INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN PROGRESSIVE EDUCATION & DEVELOPMENT

OPEN ACCESS JOURNAL

Vol 14, Issue 2, (2025) E-ISSN: 2226-6348

Gender Differences in Reading Interests among High School Students and their Impact on Chinese Language Achievement: A Quantitative Analysis Using a Three-Dimensional Classification Model

Liu Chunyan, Assoc. Prof. Dr. Nurfaradilla Binti Mohamad Nasri

Faculty of Education , Universiti Kebangsaan Malaysia, Bangi, Selangor, Malaysia

Email: p142726@siswa.ukm.edu.my

Corresponding Author Email: nurfaradilla@ukm.edu.my

To Link this Article: http://dx.doi.org/10.6007/IJARPED/v14-i2/25187 DOI:10.6007/IJARPED/v14-i2/25187

Published Online: 24 May 2025

Abstract

Chinese language education is a cornerstone of China's basic education system, pivotal not only for language skill development but also for enhancing students' cultural literacy and cognitive growth. However, a persistent challenge is students' lack of interest in reading, which adversely affects learning outcomes. Prior studies suggest that gender differences may influence reading interests and Chinese language achievement, with female students often outperforming males, particularly in middle school. Yet, whether reading interests mediate the relationship between gender and achievement remains underexplored. This study empirically investigates the interplay among gender, reading interests, and Chinese language achievement, offering evidence-based insights for pedagogical practice. We developed a three-dimensional reading interest framework—"Emotional-Imagery," "Logical-Analytical," and "Integrative-Practical"—to categorize students' reading preferences. Data were collected via a survey of 370 undergraduate students from a university in Heilongjiang Province, yielding 329 valid responses. Analytical methods included t-tests, Pearson correlation analysis, and Bootstrap mediation analysis to ensure robust and reliable findings. Results revealed significant gender differences in reading interests: males scored higher in "Logical-Analytical" ($p < 0.001$) and "Integrative-Practical" ($p < 0.001$) types, while no significant difference emerged in "Emotional-Imagery" ($p = 0.463$). Only "Emotional-Imagery" interests showed a significant positive correlation with Chinese language achievement ($r = 0.110$, $p < 0.05$). Gender exerted a significant total effect on achievement ($p = 0.011$), but the indirect effects via reading interests were nonsignificant (95% CI included 0), with the model explaining limited variance ($R^2 = 0.052$), suggesting other factors may predominate. We recommend educators prioritize cultivating "Emotional-Imagery" reading interests, such as through emotionally resonant literature, and adopt gender-tailored teaching strategies. Schools should also promote reading engagement through targeted activities. Future research should broaden sample diversity and incorporate additional variables (e.g., family background, motivation) to elucidate the mechanisms driving Chinese language achievement.

Keywords: Gender Differences, Reading Interests, Chinese Language Achievement, Mediation Effect, Teaching Strategies

Introduction

Background of the Research

Chinese language education occupies an irreplaceable position within China's basic education system. It serves as the primary avenue for developing students' linguistic skills while also conveying humanistic values through literary works, fostering a deep understanding of life (Sun, 2020). However, a prominent challenge confronts current junior high school Chinese language teaching: students' reading interest remains widely insufficient. Research by Han (2020) reveals that Chinese students exhibit low enthusiasm for reading, a trend that directly hampers improvements in their Chinese language grades and the fulfillment of educational goals. The *National Medium- and Long-Term Education Reform and Development Plan (2010-2020)* emphasizes that reading literacy forms a critical foundation for students' holistic development, yet this lack of interest has emerged as a major obstacle to enhancing educational quality (Gov, 2010). International assessments further underscore the universality of this issue. For instance, the PISA 2009 results show that male students in Shanghai scored 40 points lower than their female peers in reading, while the OECD average gap stands at 39 points, indicating that gender disparities in reading interest and proficiency constitute a global concern (Chen & Liu, 2011). This challenge not only affects students' academic performance but may also hinder the long-term development of their cognitive and emotional competencies, warranting in-depth investigation and strategic intervention.

Gender Differences in Reading Interest and their Impact on Chinese Language Achievement

Gender differences are pronounced in students' reading interests and behaviors and further influence Chinese language achievement through the mediating role of interest. Carmichael and Hay (2009) observed that Australian secondary school students display gendered preferences: females tend to gravitate toward texts involving personal and social themes, while males favor materials related to technology and sports. Jabbar and Warraich (2022) confirmed this through a systematic literature review, reporting that females engage more frequently and enthusiastically in leisure reading—especially fiction—whereas males prefer factual and informational content. According to PISA findings, differences in reading interest and strategy explain a significant portion of the gender gap in reading performance across most countries and regions. Data from Shanghai reveal that females outperform males across all three reading dimensions— "access and retrieve," "integrate and interpret," and "reflect and evaluate" (Chen & Liu, 2011). Chen and Zhang (2024) further demonstrated a strong link between reading interest and learning motivation, noting that students with lower interest often fall behind in language development, while highly motivated students are approximately 20% more engaged in reading, yielding notably better academic outcomes. In China's Gaokao, reading comprehension and literary analysis constitute key components, and students with insufficient interest tend to perform poorly in these sections (Sun, 2020). Moreover, physiological brain differences may partly account for this disparity: studies suggest that females exhibit more balanced development across language centers and reach reading proficiency earlier, whereas males tend to rely on sensory processing and mature later (Shanghai Academy of Educational Sciences, 2011). Collectively, these findings indicate that the mechanism by which gender differences affect Chinese language achievement through reading interest merits further exploration.

Research Gaps and Objectives of the Present Study

Although existing literature has documented gender differences in reading interests and Chinese language performance, few studies have systematically examined the underlying mechanisms within the context of junior high school education in China. Prior research (e.g., Carmichael & Hay, 2009; Jabbar & Warraich, 2022) has explored the relationship between gender and academic achievement, as well as between reading interest and learning outcomes, yet seldom has the mediating pathway— "gender → reading interest → Chinese language performance"—been comprehensively validated. PISA data indicate that 6.6% of male students in Shanghai fall below Level 2 in reading literacy, compared to just 1.6% of females. Reading interest and strategies explain only 33.3% of this gender gap, suggesting that additional factors—such as physiological, psychological, or educational environment variables—remain insufficiently examined (Chen & Liu, 2011). This gap limits our understanding of the deeper mechanisms at play and hinders the development of targeted instructional strategies. In response, this study aims to empirically examine how gender differences influence Chinese language achievement through the mediating role of reading interest among high school students. We propose a three-dimensional classification framework— "Emotional-Imagery," "Logical-Analytical," and "Integrative-Practical"—to categorize reading interests. By aligning this framework with the realities of Chinese language instruction, the study seeks to quantify gender-based differences in reading preferences and map their influence pathways. Beyond addressing theoretical gaps, this research intends to offer data-driven insights to support differentiated teaching strategies, enhance student interest and reading literacy, and contribute to the educational goals outlined in the *National Medium- and Long-Term Education Reform and Development Plan (2010–2020)*.

Literature Review and Theoretical Framework

Mechanisms of Gender Differences

Gender differences in language-related academic performance emerge from a multifaceted interplay of neurobiological and sociocultural mechanisms. Extensive empirical research has shed light on how cognitive processing, neural structures, and societal expectations dynamically interact to shape these differences. For instance, Kimura (2000) found that females excel in emotional processing and linguistic nuances, an advantage attributed to their more intricate neural network connectivity and greater sensitivity to contextual language cues. In contrast, Baron-Cohen's (2005) cohort study revealed that males tend to outperform in spatial-logical processing, a trait linked to hormonal influences, such as testosterone, and functional specialization in certain cortical regions. Lindberg et al.'s (2010) meta-analysis further underscores that these cognitive differences are not fixed; rather, they are dynamic processes significantly shaped by environmental factors, highlighting the interplay between biology and context.

Sociocultural influences also play a pivotal role in reinforcing gender differences. According to Eccles (2005), societal expectations and gender roles shape students' learning behaviors through educational practices. For example, teachers may subtly encourage females toward emotionally rich literary tasks while directing males toward logically structured analytical texts. This pattern is particularly evident in Chinese language education, where females often excel in narrative reading and expressive fluency, while males demonstrate strengths in logical reasoning and abstract thinking, especially in argumentative essays (Zhang, 2007). Additionally, Wang Xiaolei (2010) points out that gender biases in teaching practices and

stereotypical textbook portrayals—such as casting females as emotionally nuanced and males as rational decision-makers—further entrench these differences, influencing students' reading interests and approaches to learning.

Despite the insights provided by these studies, a critical gap remains: they do not sufficiently explore how these neurobiological and sociocultural mechanisms specifically relate to reading interests. For instance, while Kimura (2000) and Baron-Cohen (2005) detail cognitive processing differences, they do not address how these traits translate into preferences for particular reading materials. Similarly, Eccles' (2005) analysis of sociocultural influences stops short of examining their implications for reading interest development. This limitation hinders a comprehensive understanding of how gender differences shape reading preferences and, in turn, impact academic outcomes in language education.

To bridge this gap, contemporary educational research advocates for personalized interventions that capitalize on learners' cognitive strengths while addressing systemic biases. One effective strategy is guiding extracurricular reading interests, which research has shown to positively correlate with Chinese language achievement (Sun, 2020). This correlation suggests that gender differences may influence academic performance through the mediating role of reading interests, providing a theoretical basis for further investigation in this study.

The Relationship between Reading and Chinese Language Achievement

Numerous empirical studies confirm a significant positive correlation between reading volume and Chinese language achievement, a conclusion supported by multidisciplinary theories. From an international perspective, Wigfield and Guthrie (1997) found that reading interests—encompassing curiosity, emotional engagement, and challenge—collectively enhance the depth and breadth of language learning. McGeown et al. (2011) further argued that reading interests, as intrinsic motivators, significantly boost students' engagement and text comprehension. However, these studies primarily focus on general language learning and do not specifically address the Chinese educational context.

Within the Chinese educational context, comprehensive quantitative studies on this relationship remain limited. Han (2020), analyzing the reasons for students' low Chinese Gaokao scores, proposed strengthening autonomous learning through deep textual reading to foster interest in Chinese language studies. Yang et al. (2020) conducted a field survey of 46,646 eighth-grade students in Region Z, examining the relationship between reading ability, engagement, and writing performance. Their findings revealed that intrinsic factors—such as reading interests, strategies, and habits—have a greater impact on writing performance (a component of Chinese language achievement) than extrinsic factors like reading volume and time. This suggests that while reading volume is important, the types and quality of materials influenced by students' reading interests may play a more critical role in improving academic performance.

Similarly, Dan and Li's (2023) analysis of PISA test results offers indirect evidence: Chinese students perform relatively well in PISA reading assessments but lag in comparison to mathematics and science, with Chinese language education often criticized as "time-consuming and inefficient." Although this study did not directly validate the link between reading volume and Chinese language achievement, it implies that increasing reading volume

could be a potential avenue for improvement, given that PISA assesses reading literacy, which is closely tied to language proficiency.

Despite the valuable insights offered by the aforementioned studies, a key limitation remains: existing research has not sufficiently examined how reading interests mediate the relationship between gender and Chinese language achievement. For instance, while Yang et al. (2020) underscore the importance of intrinsic factors, they do not analyze gender differences in these dimensions. Likewise, Han (2020) and Dan and Li (2023) do not address how reading interests shape academic outcomes. This limitation hinders a comprehensive understanding of how gender differences influence academic performance through reading behaviors.

To address this gap, this study hypothesizes that reading interests may mediate the relationship between gender and Chinese language achievement. Specifically, existing research (Zhang, 2007; Zhang, 2009) indicates that the type of reading materials significantly affects academic performance, while reading interests directly determine students' reading volume and material choices. Thus, a deeper exploration of reading interests not only aids in understanding how gender differences influence academic outcomes through reading behaviors but also provides theoretical and practical guidance for optimizing Chinese language education.

Three-Dimensional Classification Framework for Reading Interests

To systematically analyze the intrinsic logic of high school students' reading interests and their association with gender differences, this study integrates Zhang Lu's (2007) theory of gendered genre preferences, Zhang Qiong's (2009) theory of reading levels, and Witkin's (1971) field dependence-independence theory to construct a three-dimensional classification framework: "Emotional-Imagery," "Logical-Analytical," and "Integrative-Practical." The derivation process and theoretical foundations are outlined below:

Theoretical Foundations and Complementary Integration

- **Zhang's (2007) Theory of Gendered Genre Preferences:** This theory highlights significant divergences in reading interests between male and female students. Females tend to prefer emotional and imagery-rich texts (e.g., prose, poetry), excelling at constructing meaning through detailed descriptions and emotional metaphors. Males, conversely, favor abstract and logical texts (e.g., argumentative essays, scientific explanations), focusing on overall structural analysis and causal reasoning. This gender disparity provides a foundational gender perspective for the classification.
- **Zhang's (2009) Theory of Reading Levels:** This theory categorizes reading behaviors into "perceptual reading" and "comprehension reading." Perceptual reading emphasizes emotional resonance and holistic perception (e.g., experiencing the imagery in poetry), aligning with female preferences. Comprehension reading involves logical deconstruction and critical analysis (e.g., dissecting arguments in an editorial), resonating with male inclinations. This distinction adds a vertical dimension to cognitive behaviors.
- **Witkin's (1971) Field Dependence-Independence Theory:** This theory reveals the gendered basis of cognitive styles. Field-dependent individuals (more common among females) rely on external emotional cues to construct overall textual meaning, demonstrating strong emotional projection abilities. Field-independent individuals (more

common among males) excel at extracting logical relationships from complex information, exhibiting critical thinking skills. This theory provides a cognitive science foundation for the classification.

However, traditional two-dimensional classifications (e.g., emotional vs. logical) merely describe static gender oppositions and fail to account for ability transfer in mixed cognitive scenarios (e.g., science fiction requiring both logical deduction and emotional resonance) or complementary dynamics in collaborative tasks (e.g., cross-gender group synergy). To address these limitations, this study introduces the "Integrative-Practical" dimension, creating a three-dimensional framework. Specifically, this framework cross-maps the aforementioned theories to distill three types of reading interests:

- **Emotional-Imagery:** Integrates "emotionality" (Zhang, 2007), "perceptual reading" (Zhang, 2009), and field-dependent characteristics (Witkin's, 1971), emphasizing emotional resonance and scene visualization.
- **Logical-Analytical:** Merges "abstraction" (Zhang, 2007), "comprehension reading" (Zhang, 2009), and field-independent advantages (Witkin's, 1971), focusing on structural deconstruction and rational criticism.
- **Integrative-Practical:** Derived from Zhang's (2009) "dual curriculum model for oral communication," this dimension stresses cross-domain knowledge integration and collaborative problem-solving, addressing the limitations of single-gender cognitive styles.

Construct

Based on the above classification dimensions, this study constructs the following theoretical framework.

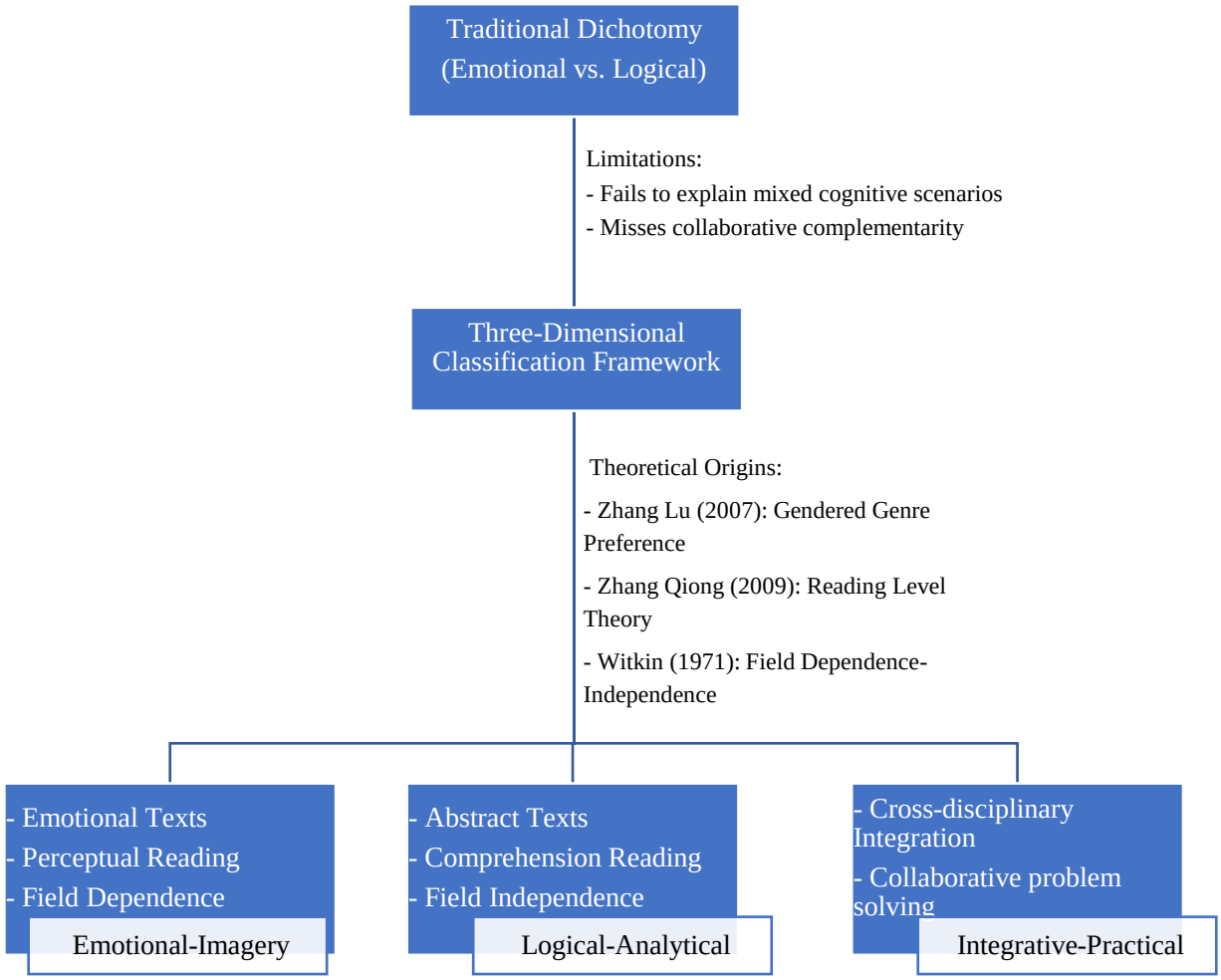

Figure 1: Three-Dimensional Classification Framework

- **Emotional-Imagery Reading** centers on emotional resonance and scene visualization. Its cognitive behaviors include emotional projection, where personal experiences activate emotional symbols in texts (e.g., family themes in prose evoking readers' memories), and scene concretization, transforming abstract language into mental images (e.g., visualizing "a lone sail vanishing into the blue sky" from poetry). Typical materials include lyrical prose, narrative poetry, and epistolary texts. This type is particularly suited to field-dependent students, predominantly females, whose emotional strengths are enhanced in contextual tasks like role-playing.
- **Logical-Analytical Reading** emphasizes rational deduction and structural analysis. Cognitively, it involves structural deconstruction (e.g., identifying the framework and logic of argumentative essays), causal reasoning (e.g., tracing technological evolution from steam engines to AI in scientific texts), and critical scrutiny (e.g., analyzing discrepancies in historical accounts). Typical materials include argumentative essays, scientific explanations, and historical commentaries. This type aligns with field-independent

students, often males, whose rational thinking is bolstered through exercises like mind mapping.

- **Integrative-Practical Reading** stresses multimodal transformation and collaborative problem-solving. Its cognitive behaviors include converting written texts into oral forms (e.g., adapting *The Battle of Red Cliff* into a debate script), applying reading materials in simulated interviews or project-based learning, and fostering collaborative knowledge construction in mixed-gender groups, where females offer emotional perspectives and males provide logical frameworks. Typical materials include cross-disciplinary texts (e.g., science fiction) and project-based learning resources. This type serves as a "buffer" for cognitive styles, promoting complementary abilities through collaborative tasks.

Classification of Reading Materials

To construct a comprehensive and rational set of reading material categories as the foundational data for empirical analysis, this study references K Al-Nafisah's (2009) study on the reading interests of students at Saudi Arabian education colleges. This study's instruments have undergone peer review and have been validated for reliability and validity. Specifically, the study employed a questionnaire survey to classify reading materials by type, content, and form. Given the richness of the data, this study adopted the type classification logic, dividing reading materials into 35 categories. These categories were then integrated into the three-dimensional framework developed in this study, with the classification results as follows.

Table 1
Classification of Reading Materials

Emotional-Imagery Type	Storybooks, Adventure books, Books about religion, Novels, Poems, Dramas, Letters, Science fiction/fantasy books, Fairy tales, Books about social issues, Comic books
Logical-Analytical Type	Newspaper world events, Magazines about new technological advancements, Newspaper local news, Books about the Internet, Books about new technological advancements, Science magazines, Biographies (about people), History books, Newspaper editorials, Science books, Books about economics
Integrative-Practical Type	Magazines about the Internet, Magazines about computers, Sports magazines, The sports section of newspapers, Picture magazines, Books about computers, Newspaper comics, Men's magazines, Travel magazines, Books about work, Travel books, Picture books

Research Gaps and Hypothesis Development

Although existing research widely acknowledges the influence of gender differences and reading interests on Chinese language achievement, most studies remain limited to descriptive analyses or discussions of pedagogical strategies. There is a conspicuous absence of quantitative evidence to substantiate the causal pathway of "gender → reading interests → Chinese language achievement." For example, it is well-established that females typically exhibit superior verbal skills and emotional sensitivity, demonstrating a greater inclination toward narrative and lyrical texts, whereas males tend to excel in logical reasoning and prefer argumentative and expository texts. However, the mechanisms by which these differences affect academic performance via reading interests have yet to be empirically validated, particularly within the specific context of Chinese high school language learning.

Specifically, prior research exhibits the following limitations:

Lack of Targeted Analysis within the Chinese high School Language Learning Context

While studies such as Carmichael and Hay (2009) and Jabbar and Warraich (2022) have explored the relationship between gender and reading preferences, their focus has largely been on international or non-Chinese educational settings. These studies fail to account for the unique characteristics of Chinese high school students, who navigate intense Gaokao pressures and curriculum standards. For instance, Carmichael and Hay (2009) based their findings on Australian secondary school students, making their conclusions less applicable to the Chinese language teaching environment.

Incomplete Validation of the Mediating Role of Reading Interests

Research by Li et al. (2019) examined the direct association between gender and academic performance but did not delve into the mediating effect of reading interests. Similarly, Dai (2024) highlighted the role of reading in enhancing Chinese language achievement but did not differentiate the impact of various types of reading interests (e.g., emotional vs. logical). PISA data further reveal that 6.6% of male students in Shanghai fall below Level 2 in reading literacy, compared to just 1.6% of females, yet reading interests explain only 33.3% of this gender gap. This suggests that other potential factors—such as cognitive styles or instructional methods—remain underexplored (Chen & Liu, 2011).

Insufficient Refinement in the Classification of Reading Interests

Although Zhang (2007) and Zhang (2009) addressed reading interests and gender differences, their classifications (e.g., "emotional vs. abstract") are overly broad and fail to capture the multidimensional nature of reading interests, thereby limiting a deeper exploration of causal mechanisms.

Based on these research gaps, the present study seeks to investigate the following three research questions:

- Are there significant differences between male and female high school students in their preferences for Emotional-Imagery, Logical-Analytical, and Integrative-Practical reading interests?
- How do these three categories of reading interests predict Chinese language achievement?
- Does gender exert an indirect influence on Chinese language achievement through reading interests?

To address these gaps, this study introduces a three-dimensional classification framework for reading interests—comprising "Emotional-Imagery," "Logical-Analytical," and "Integrative-Practical" dimensions. This framework aims to quantify gender-based differences in reading preferences and empirically validate the mediating role of reading interests in the "gender → reading interests → Chinese language achievement" pathway. By doing so, the study not only fills theoretical voids but also provides data-driven insights to optimize Chinese high school language teaching.

Research Methodology

Research Design

This study adopts a quantitative research approach, employing a survey-based empirical investigation. The aim is to empirically examine the mechanisms linking gender, reading

interests, and Chinese language achievement, thereby providing a scientific basis for pedagogical practices. Quantitative methods are particularly advantageous for this purpose, as they facilitate the collection of large-scale data and enable hypothesis testing through statistical analysis, ensuring objective and robust conclusions.

Participants

The study involves 370 undergraduate students from a university in Heilongjiang Province, China. This population was chosen because they have recently completed the Gaokao—China's highly standardized and equitable national college entrance examination—offering an objective measure of their Chinese language proficiency. The sample comprises an equal gender distribution (185 males and 185 females), spans all academic years (freshman to senior), and includes students from diverse academic disciplines, such as science and engineering, business, social sciences, and humanities, ensuring representativeness and variety. Participants are predominantly aged 18 to 22 years and are all Gaokao graduates capable of reporting their Chinese language scores (out of a maximum of 150 points). To ensure data quality, eligibility criteria required participants to have engaged in extracurricular reading during high school and to accurately recall pertinent details.

Instruments

To ensure reliability and validity, this study utilizes a questionnaire originally developed by K Al-Nafisah (2009), adapted to align with a reading interest classification framework and informed by established reading motivation scales from prior literature. The questionnaire is structured into three key sections (Appendix 1):

- **Demographic Information:** Captures participants' gender, academic year, major, and the time elapsed since their Gaokao.
- **Reading Interests:** Employs a 5-point Likert scale (1 = "not interested at all," 5 = "very interested") to evaluate preferences for 35 types of reading materials, including storybooks, novels, and science magazines.
- **Gaokao Chinese Language Score:** Participants self-report their Chinese language scores as an indicator of language proficiency.

To enhance the instrument's reliability and validity, the questionnaire was translated into Chinese and pre-tested with 40 students. Based on their feedback, ambiguous items were refined to improve clarity and logical consistency. The finalized questionnaire was distributed online via the Wenjuanxing platform, with participants completing it during their free time.

Data Collection

Data were gathered through an online survey targeting undergraduate students at a university in Heilongjiang Province. The survey was disseminated via WeChat groups and in-person classroom sessions from March 15 to March 17, 2025. Of the 370 questionnaires distributed, 329 valid responses were received, achieving a response rate of 89.2% (329/370). The sample included 163 females (49.7%) and 166 males (50.3%), reflecting a balanced gender distribution. To verify the reliability of the reading interest scale, a Cronbach's alpha analysis was performed, yielding corrected item-total correlations (CITC) of 0.898 for Logical-Analytical (LA-Avg), 0.814 for Emotional-Imagery (EI-Avg), and 0.905 for Integrative-Practical (IP-Avg), with a standardized Cronbach's alpha of 0.937. These results indicate excellent internal consistency, and the data adhered to a normal distribution (Appendix 2), rendering it suitable for further statistical analysis.

Ethical Considerations

This study adhered rigorously to academic ethical standards to safeguard participants' rights. Prior to data collection, all participants provided informed consent, ensuring they were fully informed of the study's objectives, data usage, and privacy protections. The questionnaire was administered anonymously, with no personally identifiable information (e.g., names or student IDs) collected. All data were used exclusively for research purposes and securely stored and managed post-study to uphold participants' anonymity and privacy.

Data Analysis and Results

This study employed quantitative analysis methods to systematically investigate the relationships among gender, reading interests, and Gaokao Chinese language scores. A total of 370 questionnaires were distributed, and after data cleaning, 329 valid responses were obtained (N=329). The data analysis included gender difference tests (t-tests), correlation analysis between reading interests and Chinese language scores (Pearson correlation), and mediation effect testing (Bootstrap method). The results of each analysis are presented below.

Gender Differences Analysis

To examine the influence of gender on reading interests, this study used independent samples t-tests to compare males (n=166) and females (n=163) across three reading interest dimensions: "Logical-Analytical" (LA_Avg), "Emotional-Imagery" (EI_Avg), and "Integrative-Practical" (IP_Avg).

Table 2

Results of T-test analysis between gender and reading interests

Results of t -test analysis			
Gender (mean ± SD)	LA-Avg	EI-Avg	IP Avg
Female (n = 163)	3.28±0.73	3.64±0.65	3.32±0.64
Male (n = 166)	3.61±0.77	3.69±0.65	3.60±0.77
t	-3.903	-0.734	-3.602
p	0.000**	0.463	0.000**
* p<0.05 ** p<0.01			

The results showed that males scored significantly higher than females in "Logical-Analytical" reading interests (M = 3.61, SD = 0.77 vs. M = 3.28, SD = 0.73), t(327) = -3.903, p < 0.001, and in "Integrative-Practical" reading interests (M = 3.60, SD = 0.77 vs. M = 3.32, SD = 0.64), t(327) = -3.602, p < 0.001. However, no significant gender difference was observed in "Emotional-Imagery" reading interests (t(327) = -0.734, p = 0.463).

These findings indicate that gender significantly influences "Logical-Analytical" and "Integrative-Practical" reading interests, with males exhibiting greater interest, while "Emotional-Imagery" reading interests show no notable gender disparity.

Correlation between Reading Interests and Chinese Language Scores

To investigate the relationship between reading interests and Chinese language scores (Score), Pearson correlation analysis was conducted.

Table 3
Results of Pearson correlation

Pearson Correlation		
		Score
LA-Avg	Correlation coefficient	-0.018
	p -value	0.74
	Sample size	329
EI-Avg	Correlation coefficient	0.110*
	p -value	0.047
	Sample size	329
IP Avg	Correlation coefficient	-0.003
	p -value	0.96
	Sample size	329
* p<0.05 ** p<0.01		

The results revealed a significant positive correlation between "Emotional-Imagery" reading interests and Chinese language scores ($r = 0.110$, $p < 0.05$), suggesting that interest in emotional and imagery-rich reading materials may enhance academic performance. In contrast, neither "Logical-Analytical" ($r = -0.018$, $p = 0.165$) nor "Integrative-Practical" ($r = -0.083$, $p = 0.648$) reading interests demonstrated a significant correlation with Chinese language scores.

Overall, the impact of reading interests on academic performance varies by dimension, with only "Emotional-Imagery" interests showing a significant effect.

Mediation Effect Analysis
To further explore whether gender indirectly affects Chinese language scores through reading interests, a Bootstrap mediation analysis (5,000 samples, 95% confidence interval) was performed.

Table 4
Summary of mediation test results

Summary of mediation test results									
item	c Total effect	a	b	a*b mediation effect value	a*b (Boot SE)	a*b (z value)	a*b (p -value)	a*b (95% BootCI)	c'direct effect
Gender=>LA-Avg=>Score	-3.309**	0.323**	0.181	0.059	0.014	4.285	0	-0.024 ~ 0.031	-3.367*
Gender=>EI-Avg=>Score	-3.309**	0.053	2.092*	0.11	0.008	14.387	0	-0.008 ~ 0.022	-3.419**
Gender=>IP-Avg=>Score	-3.309**	0.281**	0.417	0.117	0.013	9.282	0	-0.017 ~ 0.033	-3.426**
Remark: * p<0.05 ** p<0.01									
Bootstrap type = percentile bootstrap method									

The results indicated that while the total effect of gender on Chinese language scores was significant (c = -3.309, p = 0.011), the indirect effects through "Logical-Analytical," "Emotional-Imagery," and "Integrative-Practical" reading interests were not significant, as all 95% confidence intervals included zero. The above mentioned analysis showed that "Emotional-Imagery" reading interests had a significant positive effect on Chinese language scores (p = 0.001), but gender did not significantly mediate this relationship. The mediation effects for "Logical-Analytical" and "Integrative-Practical" interests were also unsupported due to the nonsignificant path b (interest → score).

This suggests that gender's influence on Chinese language scores likely operates through other unmeasured variables rather than the mediation of reading interests.

Conclusion and Discussion

The study's findings indicate that males scored significantly higher than females in "Logical-Analytical" and "Integrative-Practical" reading interests, while no significant gender difference was observed in "Emotional-Imagery" reading interests. Regarding the relationship between reading interests and Chinese language scores, only "Emotional-Imagery" reading interests exhibited a significant positive correlation with academic performance, whereas "Logical-Analytical" and "Integrative-Practical" interests showed no significant relationship. Additionally, although gender had a significant total effect on Chinese language scores, none of the three reading interest dimensions demonstrated a significant mediating role, suggesting that the factors influencing academic performance are more complex and likely involve other unmeasured variables not included in the model.

Despite the absence of a significant mediating role of reading interests between gender and Chinese language scores, this study found a significant positive correlation between "Emotional-Imagery" reading interests and academic performance. This suggests that improving Chinese language scores may hinge on fostering students' interest in such reading materials, rather than relying solely on gender-based interventions. This finding offers new practical directions for Chinese language instruction. Based on these insights, the following teaching strategies are proposed, focusing on cultivating "Emotional-Imagery" reading interests while integrating personalized instruction and teacher support to ensure scientific rigor and practical feasibility.

Enhancing the Cultivation of "Emotional-Imagery" Reading Interests

Given the positive correlation between "Emotional-Imagery" reading interests and Chinese language scores, teachers should employ emotion-driven instructional designs to stimulate students' interest in such materials. Research shows that emotional resonance significantly enhances reading motivation and text comprehension. Specific strategies include:

- Designing role-playing or emotional diary activities to allow students to deeply experience emotional conflicts and aesthetic imagery in literary works;
- Incorporating audiovisual resources (e.g., film clips, poetry recitations) to strengthen students' perception of textual imagery (Wirth et al., 2022);
- Encouraging students to concretize textual content through drawing or short videos to spark interest in imagery-rich materials.

These measures, by blending emotion and imagery, not only improve academic performance but also cultivate students' aesthetic and emotional expression abilities.

Personalized Instruction Focusing on Individual Interest Preferences

Although no significant gender differences were found in "Emotional-Imagery" reading interests, individual students exhibit diverse reading preferences. Personalized instruction can effectively stimulate intrinsic learning motivation in language education (Wang Zhijuan, 2010). Teachers should design differentiated tasks based on students' interest preferences rather than gender, such as:

- Creative writing exercises for students who prefer narrative texts;
- Argumentative essay analysis for those inclined toward logical materials;
- Integrating Chinese language learning with students' interest areas (e.g., art, science) and fostering critical thinking through analyzing ethical dilemmas in literature.

By addressing individual differences, personalized instruction can more effectively enhance students' reading enthusiasm and language literacy, avoiding interference from gender stereotypes.

Exploring More Factors Influencing Chinese Language Scores

The lack of a significant mediating role of reading interests between gender and Chinese language scores suggests that gender influences academic performance through other pathways. Teaching strategies should explore additional factors such as learning motivation or reading habits, which prior research has linked closely to academic achievement (Kissau, 2006; Huang & Jiang, 2022). Specific measures include:

- Designing challenging tasks (e.g., literary debates, project-based learning) to boost motivation;
- Encouraging regular reading of "Emotional-Imagery" materials through reading check-ins or logs;
- Enhancing emotional engagement and learning experiences via interactive activities like group discussions or story relays.

These strategies optimize teaching effectiveness across multiple dimensions, compensating for the limited mediating role of reading interests and offering supplementary pathways to improve Chinese language scores.

Optimizing Teacher Allocation and Instructional Support

Teachers play a critical role in fostering reading interests and improving Chinese language scores. A gender-balanced teaching team can provide diverse instructional support (Zhang, 2007). Therefore, it is recommended that:

- Ensuring gender balance in the Chinese language teaching staff to offer varied teaching styles and emotional support;
- Enhancing teachers' mastery of "Emotional-Imagery" instructional methods through professional development (e.g., storytelling, imagery analysis);
- Providing teachers with abundant "Emotional-Imagery" teaching materials (e.g., literary excerpts, multimedia presentations) for classroom use.

These measures reinforce the cultivation of "Emotional-Imagery" reading interests through teacher support, indirectly enhancing the effectiveness of Chinese language education.

Limitations of the Study

This study empirically explored the relationships among gender, reading interests, and Chinese language scores, providing scientific insights for educational practice. However, several limitations in its design and implementation affect the explanatory power and

generalizability of the findings. These are analyzed below in terms of sampling, variable control, and gender differences, offering suggestions for future research improvements.

Sampling Limitations

The sample consisted of 329 undergraduate students from a single university in Heilongjiang Province, limiting generalizability due to geographical and institutional homogeneity. High school students from different regions vary in reading interests and learning environments; for example, urban-rural disparities in reading resources may affect habits and performance. Additionally, the sample's age range (18-22 years) does not fully match the target population of high school students, reducing direct applicability to secondary education. Future research should expand the sample to include high school students from diverse regions across China to enhance diversity and representativeness.

Inadequate Variable Control

The study did not fully account for other variables potentially affecting Chinese language scores, such as family book collections, parental education levels, teaching styles, or intrinsic motivation. These factors may mediate or moderate the relationships among gender, reading interests, and performance. For instance, students with rich family reading resources might lean toward "Emotional-Imagery" interests, indirectly boosting scores. The omission of these variables resulted in low explanatory power ($R^2 = 0.052$). Future studies could use hierarchical linear modeling (HLM) or structural equation modeling (SEM) with additional control variables to strengthen findings.

Complexity of Gender Differences

The significant total effect of gender on Chinese language scores ($c = -3.309$, $p = 0.011$) without a mediating role of reading interests suggests that gender influences performance through unexplored pathways, such as gender role expectations, teacher biases, or classroom interaction patterns. The exclusion of these sociocultural factors limits understanding of gender difference mechanisms. Future research could integrate qualitative methods (e.g., interviews, classroom observations) to explore the deeper causes of gender disparities in Chinese language learning.

References

Baron-Cohen, S. (2005). The essential difference: The male and female brain. *In Phi Kappa Phi Forum*, *85*(1), 23-26.Retrived from https://www. researchgate.net

Carmichael, C., & Hay, I. (2009). Gender Differences in Middle School Students: Interests in a Statistical Literacy Context. *Annual conference of the Mathematics Education Research Group of Australasia (pp. 97-104). Mathematics Education Research Group of Australasia*, 97-104. Mathematics Education Research Group of Australasia

Chen, & Liu. (2011). *The gap in reading literacy between male and female students is a worldwide problem*. Shanghai Academy of Educational Sciences. https://www.cnsaes.org.cn/homepage/html/resource/res12/4728.html

Chen, R., & Zhang, L. (2024). On Chinese learning strategies of learners from Central Asian countries: an analysis of gender, age, and learning duration effects. *Frontiers in Psychology*, *15*. https://doi.org/10.3389/fpsyg.2024.1372005

Dai, Z. (2024). Practical exploration of cultivating students' reading literacy in junior high school Chinese teaching. *Enlightenment and Wisdom (Part 1)*, (7), 89-91.

Kong, D., Li, H. (2023). Analysis of Reading Literacy in the PISA Examination and Its Enlightenment to Chinese Reading Education.

Eccles, J. S. (2005). Influences of parents' education on their children's educational attainments: the role of parent and child perceptions. *London Review of Education*, *3*(3). https://doi.org/10.1080/14748460500372309

Gov. (2010). *National Medium- and Long-Term Education Reform and Development Plan (2010-2020)*. https://www.gov.cn/jrzg/2010-07/29/content_1667143.htm

Han, L. (2020). Analysis of the reasons for low Chinese Gaokao scores and rational suggestions. *Teaching and Management*, (9), 119-121. (online) https://cstj.cqvip.com/Qikan/Article/Detail?id=7101393502

Huang, J., & Jiang, G. (2022). The Predictive Effects of Gender and Academic Discipline on Foreign Language Enjoyment of Chinese High School Students. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.802152

Jabbar, A., & Warraich, N. F. (2022). Gender differences in leisure reading habits: A systematic review of literature. *Global Knowledge, Memory and Communication*, *72*(6/7), 572-592. https://doi.org/10.1108/gkmc-12-2020-0200

Jin, H., Jiao, S., Ma, X., & Xia, Y. (2024). Cultural capital as a predictor of school success: Evidence and gender differences in Chinese middle schools. *Humanities and Social Sciences Communications*, *11*(1). https://doi.org/10.1057/s41599-024-03382-x

Kimura, D. (2000). *Sex and cognition*. MIT Press.

Kissau, S. (2006). Gender Differences in Motivation to Learn French. *The Canadian Modern Language Review*, *62*(3), 401-422. https://doi.org/10.3138/cmlr.62.3.401

Li, M., Hao, Y., & Wang, J. (2019). Meta-analysis of gender differences in academic performance of students in compulsory education: An empirical study based on large-scale academic quality monitoring data. *Educational Science Research*, (11), 45-56.

Lindberg, S. M., Hyde, J. S., Petersen, J. L., & Linn, M. C. (2010). New trends in gender and mathematics performance: A meta-analysis. *Psychological Bulletin*, *136*(6), 1123-1135. https://doi.org/10.1037/a0021276

McGeown, S., Goodwin, H., Henderson, N., & Wright, P. (2011). Gender differences in reading motivation: Does sex or gender identity provide a better account? *Journal of Research in Reading*, *35*(3), 328-336. https://doi.org/10.1111/j.1467-9817.2010.01481.x

Ren, X. (2020). Investigation on the differences in academic performance between male and female students and their influencing factors: Taking junior high school Chinese as an example. *Middle School Teaching Reference*, (6). https://doi.org/10.3969/j.issn.1674-6058.2020.06.045

Shi, H. (2018). Analysis of learning differences between male and female students in junior high school Chinese and research on improvement strategies. *The Road to Success in Composition (Middle)*, (6), 12.

Sun, W. (2020). Strategies for cultivating students' reading ability in junior high school Chinese teaching. *International Education Forum, 2*(10), 103. https://doi.org/10.32629/jief.v2i10.2321

Wang, X. (2010). *Research on gender roles in high school Chinese textbooks and the cultivation of students' gender awareness* [Doctoral dissertation, Inner Mongolia Normal University].

Wang, Z. (2010). Research on intrinsic motivation in English learning among rural junior high school students. *Business Situation*, (18), 66.

Wigfield, A., & Guthrie, J. T. (1997). Relations of children's motivation for reading to the amount and breadth or their reading. *Journal of Educational Psychology*, *89*(3), 420-432. https://doi.org/10.1037//0022-0663.89.3.420

Wirth, L., Kuhl, P., & Ehmke, T. (2022). Relationships Between Language-Related Variations in Text Tasks, Reading Comprehension, and Students' Motivation and Emotions: A Systematic Review. *Journal of Language and Education*, *8*(2), 179-191. https://doi.org/10.17323/jle.2022.13572

Witkin, H. A. (1971). Group embedded figures test. *PsycTESTS Dataset*. https://doi.org/10.1037/t06471-000

Yang, J., Zheng, G., Ren, M., & Wang, S. (2020). What reading means to writing: An empirical study on the impact of Chinese reading level and reading engagement on writing performance. *Journal of China Education*, (2), 65-71.

Zhang, L. (2007). Research on the current situation and countermeasures of gender difference education in middle school Chinese teaching. *Journal of Shandong Institute of Education*, (1), 67-70.

Zhang, Q. (2009). Research on Chinese reading and writing teaching based on students' gender differences. *Yangzhou University Education Journal*.