

Proceedings of Postgraduate Research Symposium on Linguistics and Language Data Analytics

PRSLA (2023)

2-5 December 2023

The Hong Kong Polytechnic University
Hong Kong, China

Publication Details: Proceedings of Postgraduate Research Symposium on Linguistics and Language Data Analytics

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1 Foreword

Welcome to the Postgraduate Research Symposium on Linguistics and Language Data Analytics (PRSLA) 2023! It is with great delight that we present to you the meticulously crafted program for this prestigious event, which promises a captivating journey into the realms of linguistic research and language data analysis.

Commencing on December 2, 2023, our symposium will unfold over three enlightening days, filled with thought-provoking discussions, insightful presentations, and invaluable networking opportunities. The program has been thoughtfully designed to cater to a diverse range of interests, ensuring a rich and rewarding experience for all attendees.

On the inaugural day, December 2, we kickstart the symposium with a captivating Roundtable discussion. Join esteemed panelists Mary Dalrymple from Oxford University, Lori Levin from Carnegie Mellon University, and Charles Yang from the University of Pennsylvania as they engage in an intellectually stimulating exchange of ideas. Moderated by Chu-Ren Huang from The Hong Kong Polytechnic University, this session sets the stage for the exciting discussions to follow.

The following days, December 3 and 4, feature captivating Keynote Talks by renowned experts in the field. On December 3, we have the privilege to host Prof. Lori Levin from Carnegie Mellon University, who will deliver a keynote address titled "Interlinear Gloss in Natural Language Processing and Language Documentation." This enlightening talk, chaired by Kathleen Ahrens from The Hong Kong Polytechnic University, will shed light on the intersection of linguistics and language documentation.

Continuing the momentum on December 4, we eagerly anticipate Prof. Charles Yang from the University of Pennsylvania, who will present his keynote talk titled "Learning by Satisficing." Chaired by Emmanuele Chersoni from The Hong Kong Polytechnic University, this session promises to delve into the fascinating realm of cognitive processes and learning.

The final day, December 5, is dedicated to presentation sessions that showcase the outstanding research being conducted by our talented participants. In the session titled "Semantics and Grammar," presenters Yu Wang, Bingxian Chen, and Menghan Jiang will captivate the audience with their research on Chinese classifiers, alternative semantics, and dative variation in Mandarin Chinese.

The subsequent session, "Lexicon and Cognition," features presentations by Jason Kan, Zhihong Chen, and Mengchen Li, who will delve into topics such as corpus-based word frequency effect, second language acquisition of English spatial prepositions, and cognitive processes of meaning extension in language.

We conclude the day with a stimulating Poster Session, where researchers Hongrui Wang, Yixin Cui, Tingting Wang, Wanying Zhao, Haiying Li, Yingnan Li, and Ke Liang will present their diverse studies, ranging from the analysis of moral change in Chinese society to the acceptability of sentence structures in Shandong Mandarin, and from semantic reasoning based on large language models to corpus-based studies on language use bias.

With each session carefully crafted to inspire discussion, foster innovation, and encourage collaboration, the PRSLA 2023 program promises to be an intellectual feast for all participants. We extend our heartfelt gratitude to our esteemed keynote speakers, panelists, and presenters for sharing their expertise and contributing to the intellectual vibrancy of this symposium.

Junlin Li
Yu-xi Li
PRSLA 2023 Chairs
(on behalf of the Organizing Committee)

2 Organizing Committee

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4 Awardees

Best Presentation Awardees Menghan Jiang; Yu Wang

Best Paper Yu Wang

Accepted Abstracts

Analysis of Corpus-based Word Frequency Effect in Test-based Age-of-Acquisition Norm for Cantonese Vocabulary

Jason Kan

The Hong Kong Polytechnic University

Abstract

Objectives This paper presents a comprehensive investigation into research findings derived from the scrutiny of corpus linguistic data, generated by two distinct databases of Cantonese-speaking preschool children in Hong Kong. The primary focus of the research detailed in this paper is a comparative analysis of the corpus-based word frequency and the age of acquisition (AoA) for Cantonese vocabularies as demonstrated in a norm-referenced test. The novelty of our research lies in the shift of focus from traditional AoA studies, which have primarily dealt with adult ratings. In contrast, the present study embarks on an in-depth exploration of the performance of corpus-based word frequency in estimating AoA, thus providing a fresh perspective on the topic.

Methods The methodology employed in this study is centered on the analysis of corpus linguistic data. A comparative approach is applied to the corpus-based word frequency and AoA for Cantonese vocabularies in a norm-referenced test. The study identifies that the performance of word frequency as a measurement tool is influenced by the size of the corpus, elucidating that a larger corpus can lead to more accurate estimations.

Results The results lend further weight to the growing body of evidence supporting the utilization of corpus-based word frequency in AoA estimation. Interestingly, unlike previous assumptions, we found that the age range of the corpus does not significantly affect the performance of word frequency in estimating AoA. The findings of this research suggest that frequency is a significant factor for assessing AoA in preschool children.

Conclusion and Implication This research adds to the broader discourse on AoA by investigating the role of corpus-based word frequency. It highlights the need for a comprehensive approach when assessing AoA in preschool children and offers valuable insights for future studies. The findings of this research have important implications for both the academic community and practitioners working in the field of language acquisition and education.

Keywords Corpus Analysis, Age of Acquisition, Cantonese Vocabulary, Word Frequency.

A Study of Second Language Acquisition of English Spatial Prepositions "on," "in," and "at" Based on Conceptual Metaphor Theory

Zhihong Chen
The Hong Kong Polytechnic University

Abstract Spatial prepositions are considered to have different image schemas in Conceptual Metaphor theory, and these image schemas can be mapped from the original space domain to different target domains (Lakoff, 1987; Wang, 2020). However, in different languages, prepositions with the same image schema in spatial domains can be different when mapped to other domains, leading to challenges in using a second language to express spatial concepts (Alonso& Cadierno, 2016; Jin, 2011). Therefore, this study aims to investigate the acquisition of the image schemas in English spatial prepositions "on," "in," and "at" in the state domain and emotion domain by Chinese L1 so as to explain the effects in the differences of target domain on the acquisition of different prepositions in English. This provides new insights for the teaching of English spatial prepositions to these students.

Therefore, according to the state domain and emotion domain, this study divided "on", "in", and "at" into 6 groups (3*2), and 7 sentences were selected from each group as experimental materials. Then, the reaction time (RT) and accuracy (ACC) of 33 L1 Chinese in judging the correct or incorrect use of spatial prepositions in these sentences were recorded. The result is shown in Table 1. Then, the mixed-effects model with prepositions and target domains as fixed effects in R is used in the statistical analyses.

In this study, it was observed that when the target domain of spatial prepositions was the Emotion domain, participants exhibited significantly shorter reaction times. Also, when the spatial preposition was "at" the participants' accuracy was significantly lower in both target domains.

According to posthoc tests, it was also found that when the target domain was the emotion domain, participants had the highest accuracy when dealing with "in," followed by "on," and "at" had the lowest accuracy. In the State domain, participants had the highest accuracy when dealing with "on," whereas their accuracy for "in" and "at" were comparatively lower. Also, "in" had significantly higher accuracy in the emotion domain compared to the state domain, while "at" and "on" showed no significant differences in these two target domains.

Keywords Conceptual Metaphor, Image schema, Target domain, SLA

Categories	Emotion domain		State domain	
	RT(s)	ACC	RT(s)	ACC
on	1.520	0.646	1.620	0.725
in	1.539	0.765	1.724	0.549
at	1.586	0.504	1.925	0.493

Table 1

The Cognitive Processes of Meaning Extension in Language: A Case Study of the Chinese Character fan (饭)

Mengchen Li

Macao Polytechnic University

Abstract It is widely acknowledged that the radical network of a word can be composed of four cognitive processes, namely, metonymy, metaphor, specialization, and generalization. These processes play crucial roles in facilitating the logical detection of meaning extensions in words. Within the framework of these four processes, numerous seemingly unrelated meaning extensions of words can be systematically traced. This paper aims to investigate the meaning extension of the Chinese character “fan” (饭) and provide evidence supporting the interpretation of its various commonly used meanings from the perspective of cognitive linguistics, emphasizing the influence of the four cognitive processes. By exploring these connections, a comprehensive understanding of the intricate relationship between the cognitive processes and the diverse meanings associated with the very character “fan” can be gained.

Keywords Cognitive process in language, metonymy, metaphor, specialization, generalization, meaning extension, theory and application, case study

The Model of Moral Change and Development Stages in Chinese Society

— Based on the Vocabulary Analysis of the 70-year "People's Daily"

Hongrui Wang
Minzu University of China

Abstract The diachronic use of moral keywords is a projection of social moral changes at the lexical level. As the most basic and flexible linguistic unit, vocabulary records the diachronic changes in Chinese social morality and contains the moral concept of the nation. Moral keywords refer to representative words that can reflect the moral concepts of Chinese society, such as "integrity" and "patriotism". By observing the changes in the diachronic use of moral keywords, we can reflect the changing trend and development law of social morality.

Due to the complexity of the concept of social morality in contemporary China, the use of computational methods to investigate the dynamic changes of moral keywords in big data texts can provide a new perspective for the study of the diachronic changes of social morality.

Based on this, this paper explores the change and development of Chinese social morality from the perspective of vocabulary. We propose two analytical models of moral change types and moral change motives, and calculate and analyze the corpus of People's Daily in 1946-2015 by using computational linguistics research methods.

The results show that the diachronic use of moral keywords can reflect the interactive relationship between the use of words and the changes of social morality, and the seven types of moral changes and four types of moral motivations can show the overall trend, core theme, development content, and change reasons, and depict the diachronic change and development of Chinese social morality in the past 70 years. The method proposed in this paper provides a new research perspective for the analysis of social morality and provides a new analytical dimension and problem reference for the study of linguistics and lexicology.

Keywords Social Morality; Moral Change; Diachronic Measurement

Existence Justifies Reason: A Data Analysis on Chinese Classifiers Based on Eye Tracking and Transformers

Yu Wang

The Hong Kong Polytechnic University

Abstract Classifiers are not widely present in various languages such as English, Russian, and Spanish. Moreover, even in languages that have classifiers, removing them from a sentence does not significantly affect comprehension (e.g., 我有一[张]纸。 I have a [piece] of paper). Previous research on classifier function has predominantly relied on corpora or surveys. This article investigates the role of Chinese classifiers in semantic processing using eye tracking and transformer models. The duration of eye tracking reflects the time it takes for the brain to comprehend information. We analyze eye movement data from 1.33 million gaze points to examine the processing time differences for nouns with and without classifiers. Our findings indicate that 72.41% of cases exhibited shorter processing times, while 27.59% experienced longer processing times. Additionally, we utilize transformer models such as BERT, to predict masked words based on large-scale language distributions and sentence context. Through word prediction experiments on a dataset containing 100,000 segmented and classifier-tagged sentences (e.g., 男人喜欢一小(瓶) [MASK]陪自己的哥们。 Men like to have a small (bottle) of [MASK] to accompany their buddies.), we demonstrate that retaining the classifier significantly enhances prediction accuracy and semantic similarity compared to cases without the classifier. Notably, the prediction accuracy for nouns following a classifier is 2.56 times higher than for nouns without a classifier (49.89% vs. 19.48%). Furthermore, our study reveals that sort classifiers outperform measure words in semantic prediction. Nevertheless, it is intriguing to note that measure words display an unexpected and noteworthy capacity to contribute to prediction, a phenomenon that has not yet been acknowledged within scholarly literature. Regarding the prediction of verbs preceding classifiers, retaining the classifier also leads to a noticeable increase in prediction accuracy compared to cases without the classifier (64.17% vs. 59.14%). Moreover, it is worth noting that event classifiers and approximation classifiers offer greater advantages in verb semantic prediction as compared to general individual classifiers. These experimental findings demonstrate that classifiers significantly assist in the subsequent comprehension of nouns for human. And its function in the understanding of preceding verbs also provides support for the argument that classifiers constitute an ontologically motivated lexical-semantic system.

Keywords Chinese classifiers; Eye tracking; Transformers; Ontology; Lexical-semantic

The acceptability of diverse sentence structures with right dislocation in Shandong Mandarin

Yixin Cui

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Introduction

Many languages use right dislocation (RD). Mandarin also has RD mainly in colloquial communication, a typical example is (a) (Guo, 1997), where the subject *ni3* “you” has undergone RD to the end of the sentence after the sentence-final particle *le*.

- (a) *Bie4 xia1shuo1 le, ni3*
Don’t talk-nonsense PART you
“Don’t talk nonsense.”

RD in Shandong province appears to occur with higher frequency and in more diverse structures than in other provinces of China. What’s more, many structures with RD appear to be ungrammatical in standard Mandarin, but are commonly used in Shandong Mandarin. One example is (b), where the subject *ta1* “she” and the adverb *gang1gang1* “just now” have both undergone RD.

- (b) *Ku1 le ta1 gang1gang1*
Cry PART she just-now
“She cried just now.”

This study aims to investigate the potential types of RD found in Shandong Mandarin that are non-canonical in standard Mandarin, as well as the differences in acceptability among different types.

Methods

This study was conducted by questionnaire. The questionnaire included 46 sentences (31 targets, 15 fillers). Targets can be divided into 3 sentence structures (i.e., plain sentences, multi-verb sentences, and sentences with embedded clauses) and 7 types of RD (e.g., subject RD like (a), subject + adverbial RD like (b), etc.). Participants rated the acceptability of each sentence from 1 to 5 (1 = totally unacceptable, 5 = totally acceptable). 63 valid questionnaires done by Shandong residents were collected.

Results & Conclusion

Higher acceptability with several types of RD is found. RD of subjects and adverbials separately demonstrated higher acceptability compared with other types. By contrast, some RD (e.g., adverbial + verb RD) appears to be far less acceptable. Additionally, sentence structure affects the acceptability. Plain sentences demonstrate the highest flexibility, allowing many kinds of RD.

The overall findings suggest that more types of RD are accepted in Shandong Mandarin than in standard Mandarin. The reasons may be differences in pragmatic functions, for instance, whether special RD is for defocalization or emphasis. Previous research suggested that Cantonese RD serves to defocus the right-dislocated constituent (Lee, 2017), and there is a similar RD movement in Shandong Mandarin, namely subject RD (e.g., (a)). Consequently, it is plausible that a similar function exists in Shandong Mandarin. As there are types of new RD (e.g., (b)) that have not been previously discovered, their pragmatic functions may be diverse (e.g., emphasis), which can be further discussed in future research.

Keywords Right Dislocation; Shandong Mandarin; Sentence Structure; Acceptability

New Words Semantic Reasoning Based On Large Language Model

Tingting Wang
Minzu University of China

Abstract New words (referring to both new meanings of existing words and completely new words) keeping explosion on the internet, which poses certain challenges to the semantic study of new words in linguistics. Therefore, it is necessary to explore a flexible and efficient technical approach for reasoning the semantics of new words and significantly enhancing the efficiency of such research.

The rapid development of large language models has resulted in significant improvements in the performance of various natural language processing tasks, particularly in text understanding and generation. Large language models can learn statistical patterns from a vast amount of textual data and utilize these patterns to generate text that closely resembles human language, making them an ideal tool for reasoning the semantics of new words.

This study proposes a method for reasoning the semantics of new words based on large language models. The context relationships are leveraged to aid the model in better understanding the semantic meanings of target vocabulary in diverse contextual sentences. The method consists of four steps: data collection, data preprocessing, data annotation, and model fine-tuning. Data collection mainly involves data mining from Sina Weibo with web crawling techniques under a reasonable network load. Data preprocessing involves cleaning the corpora and splitting them into sentences, with each sentence serving as a training input. Data annotation aims to minimize annotation costs by only annotating the semantic interpretation of a single keyword in each sentence. Finally, model fine-tuning utilizes the Llama2-13B model, which strikes a balance between resource consumption and inference performance, and employs a thinking chain pattern to reinforce the model's understanding of word meanings in sentence contexts, thereby improving its ability to infer the semantics of unknown new words.

The results show that the method for reasoning the semantics of new words based on large language models exhibits significant advantages in terms of semantic inference capability and inference speed compared to traditional methods. Large language models comprehensively understand sentence structure and meaning and capture syntactic structures to better comprehend the semantics of words in context, thereby demonstrating a notable advantage in semantic inference tasks for unknown words. In conclusion, the method for reasoning the semantics of new words based on large models provides a novel solution and research direction for automated semantic inference of new words and holds great scientific and practical significance

Keywords New words; Semantic Reasoning; Large Language Model

A Comparable Corpus-Driven Study on Dative Variation in Mandarin Chinese

Menghan Jiang
Shenzhen MSU-BIT University

Abstract Dative alternation, observed widely in world languages (e.g., ‘I gave the children toys’ and ‘I give toys to the children’), exhibits a more complex structure in Chinese compared to English. Apart from the two word orders existing in English (e.g., ‘我送他一本书’ and ‘我送一本书给他’), Chinese also allows for the indirect object to precede the verb (e.g., ‘他每人送了一本书’), or appear in adverbial prepositional structure (e.g., ‘我给他送了一本书’). Besides, direct object can also appear before the verb as in BA construction or a topicalized sentence (e.g., ‘我把一本书送给他’ and ‘书送给他’). However, systematic empirical research on the syntactic choices of dative alternation in Chinese is rare. Particularly noteworthy is variation in syntactic choices between different Chinese variants. For instance, we found certain dative alternation seemingly significant favored by Taiwan Mandarin, and are rarely observed in Mainland Mandarin (e.g., ‘赠书图书馆’). Yet, few have delved into the differences in sentence structure selection between Mainland and Taiwan Mandarin.

This study adopts a comparable corpus-driven statistical approach to investigate the dative construction variations between Taiwan and Mainland Mandarin using the Chinese Gigaword Corpus. We compiled a list of 36 verbs that could be used ditransitively, and extracting sentences containing these words and manually selected the dative constructions, as well as annotated their alternative types. The results show that Taiwan and Mainland significantly differ in the word order. Mainland Mandarin predominantly prefers postverbal ditransitive construction (e.g., ‘颁发奖品给参赛选手’ and ‘颁发参赛选手奖品’), while Taiwan Mandarin favors preverbal ditransitive construction (e.g., ‘向参赛选手颁发奖品’ and ‘把奖品颁发给参赛选手’).

Moreover, besides investigating the alternative preferences between Mainland and Taiwan Mandarin, we aim to explore the differences between these regions in terms of factors influencing sentence structure selection (e.g., features), as which the choice of surface form in a dative sentence is not completely random but influenced by various features.

Keywords Dative Alternation; Language Variation; Corpus-Driven Approach

A Corpus-based Study on the Use Bias of "了" in the Written Chinese Language of Elderly Hearing-impaired Children

Guanying Zhao, Haiying Li
Ludong University

Abstract In modern Chinese, "了" has both intonational and dynamic auxiliary properties, and it is used more frequently and acquired earlier in childhood, whether it expresses intonation or the sense of "completion" in oral and written expressions. The pre-corpus observation shows that children with hearing impairment have a significant bias towards the use of "了".

As the "fairest" way of communication between children with hearing impairment and typically developing children, the importance of written expression is self-evident, especially in the case of older children with hearing impairment, whose cognition and vocabulary acquisition have reached a certain level, and whose improvement and development of language proficiency is more reflected in the use of written language.

This paper takes the grammatical meaning and pragmatic function of the imaginary word "了" in the written language of typical developmental children as a reference, and takes the self-constructed corpus of the written language of senior hearing-impaired children as a basis to systematically investigate the performance of the written language usage bias of "了" in hearing-impaired children: first, we analyze its distributional characteristics in terms of frequency and density; second, we analyze its distributional characteristics in terms of frequency and density. Secondly, we analyze the distributional characteristics from the perspectives of frequency and density of use; secondly, we analyze it from the levels of words and sentences, the former of which shows that children with hearing impairment habitually attach "了" to spoken words and form "fixed collocations" by conjugating the word with commonly used verbs; the latter of which includes the habitual use of "了" in running sentences; the latter includes the habitual use of "了" in flowing sentences. The latter includes the habitual use of "了" to end sentences and the common use of the word to break sentences in short sentences, and lastly, the redundant use of "了" is also characterized by the misuse of "了". Based on this, the main reasons for the bias in the use of "了" are explored in the light of the expression habits of hearing-impaired children, to better solving the problem of the correct use of the imaginary word "了" by hearing-impaired children and the related language acquisition problems.

Keywords Chinese Hearing-impaired Children; Written Language; Dummy Word "了"; Usage Bias

Does Chinese Focus Units Follow the Alternative Semantics? — Evidence From A Semantic Priming Study

Bingxian Chen

Nanjing Normal University

According to Rooth's Alternative Semantics, focus units activate a set of alternative units with semantic implications. This study aimed to examine the applicability of this theory to Mandarin Chinese through a semantic priming experiment. Specifically, our investigation focused on whether the activation of semantic alternatives could occur with Chinese focus phrases introduced by focus markers - "zhiyou" (only) and "lian" (even) - in sentence-initial and sentence-internal positions, as well as with unmarked focus. In the self-paced reading experiment, participants encountered four types of target words: alternative, contrastive, non-contrastive, and unrelated. We explored (1) whether Mandarin native speakers' ratings on 7-point Likert scales for the four types of target words were influenced by reading a priming focus discourse; (2) whether their reaction times (RTs) when processing semantic associations were affected by the focus prime. Furthermore, Chinese focus can be categorized into unmarked focus and marked focus. Unmarked focus typically appears in sentence-final position, while marked focus is often realized through the use of focus markers. This study also explored whether different types of focus construction and the position of focus markers could elicit different focus effects. The priming focus contained: initial-only, internal-only, initial-even, internal-even, and canonical sentences (unmarked focus).

We performed a linear mixed-effects analysis of the relationship between rating values for target words and target type. The results revealed that the model comparison was significant ($\chi^2(3) = 368.82, p < .001$), indicating that four target types had a significant impact on values. Pair-wise comparisons indicated that there was a significant difference between alternative and contrastive ($p < .001$), non-contrastive ($p < .001$), and unrelated targets ($p < .001$). We then analyzed the relationship between the RTs for target words and target type. However, we found that target type did not have a significant effect on RTs. Additionally, we conducted linear mixed-effects analyses to explore the relationship between values for target words and sentence type, as well as the relationship between RTs for target words and sentence type. Nonetheless, neither of these model comparison results yielded any statistically significant findings. It is noteworthy that there was no interaction effect between focus position (initial vs. internal) and target type. We thus concluded that Chinese focus construction follows the principles of Alternative Semantics. However, our study did not find evidence to suggest that the type of focus or the position of the focus markers influences the activation of alternative units.

Keywords Semantic Priming; Focus, Alternative Semantics

Effectiveness of an Adapted High-Variability Phonetic Training Paradigm on Updating Online and Offline Tone Perceptual Abilities for Second Language Learners

Yingnan Li

The Hong Kong Polytechnic University

Introduction The perception of lexical tones presents a significant challenge in second language (L2) acquisition, persisting from beginners to experienced learners. And the non-optimal condition, such as fast speech rate, may further reduce learners' accuracy in identifying tone categories. The tone perceptual difficulties in fast speech primarily stem from two aspects: the insufficient ability in offline acoustic-to-tone representation and the lack of automaticity in the online attention selection to tones. To address these challenges, high-variability phonetic training under adverse conditions (HPVT-AC) has been proposed as a potential solution. However, previous studies on HVPT-AC primarily focused on L2 segmental learning, with limited attention given to the acquisition of lexical tones. This study aimed to investigate the effectiveness of HVPT-AC in L2 tone perceptual learning under non-optimal condition (i.e., varying fast speech rates) for immediate learners. We examined the learners' training outcomes of HVPT-AC in two aspects: the robustness of offline tone representation and automaticity of online tone selection mechanism.

Method Fifty-six (mean age= 21.3 years, SD = 2.1) Indonesian-speaking adults, who were late and intermediate learners of Mandarin, participated in the experiment. The participants were equally reclassified into two training groups in a quasi-random fashion. The experimental group took part in HVPT training with a mixture of slow and fast speech rates produced by 3 talkers (i.e., HVPT-AC), while the control group was conducted with a slow speech rate across 3 talkers (i.e., HVPT-SLOW). The four-session training program conducted over two consecutive days with a pre-post design. In the pre- and post-test, a self-paced AX tone identification test was used to evaluate learners' offline tone representation ability. And the time-limited attention selection (AST) test was adopted to assess learners' online tone selection ability.

Findings

- In general, intermediate learners with high tone aptitude benefited more from HVPT-AC compared to traditional tone perceptual training in slow speech.
- HVPT-AC effectively reduced the difficulties associated with tone perception in fast speech for learners, by both sharpening their tone categorical perception (i.e., offline tone representation) and enhancing the automation of their attention selection mechanism (i.e., online tone selection ability) when processing tonal information under fast speech.

Significance This study contributed to the long-standing effort in L2 perceptual training, broadening researchers' understanding of the complex role of tone perception beyond the slow and favorable laboratory setting and connected to non-optimal conditions which learners may encounter in real-life communication scenarios.

Keywords Tone Perception; High Variability Phonetic Training, Non-optimal Conditions

Research on Color Words in the Shanhai Jing Based on Multi-text Comparison

Ke Liang

The Hong Kong Polytechnic University

Abstract The Classic of Mountains and Seas or Shanhai Jing was written in the pre-Qin Dynasty and is an important ancient classic. Starting from color words, this paper uses digital humanities methods such as word frequency analysis and data visualization to conduct a comparative analysis of the color words in Shanhai Jing and 25 other ancient books of the pre-Qin and Han Dynasties, with intention to explore the writing time and textual nature of Shanhai Jing. On the basis of analyzing previous research and the original texts of the pre-Qin and Han Dynasties, six color categories of "green", "red", "yellow", "white", "black" and "other" were sorted out, with a total of 186 color words.

The experiment found that in terms of frequency, the frequency of color words in Shanhai Jing is much higher than that of other pre-Qin and Han documents. The color word frequency in two poetry collections Shi Jing (“诗经”) and Chu Ci (“楚辞”) is also higher than other books. As far as the text of Shanhai Jing is concerned, the frequency of color words in Shan Jing, Hai Jing and Huang Jing part is about the same. We further compare the types of color words in three documents with higher frequency of color words: Shanhai Jing, Shi Jing, Chu Ci, and finds that Shanhai Jing has fewer types of color words, mainly concentrated in cyan, red, yellow, white, and black which are the five primary colors, while Shi Jing and Chu Ci have many types of color words, and there are also more secondary color (“间色”) words besides the five primary colors.

We believe that the characteristics of the use of color words in Shanhai Jing is worthy of attention and it may reflect the written time and the nature of the text. But at the same time, it is difficult to accurately figure out the written time and the nature of the text based on color words alone. During the experiment, the phenomenon of the combination of material and color (“物色合一”) in ancient Chinese caused a lot of interference in the definition of color words. And we think this phenomenon in ancient Chinese is an area that has not yet been fully studied. It may reflect the transitional state of the Chinese color word system from unsystematic to systematic.

Keywords Shanhai Jing; Color Words; Multi-text Comparison

Full Papers

A Study of Second Language Acquisition of English Spatial Prepositions "on," "in," and "at" Based on Conceptual Metaphor Theory

Chen Zhihong

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Abstract

Based on Conceptual Metaphor Theory (Lakoff, 1987), this study aims to investigate the acquisition of the image schemas in English spatial prepositions "on," "in," and "at" in the state domain and emotion domain by Chinese L1, so as to explain the effects in the differences of target domain on the acquisition of different prepositions in English. This provides new insights for the teaching of English spatial prepositions to these students.

1 Introduction

Lakoff and Johnson's Conceptual Metaphor framework introduces Image Schema theory, suggesting that these dynamic patterns stem from our experiences and bodily interactions with the physical world. Spatial prepositions are considered to have different image schemas in Conceptual Metaphor theory, and these image schemas can be mapped from the original space domain to different target domains (Lakoff, 1987; Wang, 2020). However, in different languages, prepositions with the same image schema in spatial domains can be different when mapped to other domains, which also leads to challenges in using a second language to express spatial concepts (Alonso & Cadierno, 2016; Jin, 2011). Spatial prepositions like "in," "on," and "at" in English carry distinct Image Schemas: the container schema for "in," contact schema for "on," and point schema for "at" (Lakoff, 1987). These prepositions play a crucial role in spatial metaphors, and their Image Schemas extend to various target domains through mappings. Lindstromberg (2010) suggests that spatial

metaphors convey states, actions, emotions, and more. In this article, the state and emotion are used as the target domain in the research.

2 Research Background

From previous research about the acquisition of spatial prepositions, it has been found that when using metaphorical prepositions, native English speakers prefer "in," while native Chinese speakers prefer "shang" (on) (Jin, 2011). Meanwhile, the absence of a corresponding preposition "at" in Arabic, to some extent, affects the use of it by native Arabic speakers. (Reham, 2023). It also found that the "container schema" is more commonly used when expressing emotions in Chinese (Yu, 2007).

3 Present Study

Currently, the research on preposition acquisition examines the pedagogical impact of conceptual metaphors in second language instruction, with limited analysis on second language learners' acquisition of image schemas of spatial prepositions (Blasko & Connine, 1993; McGlone, 1996). This study focuses on systematically analyzing how Chinese L1 learners acquire English spatial prepositions, exploring challenges in projecting from spatial to state and emotion domains (e.g., "in good health" and "interested in"). The aim is to identify the difficulty in grasping different Image Schemas of English prepositions and mapping them to the state and emotion domains.

4 Methodology

4.1 Experimental Design

This study employed a 2*3 within-subjects design. The independent variables were the category of prepositions and the category of domains. The preposition category had three levels: on, in, and at. The domain category had two levels. The dependent variables were reaction time (RT) and accuracy (ACC).

4.2 Participants

A total of 33 native Chinese speakers participated in the study (aged from 21 to 28 years, with an average age of 24.6 years). Their IELTS scores were above 6.0.

4.3 Materials

The usage of Image Schemas for the words "On," "In," and "At" in the state domain and emotion target domain was divided into six (3*2) groups, with 7 sentences in each group, totaling 42 sentences. Example sentences are in Table 1.

	State domain	Emotion Domain
on	They are __ sale at the normal price.	They are keen __ this music.
in	They are still __ good health.	They are interested __ this movie.
at	They are still __ work at this time.	They are surprised __ his decision.

Table 1: The example of the sentences in the experiments.

4.4 Experimental Procedure

The experimental program was created using Psychopy. Prior to the formal experiment, there was a pre-experiment session consisting of four sentences, aiming to familiarize participants with the experimental procedure. At the beginning of each trial, a fixation point was presented in the center of the screen for 300ms. Subsequently, a sentence with a blank for the preposition appeared, remaining on the screen for 7000ms before disappearing. Following this, three preposition options (in = "left", on = "down", at = "right") were displayed on the screen for participants to select. All sentences and vocabulary were presented in the center of the screen. Reaction times and accuracy for each participant were

recorded during the experiment for further data analysis.

4.5 Data Analysis

Upon obtaining reaction time and accuracy data, we will perform both descriptive and inferential statistical analyses. For inferential statistical analysis, this study will utilize mixed-effects models in R to analysis participants' reaction times and accuracy, with preposition category (PR) and target domain category (TD) as fixed effects, and subject (subj) and trial (trial) as random effects. We will report means, standard deviations, etc., in descriptive statistics and β , SE, t, p in the inferential statistics.

5 Results

5.1 Behavioral Data

This The experiment recorded reaction times and accuracy for each participant. Reaction times greater than 0.15 seconds and within 2.5 standard deviations were included in the analysis. Table 2 provides a statistical summary of participants' reaction times (RT) and accuracy (ACC).

Categories	Emotion filed		State filed	
	RT(s)	ACC	RT(s)	ACC
ON	1.520	0.646	1.620	0.725
IN	1.539	0.765	1.724	0.549
AT	1.586	0.504	1.925	0.493

Table 2: A statistical summary of participants' reaction times (RT) and accuracy (ACC)

5.2 Reaction Time (RT)

The analysis of reaction times was conducted using the lmer function from the lme4 package. Initially, we examined whether there was an interaction effect between PR and TD that affected participants' reaction times and found no interaction between the effect of PR and TD. It was observed that the main effect of PR was marginally significant ($\chi^2(2) = 5.053, p = 0.080$), while the main effect of TD was significant ($\chi^2(1) = 14.1052, p < .001$). Post hoc comparisons revealed that the participants had significantly shorter reaction times in the Emotion domain compared to the State domain ($\beta = -0.141, SE = .0374, t = -3.756, p < .001$).

5.3 Accuracy (ACC)

For participants' accuracy, a mixed-effects model was fitted to the data using the glmer function from the lme4 package. The interaction between the effect of PR and TD ($\chi^2(2) = 23.622, p < .001$) was found in ACC. It was also observed that the main effect of TD was marginally significant ($\chi^2(2) = 3.745, p = 0.053$) while the main effect of PR was significant ($\chi^2(1) = 41.684, p < .001$). Table 3 and Table 4 shows the post hoc test on the interaction (E means Emotion domain, S means State domain).

PR	TD	estimate	SE	df	t.ratio	p.value
on	E - S	- 0.0788	0.0 44	1323	- 1.791	0.0735
in	E - S	0.2173	0.0 44	1323	4.908	<.0001
at	E - S	0.0114	0.0 44	1324	0.259	0.7957

Table 3: TD

T D	PR	estimate	SE	df	t.ratio	p.value
E	on - in	- 0.1198	0.0 441	1323	- 2.716	0.0067
	on - at	0.1414	0.0 44	1323	3.213	0.0013
	in - at	0.2613	0.0 442	1324	5.915	<.0001
S	on - in	0.1762	0.0 441	1323	3.994	0.0001
	on - at	0.2316	0.0 44	1324	5.267	<.0001
	in - at	0.0554	0.0 441	1324	1.255	0.2096

Table 4: PR

6 Discussion

In summary, when considering the overall results, it was observed that when the target domain of spatial prepositions was the Emotion domain, participants exhibited significantly shorter reaction times. Therefore, overall, the Emotion domain might be easier for native Chinese

speakers to acquire. At the same time, when the spatial preposition was "at," the participants' accuracy rates were consistently low in both target domains, which aligns with the predictions made before the experiment. This is because there is no direct correspondence between the Chinese language and the point schema represented by "at," making it more challenging for L1 Chinese speakers to grasp its spatial imagery.

Looking at the results from different target domains, it was found that when the target domain was the Emotion domain, participants had the highest accuracy rates when dealing with "in," followed by "on," and "at" had the lowest accuracy. This outcome is consistent with the pre-experiment predictions. According to Yu (2007), in the Chinese language, the spatial preposition "in," representing the container schema, is primarily used when expressing emotions. Hence, for learners whose native language is Chinese, "in" is easier to grasp when the target domain is the Emotion domain. In the State domain, participants had the highest accuracy rates when dealing with "on," whereas their accuracy rates for "in" and "at" were comparatively lower. Chinese tend to use the spatial imagery of "on" in various contexts, except when expressing emotions (Zhang 2013).

Regarding different prepositions, sentences containing "at" and "on" showed no significant differences in accuracy rates across both target domains. However, sentences with "in" had significantly higher accuracy rates in the Emotion domain compared to the State domain, which aligns with Yu's (2007) hypothesis.

In conclusion, these findings shed light on how native Chinese speakers acquire spatial prepositions in English. The ease or difficulty of acquisition appears to depend on factors such as the target domain, specific prepositions, and the spatial imagery associated with them. These insights have implications for second language acquisition and language teaching, particularly for Chinese learners of English.

7 Limitation

This study also has some limitations. It only discussed the acquisition of the commonly used spatial prepositions "in," "on," and "at" among native Chinese speakers in different target domains. There are more spatial prepositions in English that warrant further investigation. What's

Table 1: The example of the sentences in the experiments.

more, the conceptual training of the participants need to be considered.

References

- Alonso, R. A., Cadierno, T., & Jarvis, S. 2016. Crosslinguistic influence in the acquisition of spatial prepositions in English as a foreign language. *Crosslinguistic Influence in Second Language Acquisition*, 93 – 120. <https://doi.org/10.21832/9781783094837-008>
- Becker, A., & M. Carroll. 1997. *The Acquisition of Spatial Relation in a Second Language*. Amsterdam: John Benjamins.
- Blasko, D. G., & Connine, C. M. 1993. Effects of familiarity and aptness on metaphor processing. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 19(2), 295 – 308. <https://doi.org/10.1037/0278-7393.19.2.295>
- Jin, L, T. 2011. *Second language acquisition of spatial metaphors in English and Chinese writings: Insights from native and learner language corpora*. The University of Arizona.
- Lakoff, G., & Johnson, M. 1980. *Metaphors we live by*. University of Chicago Press.
- Lakoff. 1987. *Women, fire and dangerous things: What Categories reveal about the mind*. University of Chicago Press.
- Lindstromberg, S. 2010. *English prepositions explained (Revised ed.)*. Amsterdam / Philadelphia: John Benjamins Publishing Company.
- McGlone, M. S. 1996. Conceptual metaphors and figurative language interpretation: Food for thought? *Journal of Memory and Language*, 35(4), 544–565. <https://doi.org/10.1006/jmla.1996.0029>
- Reham Alhammad 2023 The Acquisition of the English Spatial Prepositions: in, on, and at by Saudi EFL Students, *WORD*, 69:2, 175-204. <https://doi.org/10.1080/00437956.2023.2208897>
- Wang, C. 2020. Implicit cognitive meanings of the spatial prepositions in, on, and at in English. *International Journal of Linguistics and Translation Studies*, 1(2), 70 – 83. <https://doi.org/10.36892/ijlts.v1i2.33>
- Yu, N. 2007. The Chinese conceptualization of the heart and its cultural context. *Applied Cultural Linguistics*, 65 – 85. <https://doi.org/10.1075/celcr.7.06yu>

Zhang, Y., Segalowitz, N., & Gatbonton, E. (2011). Topological spatial representation across and within languages. *The Mental Lexicon*, 6(3), 414-445. <https://doi.org/10.1075/ml.6.3.04zha>

The acceptability of diverse sentence structures with right dislocation in Shandong Mandarin

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Abstract

The linguistic phenomenon of right dislocation (RD) seems to be more frequently used among Shandong Mandarin (SDM) speakers than with speakers of other varieties of Mandarin, as observed in everyday communication trends. Moreover, Shandong residents frequently employ RD constructions that are considered uncommon in Standard Mandarin (PTH; Putonghua). This study investigates the divergence in RD acceptability between SDM and PTH. Additionally, it explores the acceptability spectrum of various RD types within SDM itself. The results show that there are differences in syntactic constituents in RD between SDM and PTH. SDM has more types of RD than those in PTH. For instance, there are RD of Subject, Adverb, and [Subject + Adverb] in SDM, which are less acceptable in PTH. Also, within SDM, there are degrees of acceptability for different RD types. The results further indicate that the simpler the sentence structure is, the more conducive it is to RD. These findings contribute to a deeper understanding of the syntactic flexibility in SDM and highlight the dynamic nature of RD across Mandarin dialects.

1 Introduction

Like many languages, Mandarin has right dislocation (RD), mainly in colloquial communication. A typical example is (1) (Guo, 1997), where the subject *ni3* “you” has undergone RD to the end of the sentence after the sentence-final particle *le*.

1. *Bie2 xia1shuo1 le, ni3*
别瞎说了, 你
don't talk-nonsense PART you
“Don't talk nonsense.”

RD in SDM appears to occur with higher frequency and in more diverse structures than in

other dialects of Mandarin. What's more, many structures with RD appear to be ungrammatical in PTH but are commonly used in SDM. One example is (2), where the subject *ta1* “she” and the adverb *gang1gang1* “just now” have both undergone RD.

2. *Ku1 le ta1 gang1gang1*
哭 了 她 刚刚
Cry PART she just-now
“She cried just now.”

This study aims to investigate the potential types of RD found in Shandong Mandarin that are non-canonical in PTH, as well as the differences in acceptability among different types.

2 Methods

This study was conducted by questionnaire. The questionnaire included 46 sentences (31 targets, 15 fillers). Targets were divided into 7 types of RD (see Table 1) and 3 sentence structures (see Table 2). For each sentence structure, there was 1 declarative and 1 interrogative sentence. Fillers are sentences ungrammatical in both PTH and SDM. An example is given in (3).

3. **Ni3 wo3 neng2xie3 wan2*
*你 我 能 写 完
You I can write finish
na4 pian1 lun4wen2 ma
那 篇 论文 吗
that CL paper Q
xia4wu3jue2de?
下午 觉得?
afternoon think

Participants rated the acceptability of each sentence from 1 to 5 (1 = totally unacceptable, 5 =

Types of RD	Examples
Subject	Gang1gang1 ku1 le ta1. 刚刚 哭 了 她 Just-now cried PART she
Subject + Adverb	Ku1 le ta1 哭 了 她 Cried PART she gang1gang1. 刚刚 just-now
Subject + Adverb + Verb	Qu4 lü3xing2 wo3 去 旅行 我 Go travel I ming2tian1 da3suan4. 明天 打算 tomorrow plan
Subject + Adverb + Auxiliary + Subject of clause	Shui4guo4tou2 le 睡过头 了 Overslept PART wo3 hai2 yi3wei2 ni3. 我 还 以为 你 I Adv. thought you
Adverb	Ta1 ku1 le gang1gang1. 她 哭 了 刚刚 She cried PART just-now
1 st Verb	Wo3 ming2tian1 qu4 我 明天 去 I tomorrow go-to lü3xing2 da3suan4. 旅行 打算 travel plan
Adverb + Verb	Wo3 qu4 lü3xing2 我 去 旅行 I go-to travel ming2tian1 da3suan4. 明天 打算 tomorrow plan

Table 1: Types of RD with examples.

totally acceptable). In addition, participants who rated more than 3 fillers with a score higher than 2,

1 The highest rated filler is a fake interrogative sentence:

*kuai4le le ni3 ma xian4zai4?
*快乐 了 你 吗 现在
happy PART you Q at-present

2 This filler:

ta1 yi4 ben3 ke4wai4shu1
他 一 本 课外书
he a CL extracurricular-book

Sentence Structures	Examples
Plain sentences	Ta1 gang1gang1 ku1 她 刚刚 哭 She just-now cried le. 了 PART
Multi-verb sentences	Wo3 ming2tian1 da3suan4 我 明天 打算 I tomorrow plan-to qu4 lü3xing2 去 旅行 go travel
Sentences with embedded clause	Wo3 hai2 yi3wei2 ni3 我 还 以为 你 I Adv. thought you shui4guo4tou2 le. 睡过头 了 overslept PART

Table 2: Sentence structures with examples.

were excluded from the results. One filler was rated higher than 2 by around 24% of participants, which had the second highest rating out of all the fillers.¹ Because the structure of this filler was also similar to a possible sentence structure in Mandarin, it was excluded from the fillers as well as other analysis parts.²

In total 88 participants did the questionnaire. Participants are all Shandong natives, aged from 18 to 28 years old. Although some of them live outside Shandong at present, they all lived in Shandong until 18 years old, and they all speak PTH in their daily lives. 70% of them grew up in Zibo City, while others are spread out geographically. After exclusion based on the fillers, 63 valid questionnaires remained.

shang4zhou1mo4 mai3 le.
上周末 买 了
last-weekend buy PART

The filler's structure is [Subject + Object + Adverb + Verb], which is similar to a sentence with object fronting (i.e., Subject + Object + Verb) in PTH. Although it appears to be unacceptable to most of the participants, the similarity may have affected the rating to some extent.

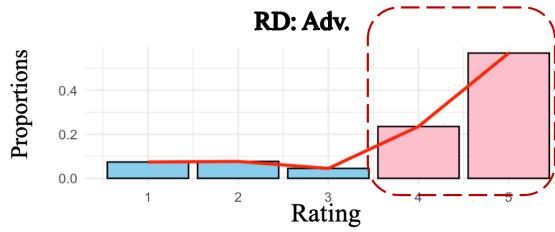


Figure 1: Acceptability ratings for RD of Adverb.

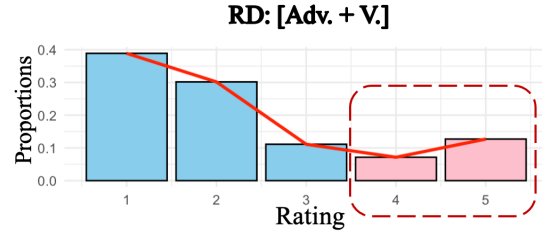


Figure 3: Acceptability ratings for RD of [Adverb + Verb].

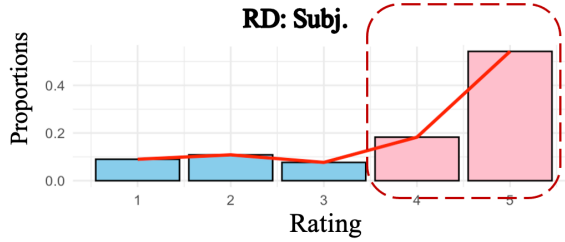


Figure 2: Acceptability ratings for RD of Subject.

Types of RD	mean	SD
Adverb	4.15	1.25
Subject	3.98	1.37
Subject + Adverb	3.62	1.55
Subject + Adverb + Auxiliary + Subject of clause	3.38	1.53
1 st Verb	3.29	1.47
Subject + Adverb + Verb	2.94	1.50
Adverb + Verb	2.25	1.37

Table 3: The actual means and standard deviations among different types of RD.

3 Results

Our findings indicate varying degrees of acceptability in SDM for the different types of RD investigated. RD of Adverb exhibits the highest level of acceptability (mean: 4.15; SD: 1.25; see Figure 1). Among the six conditions assessed varying in sentence structure and type (i.e., interrogative or declarative), four items had means exceeding 4.10. The remaining two items had means of approximately 3.91. In contrast, Standard Mandarin (PTH) typically positions the adverb before the verb (Ross & Ma, 2017:18-19). Putting the adverb at the end seems to be less common, especially in a written form. Therefore, while the RD of Adverb is seen to be acceptable within the usage of SDM, it deviates from the general grammatical standards of PTH.

Following the high acceptability of RD of Adverb, the data also showed RD of Subject to be well-received in SDM. The mean acceptability score for this category was 3.98 (SD: 1.37; see Figure 2). Of the six items investigated within this category, four yielded a mean of 4.00 or higher. One item registered a mean of 3.41, and another displayed a slightly lower mean of 2.97. The result shows a high degree of acceptability towards RD

of Subject in SDM. In contrast, the basic standard structure in PTH follows either an SVO or SOV order, as previously established by Li & Thompson (1974) and Light (1979). This means that for a basic sentence with subject, verb and object, the general word order should be SVO or SOV, instead of OVS or VOS. Putting the subject at the end seems to be uncommon³. RD of Subject in basic SVO structure was tested under the plain sentence structures, and all means of tested plain sentences were at least 0.14 points higher than those under the other two structures. This result indicates that, regardless of the difference in sentence complexity, RD of Subject is acceptable in SDM, although it is unusual in PTH.

In contrast, certain types of RD appear to be less acceptable. For instance, RD of [Adverb + Verb] had lower mean acceptability (mean: 2.25; SD: 1.37; see Figure 3). This category includes only two conditions (under multi-verb sentence structures) with means of 2.21 and 2.29 respectively; the other items under other structures were regarded as fillers. Table 3 gives all means

3 Although the example (1) mentioned such RD of Subject, the construction before the subject is an imperative sentence, in other words, the part before the subject is a completed sentence. Phenomenon like example (1) refers to adding an unplanned part to a completed sentence to fix the

omission problem (Chao, 1968). Conversely, in our experiment, the part of target sentences before Subject RD is not completed, which means it is not an independent sentence.

and standard errors of the different types of RD in descending order.

The influence of sentence structure on the acceptability of RD is also noteworthy. The plain sentence structure exhibited the greatest degree of flexibility for incorporating the various types of RD tested (mean: 4.22; SD: 1.23), which suggests a broad tolerance for RD. There were four types of RD among the items under this sentence structure. Specifically, the RD of [Subject + Adverb] originally comprised two items, each with 1 declarative and 1 interrogative sentence. However, due to some complications, there ended up being two examples for either interrogative or declarative sentences, totaling four items for this RD type. Seven out of the nine items had means exceeding 4.16, one item recorded a mean of 3.9, and another showed a mean of 2.75. Because a mean higher than 4.16 is in the top 30% highest scoring among all target sentences, seven items are in the top 30% rankings, which demonstrates a high acceptability of types of RD in plain sentences.

When compared to more complex sentence structures, such as multiple-verb sentences (mean: 3.32; SD: 1.55) and sentences containing embedded clauses (mean: 3.28; SD: 1.55), plain sentences maintain the highest mean ratings. The estimated marginal means (EMMs) were calculated in R to examine the outcome. A Cumulative Link Mixed Model (CLMM) was used, with the formula below. ‘Rating’ refers to scores of all items by participants; ‘Inverse’ is one of the fixed variables, referring to the seven types of RD; ‘Structure’ is the other fixed variable, referring to the three sentence structures; ‘Subject’ is the random variable, referring to tested participants.

$$model = Rating \sim Inverse + Structure + (1 | Subject)$$

The EMMs of this CLMM model suggest that the plain sentence structure has the highest predicted mean value, indicating a higher probability of acceptability for RD (emmean: 1.7631; prob.: 0.8536; see Table 4).⁴ This high probability is indicative of a higher degree of acceptance of various RD types in plain sentences compared to the other structures. The significant differences among the EMMs support that the plain sentence structure is the most acceptable one, followed by

Structure	emmean	SE	Prob.
Plain sentences	1.7631	0.217	0.8536
Multi-verb sentences	0.6766	0.200	0.6630
Sentences with embedded clause	0.0708	0.204	0.5177

Table 4: EMMs of different structures

Contrast	estimate	SE	p-value
Plain - Multi-verb sentences	1.087	0.129	<0.001
Plain sentences - Sentences with embedded clause	1.692	0.138	<0.001
Multi-verb - Sentences with embedded clause	0.606	0.120	<0.001

Table 5: Pairwise comparisons of different structures.

the multi-verb structure and the sentence with embedded clause is the least acceptable among the three (see Table 5), reinforcing the conclusion that sentence structure significantly influences the acceptability of RD types. In conclusion, the figure of calculated means and estimated marginal mean values suggests that the plain sentence has the highest degree of acceptance of RD with various RD types.

4 Summary of findings

There are some types of RD (i.e., RD of Adv., RD of Subj.) that show high acceptability in SDM but are ungrammatical in PTH based on the standard syntactic structure of Mandarin. Additionally, within SDM, there is a spectrum of acceptability among various RD types.

Moreover, the complexity of sentence structure plays a significant role in the extent of acceptability for RD. The simplest sentence form, which is the plain sentence structure (i.e., subject + predicate), shows the greatest openness to RD variation, receiving the highest acceptability scores in comparison to the other two structures. This suggests that the less complex the sentence, the more amenable it is to different types of RD,

back-transforming from the log-odds scale to the probability scale.

⁴ The EMMs from the CLMM model are presented on the log-odds scale. The values in the column labeled ‘Prob.’ refer to the predicted probabilities, which are obtained after

demonstrating the inverse correlation between the complexity of sentence structures and syntactic flexibility in SDM.

5 Conclusion and Discussion

The overall findings suggest that more types of RD are accepted in SDM than in PTH. One reason for this may be differences in pragmatic functions, for instance, whether RD that is only acceptable in SDM is for defocalization or emphasis. Previous research has argued that the RD of Subject in Cantonese serves to defocus the right-dislocated constituent (Lee, 2017). Since RD of Subject also occurs in SDM (e.g., (1)), it is plausible that a similar function exists in this language. Furthermore, as there are less well-studied types of RD, for example, [Subject + Adverb] (e.g., (2)), their pragmatic functions may be diverse (e.g., emphasis), and can be further investigated in future research.

The 2023 Postgraduate Research Symposium on Linguistics and Language Data Analytics provided valuable feedback for refining future experimental approaches. Here are some limitations of the experimental design that could be improved in future work. First, items in this study are contextually unrelated to each other. It may be better to use one original sentence as a base and apply different types of RD to it. For example, in the first two examples in Table 1, their original sentence order and content are the same, but what makes them different is the types of RD: Subject vs [Subject + Adverb]. Second, there were only one or two items under each condition. Because of this, the differences in lexical content or frequency within items may affect the rating to some extent. Rating differences among types of RD or sentence structures may therefore not be merely due to these factors. More items under each condition could generally reduce the impact of other potential differences. Additionally, the experiment was conducted in written form. However, an audio version may be more appropriate for this study. Because the use of RD is mostly observed in spoken language, and less in written form, the format could affect participants' perceptions. What's more, there is only one experimental group with Shandong natives. A contrast group of PTH speakers without SDM background should be conducted. If so, there will be a concrete result about whether tested sentences with RD are acceptable in PTH. Then, a clearer comparison can

be made between SDM and PTH in sentences with different RD types. If conducting contrast and supplement experiments with the four improvements, the results of this study may be clearer or different.

Acknowledgments

I would like to express my sincere gratitude to my supervisor, Dr. Henrison Hsieh, for his invaluable guidance, patience, and support throughout this research. His insights and expertise have been instrumental in shaping both the direction and outcome of this work.

I also wish to thank Dr. Yu-Yin Hsu, for her constructive suggestions and technical assistance that greatly enhanced the substance of this research.

References

- Yuen Ren Chao. 1968. *A grammar of spoken Chinese*. University of California Press.
- Jiansheng Guo. 1999. From information to emotion: The affective function of right-dislocation in Mandarin Chinese. *Journal of Pragmatics*, 31(9):1103-1128. [https://doi.org/10.1016/S0378-2166\(98\)00094-0](https://doi.org/10.1016/S0378-2166(98)00094-0).
- Tsz Ming Lee. 2017. Defocalization in Cantonese Right Dislocation. *Gengo Kenkyu*, 152:59–87. https://doi.org/10.11435/gengo.152.0_59
- Charles N. Li & Sandra A. Thompson. 1974. An Explanation of Word Order Change SVO→SOV. *Foundations of Language*, 12(2):201-214. <https://www.jstor.org/stable/25000832>
- Timothy Light. 1979. Word Order and Word Order Change in Mandarin Chinese. *Journal of Chinese Linguistics*, 7(2):149-180. <https://www.airitilibrary.com/Article/Detail?DocID=P20181204001-197906-201904110013-201904110013-149-180>
- Claudia Ross & Jing-heng Sheng Ma. 2006. *Modern Mandarin Chinese Grammar: A Practical Guide*. Routledge.

A Corpus-based Study on the Use Bias of “了” in the Written Chinese Language of Elderly Hearing-impaired Children

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Abstract

Written expression is the “fairest” way of communication between hearing impaired children and typically developing children, and “了” plays an important role in written expression and is used frequently. In this paper, we use survey and corpus research methods to systematically investigate the usage bias of the dummy word “了” based on a limited scale self-built corpus of the written language of these children, taking the grammatical meaning and pragmatic function of the word in the written language of typically-developing children as a reference. And we further analyze the specific causes of the bias in the use of “了” in the light of the special characteristics of hearing-impaired children’s language variants, with a view to better solving the problem of the correct use of the dummy word “了” by hearing-impaired children and the related language acquisition problems.

1 Introduction

Hearing impairment is one of the common birth defects in newborns. The results of the second national sample survey on persons with disabilities show that the existing number of hearing-impaired (HI) children between the ages of 0 and 6 in China is 137,000, with about 23,000 new children added every year (Sun Xibin et al, 2008). Hearing impairment in newborns is prone to cause delay in children’s speech development, which is a common disease leading to the occurrence of speech disorders.

At this stage, there are few studies on the relationship between hearing impairment and language disorders. Taking CNKI as an example,

we searched 156 relevant papers with “hearing impairment” and “language disorder” as the subject terms. According to Guo Xuehui and Wang Zhiqiang’s (2020) review of 26 papers, there is a wealth of research on the grammar of written language for HI children. However, there is no specific study on “了” in these papers, which shows that this area needs to be further explored.

These children have incomplete phonological acquisition due to hearing loss, so written expression is the “fairest” way for them to communicate with typically developing (TD) children, especially for the older HI children, whose cognitive and vocabulary acquisition has reached a certain level, and the improvement and development of their language ability is more reflected in the use of written language. However, existing research shows that their overall written expression lags behind that of their peers (Shen, Yulin, 1998), reflecting a generalized problem with written language use.

Both TD children and HI children acquire “了” early and have the cognitive ability to understand its grammatical meaning and pragmatic function. However, the use of the dummy word “了” by older HI children with is still a common error in written language use. Therefore, this paper takes the dummy word “了” as the object of investigation, extracts and analyzes “了” from the self-built corpus of the written language of senior HI children, and investigates the bias in the use of “了” and the reasons for it.

1.1 The Functional Meaning of “了”

The dummy word “了”, with its variable syntactic position and complex grammatical meaning, has always been one of the research hot spots in linguistics. At this stage, the linguistic community

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widely agrees with the “dichotomy” of the lexical nature of “了”, that is, “了” is considered to be both a dynamic auxiliary and an intonational lexical nature.

1.1.1 Dynamic Auxiliary

When “了” is used as a dynamic auxiliary, it is mostly used after adjectives and verbs to indicate that the state or action in the sentence has become a fact, and it is the mark of “completed dynamic” in the category of dynamic in Chinese, which can be put in the middle and at the end of the sentence.

Example:

A. 船长想起了那个激动地蹦跳的船员，不由得皱了一下眉头。【MC²】

B. 瞎猫碰着了死老鼠。【MC】

The word “了” in A. indicates that both actions of “想起” “皱” have been realized, and B. indicates that the state of “碰着” has become a fact (Huang Borong and Liao Xudong, 2017).

1.1.2 Modal Particle

The modal particle “了” is used to express a declarative and imperative tone, and grammatically serves to end a sentence, which can indicate that a new situation has arisen or is about to arise, and can only be used at the end of a sentence. Unlike the dynamic auxiliary “了”, it can be preceded by a noun. Moreover, researchers believe that the end-of-sentence intonation “了” can make the linguistic structure of the bare-bones adjective as a predicate self-sufficient (Kong Lingda, 1994).

C. 树叶黄了。【MC】

D. 别说话了。【MC】

In Example C, “了” is used in a declarative tone to indicate that the new situation of “黄” has already appeared, making the linguistic structure of the adjective as a predicate self-contained and serving to end the sentence. “了” in example D. is used in an imperative tone (Huang Borong and Liao Xudong, 2017).

It is important to note that the verb followed by the final “了” may also be a contraction of the auxiliary and intonational forms.

E. 自行车他骑走了。【MC】

F. 枫树的叶子红了。【MC】

In the above examples, “了” is placed after a verb or adjective to indicate both the realization of an action or trait and a change of state of affairs (Huang Borong and Liao Xudong, 2017).

1.2 The Rules for the Use of “了”

Because of its complex grammatical meaning and pragmatic function, the dummy word “了” should be carefully avoided when co-occurring with other syntactic components, so as not to result in an unqualified sentence.

1.2.1 The Dynamic Pairing of “了”

Referring to Wu Chunxiang’s (2003) categorization of dynamics, the dynamic auxiliary “了” is a marker of “completed dynamics”, so it generally cannot co-occur with dynamics that indicate that the action is not completed, and there are two main types of dynamics that conflict with it: future dynamics and ongoing dynamics. Such as:

Future dynamics examples: 明天我弟弟上学了, 他也没有放假呢。(Error) 【A limited scale self-built corpus】

Ongoing dynamics examples: 中午, 我在睡觉了。(Error) 【A limited scale self-built corpus】

It should be noted that these types of conflict are not absolute and need to be judged according to the context and the specific semantic function of “了”. The word that needs to be judged for dynamic conflict is a dynamic auxiliary, not an end-of-sentence intonation. In addition, the presence of the relevant marker does not necessarily indicate the dynamic, but has to be judged according to the context.

1.2.2 “Reappearance” of “了”

We refer to the occurrence of “了” twice or more in a sentence as a reappearance of “了”. Reappearances are generally justified when “了” assumes different functions and denotes different meanings.

² Huang Borong and Liao Xudong. 2017. Modern Chinese (6th updated edition). Higher Education Press.

Example: 他掌握了三门外语了。(Correct)

【MC】

The two “了” in the sentence take on different functions. The first one is a dynamic auxiliary, indicating that the action “掌握” has been completed. The final “了” is a modal marker, which is an affirmative, emphatic statement of the information “三门外语”.

When several “了” indicate completion, it is necessary to satisfy the following: firstly, all actions have been completed. Secondly, there exists some logical relationship between the actions. Otherwise, there will be a redundant reappearance of “了”.

Example: 看见了妈妈厨房做饭了。(Error)

【A limited scale self-built corpus】

In this sentence, “看见了” should be followed by an objective fact or the result of an action or behavior, and “妈妈做饭了” is a process of change, and the two are in conflict with each other, resulting in the redundancy of “了”.

2 Methods

2.1 Participants

The researchers selected senior HI children in grades 7 to 9 with some written expression skills from special education schools in Yantai City, all of whom were between 15 and 19 years old. Forty-two subjects were included in this study, of which 23 were girls and there were 19 boys. The study tried to average the number of subjects in each grade as much as possible by selecting 12 subjects in the 7th grade, 14 subjects in the 8th grade and 16 subjects in the 9th grade.

2.2 Materials

The present study was conducted based on a limited scale self-built corpus of written language of HI children in the upper grades, which consisted of the subjects' essays and diaries. After excluding teacher comments and those judged to be plagiarized, 338 diaries and essays were included in the study, for a total corpus of 68,069 words.

2.3 Procedure

The researchers visited special education schools, searched and collected written materials of senior HI children who met the requirements, and

categorized and organized these materials to form a corpus of senior HI children's written language. Then, the corpus was studied: first, we took the grammatical meanings and pragmatic functions realized by the dynamic auxiliaries and intonational lexemes of “了” as references, and made subjective breaks for sentences in the corpus in which “了” appeared but there were no punctuation breaks, and categorized them in order to achieve the categorical extraction of them. Second, dynamic auxiliaries that can be used as typical dynamic markers as well as common end-of-sentence modal particles were grasped and their numbers were compared with the number of “了” respectively. Finally, we extracted “了” from various perspectives, including distribution, words, sentences and misuse, and compiled the data.

2.4 Data

2.4.1 The Number of End-of-sentence Inflections

We counted the number of sentence-final modal particle in the corpus, and arranged them in order of number. We found that the number of intonational word “了” is 1252, which is the highest number. The highest number of other modal particle is “吧” with 130, and the lowest number is “喽” with 2. See Figure 1.

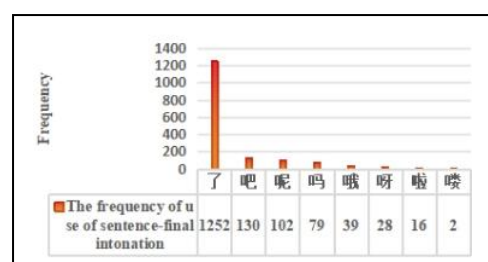


Figure 1 The frequency of use of sentence-final modal particle

2.4.2 The Number of Typical Dynamic Markers

In Modern Chinese, there are “着” “了” “过” typical dynamic markers. We have counted the number of them separately, among which “了” has the highest number of 1,452, as shown in Figure 2.

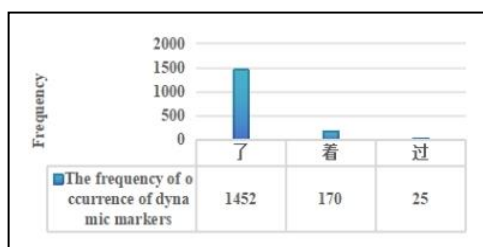


Figure 2 The frequency of occurrence of dynamic markers

2.4.3 The Statistics and Categorization of “了”

In the corpus, we counted a total of 1,946 words for “了”, accounting for 2.85% of the total number of words in the corpus. Among them, 694 appeared in the middle of the sentence and 1,252 appeared at the end of the sentence. Among the end-of-sentence “了”, 494 are modal particle and 758 are modal particle and dynamic auxiliaries. The specific weights are shown in Figure 3 and 4.

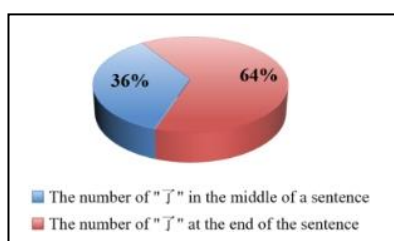


Figure 3 The proportion of “了” in different positions

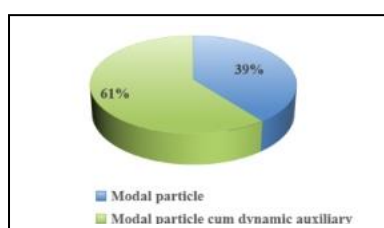


Figure 4 The proportion of “了” at the end of sentences with different lexical properties

3 Results

As can be seen from Figure 1 and 2 in the data section, in the self-constructed corpus, “了” whether as a sentence-final intonation or a dynamic auxiliary has a tendency to be used in a disconnected high-frequency manner compared with other common modal particle and typical

dynamic markers, which suggests that a bias in the use of the word does exist.

In the following, we further analyze “了” from four perspectives: distribution, word, sentence and bias, and derive its different levels of bias manifestation based on the data.

3.1 The Distributional Characteristics of “了”

The bias in the use of “了” is firstly reflected in the distributional features, which are as follows: firstly, there is a frequency bias in the use of the word. Secondly, the position of “了” is end-of-sentence biased. The following is a sequential description.

3.1.1 The Frequency Bias in the Use of “了”

The use of “了” is overused in the written language of senior HI children. The specific manifestation is that the word is used too densely in the written language, and some subjects showed a tendency of sentence by sentence. According to the data, the total number of it accounts for 2.85% of the whole corpus. In other words, there is one “了” in an average of 34 words, which is much more frequent than that of TD children.

Example 1:

今天我起床了，我去洗脸、刷牙、换衣服，换好了。

中午妈妈带弟弟去英语课了，我在家好无聊呢？我问问我妈妈，电脑呢？妈妈同意给我玩电脑了，下午我高兴了。

晚上我妈妈回来了，我好饿了，妈妈去做饭了，吃完饭去睡觉了。

明天精神去学校了。

The total number of words in this text is 111, and the number of “了” is 10, which is about 9.01% of the total number of words, i.e. an average of 11 words with one “了”. The diary can be divided into 14 sentences, and there are 10 sentences containing the word, accounting for 71.43% of the total number of sentences, i.e. an average of 1.4 sentences with it. Most of the single sentences in the example sentences end with “了” except for a few “呢”.

3.1.2 The End-of-sentence Bias in the Use of “了”

We analyzed the positional bias of “了” according to Figure 3 in the Data section, and found that the older HI children tended to place the word at the end of the sentence in their written language, adopting sentence-final inflectional or dynamic auxiliary-cum-inflectional usage of the word. In both uses, as shown in Figure 4, they tend to use a combined form of both uses of the word.

3.2 The Biased Characterization of “了” at the Word Level

These children also show a bias towards the use of the word “了” in their use of words. This is reflected in the use of colloquialisms and “fixed collocations”.

3.2.1 The Habitual Attachment of “了” in Spoken Words

Further analyzing the relationship between “了” and words, the researcher found that there were 253 spoken words in the written vocabulary of the older children with hearing loss (HL), such as “完了” “讲了” “批了” “乱了” and so on, and that they were used with the habitual apposition of “了”. All these habits make these children's written words ultimately show a spoken character.

Example 2: 我常常提醒他, 他还不听了。

(Correct)

Example 3: 写完后给祝老师批了, 都没错了。

(Correct)

Example 4: 还有三个问题不会, 等老师讲了, 最后我学会, 就可以补写。(Correct)

Example 5: 再到一年级开始军训了……一年级完了, 到二年级了。(Correct)

Example 6: 我看到家乱了, 我忍不住去做家务, 快完了的时候, 正巧看见……(Correct)

The above examples are colloquial expressions with the word “了” appended to the colloquial word. The use of these colloquial words is grammatically correct, but not formal and appropriate. The words “听了” “批了” “讲了” “完了” “乱了” can respectively be replaced by “听劝” “批改” “讲解” “做完” “杂乱无章” or other words, the expression of a more written, more in line with the style of language.

3.2.2 Form “Fixed Collocations” by Concatenating “了” with Common Verbs

The Chinese language has a rich variety of fixed collocations, including idioms, common sayings and so on, and the components of fixed collocations are used in a conjunctive way and cannot be separated. However, a special kind of “fixed collocation” is found in the written expressions of the elderly HI children: usually some common one- or two-syllable verbs are conjugated with “了” to form a fixed usage, which is used in a high-frequency way.

The main “fixed collocations” in the corpus are “来了” “到了” “看到了” “说了”, these examples of verbs combined with “了” are commonly used in everyday expressions, and indicate something that is often done. They are repeated with high frequency in the written language of older HI children, as shown Figure 5.

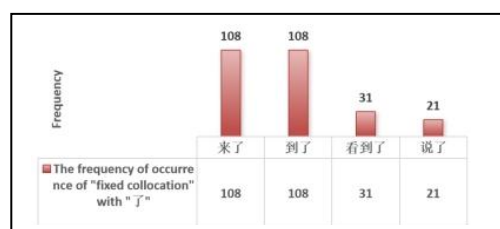


Figure 5 The frequency of occurrence of “fixed collocation” with “了”

Take “来了”, which occurs more frequently in the corpus, as an example. “来了” is an action that is often seen or made in daily life, and it occurs as many as 108 times in the written language of senior HI children. According to the statistics, 86.11% of “来了” is correct, while 13.89% is inappropriate. Take for example the following three sentences:

Example 7: 今天下午我看见叔叔摩托车来了接我回家。(Correct)

Example 8: 中午下雨了叔叔来了到我家。(Error)

Example 9: 做完饭, 等姑姑和姑父来了一起吃饭, 看, 七点了, 他们没来了, 奶奶和爷爷在看电视, 爸爸睡觉了。(Error)

Although there is no grammatical error in Example 7, if “了” is split and moved to the end of the sentence (i.e. “今天下午我看见叔叔摩托车来接我回家了”), it means that the act of “接我

回家” is also included in the completion dynamic, which is more in line with Chinese expression habits in context. In Example 8, the sentence structure is more reasonable and the semantic meaning is clearer if we split the word “来了” and move the word “了” to the end of “到” (i.e. “叔叔来到了我家”). Similarly, in Example 9, the word “了” is deleted from “来了”.

3.3 The Biased Characterization of “了” at the Sentence Level

The written sentences of the older HI children showed a significant tendency to be colloquial, differing greatly from those of children of the same age, and it has been shown that most of the students with HL were far less proficient in written language than their peers (Shen Yulin, 1998). This is reflected in the use of “flowing sentences” and short sentences, which show a tendency to use the word “了”.

3.3.1 “Flowing Sentence” Often End with “了”

“Flowing sentence” is a special kind of intensional compound sentence with no associated markers, a case of dividing successive events into different equal clauses. Lv Shuxiang (1979) characterized running sentences as “one small sentence after another, with a lot of places that can be disconnected or connected”.

According to the statistics, “flowing sentences” appeared in 36 articles, which accounted for 10.65% of the total number of articles, indicating that this type of sentences appeared more frequently in the corpus and that these children used to end their sentences with “了”.

Example 10: 再到一年级开始军训了, 有点可爱, 不过做的还可以的, 一年级完了, 到二年级了, 大家看二年级做的好不好呢? 二年级开始做吧, 二年级做得一般, 到三年级开始了做完了。到四年级开始做操了, 做完了, 到五年级了, 但是做的一般的。到六年级做的认真, 做的太漂亮了。到七年级做非常好的。到八年级做操非常认真的, 结束后, 到大年级了, 我准备活动, 准备上场了, 我们有点紧张的, 但是我们学会了放松点呢。(Correct)

The above example is like a detailed list of events, roughly recording everything, big or small, in chronological order within the time period. Most of the changes or actions recorded have already taken place or been completed, so the use of “了” to indicate “a change in the situation” or “the completion of a development” is naturally more frequent.

3.3.2 Short Sentences Are Often End with “了”

In the written language of TD children of the same age, more complex sentence structures are often used to express more comprehensive and in-depth information, showing the characteristics of formal corpora. In the self-constructed corpus, there are 78 chapters using short sentences, accounting for 23.08% of the total number of articles, showing a tendency of excessive frequency of short sentence use in senior HI children, and these sentences are end with “了”.

It is important to note the difference between flowing sentences and short sentences in the corpus: Flowing sentences show more meaning relations between sentences and clauses, and most of them are short sentences, but short sentences highlight more the formal features of the sentences themselves.

Example 11: 回家的路上。我困了, 睡着了, 到了奶奶家, 我醒了。(Correct)

Example 12: 我继续写作业, 终于写完了, 等到中午, 爸爸做焖面, 做完了, 吃完了, 我洗澡, 洗完了, 准备书包, 爸爸去洗澡, 我准备好了, 玩一会儿手机, 玩完了, 我们出发了。(Correct)

The two examples above show a strong tendency to express themselves in short sentences with little information, no description of actions or events, and a tendency to break the sentence with the word “了” after the short sentence. TD children can describe details in more complex sentences, but this is not reasonably evident in the diaries of older children with HL.

3.4 The Significant Redundancy Features in the Misuse of “了”

Based on the collocation rules of “了” mentioned above, we examined the collocations of it in the

self-built corpus, and found that this word is prone to incorrect collocations with other dynamics. Moreover, the repetition of “了” is prone to produce bias. Examples are given and analyzed below.

3.4.1 The Conflict Redundancy between “了” and Proceeding Dynamics

In terms of the type of co-occurrence of “了” with other dynamic categories, the dynamic conflict of the word in children with HL is centered on the co-occurrence with proceeding dynamics.

The temporal adverbs “正” and “在” precede the verb to indicate that the action is in progress. According to further statistics, it can be seen that in the 96 sentences with such dynamic marking, there are 7 times when “了” co-occurs after the verb, which causes semantic conflict and is manifested in the redundancy of “了”. Such as:

Example 13: 祝老师和梁利玮妈妈在商量了梁利玮的事。(Error)

Example 14: 今天上午我们在等父母来了, 8:00集合, 我们就下楼了。(Error)

Example 15: 现在我正在写作业了, 但是我弟弟不听话, 不写作业, 我真烦他。(Error)

In the above three examples, the sentences contain the signs “正在” or “在” which indicate that the action is in progress, so the sentence cannot have “了” which is used as a dynamic auxiliary to indicate that the action is completed, otherwise there will be a semantic conflict, resulting in the redundancy of “了”.

3.4.2 The Redundant “Reappearance” of “了”

The occurrences of “了” two or more times in a sentence are considered to be “reappearance”, some of which are linguistically justified, but others are redundancies. According to our statistics, children with HL show significant redundancy in the repetition of “了”: out of 47 reappearances of “了”, 24 are incorrect, i.e. 51.06% are redundant.

Example 16: 正好打开门, 看见了妈妈厨房做饭了。(Error)

Example 17: 今天上午, 第三节课, 我看见了灯亮了。(Error)

Example 18: 我看见了段老师来了。(Error)

The same type of error is found in all three sentences, so only example 17 is explained, “看见了” should be followed by “an objective fact or the result of an action or behavior”. “灯亮了” indicates a new situation, a “process of change”, the two are in conflict, and there is a redundant recurrence of “了”.

4 Discussion

In this study, we found that older HI children have a tendency to use “了” extensively in written language. Analysis of the data revealed that these children usually used the word to complete sentences, that the use of “了” is frequent in spoken expressions, and there is often redundancy in the use of it when it is a dynamic auxiliary.

Based on the bias in the use of “了” and the general pattern reflected in the data, we consider that it is caused by the specificity of the language use by HI children, which is analyzed separately below.

4.1 The Incomplete Acquisition of the Grammatical Function of the “了”

In modern Chinese, the grammatical meaning and rules of use of “了” itself are very complicated, it commonly used in Chinese but difficult to master, and even children who are native speakers of Chinese often make mistakes in its use. In addition, as light-reading fictitious words, they usually do not carry strong phonetic stress, so they may be more difficult to capture and understand for children with HL. For these children with low language acquisition ability, the discrepancy between language ability and the difficulty of acquiring “了” leads to incomplete acquisition of the grammatical function of the word, which in turn causes HI children make errors when co-occurring with other sentence components, of which the redundancy bias is more obvious, and it is necessary to explain the reasons for it separately.

4.1.1 Reasons for Conflict between “了” and Proceeding Dynamics

Around 5.5 years old is the critical period for children to acquire Chinese grammar and understand abstract vocabulary. Older HI children have learned the significance of the completion

dynamics of “了”, but they have not learned the rules of combining it with other dynamic categories, which leads to the conflict between “了” and the proceeding dynamic, resulting in the production of substandard sentences.

4.1.2 Reasons for the Redundant Reappearance of “了”

The presence or absence of “了” triggers a change in the verb’s collocations. The redundant reappearance of “了” in written language is caused by the incomplete acquisition of the rules of reappearance by children with HL, for example in Example 16, “正好打开门, 看见了妈妈厨房做饭了。” This is a temporal confusion caused by the redundant reappearance of the word.

4.2 Discourse Motivation Drives the Formation of Expressive Strategy Generalization

“了” functions as a sentence finisher, and HI children generalize the pragmatic function of it in their sentence expressions. The sentence ending device of “了” is effective in competent sentences, but these children tend to overemphasize this function of the word, resulting in a generalization of the expressive strategy, which, in turn, leads to the production of unqualified sentences.

In addition, these children can’t free to complete sentences with tone, so the use of modal particle becomes the “preferred” means. “了” is acquired earlier and used more frequently in childhood, also resulting in the generalization of the function of “了” to end sentences.

As we can see from the above, the high proportion of “了” in 2.85% of the total number of words in the whole text and the occurrence of one “了” in an average of 34 words in HI children, as well as the irrational sentences caused by the tendency of sentence-by-sentence use in some of the subjects, which are practical manifestations of the word’s functional generalization.

4.3 Low Level of Vocabulary Acquisition Leads to Colloquialisms in Written Language

As a result of hearing loss, HI children face constraints such as language input limitations and differences in language environments, and their vocabularies are limited, which directly results in their written language showing significant colloquial features. Therefore, the tendency of

colloquialization in written expression is one of reasons for the excessive use of the imaginary word “了”.

The spoken language of these children is manifested in various aspects of language: firstly, they make extensive use of colloquial words in their texts. Secondly, sentence expressions are mostly in the form of short sentences. Finally, their early narratives rely heavily on “flowing sentence” forms. As mentioned earlier, these colloquializing tendencies lead directly to the “了” bias.

Code-switching Causes Sign Language Pragmatic Transfer

HI children use both vocal and sign language fluently, and often code-switch in communication, so it is easy to form means of expression transfer. In these children’s acquisition of Chinese, a verbalized language, is characterized by the pragmatic transfer of sign language to Chinese. Since sign language includes the meaning of the virtual words in the gestures of other words, HI children often omit the virtual words (Gao Yanyi, 2018), including the associative words (Ni Jidong, 2011). As a result, these children lack the means to connect sentences with associative words, this is one of the reasons for the expression of flowing sentences.

As a language of spatial immediate expression, manual sign language, for the sake of simplicity of expression, a large number of phrases, pauses, omission and pointing forms occur when using gestures for expression (Gao Yanyi 2018). This linguistic characteristic creates a tendency for HI children’s written expressions to make extensive use of colloquial sentences such as short sentences.

Conclusion

The research confirmed that “了” in the penmanship corpus of senior HI children, both as a sentence-final intonation and dynamic auxiliary, showed a disconnected high-frequency use compared to other intonation and typical dynamic markers, so there was indeed a usage bias. As we can see by the data, which was manifested in three ways: firstly, the frequency of use was high, and the subjects showed a tendency to use the word in a sentence-by-sentence manner. Secondly, at the linguistic level, the tendency to use “了” in large quantities is reflected at both the word and sentence levels. In terms of words, there is a large

number of spoken words, and forming “fixed collocations” between common verbs and “了”. In the terms of sentence, it is reflected in the extensive use of flowing sentences ending with the word and short sentences end with it. Thirdly, in terms of misuse, it reflects the redundancy in the use of it. This is manifested in the conflict between the word and the proceeding dynamics and in its redundant repetition.

After existing studies, there are several reasons that may be analyzed: first, the acquisition of “了” is incomplete in older HI children. Second, linguistic motivation contributes to the generalized use of the word’s sentence-ending function. Third, the low level of vocabulary acquisition leads to the oralization of written language. Finally, the code-switching of HI children resulted in the negative transfer of sign language to Chinese.

Therefore, by studying “了” in written language, it helps us to understand more intuitively the language ability and cognitive characteristics of HI children, and provides a theoretical basis for the improvement of their written language ability. At the same time, it helps to enrich the study of written language of speech-impaired children, and it also helps to enrich the study of Chinese dummy words.

References

- Chen Fengyun. 2008. *On Acquisition Characteristics of Chinese Predicate —object Structure in Deaf Children*. Chinese Journal of Special Education, 2008(1):50-55.
- Fan Xiaolei. 2021. *The Tense-aspect Function and Phase-complement Function of “Le 2” in Mandarin*. Language Sciences, 20(01):60-75.
- Fang Junming and He Dafang. 2003. *A Study of Chinese Sign Language of Deaf People Using Functional MRI*. Chinese Journal of Special Education, (02):52-59.
- Gao Yanyi. 2018. *Research on Errors of Chinese Written Language of Hearing-impaired Students*. Jilin University.
- Gu Qinxin. 2016. *Analysis of the Results of 129,306 Cases of Newborn Hearing Screening*. Contemporary Medicine, 22(09):163-164.
- Guo Xuehui and Wang Zhiqiang. 2020. *A Review of Research on Written Grammar Bias in Deaf Schools for Students with Hearing Impairments*. Journal of Suihua University, 40(01):35-38.
- Huang Borong and Liao Xudong. 2017. *Modern Chinese (6th updated edition)*. Higher Education Press.
- Kong Lingda. 1994. *Linguistic forms that affect sentence completeness in Chinese*. Studies of the Chinese Language, 6, 434-440.
- Liang Xu. 2014. *Development and Training of Written Language Skills for Hearing Impaired Students*. Ability Wisdom, (07):63.
- Lv Shuxiang. 1979. *Problems of Chinese Grammatical Analysis*. Beijing: The Commercial Press.
- Ni Weidong. 2011. *A Survey and Analysis of the Omission of Written Language by Deaf Students*. Bulletin of Chinese language teaching, (03):56-58. DOI: 10.13525/j.cnki.bclt.2011.03.012
- Ni Yu. 2013. *Research on the Modal Particles of Modern Chinese at the End of a Sentence and Pragmatic Function*. Journal of Mudanjiang College of Education, (03):19-21.
- Shen Yulin. 1998. *Introduction of Bilingual Teaching in Schools for the Deaf*. Chinese Journal of Special Education, (4): 36-38.
- Sun Xibin, Yu Limei, Qu Chengyi et al. 2008. *An epidemiological study on the hearing-impaired population identified in China and proposed intervention strategies*. Chinese Scientific Journal of Hearing and Speech Rehabilitation, (02):21-24.
- Tang Wenyan. 2010. *Research about Syntax of Written Language of Hearing-impaired People*. East China Normal University.
- Wan Bo. 1996. *A Review of the Study of Aspect Categories in Modern Chinese*. Journal of Jiangxi Normal University (Natural Sciences Edition), (01):22-26.
- Wu Chunxiang. 2003. *The Aspect of Contemporary Chinese and the Serial Verb Construction of Serial Action*. Yanbian University
- Wu Ling. 2007. *A Study of Learning Difficulties in Written Language of the Deaf*. Chinese Journal of Special Education, (05):33-37.
- Xu Zhao. 2021. *On the Functions of “le” Based on the Event Domain Cognitive Model*. Chinese Language Learning, (04):54-62.
- Zhang Fan. 2015. *The Syntactic Analysis of Degree Adverb “very” of Hearing-Impaired Students*. Modern Special Education, (16):30-33.