

国際コミュニケーション研究科

博士論文審査報告書

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題目・副題: (英語)	Testing Second Language Linguistic Perception A Case Study of Japanese, American English, and Australian English Vowels
題目・副題: (日本語)	L2LP モデルの検証 日本語と米豪英語間の母音知覚に関する事例研究

*論文の使用言語が英語の場合でも日本語の題目・副題の記入が必要。

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学位論文審査および口頭試験の結果を以下のとおり報告いたします。

1. 学位の種類 博士(国際コミュニケーション学)

2. 課程博士

3. 審査年月日 学位論文審査 : 2019年 11月 7日 ~ 2020年 1月 17日

口 頭 試 問 : 2020年 1月 6日

4. 学位論文審査および口頭試問の結果 *合格,不合格 を記入

学位論文審査: 合格

口 頭 試 問: 合格

5. 学位論文の要旨

別紙に記載のとおり

6. 論文目録

別紙に記載のとおり

7. 学位論文審査および口頭試問結果の要旨 (和文 3,000 字程度、英文 1,000 語程度)

(1) 評価と審査結果の要旨(論文の概要を含む)

The main aim of Mr. Yazawa's thesis is to test second language (L2) perception models, in particular the Second Language Linguistic Perception (L2LP) model, by examining Japanese speakers' English vowel perception. There have been a few theoretically influential language acquisition models, such as the Speech Learning Model (SLM), the Perceptual Assimilation Model (PAM) and its extension to second language learning (PAM-L2). These have been tested in many languages, including Japanese speakers' L2 acquisition, especially L2 English. Another model has been developed, the Second Language Linguistic Perception (L2LP) model, that may be better able to capture more realistic L2 phonological acquisition processes, but it has not yet been tested with Japanese language, either first language (L1) or L2. One of the strengths of L2LP is that it is possible to test its theories by running computational simulations of L2 perceptual acquisition. It is not always easy to test L2 acquisition, particularly longitudinal processes for many obvious reasons, because it requires following the progress of a large number of subjects for a long time. But computational simulations allow the model to predict the effect of training and linguistic environmental change on the language acquisition. Mr. Yazawa adopted vowel acquisition of American and Australian English by native speakers of Japanese. In research of L2 English acquisition by L1 Japanese, there has been various studies on consonantal acquisition, but only a small number of studies on vowel acquisition, mainly with American English. In his study, he used both American and Australian vowels because these varieties of English have different vowel inventories making them appropriate to examine Japanese speakers' perception of English vowels in reference to the acquisition models, especially L2LP. There now follows a brief summary of the main chapters, highlighting the significant achievements and contribution to linguistic research.

The first two chapters describe the purpose of this research and the relevant phonetic and phonological background. The research purposes and objectives of each experiment are clearly explained. Phonetics and phonology of Japanese language as well as American and Australian English phonology are laid out well. In particular, the explanation of the vowel systems and comparisons are well explained, especially the section about the Australian English vowel system which includes recent findings that help readers to understand the main experimental chapters.

Chapter 3 summarises the major perception models in the last few decades, namely SLM, PAM, PAM-L2 and L2LP, the last of which this thesis closely followed and tested its theoretical credibility. The explanation of each model was thorough, and strengths and weaknesses of each model are discussed very clearly. This chapter will be a very good reference for future students who want to study L2 perception.

Chapter 4 is the main chapter of this thesis and discusses the three experiments that Mr. Yazawa conducted to test L2LP: (1) Japanese listeners' perception of American English tense /i:/ and lax /ɪ/, (2) Australian English listeners' perceptions of Japanese long vowel /ii/ and short vowel /i/, and (3) Japanese listeners' perception of vowel /æ/ in American English.

Experiment 1 examined American English /i:/-/ɪ/, whose contrast is similar to Japanese /ii/-/i/. Japanese /ii/-/i/ contrast is duration based, but the difference between American English /i:/-/ɪ/ is more dependent on

spectra rather than duration. He used L2LP-based computational simulations of durations and spectra, and manipulated the language context in two sessions with different instruction languages. Japanese listeners showed the predicted shift in cue weighting between the two sessions, despite the stimuli being identical. This computational simulation made it possible to demonstrate a longitudinal change in L2 sound perception and the results support L2LP's separate grammar and perception modes hypotheses. An article entitled "Language-dependent cue weighting: An investigation of perception modes in L2 learning" based on the Experiment 1 was published in a major journal, *Second Language Research*, in April 2019, with Mr. Yazawa as the first author.

Experiment 2 studied Australian English listeners' perceptions of Japanese /ii/ and /i/, which constitute a subset of their native vowels /i:, ɪ, ɪə/. The simulations predicted that Australian listeners would fully transfer their L1-like use of temporal and dynamic spectral cues to the perception of Japanese vowels. The experimental results supported this prediction that the listeners relied not only on duration but also on onset and offset formant frequencies in categorizing the Japanese vowels. Australian English relies on onset and offset formant frequencies to differentiate vowels, but they are redundant features in Japanese vowel /ii/ - /i/ contrast. This result supported the L2LP's *Full Copying* hypothesis.

Experiment 3 investigated Japanese listeners' perception of the American vowel /æ/ and provided a solid theoretical explanation of new sound acquisition. The American English vowel /æ/ is articulatorily and acoustically very different from any Japanese vowel, and therefore is considered as a "NEW" vowel. This experiment adopted segment- and feature-based versions of L2LP because the segmental model alone was not able to account for the process fully. The segmental model had difficulty in explaining why /æ/ is perceived as a 'deviant' exemplar of L1 Japanese categories and how this relates to new L2 category formation. In contrast, the featural modeling analysis provided a coherent explanation. American English /æ/ sounds deviant because it consists of /low/ and /front/ features that do not co-occur in Japanese (*low, front/), and these features can be reorganised to form a new well-formed category in American English. The experimental results indicated that the American English vowel /æ/ was perceptually represented by Japanese listeners as a 'fronted version of /a/', which aligns well with the featural account. The experiment showed that relatively inexperienced Japanese listeners with limited experience of English could successfully establish a new sound representation, which enables naïve learners to be able to recognize new L2 sounds. His results indicated that the process seems much more straightforward than what the L2LP model proposes, and that the difficulty of acquisition may be closely related to whether and how the relevant cues are utilized in the L1. These are significant findings that can help consolidate the L2LP theory further.

Overall, the thesis examined the reliability of the current L2 acquisition theory, backed up by experimental results. The experiments showed many important findings which scientifically tested theories that had been used in English acquisition research. The outcome of this research is very useful not just for perceptual studies, but also to help investigate the acquisition of L2 English production. In addition, the findings can be extended to the acquisition of other languages.

All examiners agree that this thesis is one of the best theses we have ever examined and are happy to recommend it to be awarded the Ph.D.

(2) 口頭試問結果の要旨(各種質疑応答も含む)

At the viva, Mr. Yazawa presented his research for 45 minutes as a part of the examination, highlighting the results of the experiments he conducted and discussing them in relation to the perception models mentioned above. The presentation was very clear and easy to follow for the examiners as well as general participants in the audience. Mr. Yazawa answered the questions well with appropriate examples. All examiners were happy with the thesis and his performance during the viva. Generally, statistical analyses were conducted correctly and the treatment of the data were appropriate. However, there were some questions about alternative methods for statistical analyses regarding Experiment 1. Firstly, probability was used as the dependent variable in the statistics, but binary responses can be used. Secondly, for the random factors in a linear mixed effects model, the participants should be nested under the session order, and finally there may be a way to test a correlation between the real learners' responses and the simulation responses, but it was not clearly presented in the thesis. Another main point mentioned during the viva was that there was no explanation provided for individual variability. Individual variability is an important issue in language acquisition and it would have been good to discuss possible reasons of variability if English experience was not the main factor among the subjects of this study.

There were a few typos and language mistakes, but they were corrected for the final version of the thesis.

以上