A longitudinal study of Kanji recognition, spontaneous air writing and eye movement by Japanese L2

Yoko Okita

International Center, Juntendo University

y-okita@juntendo.ac.jp

Abstract

This study examined the longitudinal changes of correct rates of Kanji recognition tasks, eye movements and spontaneous air writing with 5 beginning and 18 intermediate L2 learners of Japanese from non-Chinese character culture areas (JSLNC). We employed the five different character types, Vague, Pseudo, and Inverted, Real and Korean characters. Vague are based orthographic errors of JSLNC.

Keywords

Eye movement, Kanji Recognition, Learners of Japanese as a second language

1. Introduction

Radical position is inverted in Inverted Kanji. Several studies show that knowledge of radical position is important in Kanji learning. Therefore, we supposed that correct rates of recognition of Inverted Kanji reflect mastery of Kanji learning. Air writing, writing a character by finger in the air, was a unique behavior for those who use Chinese characters in their mother language when they try to reconstruct a Kanji character from its components (Sasaki and Watanabe, 1984). Writing a Kanji character is most popular Kanji learning strategy. Therefore, spontaneous air writing during Kanji character recognition reflects trace and depth of hand writing practice in Kanji learning. Eye movement is also a good indicator of cognitive processes. This paper explores cognitive mechanisms of air writing by examining the relationship among air writing, eye movements and Kanji learning by JSLNC.

2. Method

1.1 Participants

Five beginning JSL-NC participants (4 men, 1 women, *M*age=29.2years, age range: 28-33years) and 18 intermediate JSL-NC participants (11 men, 7 women, *M*age=28.4years, age range: 24-35years) were recruited from universities in Tokyo. All participants were beginning level learners of Japanese. All participants have received at least 100 hours of Japanese classes. The all participants were tested twice with one year interval. The five beginning participants did not pass Japanese Language Proficiency Test 5 (JLPT5, lowest level from 1 to 5). The 18 intermediate participants had passed JLPT5 or 4.

1.2 Stimuli

The stimulus consisted of 5 characters groups, 20 Real Kanji (Real), 15 Vague, 15 Pseudo, 15 Inverted and 15 Korean characters. Vague had small wrong graphic features which were found in writing mistakes by JSLNC. Pseudo had a wrong combination of a radical and other parts. Radical position is switched in Inverted. Twenty real Kanji were chosen from 317 Kanji in the textbook and five real Kanji were complex and not taught in the textbook.

1.3 Procedure

A character was presented on a computer monitor and remained until a participant hit a key. All stimuli were presented randomly by computer and presented on the monitor until a participant hit a key. Eye movement and responses were measured and recorded with Tobii X2-30. A short practical session was conducted before the experiment. Mann-Whitney tests were used to compare medians between air writing and without air writing groups in the cross-sectional group.

Cochran Q tests were used to compare the correct rates between Time1 and Time2 in each participant.

2 Results and Discussion

In the all 5 beginning participants, significant progress in correct rates and spontaneous air writing was not found within one-year interval period. Figure 1 shows changes of correct rates for JSLNC-Beginning. The correct rates of Vague and Pseudo remained below around 0.2.

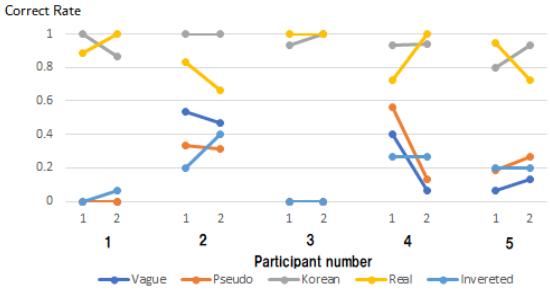

Figure 1. Changes of correct rates for JSLNC-Beginning.

Figure 2 shows changes of correct rates for JSLNC-Intermediate. In the intermediate participants, 7 participants (from I-1 to I-7) showed no spontaneous air writing in both Time 1 and Time2, 4 participants (I-8, I-10, I-11, and I-12) showed spontaneous air writing only in Time 2, and 7 (I-9, and from I-13 to I-18) participants showed spontaneous air writing both in Time1 and Time2. Significant progress was found in Inverted in the 4 participants I-8, I-10, I-11, and I-12. In I-8 and I-16 significant progress was found in Vague and Pseudo. In I-11, I-13, and I-15 with spontaneous air writing, the correct rates of Vague or Pseudo were improved, but statistically significance was not found. In the 7 intermediate participants without spontaneous air writing, from I-1 to I-7, the correct rates of Vague and Pseudo had remained low or decreased. In the 11 intermediate participants with spontaneous air writing, the correct rate of Inverted had reached 0.8 or above in Time2. The 2 intermediate participants with spontaneous air writing, I-17 and I-18 had already reached the same level with Japanese. 0.9 in Time1.

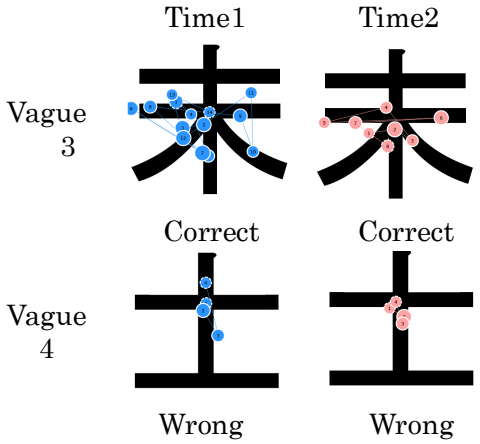

Figure 3. Eye movments and Vague3 and Vague 4 of I-17 in Time 1 and 2.

Figure 3 shows eye movments and results of judegements of Vague3 and Vague 4 of I-17 in Time 1 and 2. I-17 showed spontaneous air writing in both Time1 and Time2. Eye movoments indicated that attention to distictive features important for correct judgement of a character.

3. Conclusion

Spontaneous air writing seems to be a good index of Kanji learning at the beginning and intermediate level. Selective attention to distinctive orthographic features is also crucial for correct recognition of Kanji characters.

References

Sasaki, M. and Watanabe, A. (1984). "Kush" koodoo no bunkateki kigen: Kanjiken to Hikanjiken no hikkake, *Koku Shinrigaku, 32*(3), 182-190.

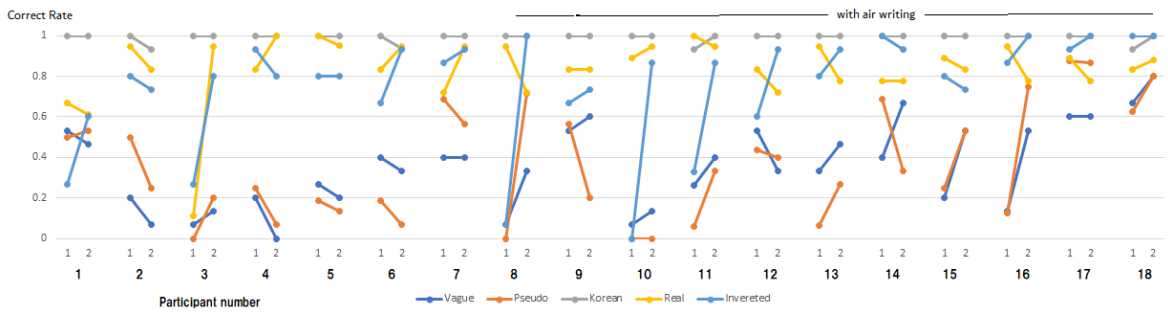

Figure 2. Changes of correct rates for JSLNC-Intermediate.