Eye Movement Study on Mongolian and Chinese Expository Reading Mongolian College Students

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Keywords: Mongolian college students, Reading, Exposition, Eye movement characteristics.

Abstract. The eye tracking method is adopted, to read the Mongolian and Chinese text as the starting point of the Mongolian bilingual students were tested, to explore the native Mongolian Mongolian and Chinese bilingual learners in reading expository writing when the familiarity of the differences and characteristics of eye movement. The results show that the fixation frequency, fixation duration and twitching of the eyelid amplitude of Mongolian College Students reading Mongolian are better than reading Chinese text, but the difference was not significant. The familiarity of mother tongue will affect the eye movement index of Mongolian College students.

The Question Raised

The value of psychology is to provide theoretical services for education and teaching. The research on the formation and development of students’ reading ability is the requirement of quality education. Today’s society has entered the information society, the rapid growth of the amount of information in the human brain. People through listening, reading, studying and other ways to accept the external information, and then language processing. In our daily life, most of the information is obtained through reading, for example, in the teaching, students read to understand the content of the article, the teacher teach students the knowledge of their minds. So reading is indispensable in the development of society and education, it is closely related to our life. Therefore what are the similarities and differences in the characteristics of eye movement of Mongolian College Students in reading Mongolian materials and Chinese materials, which has been one of the hot issues in the field of psychology. The minority students' reading eye movement characteristics of the native language and the second language material in the study of the difference is less, we need to further depth of extensive research, mastering a second language readers, and understand what is the cognitive processing characteristics of them reading the text in native language (Mongolian) and second language (Chinese)? This research adopts the method of eye movement analysis, 15 native Mongolian Mongolian College Students as subjects, asking them to read the Mongolian and Chinese exposition. In order to explore the characteristics of the eye movement of the second language readers, and their similarities and differences in the processing of Mongolian and Chinese materials.

The Research Method

Subjects Experimental instrument

15 college students were selected randomly from the Mongolia Institute of language and culture in Northwest Minzu University. Their level of Chinese proficiency in Mandarin Chinese Proficiency Test 2. Subjects were 7 boys and 8 girls, all subjects were uncorrected or corrected visual acuity was above 1, have no color blind, partial tritanopia and reading disorder.

Experimental Instrument

The instrument used in this experiment is Hi-speed1250 high speed SMI German company production of eye tracking system, can be recorded by reading the eye gaze position, fixation duration,
fixation times, extraction of pupil diameter data and eye movement index. This experiment is controlled by a computer, the stimuli were presented in 19 inch flat screen color display center. Screen resolution of 1024*768 pixels. A computer presents material and another computer records eye movement data.

**Experimental Materials**

Reading material select Mongolian and Chinese exposition of 3 articles, including 1 articles for exercises to prepare materials, 2 formal experimental materials. Each article is composed of two parts, including the text and the problem, the number of words in the text have been controlled in about 400 to 600 words. Each article is designed after two multiple-choice questions.

**Analysis Eye Movement Index**

1. The number of fixations (Times): the number of fixation points for students to look at the whole article. According to the situation of the number of words is different in each article, in this study, each read 100 words fixation times (referred to as 100 times the word) as test index (100 times the word= 100 times the word reading gaze point total number / total number of words 100).

2. The duration of the fixation point (second): the average fixation time of the student’s eye at each fixation point.

3. Watching frequency (times / sec): is the number per unit time (note the point of view of the gaze frequency = gaze, fixation time)

4. Twitching of the eyelid amplitude (degree): is an indicator of the perceptual span reaction of the students reading, the unit for the degree, also known as Twitching of the eyelid amplitude.

**The Experiment Result**

**The Number of Fixations**

The number of fixation of paired samples t test when the Mongolian students reading Mongolian and Chinese expository writing, the results are shown in table 1.

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Mongolian expository writing</th>
<th>Chinese expository writing</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>N average value</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>standard deviation</td>
<td>97.366</td>
<td>53.904</td>
<td>13.150</td>
<td>6.352</td>
</tr>
<tr>
<td>Fixation times (Times/100)</td>
<td>13.150</td>
<td>6.352</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \text{t} )</td>
<td>-8.944</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The number of fixation can reflect the subjects of reading processing material, but the Mongolian College Students whose native language is Mongolian, reading Mongolian expository writing watching significantly more than the number of reading Chinese Exposition (P<0.05), because this error when selecting the material, do not have a good grasp of the difficulty of the material.

**Fixation Duration Time**

The duration of fixation were analyzed by paired samples t test when the Mongolian students reading Mongolian and Chinese expository writing, the results are shown in table 2.
The duration of the fixation point is related to the encoding and semantic extraction of the word. The Mongolian College Students' reading expository gaze duration is shorter than reading Chinese expository writing, but the difference was not significant (P>0.05), because Chinese characters is a word type writing, it is hard to find the words without context boundaries, that is proficiency in Chinese is not as good as that of native speakers, the duration of fixation point is relatively long.

The frequency of reading can reflect the situation of reading comprehension and information processing, and it is easier to read the article less frequently. Mongolian College students reading watching frequency when less than reading expository Mongolian Chinese expository writing, but the difference was not significant (P>0.05), because of their mother tongue in the Mongolian students familiar with higher degrees, easier to read. This shows that familiarity with the article will affect the Mongolian College Students' eye movement index.

**Twitching of the Eyelid Amplitude**

The twitching of the eyelid distance were analyzed by paired samples t test when the Mongolian students reading Mongolian and Chinese expository writing, the results are shown in table 4.

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Mongolian expository writing</th>
<th>Chinese expository writing</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>average value</td>
<td>standard deviation</td>
<td>N</td>
</tr>
<tr>
<td>Mongolian College Students gaze duration (seconds)</td>
<td>15</td>
<td>0.332</td>
<td>0.045</td>
<td>15</td>
</tr>
<tr>
<td>Mongolian College Students Fixation frequency (times per second)</td>
<td>15</td>
<td>2.610</td>
<td>0.299</td>
<td>15</td>
</tr>
<tr>
<td>Mongolian College Students twitching of the eyelid amplitude (degrees)</td>
<td>15</td>
<td>3.350</td>
<td>1.317</td>
<td>15</td>
</tr>
</tbody>
</table>

The average twitching of the eyelid amplitude can reflect the reading efficiency and the difficulty of processing. Mongolian students read the Mongolian expository reading Chinese expository saccade amplitude is greater than that of the native language. Mongolian students familiar with the high degree of reading materials at a time on the mother tongue can obtain a lot of information, but the difference was not significant (P>0.05).
The Result

From the perspective of cognitive psychology, reading comprehension is a cognitive process of acquiring meaning. Reading is a means, and understanding is the process of interaction between the cognitive subject (the reader) and the cognitive object (reading material). Psychological research shows that 80% to 90% of the information obtained by human beings comes from the visual information collection, and reading is the main channel for the accumulation of human knowledge and experience through the understanding of meaning acquisition. In view of the importance of reading comprehension to human beings, the study of reading comprehension has always been the core field of psychology, linguistics and pedagogy. However, due to the lack of research object and research methods, the research results of reading are not mature.

A study of Mongolian College Students’ eye movement index in reading different style of Mongolian and Chinese texts: (1) Mongolian College students reading the same style of Mongolian and Chinese text, in reading expository Mongolian when watching significantly more than the number of reading Chinese expository writing, this is because the error selection of materials, not a good grasp of the difficulty of the material. (2) Mongolian College students reading the same style of Mongolian and Chinese exposition, in fixation duration, fixation frequency, fixation distance and other indicators of the differences are not significant. The processing of the mother tongue and the second language reading strategies are also different, the Mongolian exposition fixation duration is shorter than the reading of Chinese expository writing, the fixation frequency in reading Mongolian expository writing is less than in Chinese expository writing, the saccade amplitude in reading Mongolian expository writing is wider than in Chinese expository writing, it shows that Mongolian students have a higher familiarity with mother tongue, that is to say, familiarity will affect the eye movement index. The data also show that, with the development of society, education teaching optimization, Mongolian students Chinese level is also rising, in fixation duration, fixation frequency, saccade amplitude index gradually close to native level, there is no significant difference between these.

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References


