The Effects of Oral- and Silent-Reading-Based Practice on the Formulaic Sequence Acquisition: A 16-Week Classroom Practice

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Keywords: contextual formulaic/nonformulaic sequences, oral/silent reading practices, interaction

概　　要

音読または黙読練習ならびにクラスメイトとのインタラクションを含む活動が文脈内の英語定型表現と非定型表現の習得に与える影響について16週の大学の授業で検証した。本教室実践は2クラスで実施し、学期の前半と後半でそれぞれにつき事前・事後・遅延テストデザインで行った。主とする学習スタイルは、1つのクラスで音読中心の後、黙読中心の学習、2クラス目は黙読中心の後、音読中心の学習とした。刺激の定型・非定型表現は、それぞれの学習材料に埋め込んだ。分散分析の結果、黙読中心の学習を学期前半で行った後、学期後半で音読中心の学習を行ったクラスにおいて、文脈内の定型表現の知識の正確性が促進され遅延テストでも正確性が維持されたことが示された。

1. Introduction

English education in Japan aims to foster communicative competence in Japanese English as a foreign language (EFL) learners (the Ministry of Education, Culture, Sports, Science and Technology, 2018). To attain this proficiency, acquiring the knowledge of formulaic sequences (FSs) is important because of their prevalence and crucial role in fluency and idiomaticity; thus, finding effective ways to facilitate FS learning seems essential (Langacker, 2008). Despite considerable research on the advantages of the FSs, there are insufficient studies on FS learning and teaching in second language (L2) acquisition, especially when context is included (Conklin & Schmitt, 2008). Hence, this study explores the effects of English practice on contextual FS knowledge for Japanese EFL learners by comparing those on the contextual nonformulaic sequence (NFS) knowledge. Practically, it thoroughly considers the practice feasibility in the EFL context. It adopts oral and silent reading as types of practice to obtain meaningful implications for practical FS learning and teaching for Japanese EFL learners.

2. Literature Review

2.1 Usage-based model

The usage-based theory, a principal tenet of cognitive linguistics, highlights the criticality of language's actual usage, emphasizing that language is related to human interaction and other cognitive faculties (Langacker, 1987). Furthermore, it regards linguistic knowledge as a large store of categorized chunks of utterances that speakers have experienced; the accumulation of experiences throughout our lifetimes affects the formation of our linguistic knowledge. Specifically, every psychological event that we experience leaves some memory trace. When an event recurs repeatedly, the trace memory strengthens, and a novel structure is progressively entrenched. Eventually, a speaker can thoroughly master a structure, regardless of its complexity,

and develop the ability to apply it automatically; this state is called a unit. Explicitly, the units are conventionalized through repeated usage events in actual communication, and even a highly complex structure can become a pre-packaged assembly. The usage-based model proponents suggest that linguistic knowledge comprises an enormous structured inventory of conventional linguistic units (Langacker, 1987). Furthermore, from a usage-based model perspective, the FSs are considered part of the conventional linguistic units (e.g., Buerki, 2016).

Using a usage-based model as a foundation, Tomasello (2003) proposes a usage-based theory of children's language acquisition. Tomasello (2003) suggests that language acquisition is driven by the human infants' powerful motivation to communicate with other persons. Through interaction with conspecific caregivers in meaningful contexts, children gradually acquire language implicitly. In language acquisition, the linguistic items and structures that appear with a high frequency in interactions induce implicit learning. Thus, they become easily perceived and comprehended; consequently, they are stored and internalized as units in our mental lexicon (e.g., Ellis, 2002).

2.2 Formulaic sequence

2.2.1 Significance of the FSs

Pawley and Syder (1983) were the first researchers in English to identify the importance of a conventionalized language. Wray (2002) found more than 50 terms to practically express word sequences in the literature, such as chunks, constructions, conventionalized forms, and multiword items/units. Among them, following Wray (2002), this study adopted the term "formulaic sequences" to encompass the wide range of phenomena of a formulaic language. FSs are frequently used word sequences hypothesized to be stored, retrieved, and processed as single lexicalized units in language use (Wray, 2002). This hypothesized holistic representation of the FSs leads to four interrelated benefits: enhancement of fluency, accuracy, and communication, and reduction of the cognitive load in language processing.

First, regarding fluency and accuracy, since the FSs are supposed to be stored holistically in and retrieved as whole units from our minds, they are processed more quickly and efficiently than the other sequences comprising the same number of words (Pawley & Syder, 1983). Pawley and Syder's (1983) investigation of the disfluency pattern of adult native speakers' speech based on the aspect of pauses found that although skilled and fluent speakers constantly pause or slow their pace at clause boundaries, they rarely do so in the midstream of clauses. Therefore, native speakers plan a few words, or chunks, at a time. Pawley and Syder (1983) refer to this as the "one clause at a time facility" and assert that some clauses are entirely familiar and stored holistically; further, familiar phrases are spoken accurately and fluently. Due to the possession of various memorized FSs, we can completely free ourselves from a load of building expressions. Consequently, we can channel our energies to perform other activities that will further evoke accuracy and fluency. Further, Pawley and Syder (1983) consider this one clause at a time facility a crucial aspect of communicative competence in English; specifically, this aspect enables a speaker to regularly plan the complete clauses with a single operation during communication. Further, FSs are prefabricated expressions; therefore, they are unlikely to be influenced by grammar (Wray, 2002). This may improve even non-native speakers' speed and accuracy in production and reception.

The subsequent benefit is the enhancement of communication. Practically, Japanese EFL learners tend to speak and write English based on their knowledge of grammatical rules and vocabulary. Consequently, their output often sounds unidiomatic or unnatural to the native ears,

even when each sentence is grammatically correct (e.g., Pawley & Syder, 1983); this may obstruct effective communication. Hence, having command over various FSs enhances communication skills because they are ubiquitous (Nattinger & DeCarrico, 1992), prefabricated, and form a large proportion of any discourse (Biber et al., 1999). Pawley and Syder (1983) argue that mature native speakers store at least several hundred thousand FSs in their mental lexicon. Moreover, the FSs have characteristics that satisfy certain contexts, such as turn-taking and repair strategies to develop conversations (Richards, 1980). Thus, using an appropriate FS to suit various contexts will simplify communication.

The final benefit is reducing the cognitive load in language processing; this is highly important for L2 learners because it benefits the capacity-limited working memory (Just & Carpenter, 1992). As discussed above, the FSs are supposed to indicate the unit status semantically and phonologically; therefore, they need less processing effort than the other word sequences (i.e., NFSs). Cowan (2001) proposes that we can remember approximately four-word chunks in our capacity-limited working memory. Specifically, by exploiting the FSs' holistic representation, we can extend the number of linguistic symbols that can be processed at one time with less cognitive load for perception and generation (cf. Levelt, 1989). Overall, this representation enhances processing efficiency and fluent and correct language use.

2.2.2 Acquisition of FSs in L2 acquisition

Frequent encounters and interactions facilitate language acquisition (cf. section 2.1). Furthermore, language learning is implicit rather than explicit since the frequency and probabilistic knowledge play an essential role in language processing (Ellis, 2002). Although the English input is limited in the EFL context, following the FSs' implicit learning could be feasible for Japanese EFL learners from the usage-based perspective: extensive reading and listening, oral and silent reading, and interactive activities in English in meaningful contexts. This study focuses on oral and silent reading and those involving interactions.

The effect of oral reading on learning has generally been acknowledged. Specifically, oral reading involves cognitive tasks occurring simultaneously; it involves four processes: phonological processing, grammatical and semantic processing, pronunciation, and metacognitive monitoring. Specifically, oral reading is a demanding task. Thus, the automaticity of each process is important (Kadota, 2020). Further, considering the L2 learners' capacity-limited working memory, the automaticity of phonological decoding plays an important role in L2, including FS acquisition. Practically, through repeated oral reading practice, phonological decoding is gradually automatized; this condition can make cognitive resources for comprehension available. Consequently, the number of words rehearsed by our working memory increases, and subsequently, individual words, lexical chunks, and sentence structures in L2 are implicitly and efficiently stored and transported to the long-term memory (Kadota, 2020). As mentioned repeatedly, establishing a well-automatized status of phonological decoding is essential. Regarding phonological decoding, silent reading also includes the phonological decoding process. Thus, this study employed oral and silent reading as the feasible practice method regarding FS learning for Japanese EFL learners.

Regarding interaction, it occurs not only in face-to-face communication but also in reading and writing activities because they involve readers, writers, and the self in interpreting, negotiating for meaning, and expressing ideas (e.g., Savingnon, 2018). Additionally, since group or pair tasks can increase learners' communicative opportunities, they positively affect language learning.

Furthermore, Wood (2002) notes that interaction is essential to initiate the FSs' repetition in appropriate contexts that is necessary for automatization. Specifically, learners become capable of automatically using multiword units by repeatedly using them in speaking or writing, such as in communication tasks.

2.3 Research question

Among FSs, the most common multi-word expressions are phrasal and prepositional verbs (Biber et al., 1999). Phrasal verbs are considered particularly problematic in L2 teaching and learning because they are common, fixed, and have unpredictable meanings from their component words (Sinclair, 2004). Therefore, this study considers such sequences, including verbs, as the target stimuli; its research question is as follows :

RQ : How does combining oral and silent reading practice with interaction in real English classes affect FS learning?

3. Methods

3.1 Participants

The participants were 61 first-year university students who belonged to 2 classes. Their major was irrelevant to English learning. Class 1 comprised 31 students; moreover, the mean value of the Test of English for International Communication (TOEIC) IP score was 448.33. In Class 2, there were 30 students; further, the mean value of the TOEIC IP score was 430.18. The result of an unpaired t-test showed no significant difference between the TOEIC IP scores of the two classes: $t(56) = 0.69$, $p = .496$, $r = .09$.

3.2 Materials

3.2.1 Pre-, post-, and delayed tests

The whole semester was divided into two terms, A and B. Table 1 lists the flow of the classroom practice of each term (8 weeks). Each term had three tests: pre-, post-, and delayed tests. The stimulus sentences of the three tests during each term were identical (the stimulus order was randomized). Each test had 14 stimulus sentences for the FS and the NFS (28 stimuli in a test paper). The stimuli were chosen from those employed by Nishimura (2020); they were the sentences with parentheses where a word sequence would be grammatically suitable. Specifically, the stimulus sentences were of two types: those with semantically appropriate (inappropriate) contexts for the target FSs and NFSs. Regarding stimulus word sequences, control NFSs were the sequences where one word considered to be central in the paired FS was replaced (e.g., take part in [FS] and take work in [NFS]). The stimuli were controlled to be homogeneous regarding various factors (e.g., word familiarity, the number of syllables and words, readability, and the English sentence level) between the FS and NFS stimuli to compare their processing.

Regarding the allocation of the stimuli to the two tests, repeated random sampling divided the stimulus sentences into two homogeneous groups. To avoid the unnaturalness of the tasks and the students' excessive observation of patterns, the stimulus word sequences in each test were not all pairs of FSs and NFSs. Initially, regarding each sequence type, unpaired t-tests were conducted to confirm no significant differences between tests A and B; specifically, the FS and NFS stimuli between tests A and B (see Table 2). Thenceforward, unpaired t-tests were performed to confirm the homogeneity of the two types of stimulus sentences (i.e., FS and NFS) in each test (i.e., A and B) other

than the frequency of occurrence in the British National Corpus (BNC) (utilized the Bonferroni adjusted *p*-value = .025; see Table 3). Concerning the frequency of occurrence in the BNC between the FSs and NFSs, the *t*-test results demonstrated significant differences for tests A, $t(13.00) = 5.70$, $p < .001$, $r = .85$, and B, $t(13.00) = 4.57$, $p = .001$, $r = .79$, respectively (utilized the Bonferroni adjusted *p*-value = .025). The tests implemented in the classroom practice were paper-based written assessments (see Appendix 1). The order of questions in each test was randomized as many times as the number of students to avoid the influence of question order.

Table1
Flow of the Schedule of Classroom Practice for Each Term

Week	Contents	Note
1	pretest	written test (28 questions: 14 FSs + 14 NFSs)
2	practice1	solitary reading practice + groupwork (Story ordering task)
3	practice2	solitary reading practice + groupwork (Decision-making and explanation task)
4	practice3	solitary reading practice + groupwork (Using a comic strip task)
5	posttest	the same written test as the pretest (question order was randomized)
8	delayedtest	the same written test as the pretest (question order was randomized)

Note. The whole semester was divided into two terms: Terms A and B. The practice type of Classes 1 and 2 for Terms A and B: oral-reading-based→silent-reading-based practice, silent-reading-based→oral-reading-based practice.

Table2
Results of the Unpaired t-Tests for the FS and NFS Stimulus Sentences Between Tests A and B

	FSs (*df* = 26)			NFSs (*df* = 26)		
	t	*p*	*r*	*t*	*p*	*r*
Sequences						
core word familiarity	0.17	.866	.03	0.25	.808	.05
number of syllables	0.86	.401	.17	-0.5	.616	.10
BNC frequency	*0.20	.984	.04	0.29	.777	.06
Word Familiarity (contexts)	-0.33	.748	.06	0.12	.906	.02
Number of Words	-0.39	.699	.08	-0.51	.614	.10
Readability	0.62	.542	.12	1.02	.315	.20
Grade Level	-0.68	.503	.13	-1.02	.318	.20

Table3
Results of the Unpaired t-Tests Between the Stimulus Sentences for FSs and NFSs in Tests A and B

	test A (*df* = 26)			test B (*df* =26)		
	t	*p*	*r*	*t*	*p*	*r*
Sequences						
core word familiarity	-0.73	.474	.14	-0.84	.409	.16
number of syllables	0.71	.487	.14	-0.66	.516	.13
Word Familiarity (contexts)	-0.93	.360	.18	-0.57	.572	.11
Number of Words	0.00	1.000	.00	0.00	1.000	.00
Readability	-0.67	.506	.13	-0.06	.949	.01
Grade Level	0.67	.511	.13	0.12	.907	.02

Note. **df* = 24.88. Core word = a central word in each word sequence. Word Familiarity = Yokokawa, 2006, Readability = Flesch Reading Ease, Grade Level = Flesch-Kincaid Grade Level. Utilized *p*-value for Table 2 = .025.

3.2.2 Practice

Each practice comprised solitary reading practice and groupwork.

Solitary reading practice: Oral and silent reading practice. The stimulus sentences of the training session in Nishimura's (2020) research, which were cautiously controlled to be equal between the FS and NFS stimuli regarding the same criteria as the test stimuli, were used (cf. section 3.2.1). Specifically, the stimuli are the sentences embedded with the target word sequences (e.g., The girl *came up with* a surprising plan. [italicized letters: FS; target sequences on the handout were not italicized; See Appendix 2]). The target word sequences for the reading practice corresponded with those for the tests in each term. Paper-based handouts were prepared, each involving 20 sentences (those embedded with the target FSs and NFSs, and filler sentences) for the reading practice. Since there were three practice

sessions during three successive weeks, the stimulus sentences for the reading practice were divided into three groups through repeated random sampling; these three divided stimulus target sequences were also employed as stimulus sequences for each term's groupwork, embedded in the stimulus of the groupwork. The handouts were created for as many patterns as the number of students to avoid sound interference during the oral reading practice and the influence of stimulus sentence order.

Story ordering task (groupwork). The author partially created the stories for the story ordering task, referring to those from *Sunny Skyz*, a website for inspirational short stories, positive news, heartwarming pictures, and more. The stories for Terms A and B were based on ***A woman is having a heart attack and meets God*** (2017) and ***Two 90-year-old men, Mike and Joe, have been lifelong friends*** (2017), respectively. The sentences were modified by replacing some words or phrases with the target word sequences, maintaining the naturalness as much as possible. Further, the revised stories' texts were partitioned into seven parts with roughly the same amount of text per the groupwork's approach. Following the native speaker's evaluation of the sentences, seven separate slips, each with a story's part, were prepared for each term (the seven slips constituted a full story). In class, each group independently worked on the same story and was thus printed out for each group. The story title was not written on any slips. Figure 1 is an example of the slip of the story ordering task in Term A.

Figure1

A Slip Example of the Story Ordering Task (Term A)

A	"I don't want to die now! I have 20 pet cats to look after. They totally rely on me, so they must be worrying about me! So, let me choose the latter one." "OK, then…" God replied and handed a small glass of colorless liquid to her.

Decision-making and explanation task (groupwork). A set of four slips were prepared for all groups in each term. Different paragraphs were written on each slip. The author partially created the stories by modifying the materials from a workbook for a discussion titled ***The Non-Stop Discussion Workbook*** (Rooks, 1988). The original titles of the topics for discussion were "How do I advise them?" (pp. 63–67) and "Who gets the loan?" (pp. 95–99) for Terms A and B, respectively. The target word sequences were embedded in the paragraphs. The same native speaker who assessed the English in the story ordering task examined the sentences in this task. Two sets of four paragraphs for two terms were prepared and printed out for all groups. Figure 2 is an example of a slip for the decision-making and explanation task in Term B.

Figure2

A Slip Example of the Decision-Making and Explanation Task (Term B)

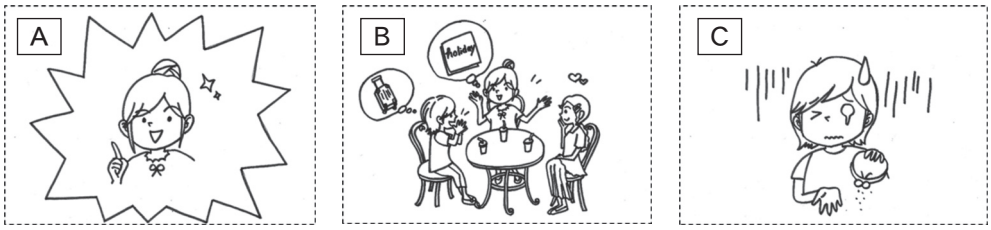
B	Loan Applicant 4: Roberta Gordon, age 17 Mr. Gordon is a high school student. He has a reputation as a genius, having won many awards which are related to the field of Artificial Intelligence (AI). He is also an amateur inventor and recently developed a small AI robot which can escape in a very narrow space and get detailed visual data. His invention has already been examined by experts to make sure of its reliability. He would like to borrow money to make three prototypes (models) of the robot.

Using a comic strip task (groupwork). The inspiration for this task was derived from a book of practical classroom activities titled ***To Learn How to Teach English*** (Okita, 2015). A handout with three cartoons and space to write down a free story was prepared for each term. Two sets of three cartoons

were originally created by the author, bearing the stimuli for each solitary reading practice preceding this task. The handouts were printed for each student. Figure 3 presents the cartoons for Term B.

Figure3

Examples of the Cartoons Employed in the Using a Comic Strip Task (Term B)



3.3 Procedure

This study was implemented in English classes (90 minutes long; all instructions were delivered in Japanese). In the first class, the author fully explained this research to the students and obtained their consent. The class' main objective was writing; therefore, textbook-based English teaching was also conducted (the first half of the class), in addition to the classroom practice (the second half of the class). The main practice type adopted in the textbook-based class hours also followed the practice type of each class (i.e., oral or silent reading) during Terms A and B. The practice condition was as follows: oral-reading-based practice (ORBP) followed by silent-reading-based practice (SRBP) in Class 1, and vice versa in Class 2. Throughout the period, no intentional instructions were given to attract the students' attention to the word sequences. All collected tests and handouts were returned to them in the final class of the semester.

3.3.1 Pre-, post-, and delayed tests

The tests were conducted at the beginning of the classes without any prior announcement. The students were instructed to intuitively judge the semantic appropriateness of the stimuli for the parentheses in the given sentences instantaneously and to draw a circle for YES and a cross for NO within 7 minutes (see Appendix 1). They were also asked not to review the previous answers once they had made intuitive judgments. Furthermore, it was confirmed that the test result did not affect their grades. Subsequently, the test papers were distributed to the students facedown. The teacher (the author) said, "Three, two, one, go!" and the students simultaneously turned over their test papers and began to answer them. An online stopwatch was presented on a screen at the front of the classroom. Immediately after responding, the students recorded the time required to answer the test at a designated place on the paper and turned it facedown. The test papers were then collected. The overall time for each test (i.e., from the instructions to the collection of the test papers) was approximately 20 minutes. A post- and a delayed test were conducted 4 weeks and 7 weeks after the pretest, respectively (without any prior announcement).

3.3.2 Practice

There were three practice sessions in the first through third weeks after the pretest. In each practice, following solitary reading practice, the students engaged in groupwork; the time required for the tasks was approximately 5 and 40 minutes, respectively. They were allowed to use dictionaries, if necessary. The groupwork procedures in Classes 1 and 2 partly differed regarding whether the students interacted through the ORBP or SRBP.

Solitary reading practice: Oral and silent reading practice. The solitary reading practice was to ensure that each student was exposed to the target sequences in context and to practice reading (e.g., phonological decoding). The students were instructed to simultaneously read (orally or silently) and comprehend the sentences in the handout as quickly as possible. They were asked to measure the reading time with their smartphones and calculate the number of words read per minute, which they reported on their reflection sheet submitted at the end of each class with their comments. Each student used the same reflection sheet over the whole semester; therefore, they could assess their progress promptly. Following these instructions, a handout with the same stimuli in a different order was distributed to each student, facedown. The teacher (the author) said, "Three, two, one, go!" and the students simultaneously turned over the handout and began tackling the task. After finishing the practice, they were instructed to turn the handout facedown so that the teacher (the author) could recognize when all students had completed the practice (and so that they could not review the stimuli again). Subsequently, the handouts were collected.

Story ordering task (groupwork). The students worked in groups of five or six. Following the instructions, a set of slips (comprising a story) was delivered to each group. The story' s original title was not provided to maximize their analogical ability and imagination. Initially, all students had one or two slips that they skimmed by themselves. In the ORBP class, each one was accountable for the slips that they initially had and was instructed not to show anyone the English text of the part that they were responsible for. Subsequently, they made a circle and read their parts aloud turn-wise until they had formed a comprehensible story. In the SRBP class, they sat in a circle; when they finished reading their part, they passed the slip to the students sitting to their right. This was continued until all group members had read all the slips and cooperated to form a comprehensible story. Whether they were engaged in the ORBP or the SRBP, they were not permitted to translate their parts into Japanese. Each slip had an alphabet letter as a sign (cf. Figure 1); they wrote the order using those letters when they finished the task. Thenceforward, the slips were collected, and the correct order was shared in class. Finally, the students were requested to freely propose a unique title for the story and write a summary in 10 minutes. They submitted their work at the end of the class. In the next class, some of the fascinating titles created by the students, followed by the original title, were shared in class.

Decision-making and explanation task (groupwork). The students formed groups of three or four for this groupwork. All groups had a set of four slips, a handout with the Japanese directions, and space to write down their output. First, each student oversaw one or two slips, depending on the number of group members. The task was to read the four cases (one case per slip) and choose one of them. For example, they acted as social workers and bank staff in Terms A and B. In the ORBP class, they orally read their case turn-wise in a group. They were instructed not to show their texts to anyone during this task. If necessary, they were allowed to request to orally repeat the texts or explain the context in their own words, if interacting with their group in English. In the SRBP class, after silently reading the case, they passed their slip to the student sitting to their right. They were permitted to read the slips several times if necessary. When all members read the four cases orally or silently, they discussed which case to choose in Japanese; further, they were required to support their decision clearly and logically. Subsequently, each group made a report to a fictional boss (the teacher, i.e., the author) in English. They were asked to complete all tasks in 30 minutes. They submitted their report (in a group); moreover, the slips were collected at the end of the class. In the following class, the ranking of the cases they had adopted from the four cases in the previous class was announced.

Using a comic strip task (groupwork). The first half of this task was a spontaneously written

production task. The task outline was to freely create an original story and share it in a group. Specifically, the students were asked to create an engaging and exciting story by adding a fourth episode to the three cartoons in the handout, the order of which was freely changeable. Following the instructions, the handout was distributed to all students. Initially, they cut the three cartoons out and put them in various orders while imagining and developing their original story with a unique ending. Subsequently, they wrote the order of the cartoons for their story at the top of the handout using the letters printed on each cartoon (e.g., B→A→C; cf. Figure 3) and the original story in English in the space provided. This story was crafted by individual, solitary writing. However, this writing task was still characterized as an interaction task because the students created the story imagining their classmates or teacher as readers. They were given approximately 15 minutes for story-making, after which they shared their original stories in groups of three or four. The mode of sharing differed per the practice style. In the ORBP class, the group members placed three cartoons in the designated order before the oral reading of each story and listened to the story delivered orally. In the SRBP class, they silently read all group members' stories. Each group's best story was instantly shared orally in both classes. The students submitted their stories at the end of the class.

3.4 Statistical Analysis

A2 (FS and NFS) × 3 (pre-, post-, and delayed tests) analysis of variance (ANOVA) with repeated measures was conducted. The dependent variable was proportion correct. Before the analysis, the students absent from the practice classes more than once during each term were discarded. Further, those who scored 13 out of 14 for the FS or NFS questions in pretests A or B were excluded from the analysis as outliers. The data of the participants absent from one class each term were replaced with each class's mean value of each test (M = approximately 7% of all students in each class/each term). Thus, in Terms A and B, 28 and 30 students remained for Class 1, and 28 and 29 for Class 2, respectively.

4. Results

Tables 4 and 5 list the descriptive statistics for the proportion correct for Classes 1 and 2, respectively. Regarding Term A (ORBP) in Class 1, as shown in Figure 4 (in this paper, the error bars denote a 95% confidence interval), a 2 × 3 ANOVA did not indicate an interaction, $F(2, 54) = 0.03$, $p = .968$, $\eta_p^2 = .001$, or a main effect for time, $F(2, 54) = 0.18$, $p = .833$, $\eta_p^2 = .01$. Regarding the sequence type, the latter was significant: $F(1, 27) = 13.34$, $p = .001$, $\eta_p^2 = .33$. The result implied that the students judged the proper FSs toward contexts more accurately than the NFSs. However, no difference in the ORBP's effect between the FS and NFS stimuli was observed. Furthermore, regarding Term B (SRBP), there was no interaction effect (Figure 5): $F(2, 58) = 0.75$, $p = .476$, $\eta_p^2 = .03$. The main effect of time was not significant, however, that of the sequence type was significant ($F(2, 58) = 1.76$, $p = .181$, $\eta_p^2 = .06$, and $F(1, 29) = 26.54$, $p < .001$, $\eta_p^2 = .48$, respectively). The students comprehended the stimuli for the FSs more correctly than those for the NFSs. However, the SRBP affected both FS and NFS stimuli equally.

Regarding Term A (SRBP) in Class 2, a 2 × 3 ANOVA indicated no interaction effect: $F(2, 54) = 0.28$, $p = .759$, $\eta_p^2 = .01$ (Figure 6). The main effect of time was not significant, $F(2, 54) = 0.50$, $p = .608$, $\eta_p^2 = .02$; however, that of the sequence type was significant, $F(1, 27) = 14.24$, $p < .001$, $\eta_p^2 = .35$. Although the FS stimuli were answered more accurately than those for the NFSs, the SRBP' effect did not differ between the FS and the NFS stimuli. Regarding Term B (ORBP), there was

no interaction effect (Figure 7): $F(2, 56) = 1.88$, $p = .162$, $\eta_p^2 = .06$. However, the significant main effects concerning both time and sequence type were revealed ($F(2, 56) = 3.95$, $p = .025$, $\eta_p^2 = .12$, and $F(1, 28) = 12.35$, $p = .002$, $\eta_p^2 = .31$, respectively). Subsequently, a post hoc analysis with the Bonferroni adjustment (utilized $p = .017$) demonstrated that the proportion correct improved remarkably from the pre- to the posttest in the FS stimuli, $t(28) = -2.79$, $p = .009$, $r = .47$; further, it did not significantly change from the post- to the delayed test, $t(28) = -0.33$, $p = .741$, $r = .06$. This significant improvement in the proportion correct was not observed in the NFS stimuli (from the pre- to the posttest: $t(28) = 0.26$, $p = .796$, $r = .05$).

Table4
Descriptive Statistics for the Proportion Correct of Class 1

	Term A (oral reading) (n = 28)				Term B (silent reading) (n = 30)			
	FSs		NFSs		FSs		NFSs	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Pre	.67	.09	.58	.19	.65	.14	.56	.10
Post	.67	.11	.58	.13	.69	.14	.57	.13
Delayed	.66	.10	.57	.19	.66	.12	.59	.11

Table5
Descriptive Statistics for the Proportion Correct of Class 2

	Term A (silent reading) (n = 28)				Term B (oral reading) (n = 29)			
	FSs		NFSs		FSs		NFSs	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Pre	.65	.10	.59	.14	.62	.11	.58	.13
Post	.68	.11	.59	.14	.69	.13	.58	.13
Delayed	.66	.12	.59	.12	.70	.13	.60	.14

Figure4
Mean Proportion Correct Changes of Class 1 in Term A

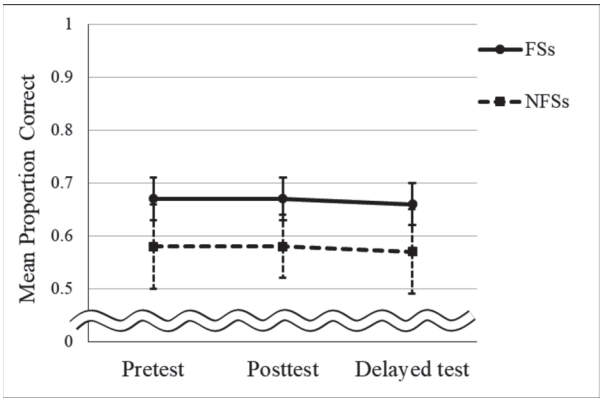


Figure5
Mean Proportion Correct Changes of Class 1 in Term B

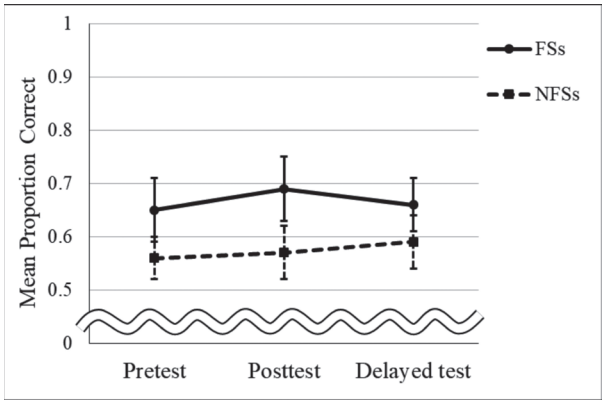


Figure6
Mean Proportion Correct Changes of Class 2 in Term A

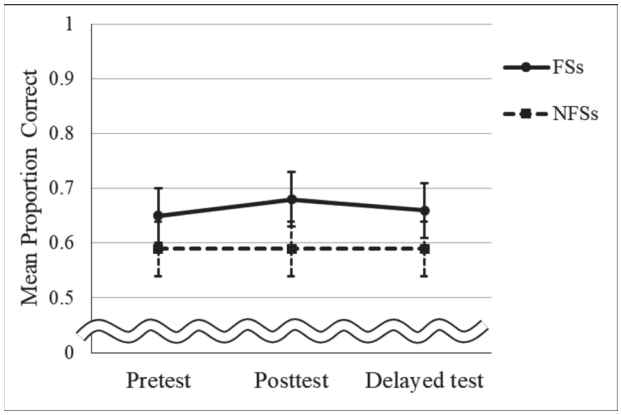
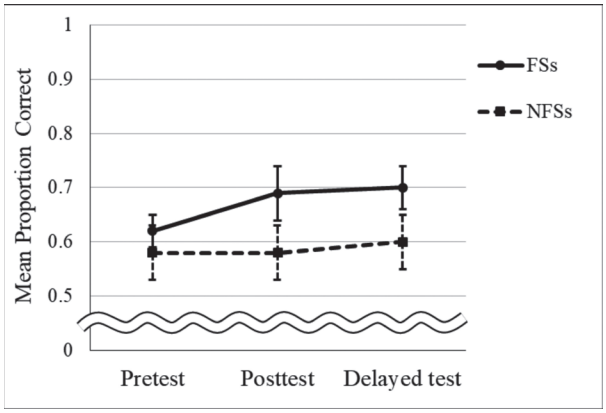


Figure7
Mean Proportion Correct Changes of Class 2 in Term B



5. Discussion

The 16-week classroom practice aimed to investigate the effect of combining oral and silent reading on contextual FS knowledge through individual practice and interactive group activities in the classroom. Overall, the students were highly diligent and participated enthusiastically in the classroom activities. Additionally, their comments indicated that their attention was not intentionally focused on the FSs, except in the classes with tests (e.g., a pretest). In the classes where the interactive activities were conducted, the students seemed to enjoy and be stimulated by their classmates' activities; specifically, they focused on the meaning of the classroom activities. Further, their comments implied that they had difficulty understanding their classmates' messages or conveying their own through the auditory output (i.e., input for listeners) only due to problems with phonetic comprehension and limited memory retention. Inevitably, they must have had repeated interactive exposure to the target word sequences.

However, only one class was found to have a statistical difference between the accuracy of the contextual FS and NFS stimuli regarding the effects of ORBP and SRBP alongside the interactive activities. The main effects analysis of the sequence type showed that the judgment of the contextually appropriate FSs was significantly more accurate than that of the NFSs in both classes throughout both terms. Regarding the improvement in accuracy, Class 1, which adopted the ORBP and the SRBP in Terms A and B, showed no statistical difference between the results of the three tests in each term based on the ANOVA. However, in contrast to Class 1, the changes between the scores on the three tests in Class 2 for Term B (the SRBP and the ORBP in Terms A and B, respectively) indicated a statistical improvement in FS learning. The FS test scores significantly increased from the pre- to the posttest, and, interestingly, the corresponding level was maintained in a delayed test administered 3 weeks after the posttest. Compared to Class 1, the results indicate that the students' readiness for oral reading was implicitly established through 8 weeks of the SRBP classes. Specifically, silent reading, including the phonological decoding process, might have been effectively practiced in Class 2 through the SRBP classes in Term A such that fewer cognitive resources were required for the ORBP. Thus, repeated ORBP with a low cognitive load successfully improved the holistic FS processing efficiency. Consequently, the students benefited from the FS processing load's reduction, thus enabling them to implicitly internalize the FSs as knowledge (cf. section 2.2.2). This indicated that although students in Class 1 practiced oral reading in Term A, the training was insufficient to approach smooth phonological decoding; specifically, the Class 1 students in Term A might have been unprepared for the oral-reading-based learning. Thus, it could be interpreted that they were still expending significant cognitive resources on phonological decoding in silent reading in Term B. This may have led to no statistical improvement in the proportion of the correct answers in the silent-reading-based Class 1 (Term B) classes; explicitly, their phonological decoding may still have been ongoing. The interpretation implied that considerable practice time is needed to approach a well-automatized oral-reading status, which is considered necessary for FS acquisition.

6. Conclusion

This study's main finding was that contextual FS knowledge could be implicitly learned and retained through the repetition of the ORBP and the (oral-reading-based) meaning-focused interactive activities after SRBP. This requires that oral reading approaches a well-automatized state; furthermore, regarding the readiness for oral reading, a state of phonological decoding that

uses fewer cognitive resources is essential. However, this research has three limitations that should be noted. First, the classroom practice was conducted for 16 weeks. Therefore, the results were not solely due to the practice and activities the author conducted in the English classroom. In practice, the students also participated in other English classes at the university; more specifically, it was impossible to capture the students' English encountering conditions outside the classroom. Second, the outcomes were limited to the stimulus word sequences employed in this study. Some stimulus FSs were relatively easy because they were created so that the L2 learners who struggle with FS learning could practice them without special mental effort. Accordingly, some participants may have already known some stimulus FSs perfectly. Finally, the stimuli might contain slightly unnatural expressions to meet the detailed control conditions due to the control factors. To address these limitations, further studies using different types of FSs and investigating the effects of other types of FS learning are needed to find effective ways to facilitate FS learning and teaching for Japanese EFL learners.

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Appendices

Appendix 1: Example of a Part of a Paper-Based Written Test

■以下の空欄に右のフレーズが意味的に当てはまるかどうかできるだけ速く判断し
○×で答えなさい（制限時間 7 分）。解答に掛かった時間を最後に記録すること。

			○ or ×
1.	She can (　　) the manager.	carry out	(　　)
2.	A famous actor (　　) this town.	lived after	(　　)
3.	Family members (　　) spring cleaning.	take part in	(　　)
4.	The glasses (　　) lots of paper.	are rolled with	(　　)
27.	The driver (　　) the traffic light.	looked after	(　　)
28.	Members learn how to (　　) the rules.	behave from	(　　)

所要時間 _____

Note. Stimulus sentences for circle (○) : 3 (FSs), 4, 28 (NFSs) ; for cross (×) : 1, 27 (FSs), 2 (NFS).

Appendix 2: Example of a Handout for Solitary Training in the Classroom Practice

■以下の英文の意味を理解しながら、できるだけ速く読みなさい。

読み終えたら、１分間で読めた語数（word/minute)を計算し、reflection sheet に記録しなさい。

計算式：　173 words÷[掛かった時間（秒）]×60 =_____words

- You can select on the business start date.
- I looked after his job while he was in hospital.
- People in the bus can look outside to the sea.
- We can't account for the reason we lost the game.
- The policeman told me to show my driver's license.
- It's been a long time since we met last.
- Heavy dieting can result in bad health.