

The Efficacy of Intonation-integrated Reading Aloud Instruction on Vocabulary Retention

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和文要旨

本研究はイントネーション指導を取り入れた音読活動が持つ、語彙保持に対する効果を検証した。日本人高校生を対象に、未知語を含む文章を教材として、従来型の音読活動とイントネーションを取り入れた音速活動を行い、1週間後に語彙の記憶を測るテストを行いそれぞれの効果を検証した。結果から、イントネーションを取り入れた音読活動には一定の効果が認められるが、習熟度の低い学習者にとっては認知負荷が重く、語彙学習において負担になることが示唆された。

キーワード : Prosody Vocabulary Learning Cognitive Load Reading Aloud

1. Background

This study examines the effect of intonation-integrated reading aloud on vocabulary retention. Intonation, defined as “the use of pitch of the voice to convey meaning” (Roach, 2009, p.3), is essential for achieving high comprehensibility. Despite its pivotal role in communication, intonation is often insufficiently addressed in language classrooms. This is partly due to time constraints, which compel teachers to prioritize the acquisition of vocabulary and grammar over pronunciation (Rogerson-Revell, 2011; Gordon & Darcy, 2016). Such constraints suggest the need to integrate intonation instruction into other activities.

One of the most promising candidates is reading aloud, a ubiquitous pedagogical practice in English language teaching. While often adopted for pronunciation training, reading aloud is also posited to facilitate the memorization and internalization of vocabulary and grammar structures (Takeuchi, 2018). This means that intonation-integrated reading aloud can foster the acquisition of both pronunciation and semantic and grammatical items simultaneously, thereby addressing the issue of limited instruction time.

Moreover, incorporating intonation may enhance the pedagogical effectiveness of reading aloud. Kadota (2012) emphasizes the necessity of comprehending both the semantic meaning and syntactic structure of the text. This comprehension enables learners to engage in processing at a deeper cognitive level, leading to longer retention of vocabulary (Craik & Tulving, 1975). Since the realization of intonation involves the semantic and structural analysis of text, it may

foster such deeper cognitive processing and promote vocabulary and grammar acquisition as well.

Thus, it can be hypothesized that the integration of intonation instruction into reading aloud not only enables the teaching of intonation under severe time constraints but also reinforces the acquisition of other skills, such as vocabulary and grammar. Accordingly, this study explores the efficacy of this reading aloud method on vocabulary retention.

2. The Process of Intonation

Intonation constitutes a highly complex system and is assumed to be virtually impossible for L2 learners to acquire and apply with native-like proficiency (Roach, 2009). Therefore, when taught in English language classrooms, the elements of intonation instruction should be carefully selected, with both teachability and learnability taken into consideration.

This study employs Wells' (2006) "3Ts" framework, Tonality, Tonicity, and Tone, as the foundation for intonation instruction. The first component, Tonality, refers to the segmentation of speech into tone units. Since this segmentation typically aligns with semantic and grammatical boundaries (Wells, 2006; Rogerson-Revell, 2011), it is considered attainable for high school students, provided they understand basic sentence structures.

The next component, Tonicity, involves determining the placement of the nucleus. Whereas the nucleus is generally placed on the last content word of the tone unit (Watanabe, 1994; Makino, 2005), it may shift to a specific word to highlight important information such as contextual or informational contrasts. Learners can effectively perform this process once they have understood the distinction between content and function words and comprehended the informational structure of the text.

Finally, Tone concerns the selection of pitch movement on the nucleus. Although a wide variety of pitch types exist (O'Connor & Arnold, 1973), this study focuses on three fundamental types: fall, rise, and fall-rise (Wells, 2006). To ensure learnability, the instruction is given to apply a falling tone to declarative sentences, *wh*-questions, and imperatives, and a rising tone to yes/no questions and a fall-rise tone to the nucleus of sentence-internal tone units, reflecting the high frequency of the fall-rise tone in such contexts (Watanabe, 1994; Makino, 2005) and allowing

learners to decide a tone based on the principles.

Thus, though intonation production is originally a complex system, it can be taught in a more concise manner, allowing learners to apply intonation patterns based on clear and robust processes. This study adopts and adapts the above-mentioned processes as instruction principles.

3. Study

3.1. Research Question

Is reading aloud with explicit stress, rhythm and intonation instruction more effective on vocabulary retention than that only with explicit stress and rhythm instruction?

3.2. Experiment

This study examined the effects of intonation-integrated reading aloud on the retention of vocabulary taught in class. The experiment was carried out over two class sessions. Participants were Japanese senior high school students (n=76). They were divided into an experimental group (n=37) and a control group (n=39), each receiving different types of instruction, and the effects were measured using pre- and post-tests. The pre-test was administered during the first session, in which the instructional intervention for each group was also implemented. One week later, the post-test was conducted in the subsequent class session to evaluate the effects of the respective instructional approaches.

3.3. Procedure

The present experiment was conducted within a class which was taught by the author. The instructional goal of the unit during the experimental period was for learners to deliver a presentation on a place that held personal significance for them. The experiment was implemented in the first and second sessions of this unit. To exemplify a presentation, a model text was used in the class, and the target expressions were taught through reading aloud activities. The model text was created by the author to include 10 English vocabulary items that were later tested in the pre- and post-tests (see Appendix).

In both the pre- and post-tests, participants were asked to answer 10 questions in which they wrote the Japanese meanings of the presented English

vocabulary items. In selecting the target vocabulary, the English proficiency level of the participants was taken into consideration. Based on *Oxford Learner's Dictionaries* (Oxford University Press, n.d.), 10 words were selected from CEFR B2- and C1-level vocabulary: four nouns (*perseverance, dedication, ambition, enthusiasm*), two adjectives (*sacred, located*), one adverb (*deeply*), and three verbs (*reach, inspire, move*). The same set of vocabulary items was used in both the pre- and post-tests, with only the order of presentation altered. Each correct response was awarded one point and each incorrect response zero points, yielding a total score out of 10, which was analyzed using a simple additive scoring method.

An overview of the instructional procedures for each group is presented in Table 1 below.

Table 1: The Overview of Each Instruction

Session	Experimental Group	Control Group
Session 1	<ul style="list-style-type: none"> • Pre-test • Teacher's model presentation • Instruction of target expressions and pronunciation • Listening to the teacher's model • Instruction on rhythm, stress, and intonation • Choral reading • Buzz reading • Student presentations 	<ul style="list-style-type: none"> • Pre-test • Teacher's model presentation • Instruction of target expressions and pronunciation • Listening to the teacher's model • Instruction on rhythm, stress, and segmental pronunciation • Choral reading • Buzz reading • Student presentations
Session 2	<ul style="list-style-type: none"> • Post-test 	<ul style="list-style-type: none"> • Post-test

Participants first completed the pre-test, after which the meanings and pronunciations of the target vocabulary items were reviewed. Following the test, in order to help students form a clear image of the unit goal, the class watched a model presentation given by the teacher. The model text was then distributed, and the expressions and pronunciations used in the text were reviewed. Next, both the experimental and control groups identified content words and function words in the text. In addition to this activity, the experimental group annotated the model text by marking phrase boundaries and pitch movements in accordance with the

principles of Tonality, Tonicity, and Tone. Subsequently, after listening to the teacher’s model reading aloud, both groups again confirmed the distinction between content and function words. The control group received instruction on segmental pronunciation, whereas the experimental group was provided with a model indicating phrase boundaries and pitch contours and was encouraged to compare it with their own annotations. Both groups then engaged in reading aloud practice through choral reading and buzz reading, after which several students were nominated to read the text aloud.

To eliminate opportunities for learning outside the classroom, the pre-test answer sheets were collected at the end of the class. The post-test was administered during the class held one week after the pre-test session.

4. Analysis

Table 2 presents the descriptive statistics for the pre- and post-test scores for each group.

Table 2: Descriptive Statistics for the Pre- and Post-tests

Test	Group	Mean	SD	Median
Pre-test	Control group (n = 39)	2.26	1.60	2.00
	Experimental group (n = 37)	2.11	1.81	2.00
Post-test	Control group (n = 39)	3.77	1.81	4.00
	Experimental group (n = 37)	3.92	2.51	4.00

To compare the instructional effects between the two groups, an analysis of covariance (ANCOVA) was initially conducted. Prior to the analysis, the assumptions for ANCOVA were examined. The assumption of homogeneity of regression slopes was violated, as a significant difference was found ($F(1, 72) = 4.28$, $p < .001$), indicating the presence of an interaction between the covariate and group.

Accordingly, the scatterplot and regression lines shown in Figure 1 were examined, which suggested that the effect of the instructional intervention varied depending on the participants’ pre-test scores. Specifically, the results indicated that the instruction provided to the control group may have been more effective for students with lower pre-test scores, whereas the instruction provided to the experimental group may have been more effective for students with higher pre-test

scores.

Based on these observations, the distribution of the pre-test scores was divided into tertiles: low-score group (0–1 points, $n = 29$), middle-score group (2–3 points, $n = 30$), and high-score group (4–6 points, $n = 17$). Then, the instructional effects were further examined using simple main effects analyses.

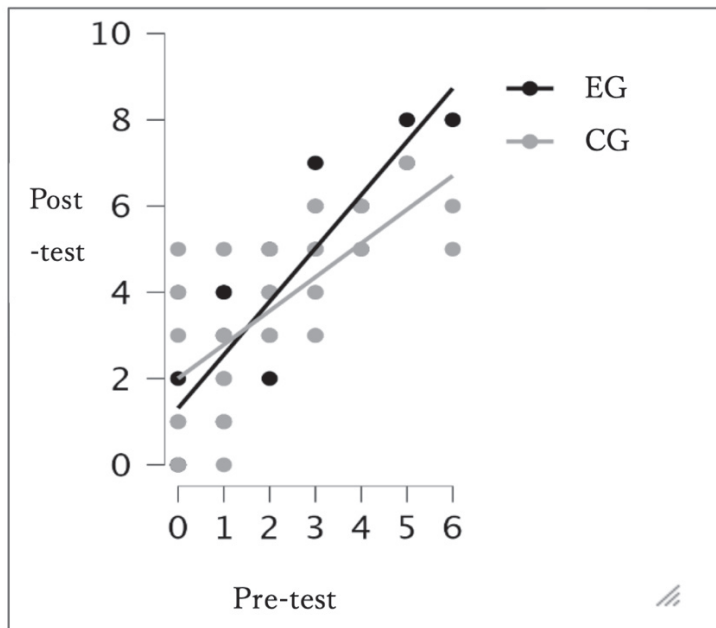


Figure 1: The Scatterplots and Regression Line (Made with JASP 0.19.3)

Table 3 presents the descriptive statistics for the pre- and post-test scores by tertile group. An examination of the post-test means showed that, in the mid- and the high-score groups, the experimental group (mid-score group $M = 4.50$; high-score group $M = 6.89$) outperformed the control group (mid-score group $M = 4.00$; high-score group $M = 5.88$). In contrast, in the low-score group, the experimental group ($M = 1.81$) scored lower than the control group ($M = 2.15$).

Table 3: Descriptive Statistics for the Pre- and Post-tests by Tertile Group

Group	Pre-test Mean	SD	Median	Post-test Mean	SD	Median
Experimental low-score (n = 16)	0.50	0.52	0.50	1.81	1.64	1.50
Experimental mid-score (n = 12)	2.25	0.45	2.00	4.50	1.38	5.00
Experimental high-score (n = 9)	4.78	0.83	5.00	6.89	1.17	7.00
Control low-score (n = 13)	0.54	0.52	1.00	2.15	1.73	2.00
Control mid-score (n = 18)	2.44	0.51	2.00	4.00	0.97	4.00
Control high-score (n = 8)	4.63	0.92	4.00	5.88	0.64	6.00

Table 4 shows the results of the simple main effects analyses. No significant differences were found between the experimental and control groups in post-test scores for the mid-score group, $F(1, 72) = 2.08, p = .154$, or the high-score group, $F(1, 72) = 2.13, p = .149$. However, a significant difference was observed in the post-test scores for the low-score group, $F(1, 72) = 4.75, p = .033$, indicating that the experimental group scored significantly lower than the control group.

Table 4: Results of the Simple Main Effects Analyses

Tertile group	df	Mean Square	F	p
Low-score group	1	7.29	4.75	.033
Mid-score group	1	3.19	2.08	.154
High-score group	1	3.27	2.13	.149

5. Discussion

For students who scored in the low range on the pre-test (0–1 points), the instructional intervention was found to be significantly less effective than the control condition. This result can be interpreted from the perspective of the Type of Processing–Resource Allocation (TOPRA) model. According to the TOPRA model, learners’ cognitive resources are limited, and when multiple types of cognitive processing are required simultaneously, competition for these resources may occur. As a result, allocating substantial resources to one type of processing may hinder other types of cognitive processing (Barcroft, 2002; Nakata, 2019).

In the instructional treatment for the experimental group, learners were required to engage in several types of processing related to intonation, including the identification and production of tone units, tonic syllables, and nuclear tones. This additional processing demand may have reduced the cognitive resources available for processing the meanings of newly introduced vocabulary items. In particular, for lower-scoring learners in the experimental group, the model text contained a relatively large number of unfamiliar words, which might have required substantial cognitive resources for lexical processing. The additive requirement of producing intonation may therefore have dispersed learners' cognitive resources, impeding vocabulary learning. These findings suggest that integrated instruction incorporating intonation may, depending on learners' proficiency levels, interfere with the acquisition of other learning targets.

However, it should be noted that vocabulary knowledge in the present study was assessed solely through a meaning-recall task, which may not fully capture the overall effects of the instructional intervention. As a direction for future research, it is necessary to examine the effects of instruction across a wider range of dimensions of vocabulary knowledge.

6. Conclusion & Pedagogical Implications

The present study aimed to develop and examine the effectiveness of an instructional approach that integrates intonation instruction into reading aloud. To examine the effects of the instruction on vocabulary learning, participants engaged in reading aloud activities using texts that contained unfamiliar words, and the instructional effects were measured through a meaning-recall test of the target vocabulary items.

One intriguing finding of the present study is that explicit intonation instruction may cause excessive cognitive burden that hinders vocabulary learning. This may be because intonation-focused reading aloud could impose a cognitive load which competes for cognitive resources with other types of processing, depending on learners' proficiency levels. This implies that instructors should carefully consider learners' proficiency levels and the difficulty of instructional materials when designing lessons, so that competition for cognitive resources does not hinder learning. For example, when working with texts that contain numerous unfamiliar vocabulary items, it may be advisable to ensure sufficient activities for vocabulary

comprehension and consolidation before introducing intonation-focused instruction.

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References

- Barcroft, J. (2002). Semantic and structural elaboration in L2 lexical acquisition. *Language Learning*, 52(2), 323–363.
- Craik, F. I., & Tulving, E. (1975). Depth of processing and the retention of words in episodic memory. *Journal of Experimental Psychology: General*, 104(3), 268–294.
- Gordon, J., & Darcy, I. (2016). The development of comprehensible speech in L2 learners: A classroom study on the effects of short-term pronunciation instruction. *Journal of Second Language Pronunciation*, 2(1), 56–83.
- Nakata, T. (2019). Learning words with flash cards and word cards. In S. Webb (Ed.), *The Routledge handbook of vocabulary studies*, (pp. 304–319). Routledge.
- O'Connor, J. D., & Arnold, G. F. (1973). *Intonation of colloquial English: A practical handbook* (2nd ed.). Longman.
- Oxford University Press. (n.d.). Oxford Learner's Dictionaries. Retrieved June 7, 2025, from <https://www.oxfordlearnersdictionaries.com/>
- Pennington, M. C., & Rogerson-Revell, P. (2019). *English pronunciation teaching and research: Contemporary perspectives*. Palgrave Macmillan.
- Roach, P. J. (2009). *English phonetics and phonology: A practical course* (4th ed.). Cambridge University Press.
- Rogerson-Revell, P. (2011). *English phonology and pronunciation teaching*. Continuum.
- Wells, J. C. (2006). *English intonation: An introduction*. Cambridge University Press.
- 門田修平 (2012). 「音読指導の実践 Q&A, Q1 音読にはどのような効果があるのでしょうか?」. 『英語教育』, 61(10), 10–12.
- 牧野武彦 (2005). 『日本人のための英語音声学レッスン』 大修館書店.

- 高橋愛紗 (2007). 「音声を併用したフレーズ・リーディングと音読が言語再生と保持に与える影響」. 『英語教育研究』, 30, 61–69.
- 竹内理 (2018). 「再考 音読活動」. 『Teaching English Now (TEN)』, 40, 5.
- 渡辺和幸 (1994). 『英語のリズム・イントネーションの指導』 大修館書店.

Appendix

Let me tell you about my sacred place, Koshien. Do you know where it is? Koshien is located in Hyogo Prefecture. It is famous for the national high school baseball tournament. For me, Koshien Stadium is more than just a place for baseball. It is a symbol of perseverance, dedication, and ambition. Players have made a great amount of effort to reach the place, and the game is filled with their enthusiasm. It always makes me feel inspired. Why don't you visit Koshien? You'll be deeply moved!