

Short- and Medium-Term Effects of Mouth Movement-Focused Instruction on English Linking Pronunciation

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Abstract

Visual cues such as mouth movements have gained attention in English pronunciation instruction, yet they have mainly targeted individual sounds (e.g., /l/ and /r/), with limited application to connected speech features such as rhythm and linking. In this study I investigated the short- and mid-term effects of mouth movement-focused instruction on English linking. I developed a single 24-minute on-demand lesson using video footage that clearly demonstrated native English speakers' lip and tongue movements. Linking performance was measured at three points—before instruction, immediately after the instruction, and at the end of the semester. Results showed that even this brief intervention led to noticeable improvement in learners' production of linking, especially at the phrase level. Learners also reported enhanced awareness of overall pronunciation through the visual instruction. However, performance in sentence-level linking was less stable, with some targets showing decline over time. These findings suggest that while short, visually guided instruction can be effective in raising awareness and improving production, repeated practice and sustained exposure are necessary for long-term retention and fluency development.

Keywords: linking, English pronunciation, mouth movement, visual information

1. Introduction

1.1 Statement of the Problem

In recent English language education, improving learners' communicative competence, particularly listening and speaking skills, has become increasingly significant. However, Japanese learners' listening scores on standardized tests such as the Test of English for International Communication (TOEIC) are notably lower compared to learners from other non-English-speaking countries such as China and Korea, with average scores showing little improvement in recent years (The Institute for International Business Communication, 2024). Consequently, there is a growing demand for more effective instructional methods for listening comprehension and pronunciation, and various approaches, including shadowing, have been adopted (Kadota, 2019). Among these, instructional methods focusing on the speaker's articulatory movements have shown promising results. However, most prior researchers have primarily targeted individual sounds or isolated words, and few have analyzed and utilized articulatory movements at the sentence level in instructional practices.

1.2 Research Objectives

Japanese learners face numerous challenges in listening and speaking, and unfamiliarity with English-specific phonetic features, especially linking, is a significant obstacle. Because English words are often linked in connected speech, learning pronunciation at the individual word level may not adequately prepare learners to comprehend spoken language or to produce speech naturally (Brown, 2012). Therefore, explicit instruction on phonetic linking is essential for overcoming these difficulties.

Additionally, few researchers have examined the effectiveness of brief prosody instruction. The present study investigates how learners acquire linking, one of the essential features of English connected speech. Specifically, this study aims to examine the effectiveness of a brief 24-minute on-demand video instruction session focusing on articulatory movements in acquiring linking skills. I will measure this intervention's effectiveness at two points: immediately after instruction (short-term retention) and at the end of the academic term (mid-term retention). Furthermore, a survey of student perceptions will be conducted to provide additional insights into

learners' awareness and attitudes toward linking instruction.

2. Literature Review

2.1 Incorporating Articulatory Movements in Pronunciation Instruction

Incorporating articulatory movements into English pronunciation instruction is a common practice and has demonstrated effectiveness in prior research (Kazumi, 2003). However, previous studies have mainly focused on isolated phonemes such as /r/, /l/, and /θ/ at the individual sound or word level, with few studies analyzing and applying articulatory movements at the sentence level. Notably, Ogata et al. (2001) extended the analysis of mouth movements beyond individual words, while Nakamori (2016) highlighted the importance of observing speakers' mouth movements for speech comprehension. Additionally, Erickson et al. (2014) and Mori et al. (2011) compared jaw opening between Japanese learners of English and native English speakers during sentence production, revealing significant differences. Nevertheless, comprehensive research systematically analyzing and patterning the precise trajectories of mouth movements at the sentence level for application in listening and pronunciation instruction remains limited and represents an area yet to be fully explored.

2.2 Importance of Suprasegmental Features

Pronunciation instruction typically addresses both segmental features (e.g., sounds like /l/ and /r/) and suprasegmental features such as rhythm and intonation. Research suggests that prosody significantly contributes to intelligibility, possibly more than individual segmental accuracy (Anum et al., 2024; Celce-Murcia et al., 1996; Hahn, 2004; Yamane, 2015). Thus, pronunciation instruction should include prosodic features like rhythm in addition to individual phonemes. Linking, a characteristic feature of English pronunciation, plays an essential role in mastering rhythm. Japanese learners of English, whose native language primarily consists of open syllables, often insert vowels in consonant clusters or at the end of consonant-final words (Koike, 2014), complicating their acquisition of linking and listening skills. Consequently, instructional strategies should focus on preventing learners from inserting unnecessary vowels.

2.3 Linking Instructions

In English language education, there is an increasing emphasis on improving listening and speaking skills, highlighting the significance of linking as an essential aspect of fluency. Linking refers to the smooth transition from the final sound of one word to the initial sound of the next, creating fluid speech. It can occur in various ways: by retaining all original sounds (consonant-to-vowel linking), omitting certain sounds (some consonant-to-consonant linking), inserting additional sounds (vowel-to-vowel linking), or altering sounds entirely. While linking is a common feature of all spoken language, its specific patterns vary among different English dialects and varieties (Guskaroska et al., 2024). However, acquiring linking skills remains challenging for many non-native speakers, especially for Japanese learners who are unfamiliar with English-specific phonetic changes, significantly impacting their listening and speaking abilities (Celce-Murcia et al., 2010). Researchers have shown that connected speech instruction helps learners better comprehend native speakers' rapid speech (Matsuzawa, 2006).

Various instructional approaches have been proposed to facilitate the learning of linking. Alameen (2014) demonstrated that explicit linking instruction positively influences both speech perception and production among non-native speakers. Furthermore, Sardegna (2011) suggested that pronunciation learning strategies, such as shadowing, effectively enhance learners' ability to master linking. Nevertheless, continuous and explicit practice remains essential for lasting acquisition.

Specifically addressing Japanese learners, Yarrow (2011) indicated that instruction often falls short at the sentence level. While students may perform adequately in isolated word contexts, naturally applying linking in real conversations remains challenging. To address this issue, Dauer and Browne (1992) emphasized the effectiveness of visual teaching aids illustrating articulatory movements. Despite this recommendation, research systematically analyzing articulatory movements at the sentence level remains limited.

Another notable challenge involves the frequency and sustainability of linking instruction. Seong (2008) developed an assessment tool to evaluate linking instruction, finding evident short-term instructional effects but emphasizing that repeated and continuous practice is necessary for long-term retention.

Considering these perspectives, the present study investigates the short-term and mid-term effects of a brief, 24-minute on-demand video instruction focusing on linking among Japanese learners of English. Through this investigation, I aim to provide new insights into effective methods of linking instruction.

3. Method

3.1 Course Overview

I conducted this study during the first semester of 2021 at a private university in Japan, within a compulsory English course that I taught. This course focused on learning English pronunciation, word processing skills using Microsoft Word, and typing skills through computer-assisted instruction. Following the textbook content, pronunciation instruction covered consonants, vowels, and rhythm. Due to the COVID-19 pandemic, the course was entirely online, mainly using an on-demand format where students individually watched instructional videos and submitted assignments. Out of the 15 weekly sessions, I conducted only three live in real-time online classes.

3.2 Participants

Out of 44 first-year students enrolled in my intermediate-level class, 31 who submitted all required recordings (Before, Mid, and After) by the designated deadlines were included in this analysis. To assess their pronunciation development, I asked students to submit either audio or video recordings. Due to the limited upload capacity (maximum 20MB) of the university's internal Learning Management System, submissions were directed to an external platform. This process caused difficulty for some students, resulting in fewer participants available for analysis.

3.3 Data Collection Procedure

In Week 1, prior to any pronunciation instruction, I asked students to record themselves pronouncing selected phrases and sentences from the textbook. I labeled these initial recordings as the Before data. Pronunciation instruction began in Week 3 with linking instruction from Unit 1 of the textbook. Immediately after this instruction, students submitted their second recordings, designated as Mid data. Following additional instruction on vowels, consonants, and rhythm throughout the semester, students completed the third recording in Week 15, which constituted the After data.

I selected 12 target linking points for analysis, including five isolated phrases and seven linking points within four sentences (Table 1). The aim was to compare students' success rates in linking within isolated phrases and sentences. Additionally, I included the phrase "check in" in both isolated phrase and sentence contexts to examine whether repetition improved retention. Students also pronounced five additional sentences at the Before and After stages, which did not contain any linking targets but were used to confirm other aspects of pronunciation instruction. For the After recording, I instructed students to pronounce the sentences carefully based on what they had learned throughout the course but did not explicitly remind them about linking. All phrases and sentences analyzed were taken from Unit 1 of the textbook, specifically focusing on linking patterns involving words ending with a consonant followed by words beginning with a vowel.

Table 1. Phrases and Sentences Used in the Analysis

Number	Phrase or Sentence	Targeted Linking Items for Analysis
1	take out	take <u>o</u> ut
2	keep on	keep <u>o</u> n
3	take off	take <u>o</u> ff
4	check in	check <u>i</u> n
5	watch out	watch <u>o</u> ut
6	We would like to check in.	check <u>i</u> n
7	Your flight number isAK1092.	number <u>i</u> s, 10 (one-ou)
8	Your seat is number fourteenA.	seat <u>i</u> s, fourteen <u>A</u>
9	That's an aisle seat.	That's <u>a</u> n, <u>a</u> n aisle

3.4 Instructional Methods

I provided the linking instruction via an on-demand video format. I created instructional videos explaining textbook content, which students could watch at their convenience within the given period to complete assignments. The video instruction began by explaining the concept of linking using textbook examples and included practice of selected phrases. Additionally, I used videos recorded by three native English speakers, clearly demonstrating articulatory movements at both natural speed and one-third of normal speed. During these segments, I highlighted important aspects and potential pitfalls of mouth movements. For example, when practicing the phrase "keep on," Japanese learners typically insert an unnecessary vowel after the consonant "p" (e.g., "keepu-on"). Therefore, I emphasized avoiding lip protrusion after producing the /p/ sound by demonstrating the precise lip movements of native English speakers. I encouraged students to mimic mouth movements visually and auditorily. The instructional video lasted approximately 24 minutes, and no further explicit linking instruction occurred afterward. Students could watch the video multiple times at their discretion throughout the semester.

3.5 Analytical Methods

I analyzed students' linking performance across the Before, Mid, and After recordings to determine instructional effectiveness. Additionally, I administered a student survey to gather perceptions regarding the instructional approach focusing on articulatory movements. To measure linking accuracy objectively, I evaluated students' recordings both by auditory judgment and by inspecting the waveform using Praat software (<https://www.fon.hum.uva.nl/praat/>). Specifically, I looked for any signs of unnecessary vowel insertion or unnatural pauses at word boundaries that would indicate a failure to produce linking.

4. Results

4.1 Results Before and Immediately After Instruction

Table 2 shows students' linking accuracy rates before instruction (Before) and immediately after instruction in Week 3 (Mid). Items numbered 1–5 represent isolated phrases, while items 6–12 represent phrases produced within sentence contexts. Using McNemar's test, significant improvements from pre- to post-instruction were found for all items (all p values < .001).

Table 2. Success Rates of Linking Before and Immediately After Instruction (Mid)

Number	Target	Before (%)	Mid (%)
Phrases			
1	take out	35.5	87.1
2	keep on	51.6	93.5
3	take off	48.4	90.3
4	check in	45.2	93.5
5	watch out	45.2	80.6
In the Sentence			
6	check in	48.4	93.5
7	number is	12.9	51.6
8	1-0 (one-ou)	3.2	19.4
9	seat is	54.8	80.6
10	fourteen A	9.7	41.9
11	that's an	61.3	93.5
12	an aisle	3.2	54.8

Overall, clear improvements were observed for all targeted linking items, indicating an immediate positive effect of the linking instruction. Specifically, linking success rates for the target phrases significantly increased from the Before stage (approximately 35–52%) to the Mid stage (approximately 81–94%). The phrases "keep on" and "check in" reached the highest post-instruction success rates (93.5%), while "watch out" showed a relatively lower improvement, reaching an 80.6% success rate.

In sentence-level linking tasks, similar improvements were observed, but with more variation. Phrases such as "check in" and "that's an" were particularly notable—both showed substantial improvements, rising from 48.4% to 93.5% and 61.3% to 93.5%, respectively. However, some linking targets remained challenging even after instruction. The success rates of linking in numerical expressions such as "1-0 (one-ou)" and "fourteen A" showed smaller gains (from 3.2% to 19.4%, and from 9.7% to 41.9%, respectively). Additionally, "number is" and "an aisle," although improved, continued to show lower success rates (51.6% and 54.8%, respectively), suggesting particular difficulty in linking these phrases immediately following initial instruction.

4.2 Results Before, Immediately After, and at the End of the Semester

Table 3 presents students' linking accuracy rates at three time points: before instruction (Before), immediately after instruction in Week 3 (Mid), and after completing the 15-week course (After). A Generalized Estimating Equations analysis revealed significant improvements in success rates for all items from Before to After instruction at the 1% significance level ($p < .01$). When comparing Mid and After stages, significant changes (either increases or decreases) in success rates were observed for most items. However, no significant differences were found for the items "check in" and "fourteen A" within sentences ($p > .05$), indicating stable performance for these items between Mid and After.

Table 3. Success Rates of Linking Before Instruction, Immediately After Instruction (Mid), and at the End of the Term (After)

Number	Target	Before (%)	Mid (%)	After (%)
Phrases				
1	take out	35.5	87.1	100
2	keep on	51.6	93.5	100
3	take off	48.4	90.3	100
4	check in	45.2	93.5	100
5	watch out	45.2	80.6	100
In the Sentence				
6	check in	48.4	93.5	96.8
7	number is	12.9	51.6	35.4
8	1-0 (one-ou)	3.2	19.4	44.0
9	seat is	54.8	80.6	66.7
10	fourteen A	9.7	41.9	38.7
11	that's an	61.3	93.5	74.2
12	an aisle	3.2	54.8	45.2

In the targeted phrases, there was a consistent increase from Before (35.5%–51.6%) through Mid (80.6%–93.5%) to After (100%). By the end of the term, all targeted phrases ("take out," "keep on," "take off," "check in," "watch out") reached full success rates (100%), indicating successful retention of linking instruction for isolated phrases.

However, sentence-level linking results were more variable. While the phrase "check in" maintained a high success rate even at After (96.8%), other sentence-level items showed mixed results. Specifically, items such as "number is," "seat is," "fourteen A," "that's an," and "an aisle" showed noticeable declines from Mid to After. Notably, "number is" dropped from 51.6% (Mid) to 35.4% (After), and "seat is" decreased from 80.6% (Mid) to 66.7% (After). Similarly, "fourteen A" decreased slightly from 41.9% (Mid) to 38.7% (After), and "that's an"

also showed a drop from 93.5% (Mid) to 74.2% (After). The linking item "an aisle," despite improvement compared to Before, experienced a decline from 54.8% (Mid) to 45.2% (After).

Interestingly, "1-0 (one-ou)," although still showing relatively low success rates overall, demonstrated continued improvement over time (from 3.2% Before to 19.4% Mid, reaching 44.0% After).

4.3 Survey Results

After the 15-week instructional period, I invited students to voluntarily complete a survey, and 13 students responded. Regarding whether students noticed any benefits from consciously paying attention to articulatory movements, 84.6% reported experiencing some form of awareness or insight. Additionally, students responded to a 5-point Likert-scale item: "Do you think your pronunciation improved by consciously practicing mouth movements?" Ten of the thirteen respondents (76.9%) selected "considerably" or "extremely," indicating that they perceived improvement in their pronunciation (Figure 1). In addition, when asked whether consciously practicing mouth movements was helpful in acquiring linking, 11 out of 13 participants (84.6%) responded either "Considerably" or "Extremely" (Figure 2).

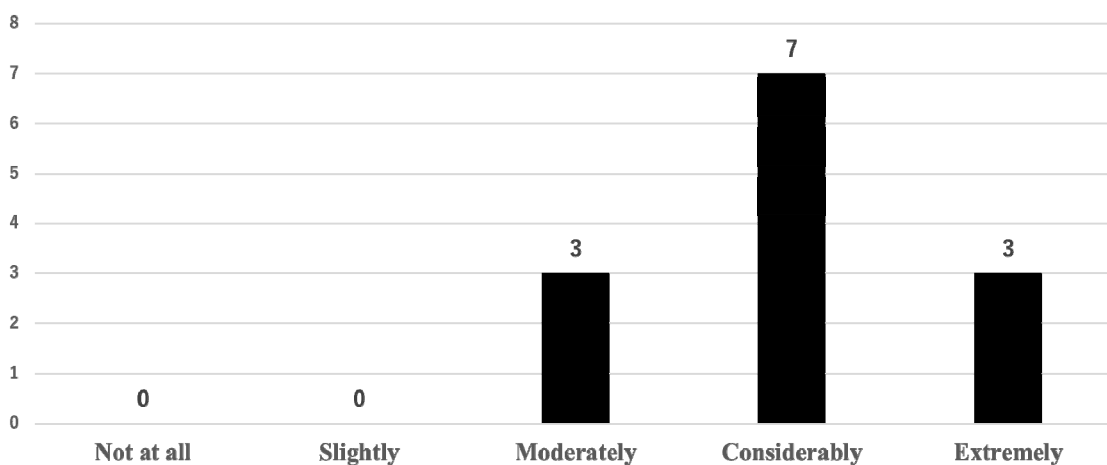


Figure 1. Perceived improvement in pronunciation through conscious practice of mouth movements

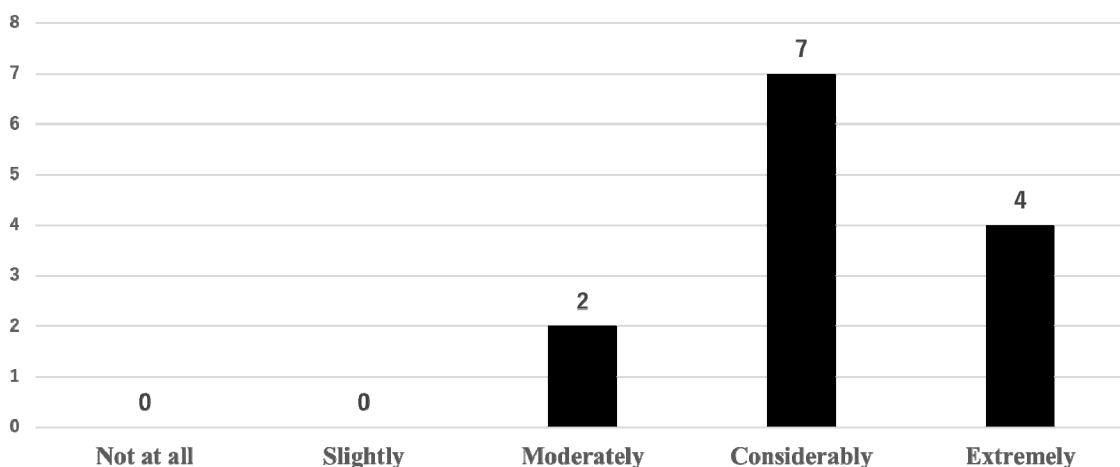


Figure 2. Perceived helpfulness of mouth movement practice in acquiring linking

5. Discussion

In this study, the effectiveness of explicit linking instruction was assessed by measuring learners' success rates at three time points: before instruction (Week 1), immediately after instruction (Mid, Week 3), and at the end of the term (After, Week 15). Significant improvements were observed across linking targets, supporting the findings of previous studies highlighting the efficacy of visual articulatory training (Hirata & Kelly, 2010; Saito & Lyster, 2012). Specifically, initial success rates around 50% rose substantially immediately following instruction, indicating that learners could rapidly acquire linking skills when provided with explicit visual cues.

However, certain linking contexts remained challenging, particularly linking involving the consonant "n" at word boundaries, such as in "fourteen A." This ongoing difficulty may be attributed to learners substituting the English "n" sound with the Japanese "ん (/N/)". Addressing this issue through instructional materials clearly illustrating tongue movements and mouth shapes could potentially improve learners' pronunciation skills.

Additionally, the exceptionally low success rate for linking "1-0 (one-ou)" was largely due to many participants pronouncing it as "one-zero" across all measurements (38 learners before, 33 at mid, and 19 after instruction). Further examination is therefore necessary to determine the most appropriate interpretation of this data.

While immediate improvements were evident, particularly in isolated phrases such as "take out," "keep on," and "check in," where success rates exceeded 80% at the Mid-point measurement, sentence-level linking proved to be more complex. Success rates declined from Mid to After for several sentence-level targets, including "number is," "seat is," "that's an," and "an aisle." The finding that success rates increased immediately after instruction but declined slightly over time is consistent with previous studies (Beebe, 1988; Sardegna, 2011). The increased cognitive load associated with simultaneously attending to intonation, rhythm, and individual phonemes, thereby diverting attention away from linking, explains this reduction (Dauer & Browne, 1992). These results collectively suggest that single-session linking instruction may be insufficient for long-term retention and underscore the necessity of repeated exposure and sustained practice. Future research should thus investigate how integrated pronunciation instruction influences the acquisition and retention of specific features like linking.

Despite these challenges, the stable high success rates observed for some phrases, such as "check in," suggest that initially practicing linking in isolated phrases may facilitate transfer to sentence-level contexts. This finding supports Celce-Murcia et al.'s (2010) assertion that controlled phrase-level practice serves as an essential foundation before progressing to more complex sentence-level and conversational practice.

Targets involving numerical expressions ("1-0 (one-ou)" and "fourteen A") consistently posed difficulties, likely due to the inherent emphasis placed on numerals that interrupts smooth linking. Specifically, the stress on "teen" in "fourteen A" appeared to disrupt learners' ability to link naturally. Similarly, vowel-initial linking (e.g., "an aisle") remained challenging due to learners' tendency, influenced by Japanese phonological patterns, to pronounce words individually rather than seamlessly linking them. Overcoming these challenges will require targeted and sustained instructional intervention.

Finally, the challenge of transferring linking skills from isolated phrases to natural conversational contexts underscores the need for more authentic and frequent practice opportunities. Incorporating sustained sentence-level practice into activities such as reading aloud and conversational exercises will be essential. Building on these findings, future pronunciation instruction should blend explicit, repeated linking practice with authentic communicative tasks to enhance learners' ability to naturally produce linked speech.

6. Conclusion and Future Study

In this study, I conducted explicit linking instruction through a single 24-minute on-demand instructional video, utilizing footage clearly illustrating the mouth movements of native English speakers. Several significant findings emerged. First, despite the short duration of the instructional intervention, results indicated notable effectiveness in improving students' linking performance.

Second, survey responses revealed that learners perceived benefits not only in linking but also felt that their overall pronunciation skills had improved through increased awareness of mouth movements. These positive outcomes underscore the potential value and practicality of brief, explicit instructional methods focusing on mouth movement awareness within English pronunciation training.

Third, the study also highlighted areas requiring further improvement. Some phrases remained challenging for learners even after instruction, and several targets showed a decline in success rates at the After stage, indicating that complete mastery and sustained retention were not fully achieved through a single instructional session.

These findings clearly suggest the necessity of ongoing practice and reinforcement to facilitate stable and lasting

pronunciation improvement. One or two brief review sessions during the semester might help students maintain the improvements achieved at the Mid stage or possibly facilitate further gains over time.

7. Limitations of the Study

This research has several limitations that future researchers should address. First, due to the absence of a control or comparison group, the results must be interpreted cautiously. Future research should include comparative studies with groups not exposed to mouth movement-focused instruction to more conclusively determine its effectiveness.

Second, this study primarily focused on quantitative measures of linking success; subsequent studies could incorporate subjective analyses, such as assessments of speech intelligibility and perceived naturalness by native listeners, to provide a more comprehensive evaluation of pronunciation improvement.

Third, increasing the number of participants and including a broader range of target phrases would enhance the robustness and generalizability of the findings.

Fourth, analyzing actual changes in learners' mouth movements through detailed phonetic or articulatory analyses would yield valuable insights. Identifying characteristics of learners who showed limited improvement could facilitate targeted and more efficient instructional approaches.

Finally, future researchers should also examine whether improved linking ability directly contributes to enhanced listening comprehension skills, further exploring the pedagogical implications and practical benefits of explicit pronunciation instruction.

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References

- Alameen, G. (2014). *The effectiveness of linking instruction on NNS speech perception and production* (Doctoral dissertation, Iowa State University). Iowa State University Digital Repository. <https://dr.lib.iastate.edu/entities/publication/71f627d2-7a3c-4f7a-820e-9d2d149e1041>
- Anum, L., Limbeng, Z. N., Lubis, F. A., Nazhira, A. D., & Lubis, Y. (2024). The role of prosody and intonation in English phonology: Implications for speech perception and production. *Bilangan*, 2(3), 160–174. <https://doi.org/10.62383/bilangan.v2i3.82>
- Beebe, L. M. (1988). The sociolinguistic perspective. In L. M. Beebe (Ed.), *Issues in second language acquisition: Multiple perspectives*. Newbury House.
- Brown, J. D. (Ed.). (2012). *New ways in teaching connected speech*. TESOL International Association.
- Celce-Murcia, M., Brinton, D. M. and Goodwin, J. M. (1996) *Teaching pronunciation: A reference for teachers of English to speakers of other languages*. Cambridge University Press.
- Celce-Murcia, M., Brinton, D. M., Goodwin, J. M., & Griner, B. (2010). *Teaching pronunciation: A course book and reference guide* (2nd ed.). Cambridge University Press.
- Dauer, R. M., & Browne, S. C. (1992). *Teaching the pronunciation of connected speech* [Paper]. 26th Annual Meeting of TESOL, Vancouver
- Erickson, D., Kawahara, S., Moore, J., Menezes, C., Suemitsu, A., Kim, J., & Shibuya, Y. (2014). *Calculating articulatory syllable duration and prosodic boundaries* [Paper]. 10th International Seminar on Speech Production, ISSP 2014 (pp. 102–1105).
- Guskaroska, A., Zawadzki, Z., Levis, J. M., Challis, K., and Prikazchikov, M. (2024). *Teaching pronunciation with confidence: A resource for ESL/EFL teachers and learners*. Iowa State University Digital Press. <https://doi.org/10.31274/isudp.2024.161>
- Hahn, L. D. (2004). Primary stress and intelligibility: Research to motivate the teaching of suprasegmentals: Research to motivate the teaching of suprasegmentals. *TESOL Quarterly*, 38, 201-223. <https://doi.org/10.2307/3588378>

- Hirata, Y., & Kelly, S. D. (2010). Effects of lips and hands on auditory learning of second-language speech sounds. *Journal of Speech, Language, and Hearing Research*, 53(2), 298–310. [https://doi.org/10.1044/1092-4388\(2009/08-0243\)](https://doi.org/10.1044/1092-4388(2009/08-0243))
- Kadota, S. (2019). *Shadowing as a Practice in Second Language Acquisition: Connecting Inputs and Outputs* (1st ed.). Routledge. <https://doi.org/10.4324/9781351049108>
- Kazumi, Y. (2003). Eigo onsei syuutoku no tameno zikogakusyuuyou kyouzai no kaihatu (Development of Self-Study Materials for English Pronunciation Acquisition). *Studies of language and culture*, 7, 31-49. <http://hdl.handle.net/2297/891>
- Koike, Y. (2014). Explicit pronunciation instruction: Teaching suprasegmentals to Japanese learners of English. In N. Sonda & A. Krause (Eds.), *JALT2013 Conference Proceedings*. Tokyo: JALT.
- Matsuzawa, T. (2006). Comprehension of English reduced forms by Japanese business people and the effectiveness of instruction. In J. D. Brown, & K. Kondo-Brown, (Eds.), *Perspectives on teaching connected speech to second language speakers* (pp. 59-66). Honolulu, HI: University of Hawaii, National Foreign Language Resource Center.
- Mori, Y., Hori, T., & Erickson, D. (2011). *The roles of duration, F0, F1, and jaw displacement in the realization of accent for English vs. Japanese speakers* [Paper]. NINJAL International Conference of Phonetics and Phonology, Kyoto, Japan.
- Nakamori, T. (2016). *Gaikokugo onsei no nintimekanizumu- tyoukaku • shikaku • syokkaku karano shingou (Cognitive Mechanisms of Foreign Language Speech: Auditory, Visual, and Tactile Signals)*. [in Japanese] Kaitakusya.
- Ogata, S., Nakamura, S., Morishima, S. (2001). Video honnyaku sisutemu- zidou honnyaku gousei onsei tono moderube-rurippusinku no zitugen (Video Translation System: Achieving Model-Based Lip Synchronization with Synthesized Speech from Automatic Translation). *Interaction*, 2001, 203-210.
- Saito, K., & Lyster, R. (2012). Effects of form-focused instruction and corrective feedback on L2 pronunciation development. *Language Learning*, 62(2), 595–633. <https://doi.org/10.1111/j.1467-9922.2011.00639.x>
- Sardegna, V. G. (2011). Pronunciation learning strategies that improve ESL learners' linking. In J. Levis & K. LeVelle (Eds.). *Proceedings of the 2nd Pronunciation in Second Language Learning and Teaching Conference*, Sept. 2010. (pp. 105-121), Ames, IA: Iowa State University.
- Seong, Y. A. (2008). Evaluating an instrument for assessing connected speech performance using facets analysis. *Second Language Studies*, 26(2), 45-101.
- The Institute for International Business Communication. (2024, July 18.). *TOEIC program data & analysis*. https://www.iibc-global.org/english/toEIC/official_data.html
- Yamane, S. (2015). Nihonjin gakusyuuusya no mezasu meiryousei no takai eigo hatsuon toha (Defining intelligible English pronunciation for Japanese learners). *Journal of foreign language studies*, 13, 129-141. <http://hdl.handle.net/10112/9660>
- Yarrow, P. (2011). Catching the connection: Pedagogy of linking for fluency. *Transactions of Nihon University, School of Dentistry*, 39, 51-55.

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