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Progress of bilingual reading studies in Tibetan and Chinese

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Abstract: *At present, there are few eye movement studies on Tibetan-Chinese bilingual reading. This paper sorts out the relevant research and puts forward some ideas for future research. First, investigate the role of tshegs in Tibetan reading. Second, investigate the influence of adding spaces between words in Tibetan texts on Tibetan reading. Third, investigate the mechanism of word saturation in Tibetan reading. Fourth, investigate whether there is "character transposition effect" in Tibetan reading? Fifth, investigate the extraction of semantic information from the parafoveal in Tibetan reading.*

Keywords: *Tibetan; reading; eye movement*

1. Introduction

Tibetans, as one of the major minority groups in China, have their own language and script. Tibetan language, as the transmission carrier of Tibetan culture, has rich linguistic and historical values. The Tibetan language is a unique symbol passed down from generation to generation by the Tibetan people, and is the main language used by the Tibetan people. Tibetan is a phonetic script with two parts: consonant letters and vowel letters. There are 30 consonant letters, 4 vowel letters. The Tibetan language also belongs to the Sino-Tibetan language family, and shows a three-dimensional character structure[1-3].

At present, the state attaches great importance to the teaching of Tibetan and Chinese to the Tibetan people. Tibetan readers need to learn Chinese and other languages while learning their own national language. Therefore, most Tibetan compatriots are Tibetan Chinese bilingual. This paper will introduce in detail the Tibetan-Chinese bilingual reading research in recent years, and on this basis, propose future research ideas.

2. The study of Tibetan-Chinese bilingual reading

Zhang Jijia and Cui Zhanling took readers who are proficient in Tibetan, proficient in Chinese and not proficient in English as subjects. Using the research paradigm of word judgment, they investigated the code-switching between Tibetan, Chinese and English and its cost under three conditions: no switching, expected switching and no switching. The researchers speculate that there is a switching cost for Tibetan-Chinese and English bilinguals when switching between the three languages in word recognition. The magnitude of the switching cost was influenced by the proficiency level of the switched languages. If the proficiency levels of the two switched languages were comparable (e.g., Tibetan-Chinese), the difference in switching cost was not significant; if the difference in proficiency levels of the two switched languages was significant (Tibetan-English, Chinese-English), the switching cost of the unskilled language was significantly larger than the switching cost of the skilled language. The experimental results showed that the characteristics of Tibetan, Chinese and English words themselves did not have a significant effect on code-switching and its cost. The code-switching cost of Tibetan-Chinese and English bilinguals in word recognition was mainly influenced by the proficiency level of the language[4].

Cui Zhanling and Zhang Jijia adopted the cross language long term repetition priming paradigm to investigate the characteristics of vocabulary and semantic representation of Tibetan Chinese English trilingual readers. The results show that Tibetan Chinese English trilinguals are distributed shared representations, and there is asymmetry between vocabulary and shared concepts. Tibetan - Chinese - English trilingual learners' lexical independent representation. The research results are of great value to

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language learning and language education of Tibetans and other minorities. When teaching English to Tibetans and other minorities, you can try to use your mother tongue as a teaching medium. Using the mother tongue as a medium to learn English, so that their national language and English can better share semantic representation. At the same time, English teaching should be started as soon as possible to enhance the proficiency of English. This is not only conducive to their language learning, but also conducive to their understanding and use of English[5].

Gao Lei et al. took proficient and unskilled Tibetan-Chinese bilinguals with Tibetan as their mother tongue and Chinese as their second language as subjects. Using the lexical judgment task, they investigated the code-switching between Tibetan and Chinese and the cost of switching under three conditions: no switching, expected switching and no switching. The results show that there is a switching cost in the process of Tibetan-Chinese bilingual code switching, which supports the suppression theory. Proficient Tibetan-Chinese bilinguals pay less for code-switching [6].

Gao Xiaolei used eye movement technology to investigate the right range, development characteristics and influencing factors of Tibetan reading perception span with Tibetan native speakers as subjects. The results showed that the reading perception span of Tibetan was 4~8 characters to the right of fixation. The Tibetan reading perception span shows a "U" shaped development trend with the increase of age. The Tibetan reading perception span of the third grade pupils is 4-8 characters on the right side of the fixation point, the reading perception span of the fifth grade pupils is 4-6 characters on the right side of the fixation point, and the reading perception span of the first grade junior high school students is 4-8 characters on the right side of the fixation point. The breadth of Tibetan reading perception is not affected by the difficulty of the materials, the reading ability of the subjects and their working memory capacity [1].

Wang et al. used eye movement technology to further investigate the perceptual breadth in Tibetan reading. The results showed that the left perceptual breadth of Tibetan reading was 3 characters to the left of the fixation point, and the right perceptual breadth of Tibetan reading was 7-8 characters to the right of the fixation point [3].

Gao Xiaolei et al. used eye movement recording to investigate the word frequency effect in Tibetan reading and the effect of word frequency on preview effect. The researchers speculate that because Tibetan has the characteristics of both alphabetic characters and Chinese, the word frequency effect in Tibetan reading and the effect of central foveal word frequency on parafoveal preview effect may be similar to that of alphabetic characters and Chinese. The results show that, first, there is a significant word frequency effect in Tibetan reading, which is reflected in the whole process of lexical processing. Second, there is a significant word frequency delay effect in Tibetan reading, which runs through the whole process of lexical processing. Third, there is a significant parafoveal preview effect in Tibetan reading, and readers can extract phonetic and font information through the parafoveal preview. In Tibetan reading, the frequency of words in the central foveal affects the magnitude of the preview effect of the sub central foveal, and the word frequency only affects the extraction of the preview information of the form in the early stage of lexical processing, that is, the preview effect of high-frequency words is greater under the condition of shape like preview. Fourthly, the word frequency delay effect and parafoveal preview effect found in the study support the view of processing parafoveal sequences in the E-Z reader model[2].

Gao Xiaolei et al. adopted the eye movement technique, took Tibetan college students as subjects, and adopted the moving window paradigm to investigate the perceptual breadth and the types of information obtained by parafoveal preview of Tibetan and Chinese readers with high and low Chinese proficiency when reading Chinese.The results found that, firstly, the total gaze time of high Chinese-level Tibetan-Chinese readers for the target area was significantly shorter than that of low Chinese-level Tibetan-Chinese readers. First, the total gaze time of high-Chinese proficient Tibetan-Chinese readers for the target area was significantly shorter than that of low-Chinese proficient Tibetan-Chinese readers, and the overall vocabulary processing speed of high-Chinese proficient Tibetan-Chinese readers was faster. This result indicates, to a certain extent, that high-level Tibetan-Chinese readers are more efficient readers. Second, the perceptual breadth of Chinese reading for the high Chinese-level Tibetan-Chinese readers was two Chinese characters to the right of the gaze point, while the perceptual breadth of Chinese reading for the low Chinese-level Tibetan-Chinese readers was the space of one to two Chinese characters to the right of the gaze point. This result indicates that both high and low level Tibetan-Chinese readers can obtain morphological and phonological information from parafoveal in Chinese reading [7].

Gao Xiaolei et al. using eye movement technology and taking Tibetan college students as subjects,

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investigated the role of font and voice information in vocabulary recognition and word frequency effect when Tibetan native speakers read Chinese sentences in different contexts. The results showed that the orthographic and phonological information jointly influenced word recognition when the context was high constraint. In low constraint context, the orthographic information played an important role on word recognition. The effect of word frequency occurred at the late stage in high constraint context while it was observed at the middle and late stage in low constraint context. These results indicate that the sentence context influences the effects and the time course of orthographic and phonological information on word recognition during the Tibetan native speakers while reading Chinese, which is in support of the two-channel theory of word recognition[8].

Li et al. used eye movement technology to investigate the effects of word length and word frequency on eye movement control in Tibetan reading. The results of experiment 1 showed that word length and word frequency in Tibetan reading significantly predicted the fixation time and location. Therefore, the results of experiment 1 provide a prerequisite for experiment 2 to further explore the effects of word length and word frequency on fixation time and fixation position. The results of experiment 2 show that there are word length effect and word frequency effect in Tibetan reading, and there is a bias toward fixation position in Tibetan reading, and fixation position is mainly affected by low-level factors, while high-level factors have no effect on fixation position, which is consistent with the results of Pinyin text research. This shows that although Tibetan and Chinese belong to the Sino Tibetan language family, and their writing structure is similar to that of Chinese, Chinese is an ideographic character, while Tibetan itself is an alphabetic character, showing the same characteristics as alphabetic characters in terms of language type, pronunciation transparency, and character/word markers [9].

3. Prospect

3.1. To investigate the role of tshegs in Tibetan reading

English belongs to pinyin script. In English, there are interword spaces marking word boundaries and this kind of visual feature plays an important role in English reading. Different from English, Tibetan also belongs to the pinyin script, there is no word boundary information such as space in its text, but there is a word boundary information named tshegs. Tibetan is also a pinyin script, but it also belongs to the Sino-Tibetan language family, and there is a close relationship with Chinese. The guarantee role of word boundary information in English reading has been confirmed by existing studies. Then, as word boundary information, what is the role of tshegs in Tibetan reading? At the same time, if the visual cue of segmentation is replaced with the space commonly used in pinyin characters, is it also conducive to Tibetan reading? No studies have been reported.

3.2. To investigate the influence of adding interword Spaces in Tibetan text on Tibetan reading

Interword spaces exist in the texts of many languages that use alphabetic writing systems. In most cases, interword spaces, as a kind of word boundary information, play an important role in the reading process of readers[10-11]. There are also some languages, such as Thai, Japanese, and Chinese, where there is no space between words. Researchers have investigated the role of space in their text reading by adding space between words. For Thai, Kohsom and Gobet found that adding spaces between words in Thai texts can improve the reading speed of Thai native speakers [12]. Winskel et al. found that adding spaces between words in Thai text will promote Thai vocabulary recognition [13]. For Chinese, some studies have found that spaces between words can hinder Chinese reading [14]; some studies have found that space between words can promote Chinese reading [15]; however, more studies have found that space between words will neither hinder nor promote Chinese reading [16-19]. In conclusion, we find that it is controversial whether the artificial addition of interword Spaces can improve reading speed in languages without interword Spaces. Although Tibetan also belongs to the pinyin script, there is no space between words in the Tibetan text. Therefore, we can investigate the effect of adding interword spaces to Tibetan texts and the artificial addition of interword spaces to Tibetan texts on Tibetan reading.

3.3. To investigate the mechanism of word saturation in Tibetan reading

When readers continue to stare at a word for a long time, they will feel that the word has become unfamiliar and cannot be recognized, or that the word has become "strange" and "unfamiliar". The

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phenomenon is a text saturation effect. A lot of research has been carried out on the mechanism behind this special phenomenon, and two main and typical viewpoints have been formed: semantic saturation and perceptual saturation.

How does the phenomenon of text saturation come into being? In other words, what is the mechanism of text saturation? Researchers hold two typical and different views on this, namely semantic saturation and perceptual saturation. The view of semantic saturation holds that the phenomenon of text saturation is caused by the loss of the semantic information of words or words due to the continuous attention of readers, while the view of perceptual saturation holds that the continuous attention of readers leads to the loss of the perceptual morphological information of words or words, which leads to the phenomenon of text saturation. Tibetan is a kind of alphabetic writing, but it belongs to the Sino Tibetan language family at the same time. It has a close relationship with Chinese and has the characteristics of both English and Chinese. Therefore, taking Tibetan as the reading material, investigating the mechanism of text saturation can control the influence of text types on the experimental results. However, there is no report on the mechanism of character saturation in Tibetan reading.

3.4 To investigate whether there is "character transposition effect" in Tibetan reading?

When readers read sentences containing transposed letters and non words, the sentence reading time increases, eye movement indicators are affected, and the reading speed decreases significantly. This reveals the importance of letter position processing in the recognition of alphabetic words. There are some words with only different letter positions, but readers can still distinguish them accurately. This shows the flexibility of letter position processing. Although letter transposition has a certain degree of damage to readers' reading, its damage is far less than that caused by character replacement. The letter position information is coded to some extent, which is flexible, but not absolutely strict.

As a language with both pinyin and ideographic characters, Tibetan has many similarities and differences with English and Chinese. Similar to Chinese, there is no strict division standard between words in Tibetan. The understanding of sentences is based on the relationship between words after the words in the sentence are segmented by the psychological dictionary. The spatial distribution of Chinese characters is consistent in level, but the degree of complexity is different. While the presentation of Tibetan language is similar to pinyin characters, it has the same three-dimensional characteristics as Chinese, so the amount of information contained in its unit space is also different. There is no character or interword marker in Chinese, but there is tshegs in Tibetan, but it is not as obvious as the interword space in English. In modern Tibetan, the number of compound words has far exceeded the number of pure words, compound words are composed of multiple meaningful monosyllabic morphemes, and there are tshegs in their vocabulary, which is a feature that neither English nor Chinese have.

Based on these characteristics of Tibetan, will Tibetan show stable character transpose effect in the process of reading Tibetan because of some commonalities between Tibetan and pinyin characters and Chinese? Or will it show some different phenomenon because of the uniqueness of Tibetan language?

3.5 To investigate the extraction of semantic information from the parafoveal in Tibetan reading

The types of information that readers extract from the parafoveal are the focus of current research in the field of reading eye movement. In Chinese studies, it is found that readers can obtain low-level visual information, such as orthographic and phonological and high-level semantic information. In the study of alphabetic languages, it is found that readers can also obtain low-level visual information, such as the initial information,orthographic and phonological information.Whether readers can get semantic information in alphabetic languages is still controversial. Tibetan is a special kind of alphabetic languages. It is found that Tibetan native speakers can obtain orthographic and phonological preview information, but whether Tibetan native speakers can obtain semantic preview information has not been verified by experiments.

Therefore, we can take Tibetan college students as subjects and use the boundary paradigm to explore whether Tibetan college students can extract the semantic prevision information of parafoveal in Tibetan reading.

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3.6 To investigate the word segmentation effect of Tibetan native speakers when reading Chinese

Tibetan college students' mother tongue is Tibetan, and they were in a strong Tibetan language environment before receiving school education. At the early primary school stage, they mainly learned Tibetan. Starting from the upper grades of primary school, they began to learn Tibetan, Chinese and English at the same time after the increase of courses. While native Chinese speakers have been exposed to Chinese since childhood, Tibetan college students may not have as much Chinese reading experience as native Chinese speakers (Han college students). Therefore, Tibetan college students are selected as subjects in this study. Compared with native Chinese speakers, their reading experience is relatively limited, they are not familiar with Chinese texts with spaces, and their familiarity with Chinese texts without spaces is relatively low. Therefore, the influence of familiarity of text presentation can be well controlled. To sum up, we can examine the word segmentation effect of Tibetan college students when they read Chinese texts.

4. Conclusion

At present, there are few researches on Tibetan-Chinese bilingual reading. And based on the above research, the author proposes future research ideas. First, investigate the role of tshegs in Tibetan reading. Second, investigate the impact of adding spaces between words in Tibetan text on Tibetan reading. Third, investigate the mechanism of word saturation in Tibetan reading. Fourth, investigate whether there is "character transposition effect" in Tibetan reading? Fifth, investigate the extraction of semantic information from the parafoveal in Tibetan reading.

References

[1] Bai X J, Gao X L, Gao L, Wang Y S. An eye movement study on the perceptual span in reading Tibetan language[J]. Acta Psychologica Sinica, 2017, 49(05):569-576.
[2] Gao X L, Li X W, Sun M, Bai X J, Gao L. The word frequency effect of fovea and its effect on the preview effect of parafovea in Tibetan reading[J]. Acta Psychologica Sinica, 2020, 52(10):1143-1155.
[3] Wang A, Yan M, Wang B, et al. The perceptual span in Tibetan reading[J]. Psychological Research, 2021, 85(3): 1307-1316.
[4] Zhang J J, Cui Z L. Language Switching and Switching Cost in Tibetan-Mandarin-English' Visual Word Recognition[J]. Acta Psychologica Sinica, 2008, 40(2): 136-147.
[5] Cui Z L, Zhang J J. A Research on Lexical and Conceptual Representations in Tibetan-Mandarin-English Trilinguals[J]. Psychological Science, 2009, 32(03):559-562.
[6] Gao L, Gao X L, Bai X J, Cheng M X, Guo Z Y. Language Switching and Switching Cost in Language Comprehension of Tibetan-Chinese Bilinguals With Different Proficiency Levels[J]. Studies of Psychology and Behavior, 2018,16(06):744-750.
[7] Gao X L, Shen M, Ren X F, Bai X J, Gao L. The Perceptual Span and Parafoveal Preview Effect of Tibetan-Chinese Readers with High and Low Chinese Level in Reading Chinese[J]. Studies of Psychology and Behavior, 2021, 19(3): 297-303.
[8] Gao X L, Shen M, Li H Y, Bai X J, Gao L. An Eye Movement Study of Chinese Word Recognition of Tibetan Native Speakers [J]. Studies of Psychology and Behavior, 2020, 18(1):45-52.
[9] Li X W, Li S, Gao L, et al. Eye Movement Control in Tibetan Reading: The Roles of Word Length and Frequency[J]. Brain Sciences, 2022, 12(9): 1205.
[10] O'Regan J K, Jacobs A M. Optimal viewing position effect in word recognition: A challenge to current theory[J]. Journal of Experimental Psychology: Human Perception and Performance, 1992, 18(1): 185-197.
[11] Rayner K, Fischer M H, Pollatsek A. Unspaced text interferes with both word identification and eye movement control [J]. Vision research, 1998, 38(8): 1129-1144.
[12] Kohsom C, Gobet F. Adding spaces to Thai and English: Effects on reading[C].Proceedings of the Cognitive Science Society, 1997, 19(1): 388-393.
[13] Winskel H, Radach R, Luksaneeyanawin S. Eye movements when reading spaced and unspaced Thai and English: A comparison of Thai–English bilinguals and English monolinguals[J]. Journal of Memory and Language, 2009, 61(3): 339-351.
[14] Liu I M, Yeh J S, Wang L H, et al. Effects of arranging Chinese words as units on reading efficiency [J]. Acta Psychologica Taiwanica, 1974, 16: 25-32.
[15] Wang H F. To space or not space? Interword spacing effects on Chinese children's reading materials [J]. Ergonomics, 2015, 58(12): 1947-1959.

ISSN 2522-6398 Vol. 5, Issue 22: 12-17, DOI: 10.25236/FER.2022.052203

[16] Bai X, Yan G, Liversedge S P, et al. Reading spaced and unspaced Chinese text: evidence from eye movements [J]. Journal of experimental psychology: Human perception and performance, 2008, 34(5): 1277-1287.
[17] Ma G. Does interword spacing influence lexical processing in Chinese reading [J]. Visual Cognition, 2017, 25(7-8): 815-824.
[18] Ma G, Li D, Zhuang X. Do visual word segmentation cues improve reading performance in Chinese reading [J]. Ergonomics, 2019, 62(8): 1086-1097.
[19] Zang C, Liang F, Bai X, et al. Interword spacing and landing position effects during Chinese reading in children and adults [J]. Journal of Experimental Psychology: Human Perception and Performance, 2013, 39(3): 720-734.