

A Study on Eye Movement in Reading English and Uyghur Exposition by Uyghur College Students

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Abstract—By the eye movement technique, we use the EyeLink-II tracker to record the eye movements of 10 Uyghur college students with different English level. They are asked to read English and Uyghur Exposition. The results showed eye movement indexes in reading Uyghur and English expositions by the Uyghur college students, eye movement indexes of Uyghur expositions are higher than that of English expositions, but with the improvement of their English level, there is little difference between them.

Keywords—Uyghur College Students; English and Uyghur Exposition; Study on Eye Movement

I. INTRODUCTION

Reading comprehension is an important cognitive activity of the human society, in the meantime it plays a key role in acquiring knowledge and knowing the world. Linguistics, psychology and pedagogy study the reading comprehension all the time. English is an international language. This paper uses the EyeLink-II tracker to record the eye movements that are about reading English and Uyghur expositions of 10 Uyghur University Students, our aim is to provide eye movement parameters so as to know about some external rules and patterns in reading ,in this way, it can help Uyghur college students to improve English reading level.

II. RESEARCH METHODS

A. Subjects

Select 10 Uyghur college students, 5 of them passed College English Test Band 4, the others didn't pass it.

B. Experiment Apparatus

This experiment uses Hi - speed eye-movement apparatus that is made by German SMI Company.

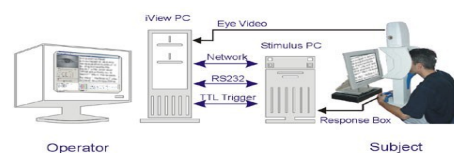


FIGURE1: FLOW CHART OF COLLECTING EYE MOVEMENT SIGNAL

C. Experiment Materials

Select 5 English expositions and 5 Uyghur expositions

D. Explanation

- ①Reading Time: the time of reading an article.
- ②Reading Speed: the number of reading words per unit time.
- ③Fixation Duration: the number of fixation point in the entire article.
- ④Fixation Duration Average: average gaze time of each fixation point.
- ⑤Fixation Frequency: the number of fixation point per unit time.
- ⑥Saccade Amplitude: an index of the perceptual span in reading.
- ⑦Saccade Count: the number of saccade of the entire article.
- ⑧Saccade Frequency: the average number of saccade per unit time.
- ⑨Saccade Duration: a fixation point moves to the next fixation point.

III. EXPERIMENTAL RESULTS AND ANALYSIS

This paper studies Uyghur college students who are different English level how to understand English、Uyghur exposition through seven saccade indexes.

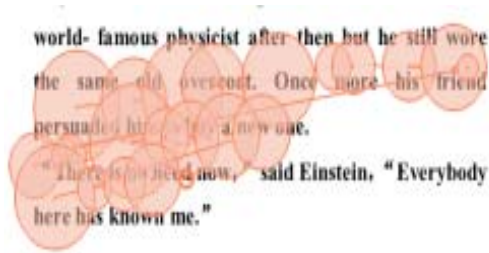


FIGURE2: TRAJECTORY GRAPH OF EYE MOVEMENT

FIGURE3: COLLECT EYE MOVEMENT PARAMETERS THOUGHT BeGAZE SOFTWARE

A. Reading Parameters

TABLE1: THE COMPARISON OF READING PARAMETERS OF UYGHUR COLLEGE STUDENTS OF LOW ENGLISH LEVEL

Level	Reading Parameters	English Exposition			Uyghur Exposition		
		N	M	SD	N	M	SD
Low	Reading Time	5	894.2	87.1	5	68.7	18.6
	Reading Speed	5	0.15	0.09	5	1.92	0.87

Table1 show Uyghur College students who are low English levels read English 、 Uyghur expositions, reading time and reading speed are different. Uyghur reading parameters are much higher than English reading parameters. This indicates that Uyghur college students are affected by mother tongue, in addition their English is poor, so it is very difficult for them to read English.

TABLE2: THE COMPARISON OF READING PARAMETERS OF UYGHUR COLLEGE STUDENTS OF HIGH ENGLISH LEVEL

Level	Reading Parameters	English Exposition			Uyghur Exposition		
		N	M	SD	N	M	SD
High	Reading Time	5	134.4	22.3	5	48.6	10.5
	Reading Speed	5	0.98	0.17	5	2.72	1.56

Table2 show Uyghur College students who are high English levels read English 、 Uyghur expositions, there is no difference in reading time and reading speed. With the

improvement of English level, results of English exposition are close to results of Uyghur exposition, this is to say they increase English proficiency step by step.

B. Fixation Parameters

TABLE3: THE COMPARISON OF FIXATION PARAMETERS OF UYGHUR COLLEGE STUDENTS OF LOW ENGLISH LEVEL

Level	Fixation parameters	English exposition			Uyghur Exposition		
		N	M	SD	N	M	SD
Low	Fixation count	5	336	43.2	5	53	8.8
	Fixation Average	5	422	49.8	5	176	18.9
	Fixation Frequency	5	2.0	0.38	5	2.56	0.45

Table3 shows Uyghur College students who are low English levels read English 、 Uyghur expositions, their Uyghur fixation parameters are higher than English fixation parameters, because Uyghur college students of low English level are affected by mother tongue, they have high Uyghur proficiency, in a word fixation frequency is high ,however, fixation duration is low. Meanwhile, fixation parameters implies that fixation count and fixation duration relate to the proficiency of the article on subjects.

TABLE4:THE COMPARISON OF FIXATION PARAMETERS OF UYGHUR COLLEGE STUDENTS OF HIGH ENGLISH LEVEL

Level	Fixation parameters	English exposition			Uyghur Exposition		
		N	M	SD	N	M	SD
Low	Fixation count	5	53	8.6	5	53	8.6
	Average Fixation Duration	5	238	19.2	5	180	19.1
	Fixation Frequency	5	1.6	0.32	5	2.16	0.48

Table4 shows that there is no obvious difference in fixation count, fixation duration average and fixation frequency. It implies that with the improvement of English level, the results of reading English exposition are close to that of reading Uyghur exposition, in other words Uyghur college students of high English level improve constantly English Level.

C. Saccade Parameters

TABLE 5:THE COMPARISON OF SACCAD E PARAMETERS OF UYGHUR COLLEGE STUDENTS OF LOW ENGLISH LEVEL

Level	Saccade parameters	English exposition			Uyghur Exposition		
		N	M	SD	N	M	SD
Low	Saccade count	5	283	18.2	5	40	11.6
	Saccade Amplitude	5	1.2	0.51	5	1.3	0.56
	Saccade Frequency	5	0.5	0.06	5	1.0	0.2
	Saccade duration	5	568	37.8	5	31	10.2

Table5 signifies fixation parameters of Uyghur college students of low English Level in reading Uyghur exposition are better than that of Uyghur college students of low English level in reading English exposition, because they are good at Uyghur , saccade amplitude and saccade frequency are high, on the contrary saccade duration is very low. In reading English exposition saccade amplitude gradually reduces, saccade duration increases.

TABLE6: THE COMPARISON OF SACCAD E PARAMETERS OF UYGHUR COLLEGE STUDENTS OF HIGH ENGLISH LEVEL

Level	Saccade parameters	English exposition			Uyghur Exposition		
		N	M	SD	N	M	SD
High	Saccade count	5	58	17.8	5	31	10
	Saccade Amplitude	5	1.4	0.25	5	1.3	0.56
	Saccade Frequency	5	0.8	0.1	5	0.9	0.3
	Saccade duration	5	38	12.2	5	31	10.2

Table6 reveals that there is no obvious difference in saccade count、saccade duration、saccade amplitude and saccade frequency. It displays that Uyghur college students of high English level improve constantly the proficiency of English because of the improvement of English level.

IV. ANALYSIS AND CONCLUSION

(1) According to reading parameters, we know that Uyghur College Students of different English Levels have obvious differences in reading same difficult English expositions, but parameters of Uyghur exposition are distinctly higher than that of English exposition. This shows that with the improvement of English level, reading result and reading speed improve, reading time reduce step by step, their English level is close to the level of mother tongue.

(2) In terms of saccade parameters, When Uyghur college students read English expositions that are the same difficulty, saccade count and saccade duration of students of

high English level reduce clearly, this shows that they use different ways to read the article. In the face of difficult and unfamiliar articles, students of low English level can increase fixation count, prolong fixation duration, shorten saccade amplitude and extend saccade duration, in order to achieve good results.

In a word, Eye patterns in reading reflect the reader's cognitive processing mode, Uyghur college students of low English level fix constantly in reading English exposition, however, Uyghur college students of high English level make good use of holistic fixation patterns, in this way, they can get good grades in reading. Meantime, it also shows that background education supplements language education. For improving their English level, we should train Uyghur college students scientifically in English teaching.

ACKNOWLEDGEMENT

This research was financially supported by the State Key Program of National Natural Science of China(61032008).

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