A Review of Research on Chinese Zhuyin Sentences

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Abstract

This paper compares the research on the reading and acquisition of the Zhuyin sentences since the 21st century, outlines the influence of the pronunciation mode on reading and learning, and the psychological process of reading the Zhuyin sentences, and finally points out the problems in the current research on the reading and acquisition of the Zhuyin sentences, including: fewer empirical studies, less attention to the cognitive processing of learners, and lower ecological validity of the research materials. In future research on the use of Chinese Zhuyin sentences, we should select annotated text materials that are more in line with the reality of Chinese teaching and use more diverse research methods to investigate the cognitive processing and reading strategies of Chinese learners when using Chinese Zhuyin sentences.

Keywords

International Chinese language education; Zhuyin Sentences; Review.

1. Introduction

There is a general consensus that Hanyu Pinyin can assist in Chinese reading and vocabulary learning. most teaching resources, including Chinese textbooks and teaching materials, choose Zhuyin Sentences in which Hanyu Pinyin and Chinese characters are presented simultaneously. This study attempts to describe and analyze the current status and development of research on various topics by using the research literature on Zhuyin texts published in Chinese core journals or web of science from 2000 to 2023 as the source data, with the aim of presenting the current development of Zhuyin text research at home and abroad.

2. Core Research Issues

2.1. How the difference in the scope of phonetic annotation affects Chinese learning

Early studies of Zhuyin Sentences examined the role of pinyin in the reading performance and character learning of lower elementary school students and children with dialects by comparing learners' character learning in reading texts with and without phonetic transcriptions (Shu et al., 1993, 1994; Xu et al., 1997). It was found that Zhuyin Sentences with full-text annotated pinyin had a facilitative effect on Chinese language learning. Subsequently, the researchers further supplemented Zhuyin Sentences with full-text annotated pinyin and non-annotated texts with partial annotated pinyin conditions for new words only, and examined the effects of these three types of annotated texts on the reading comprehension and Chinese character learning of different learning subjects under different reading conditions. It was found that first-grade children reading independently had the highest rate of incidental vocabulary learning in the full-text annotation condition and the worst learning in the new-word annotation approach, with full-text annotation being the ideal annotation approach to help lower-grade children read independently (Wu et al., 2002). Similarly, the hindering effect of new word notation on incidental vocabulary acquisition was found during shared reading for low-level first graders (Wu et al., 2002). It was found that during shared reading instruction,

children of all ability levels always had the worst learning outcomes in the new word notation condition compared to the full-text notation and all-no-notation conditions. Using first-grade elementary school students as the study participants, Wu(2009) further explored the role of the phonetic annotation approach and instructional format in children's classroom Chinese character learning through a teaching experiment. It was found that students' reliance on pinyin is reduced because they have access to more external support in classroom reading, when the phonetic approach produces little impact on Chinese character learning. On this basis, Li(2011) adopted the same research paradigm and study population as Wu(2009), and explored the effects of unannotated and full-text annotated texts on children's Chinese character learning and reading motivation under shared reading and independent reading conditions through a one-year long-term experimental pedagogical study, which was consistent with the results found by Wu et al. condition, students' Chinese character learning effects were not affected by the way reading materials were annotated, but in the independent reading condition, pinyin was able to promote Chinese character learning in children of low and middle ability. In addition to text reading, Wang(2009) used a video information processing task to examine the effects of full-text annotated captioning versus full-unannotated captioning on first-grade children's vocabulary incidental acquisition in an unguided natural reading state, and found that first-grade children with low reading levels had significantly lower new word learning effects than children with high reading levels in the unannotated captioning condition. In the field of Chinese second language acquisition, there is only one study that investigates the effect of annotation mode on Chinese character learning of international students. Wu(2008) used a classroom experiment with elementary Chinese learners to examine the effect of four annotation modes: full-text annotation, new character annotation, pinyin before, and pinyin after on learners' Chinese character learning, and found that the performance of Chinese character literacy in the full-text annotation condition The best results were found. In summary, under the independent reading condition without teacher guidance, full-text annotated texts have significant superiority in Chinese character learning compared to new-word annotated and all-no-annotated texts.

2.2. How the difference in pinyin presentation affects Chinese language learning

In addition to examining the impact of the range of phonological annotations on Chinese language learning, some studies have focused on the presentation of pinyin in vocabulary instruction. Chung(2002) examined the effects of the sequential presentation order of pinyin, Chinese characters, and English explanations and the spatial distribution of the three when they were presented simultaneously on new word learning. The study found that the sequence of presenting the target new word first and then presenting the pinyin and English explanations after a 5-second interval was more conducive to learners' pronunciation and meaning of the word; also, the layout of the target Chinese character on the left and the pinyin and English explanations on the right was more conducive to Chinese character learning. Explaining the findings in terms of connectionism and native language reading habits, the researcher concluded that presenting Chinese characters individually first promoted learners' attention and processing of Chinese characters, which enhanced the connection between Chinese characters and pinyin and meaning. And since the subjects' native language is English and the subjects' habit is to read from left to right, placing the target Chinese character chapter on the left side of the material is more helpful for learners' attention and learning. Chung (2003) then examined the effect of phonological presentation modality on word learning and found that learners learned Chinese phonology better when the phonology was presented with visual stimuli such as Hanyu Pinyin than when the phonology was presented with auditory stimuli, suggesting that Hanyu Pinyin facilitates the establishment of strong morpho-syntactic

associations, whereas spoken forms of phonology are less likely to form such representational associations. Chung (2007) later replicated the results of his first two studies and found that the presentation order of Chinese characters first and Pinyin second was beneficial for Chinese character learning. These three studies explored the effects of pinyin presentation on Chinese character learning in two dimensions: chronological and spatial distribution. Based on this, Lee & Kalyuga (2011a, 2011b) refined the issue of pinyin presentation. Lee & Kalyuga (2011a) first examined the effects of vertical and horizontal distribution patterns of pinyin and Chinese characters on character learning; then they examined the effects of full-text, partial-text, and no-text forms of Chinese ancient poems on character learning from a cognitive load perspective. Then, the effects of the full-text, partial-text, and no-text conditions on the learning of new characters and sentence comprehension were examined from the perspective of cognitive load. The results showed that the vertical distribution of pinyin and Chinese characters could effectively reduce the distraction of learners' attention, lower the cognitive load of learning Chinese characters, and facilitate the learning of Chinese characters, while the pronunciation of pinyin had no significant effect on lower level Chinese learners.

The above studies demonstrate that pinyin notation may affect learners' attention allocation, cognitive load, and representational associations, which in turn may affect the learning of Chinese characters. However, we also found that the experimental materials and tasks used in the above studies varied greatly, and that different dimensions of vocabulary knowledge may play different roles for learners with different native language backgrounds and different levels of Chinese language proficiency, and only by systematically examining the morphological, phonological, and semantic knowledge of vocabulary can we make a comprehensive analysis of learners' vocabulary learning effects.

2.3. Eye-movement study on reading of Zhuyin Sentences

There are relatively few academic studies on eye-movement of annotated text, and only four studies have examined the cognitive processing of learners while reading annotated text using practical eye-movement techniques.

Yan(2008) examined the eye-tracking patterns of learners when reading unannotated Chinese characters, full-text annotated texts, and new word-annotated texts using eye-tracking techniques with second-grade students at different reading levels. The results showed that compared with the full-text annotated text, the subjects looked at the pinyin part of the new-word annotated text significantly more often, while there was no significant difference in the gaze duration between the two annotation conditions; the number of times the learners looked at the Chinese character part of the new-word annotated text and the gaze duration were not significantly different from the Chinese character part of the full-text annotated text. This indicates that second graders can use pinyin flexibly and that the presentation of both pinyin and Chinese characters in the text does not interfere with their gaze, which somewhat responds to the concerns of the language teaching community that pinyin may have a negative impact on Chinese reading. In the area of Chinese second language acquisition, Xu (2021) used eye-movement technology to examine the differences in attention allocation and reading efficiency between second language learners and native Chinese speakers at different Chinese language levels when reading phonetic texts. The results showed that elementary-level learners did not focus their attention on the pinyin part of the text, but distributed it more evenly to both pinyin and Chinese characters, while intermediate and high-level second language speakers and native Chinese speakers devoted their attention more to the Chinese characters part, and the learners' attention allocation to the Chinese characters part was positively correlated with their Chinese language level. Meanwhile, this study found that learners' reading efficiency increased with their Chinese language proficiency. In a one-year developmental study using eye-movement technology, Yu (2022) found that pinyin had a facilitative effect on primary Chinese learners'

Chinese reading at all stages, and this effect was significantly reflected in the interest zones of Chinese characters in different text conditions; compared to the phonetic text, the subjects spent longer first reading time and total reading time, more This implies that in the early stages of Chinese language learning, learners can obtain phonological information through pinyin and then access the semantic meaning, which effectively improves their reading efficiency.

At the same time, some studies have also examined the effect of the way of spacing Chinese characters or pinyin parts in the annotated text on reading efficiency. Pang (2020) investigated the effect of the spacing mode of Chinese characters in the annotated text on the reading efficiency of Chinese second language speakers by eye-tracking technique, and the overall analysis results of the experiment showed that the differences of learners' average gaze time, average eye beat amplitude, and forward eye beat amplitude when reading the annotated text with spaces between Chinese characters and those without spaces between Chinese characters were significant. This can indicate that the pinyin-plus-space Chinese text is beneficial to the overall reading processing of elementary Chinese second language speakers. Similar to the study of Pang (2020), Xu(2018) examined the effect of the spacing pattern of pinyin in the annotated text on the reading efficiency of Chinese bilinguals through an eye-tracking technique. The results found that compared to the condition with spaces between pinyin, the condition with no spaces between pinyin had a longer average gaze time ratio; more average gaze times; shorter average eye hopping distance and lower reading efficiency. However, we found that the above study used an uncommon and potentially obstructive visual processing of pinyin concatenation, and such a letter string presentation format is less common in Chinese textbooks and teaching classrooms.

3. Conclusion

To sum up, we believe that there is still room for exploring the following studies on eye movements in the reading of annotated texts: (1) previous studies are less likely to compare the effects of factors within annotated texts on Chinese reading; (2) previous studies have used less difficult reading materials, which are suitable for comparing the overall reading efficiency between different levels through eye-movement indicators at the whole-sentence level when it is determined that learners fully understand the meaning of the sentence. (3) Some of the factors in the annotated text materials selected in previous studies were not controlled, such as the spacing of the text; (4) In previous eye-movement studies of reading, many researchers have examined the effect of whole-sentence comprehension, whole-sentence online processing, offline acquisition of new words, and online processing of new words from different perspectives. (4) In previous eye-movement studies, many researchers have examined readers' whole-sentence comprehension, whole-sentence online processing, new word offline acquisition, and new word online processing from different perspectives.

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