McDonough (2011). In order to evaluate participants' performance, this study adopted Clause Count Method (CCM), where one point is given per one correct clause utterance. This study not only evaluated participants' utterances but also adopted ESE to measure students' self-efficacy states. For analysis, the participants were placed either high group or low group according to their total performances in the six interview test results. The results showed that even though there were no differences in performances in the first interview between the high group and low group, the high group significantly performed better in the interview tests with improvements evident in self-efficacy states, but the low group did not show any significant gains in the interview tests. One of the reasons for no gains observed in the low group is that those participants were not confident enough to achieve the tasks of the first stage, and this low self-efficacy states affected participants' performance in the tasks given in the course. In other words, participants who lacked experiences in speaking English, let alone peer interactions in English, or lacking the confidence to use or learn English might have affected their performances. However, this holistic approach based on the syntactic priming paradigm showed significant improvements in sentence productions among high self-efficacy groups.

7. Conclusion

As stated above, the holistic approach adopted for this study was practical among students with higher self-efficacy toward English. However, the approach was not effective for learners with low self-efficacy. This disparity implies that further interventions are needed to promote self-confidence toward English learning before letting students engage in this approach. One of the options on how learners with low efficacy can improve their sentence productions might be to give training on the lexical selection process since they might not have enough vocabulary in the target language to produce sentences. This option might be one of the aspects that can be investigated in future research.

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