Behavior of learners of Japanese as a second language from non-Chinese character culture areas when they learn Kanji: An eye movement study

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Abstract

This study reported eye movement behavior of beginning learners of Japanese as a second language from non-Chinese character areas. The participants were asked to decide if a character is true (exist) or not true (does not exist) by pushing a key. Their eye movement were recorded while they participated in the recognition tasks by an eye movement tracker. Participants who did not have previous learning experience spent more time on components of Kanji characters. Participants who had around 200 hours classroom learning spent more time to compare components by moving eyes between components. This suggests that learning process of Kanji form might proceeds from learning of component and then learning composition of component.

Keywords

Eye movement, Kanji Recognition, Non-native speakers

Introduction

This study is a case report of eye movement behavior of learners of Japanese as a second language from non-Chinese character areas (JSL-NC) while JLS-NC participated in Kanji (Chinese characters in Japanese) recognition tasks. Kanji or Chinese characters are visually very different from alphabetic characters. Most of Kanji characters are square-shaped and consist of some sub-components. It must be tough for JSL-NC to learn Kanji forms. Knowing what graphic features are difficult to learn for them is important to develop effective teaching materials and methods to ease their Kanji learning.

1   Background

Matsubara, Susami, and Ohtsuka (1994) examined changes of eye movement patterns for three JSL-NC before and after learning of Kanji structures. Matsubara et al. (1994) reported that fixation points spread over the whole Kanji area before instruction of Kanji structures, whereas fixation points tend to gather the center of Kanji after learning. They also reported that fixation points of Intermediate JSL-NC and Japanese also gathered at the center of Kanji. Namely Pattern of fixation points becomes close to that of native speakers according to progress of learning Kanji. Average duration times of fixation points for JSL-NC became longer after learning Kanji. That of intermediate JSL-NC was shorter than that of native speakers. In the study of Matsubara et al. (1994), only correct Kanji characters were used as stimuli, their participants watched Kanji character only passively, and a Kanji character was presented only for 10 seconds. In this study, eye movements and accuracy were recorded during recognition tasks and five different stimulus groups, Vague, Pseudo, Inverted, Real and Korean characters, were employed to examine what kind of graphic aspects are difficult for JLS-NC in detail.

1.1   Method

1.1.1   Participants

In this study, cases of four participants were reported. One novice JSL-NC without classroom education, one beginning JSL-NC (Vietnam, female), one intermediate JSL-NC (Myanmar, male) and a Japanese native speaker (male). The four participants were graduate or undergraduate university students in Tokyo and age range from 25-33 years old. All participants had normal or corrected normal vision and were right handed based on

paper based Edinburgh handedness inventory.

1.1.2 Stimuli

There were four groups of Kanji character stimuli (Vague, Pseudo, Inverted and Real) and Korean character stimuli. Vague has very minor wrong graphic features based on JSL-NC learners' mistakes. Combinations of Kanji components do not exist in Pseudo. The position of a semantic radical was inverted horizontally or vertically in Inverted. There were 15 Fake, 15 Wrong, 20 Pseudo, 10 Korean, and 30 Real Kanji characters.

1.1.3 Procedure

Each character was presented randomly one by one in the computer monitor and remained until a participant's reaction. The participants were asked to decide if a character is true (exist) or not true (does not exist) by pushing a key. The participants' reaction and reaction time were recorded.

2 Results and Discussion

Figure 1 shows the eye movement of a Vague character for the four participants.

Novice-JLS-NC   Beginning JSL-NC

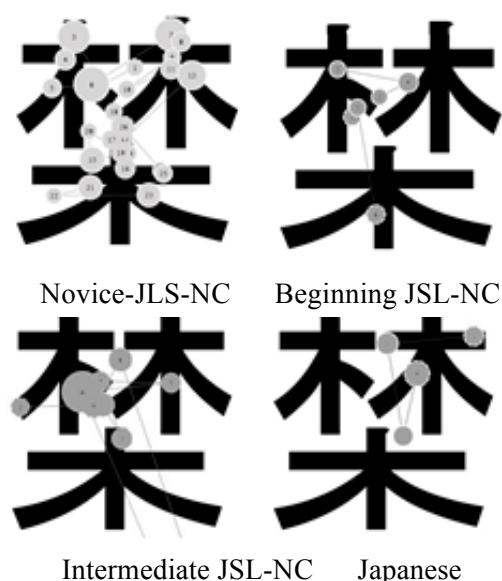Intermediate JSL-NC   Japanese
Figure 1: Eye movements of a Vague character

Figure 2 shows the eye movement of a Real character for the four participants. Figure 3 shows eye movements of an Inverted character for the four participants. The numbers of fixation points reduced according to learning progress. Novice JSL-NC payed attention to individual components rather than combination of sub components.
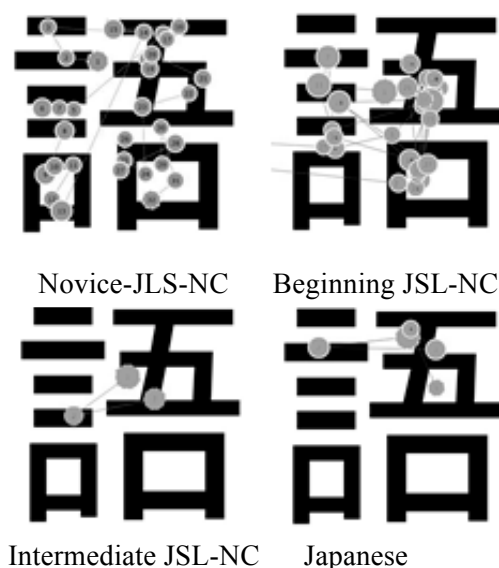

Novice-JLS-NC   Beginning JSL-NC

Intermediate JSL-NC   Japanese
Figure 2: Eye movements of a Real Character.

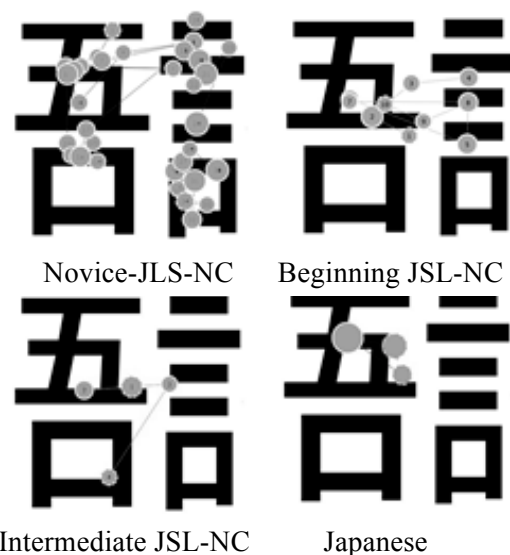Novice-JLS-NC   Beginning JSL-NC

Intermediate JSL-NC   Japanese
Figure 3: Eye movements of an Inverted Character

3 Conclusion

Novice JSL-NC watched sub components more. Attention to sub components and the number of fixation points decreased the according to learning progress.

References

Matsubara, S., Susami, K., & Ohtsuka, S. (1994). Kanji cognition and the eye movement of a non-kanji Japanese language learner during the initial kanji learning period. *Technical Report of Institute of EICI, IE-93-91*, 15-22