

学位論文要旨

# Factors Affecting Aural Decoding Ability for Japanese EFL Learners

広島大学大学院教育学研究科  
教育学習科学専攻 教科教育学分野  
英語教育学領域

D165605 ラング クリス アレキサンダー

Developing the ability to understand speech in a foreign language is a difficult task for the second language (L2) learner. Central to this process is the ability to identify words in spoken language and understand their meanings, also known as decoding. Decoding is the fundamental process of breaking up the speech stream into recognizable words making listening comprehension possible. It is a process in which the listener identifies word boundaries, recognizes words, and establishes a literal meaning of a spoken utterance (Field, 2008). Although decoding is an essential skill for listening comprehension, not enough L2 listening research attention has been focused on understanding its relationship to listening comprehension and the listeners' comprehension processes while decoding. The studies included in this dissertation primarily investigate the decoding abilities of Japanese university EFL students and the relationships that bottom-up skills, metacognitive awareness and aural vocabulary knowledge have with listening comprehension. Bottom-up skills refer to the capacity to perceive linguistic information from the speech signal. Metacognitive awareness refers to one's knowledge of cognitive processes and listening strategies while listening. Aural vocabulary knowledge refers to knowledge of acoustic representations for words. The basic aim of these studies is to assess decoding ability, gain insight into its importance for listening comprehension and try to understand the particular English decoding difficulties that are representative of native Japanese learners of English. With this information, this dissertation aims to also explore how decoding skills might be effectively developed for these learners. This dissertation presents four research studies which aim to address the following three main research objectives:

- 1) To investigate the decoding ability of Japanese EFL learners.
- 2) To examine the relative importance that various factors associated with listening ability have on L2 listening.
- 3) To identify common sources of decoding difficulties for Japanese EFL learners.

In this abstract, a brief summary of the findings in regard to each research objective will be provided followed by the primary research questions and a summary of the study. The results for Objective 1 indicate that decoding ability may be limited due to phonological modification which normally occurs in connected speech. Phonological modification refers to various changes in the pronunciation of phonemes that regularly occur in connected speech. Decoding ability for function words was better when words were presented in citation form than when presented in their normal weak forms. Function words are words which signify grammatical information (e.g. articles, prepositions, and conjunctions) and typically require phonological modification in connected speech resulting in a deemphasized and shortened form of the word, known as weak forms. In regard to Objective 2, findings from correlation and regression analysis show that decoding ability has a stronger relationship with listening ability than with aural vocabulary knowledge. However, aural vocabulary knowledge for the first 1,000-word level demonstrated greater predictive capacity in

listening comprehension scores than decoding ability. Finally, results for Objective 3 introduced quantitative and qualitative assessments to identify sources of decoding difficulty through a mixed-methods approach. The analysis identified four trends in decoding errors for Japanese EFL learners: limited collocation familiarity, syntactic knowledge constraints, difficulties utilizing co-text, and L1 phonological influence.

Three primary research questions guide the research conducted for this dissertation.

- 1) To what extent can Japanese university students decode function words from connected speech?  
(Research Study 1)
- 2) What is the strength of association that L2 listening comprehension ability has with awareness of metacognitive skills, ability to decode function words, knowledge of aural vocabulary and decoding ability? (Research Studies 2 and 3)
- 3) What sources of decoding difficulty can be identified through tests of decoding ability and analysis of introspective self-observation protocol responses? (Research Study 4)

In Research Study 1, which is entitled “Analyzing Difficulties in Aural Word Recognition for Japanese English Learners: Identifying Function Words in Connected Speech” the difficulties that Japanese listeners’ have in recognizing function words in connected speech is investigated. The results help to demonstrate the degree of difficulty this task presents to listeners as well as some defining characteristics of the words which were the most difficult to decode. A partial transcription test was administered to a cohort of first- and second-year Japanese university students ( $N = 29$ ). In the 30-item test, each item aurally presented sentences of five to six words which contained a function word. On the test paper, the first and last words of the sentence were written and students were instructed to transcribe the three to four missing words that were aurally presented. For example, the listeners heard, “I need to talk to you.” and attempted to transcribe the four missing words in the test item “I \_\_\_\_\_ you.” However, as this study focused on function words, only decoding ability for the two instances of the function word *to* were measured. The same students took this same test once more with the exception that the aurally presented sentences were spoken in citation form, without weak form phonological modification. By comparing the results from both tests (e.g. citation form and connected speech) inferences can be drawn about the degree of difficulty that attributes of connected speech presented to the listeners. Results showed that only 77.8% of the words presented with connected speech were transcribed whereas 96.3% of the words presented in citation form were transcribed. These results suggest that attributes of connected speech, such as weak form function words, were partially responsible for decoding difficulties. The findings also provide an indication of the degree of difficulty learners have with decoding weak form function words in connected speech, highlighting the importance of this research focus. Furthermore, these findings help in identifying particular

characteristics of some function words, such as voiceless initial phonemes (e.g. /h/ as in “him”), that make them particularly difficult for listeners to decode.

Research Study 2, which is entitled “Exploring the Relationship that Listening Performance has with Bottom-Up Skills and Metacognitive Awareness” investigated the strength of relationship between listening comprehension and bottom-up skills in addition to the relationship between listening comprehension and metacognitive awareness evident from a cohort of 54 first-year Japanese university students. The results indicated that the bottom-up skill of decoding deemphasized function words in a partial dictation task (i.e. cloze listening task) had the strongest correlation with listening test scores. In order to explore these relationships, this study employed the Clear Listening Diagnostic Test (Gilbert, 2012) to measure bottom-up skills, the Metacognitive Awareness Listening Questionnaire (Vandergrift et al., 2006) to assess utilization and awareness of listening strategies, and the Eiken Pre-2 grade listening section to measure listening comprehension. The results demonstrated a significant and moderately strong correlation between listening ability and one of the bottom-up skills tested, deemphasized function word transcription ( $r = .50$ ). In comparison, the relationship between listening ability and metacognitive awareness was weak ( $r_s = .21$ ), suggesting further evidence for the importance of bottom-up processes for L2 listening comprehension development. These results prompt the further investigation of bottom-up skills and their relationship to listening comprehension ability.

Research Study 3, which is entitled “Exploring the Relationships between L2 Vocabulary Knowledge, Decoding, and L2 Listening Comprehension” demonstrates the important roles of decoding in listening ability and aimed to ascertain these relationships more rigorously through correlational and multiple regression analysis. This study investigated the relationships between listening ability, using two measures of listening comprehension, aural vocabulary knowledge and decoding ability with 130 first-year Japanese university students. Listening comprehension was assessed using listening sections from the Eiken Pre-2 and TOEIC tests. The Listening Vocabulary Levels Test (McLean et al., 2015) was used to assess aural vocabulary knowledge and decoding ability was assessed through a paused transcription test. In this testing format, the test-taker listens to an audio recording and at irregular points in the recording, which correspond to the target items selected for the test, a pause is inserted. During this brief pause, the test-taker tries to transcribe the last phrase of three to five words which immediately preceded the pause. The recording resumes playback after the pause and the test-taker continues listening and transcribing the phrases heard before each pause. Paused transcription testing is thought to provide a more accurate assessment of decoding errors than dictation because the listener may more fully utilize top-down as well as bottom-up

processing skills. The findings from Research Study 3 suggest that decoding words from connected speech had a stronger relationship with the two measures of listening ability ( $r = .39$  and  $.51$ ) than aural vocabulary knowledge had ( $r = .15$  and  $.12$ ) as measured by the total scores of the Listening Vocabulary Levels Test. However, scores from the first 1,000-word level of the Listening Vocabulary Test were the strongest predictive variable, independently predicting 22% of variance in TOEIC listening scores and 21% of variance in Eiken Pre-2 listening scores. Regression analyses also indicated that in combination, aural knowledge of vocabulary at the first 1,000-word level and decoding ability could predict 34% and 38% of total variance observed in TOEIC listening and Eiken Pre-2 listening scores, respectively. These findings provide evidence that decoding ability and aural knowledge of high-frequency vocabulary is strongly associated with listening ability and worthy of further investigation and analysis.

Research Study 4, which is entitled “Analyzing Trends in the Aural Decoding Errors of Japanese EFL Learners” presents an in-depth analysis of identifiable trends in decoding errors using both quantitative and qualitative analysis. Decoding errors were elicited with the same paused transcription test utilized in Research Study 3 along with an introspective self-observation protocol which could provide more detail in investigating the sources of decoding errors for 63 first-year Japanese university students. Quantitative findings showed that decoding ability was quite limited for this cohort with only 45.1% of the target words correctly transcribed from connected speech. Supported by the quantitative data, the qualitative findings indicated that four main trends in decoding difficulty could be identified from this study: limited collocation familiarity, syntactic knowledge constraints, difficulties utilizing co-text, and L1 phonological influence. Limited collocation familiarity refers to decoding difficulty due to inadequate knowledge of some of the collocations tested. Familiar collocation were transcribed more accurately than those reported as unfamiliar. The syntactic knowledge constraint trend refers to the participants’ misapplication of syntactic knowledge to decoding hypotheses. For instance, notions of correct and incorrect word order appeared to have limited decoding accuracy in some cases. Difficulty utilizing co-text refers to decoding errors which were caused in part from misunderstanding the previously heard text (i.e. co-text). Finally, L1 phonological influence refers to the observed trend in decoding errors in which the attributes of the listeners’ native language led to decoding difficulties.

Several pedagogical implications are briefly presented here based on the studies conducted for this dissertation. First, explicit instruction for decoding and collocation development should be encouraged. Participants in these studies demonstrated low levels of decoding ability, as measured by a paused transcription test, for moderately slow speech containing high-frequency vocabulary. The average speech

rate for all test audio was 102 words per minute (ranging from 95 to 105 wpm) which is below the 'slower than normal' speech rates for interviews (120 wpm) and comparable to that for lectures (100 wpm) (Tauroza & Allison, 1990). An analysis of the 5,216 words used in the paused transcription test audio showed that 91% of them were within the first 1000-word frequency band of the Corpus of Contemporary American English (COCA) and the British National Corpus (BNC). Findings also showed that familiarity with commonly used collocation was often limited. Explicit instruction to improve knowledge of frequently used collocation is likely to enhance decoding and thereby listening comprehension ability. Second, the utilization of top-down processing for meaning should be encouraged. Participants seemed to have relied heavily on perception of the acoustic input for decoding. However, the acoustic input from connected speech is often not clearly articulated due to factors associated with connected speech such as phonological modification. Therefore, listeners need to also rely on sources of information other than the acoustic input, such as context, co-text and syntax, in order to create meaning from the speech signal. Third, more exposure to authentic connected speech should be generally encouraged to help listeners familiarize themselves with the sounds and conventions of spoken English. Such a familiarity with authentic spoken English could help mitigate many of the challenges that listeners face when trying to comprehend normal connected speech. Fourth, the use of testing to diagnose specific listening difficulties for listeners should be encouraged. Listening is a highly individualized skill that might be developed more effectively through focusing on overcoming the specific listening difficulties faced by individual learners. Diagnostic tests could be utilized to help identify these weaknesses so that teachers may focus on helping learners improve in those areas. Fifth, more focus should be placed on acquiring aural vocabulary knowledge of high-frequency words in connected speech. The results showed that high-frequency words are a critical aspect associated with listening comprehension ability and should be prioritized before the acquisition of lower-frequency words. Finally, the use of intelligible English pronunciation should be encouraged for students and teachers to foster accurate aural vocabulary knowledge as well as decoding ability. Habitual use of heavily Japanese accented English distorts the phonological representation of English words in the lexicons of the learners making listening as well as intelligible pronunciation more difficult.

The studies comprising this dissertation have several limitations and remaining issues to consider. In Study 1, the same participants were tested using both the connected speech version and citation form version of the partial dictation test. This is a limitation in that testing effects could not be controlled for. The results for the citation form version of the paused transcription test may have been higher due to taking the test twice (however, the magnitude of the difference in decoding ability between the connected speech version and citation form version (18.5%) of the same test is larger than would be expected from just hearing the test

audio twice more). Although informative, Studies 2 and 3 were limited by the correlational nature of the research design. Future interventional studies would be helpful in establishing the contributions that high-frequency vocabulary knowledge and decoding ability make on improving listening comprehension. Limitations in regard to Study 4 involve the difficulty of identifying the primary causes for decoding errors. The ISOP interviews provided useful data but participants were often unable to specifically describe their difficulties in decoding the target phrase for the paused transcription test. In future studies, creating a database of transcription errors for particular three-word phrases elicited from Japanese university students of similar English proficiency would be a useful resource to further analyze and establish these decoding trends.

The results of these studies illustrate several issues in need of further investigation in regard to decoding. Longitudinal intervention studies are needed to determine whether improving decoding ability and aural vocabulary knowledge will actually result in improved listening comprehension ability. Pedagogical studies are needed to identify which approaches are most effective for helping learners improve their decoding skills. The prospect of CALL applications and mobile apps for developing decoding ability for high-frequency words is also worthy of further investigation. The four trends outlined in Study 4 provided a preliminary assessment of common error patterns that could be observed when decoding three-word target phrases. In order to build support for these trends more data should be collected and analyzed from learners of similar proficiency to verify and support these decoding error trends. A large corpus of the decoding errors made for a specified three-word string of connected speech by L2 listeners of a common L1 population could be useful in revealing common trends in their decoding errors. If the data collected were extensive enough and classified by learner proficiency level, it could allow for predicting the likelihood that a listener would make a particular type of decoding error for a given three-word aural stimulus. Such data could allow researchers to identify underlying factors (e.g. L1 phonological influence) which may be primarily responsible for the observed error trends. Predictable trends in decoding errors could help teachers anticipate listeners' errors and provide more focused instruction to help students remedy them. Systematically addressing these trends in decoding errors with a sustained pedagogical focus can most likely help English learners overcome their unique obstacles to comprehending connected speech and foster continued listening skill development.

## References

Gilbert, J. (2012). *Clear speech: Pronunciation and listening comprehension in North American English* (4th ed.). New York, NY: Cambridge University Press.

- McLean, S., Kramer, B., & Beglar, D. (2015). The creation and validation of a listening vocabulary levels test. *Language Teaching Research, 19*(9), 741–760. <https://doi.org/10.1177/1362168814567889>
- Tauroza, S., & Allison, D. (1990). Speech rates in British English. *Applied Linguistics, 11*(1), 90–105. <https://doi.org/10.1093/applin/11.1.90>
- Vandergrift, L., Goh, C.C.M., Mareschal, C., & Tafaghodtari, M.H. (2006). The metacognitive awareness listening questionnaire (MALQ): Development and validation. *Language Learning, 56*, 431–462.