

L2 Sound Perception and Lexical Knowledge

Jayeon Lim¹ and Misun Seo²

¹University of Seoul, ²Hannam University

limjy@uos.ac.kr, misunseo@hnu.kr

Abstract

This study examined the relationship between the perceptual ability of L2 sounds and lexical knowledge. To this end, Korean learners' perceptual ability of English tokens containing /s/ and /ʃ/ was measured along with their lexical knowledge of the tokens. The results indicated that Korean learners' friction ratio of /s/ and /ʃ/ was significantly longer for the accurately perceived tokens than for the inaccurately perceived tokens. Additionally, in case when Korean learners showed accurate perception of English tokens, their production of target sounds was influenced by their accuracy of lexical knowledge.

Keywords

lexical knowledge, L2 perceptual ability, L2 sound production, English proficiency

Introduction

The perception of L2 sounds may involve a multitude of factors. Specifically, lexical knowledge of L2 learners may be related to their ability to produce L2 sounds. Previous studies have attested that inconsistent relationship exists between the two. Perfors and Dunbar (2010) have shown that phonetic training may allow language learners to better ability to learn words. Similarly, Peperkamp and Buchon (2011) have claimed that learners with better L2 production attest higher lexical knowledge. Yet, other studies have failed to demonstrate the relationship between L2 production of sounds and lexical knowledge (e.g., Dufour, Nguyen, & Frauenfelder, 2010). Thus, this study investigates the role of lexical knowledge on L2 perception of Korean learners of English. Additionally, the study investigates the relationship between L2 perception and production, and the mediating role of L2 lexical knowledge.

1 Theoretical Background

As was suggested by Johnson, Mellesmoen, Lo and Gick

(2018) who claimed for phonological 'bootstrapping', phonological knowledge may trigger lexical learning. With words containing sounds that are challenging to produce, L2 learners' accuracy with those words decreased. This study clearly indicates that there is a strong relationship between phonological knowledge and lexical knowledge.

The present study aims to investigate the relationship between Korean learners' production of English /s/ and /ʃ/ and their perceptual ability/lexical knowledge. In doing so, the study intends to investigate L2 learners at different proficiency levels in order to measure the effects of proficiency level in regard to the multiple factors related to L2 sound production.

2 Methodology

2.1 Participants

The experiment was conducted with 29 Korean learners of English with different English proficiency levels. Specifically, 10 (five males, five females) low-level learners (with TOEIC scores of 500s or lower), 9 intermediates (scores of 700s), and 10 high levels (scores of 900s).

2.2 Materials

Table 1: Words for the experiments

cell-shell	suit-shoot	plus-plush
sack-shack	sue-shoe	meshing-messing
sip-ship	mess-mesh	furnace-furnish

For the experiment, 18 words consisting of /s/-/ʃ/ minimal pairs were employed. Specifically, the particular English phonemes were chosen to examine the role of L1. In Korean language, /s/ exists as phonemes, but [ʃ] is realized as an allophonic variation of /s/.

3 Results and Discussion

Table 2 illustrates the four categories observed in the study, where 522 tokens produced by Korean L2 learners of English were classified into four categories in terms of the accuracy patterns of

their perceptual ability and lexical knowledge.

Table 2. Four categories according to perception and lexical knowledge

	Perception	Lexical knowledge
Category 1	accurate	accurate
Category 2	accurate	inaccurate
Category 3	inaccurate	accurate
Category 4	inaccurate	inaccurate

Table 3 illustrates the frequency pattern of Category 1, and Table 4 Category 2 according to proficiency level and segment type. In case of Category 1, 522 tokens were produced by Korean learners. Overall, high group learners attested more tokens with accurate perception and lexical knowledge. In addition, for this category, more tokens were observed for /s/ than for /ʃ/ in all the three groups.

Table 3. Korean learners' data with accurate perception and lexical knowledge

Proficiency	Segment type		Total
	/s/	/ʃ/	
Low	48 (53.3%)	41 (45.6%)	89 (49.4%)
Intermediate	52 (64.2%)	37 (45.7%)	89 (54.9%)
High	70 (77.8%)	51 (56.7%)	121 (67.2%)

Table 4. Korean learners' data with accurate perception and inaccurate lexical knowledge

Proficiency	Segment type		Total
	/s/	/ʃ/	
Low	38 (42.2%)	42 (46.7%)	80 (44.4%)
Intermediate	26 (32.1%)	39 (48.1%)	65 (40.1%)
High	17 (18.9%)	39 (43.3%)	56 (31.1%)

In addition, a significant interaction of segment type * speaker group was found as measure by friction ratio (F=2.748, p<.05) in the production of Category 1 as illustrated in Figure 1 below. A MANOVA was conducted with

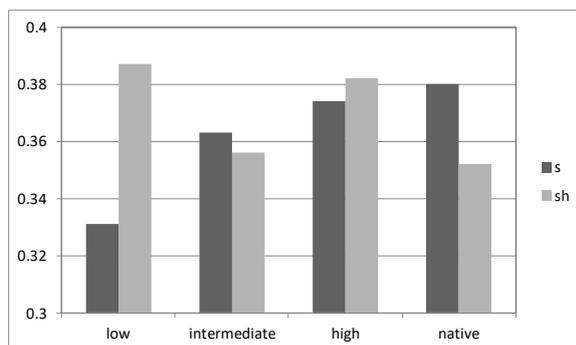


Figure 1: Mean Friction Ratio, Segment * Speaker Group
Note: sh = ʃ

Additionally, in order to compare Korean learners' production belonging to Category 2 to native English speakers' production, a MANOVA was conducted with Korean learners' 206 tokens and native English speakers' 72 tokens. In the analysis, dependent variables were CF, PAF, and friction ratio and independent variables were speaker group (low vs. intermediate vs. high vs. native) and segment type (/s/ vs. /ʃ/).

According to the analysis, no significant effect was found in terms of friction ratio. There was a significant main effect of segment type with CF ($F=450.813, p<.05$) and PAF ($F=315.002, p<.05$). CF and PAF of /s/ were significantly higher than /ʃ/ (7184.7 Hz vs. 4014.4 Hz of CF, 6994.2 Hz vs. 3449.8 Hz of PAF). In addition, a significant main effect of speaker group was attested with CF ($F=2.652, p<.05$). The low group exhibited the highest CF at 5597.8 Hz followed by the intermediate group at 5469.3 Hz, the native English group at 5377.6 Hz and the high group at 5185.3 Hz. There was a significant interaction of segment type * speaker group with CF ($F=3.421, p<.05$). Finally, since the number of tokens belonging to Category 3 and s were too small, the results will not be reported here.

Overall, it was shown that L2 sound production was related to factors other than phonetic/phonological. The fact that L2 learners were accessing a lexical knowledge when exerting phonological knowledge indicates that knowledge at these two different levels were highly interconnected. In addition, L1 phonology and Korean learners' proficiency in English also influenced production of the L2 sounds. Finally, the results of the present study indicated that L2 learners showed more difficulty in creating a new L2 category when L1 and L2 sounds are perceptually similar.

References

- Dufour, S., Nguyen, N., & Frauenfelder, U. H. (2010). Does training on a phonemic contrast absent in the listener's dialect influence word recognition? *Journal of the Acoustical Society of America*, 128(1), 43-48.
- Johnson, K. A., Mellesmoen, G. M., Lo, R. Y.-H., & Gick, B. (2018). Prior pronunciation knowledge bootstraps word learning. *Frontiers in Communication*, 3(1), 1-9.
- Peperkamp, S., & Bouchon, C. (2011). The relation between perception and production in L2 phonological processing. In C. Piero, R. de Mori, G. di Fabbriozio, & R. Pieraccini (Eds.), *Proceedings of the 12th Annual Conference of the International Speech Communication Association* (pp.161-164).
- Perfors, A., & Dunbar, D. (2010). Phonetic training makes word learning easier. In S. Ohlsson & R. Catrambone (Eds.), *Cognition in flux: Proceedings of the 32nd Annual Meeting of the Cognitive Science Society* (pp.1613-1618).