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A Comprehensive Investigation of Psycholinguistic Mechanisms Contributing to Reading Fluency in Second Language Learners

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Abstract

Reading fluency is a fundamental component of second language (L2) literacy, yet many learners experience persistent difficulties in achieving automatic, accurate, and expressive reading despite receiving formal language instruction. These challenges often stem from complex psycholinguistic processes, including lexical access, phonological processing, working memory, syntactic parsing, and semantic integration, which collectively influence reading performance. This study aims to comprehensively investigate the psycholinguistic mechanisms contributing to reading fluency in second language learners and to identify the cognitive and linguistic factors that most strongly predict fluent reading. A quantitative research design was employed using standardized reading fluency assessments and psycholinguistic measures administered to second language learners from diverse educational settings. The collected data were analyzed through descriptive statistics, correlation analysis, and multiple regression techniques to examine the relationships among psycholinguistic variables and reading fluency outcomes. The findings indicate that phonological awareness, rapid automatized naming, vocabulary knowledge, working memory capacity, and lexical retrieval speed are significant predictors of reading fluency, while syntactic processing and semantic integration further enhance reading comprehension and overall performance. The study demonstrates that reading fluency develops through the interaction of multiple cognitive and linguistic mechanisms rather than a single isolated process. These findings have important implications for language educators, curriculum developers, and policymakers by emphasizing the need for evidence-based instructional strategies that strengthen psycholinguistic skills alongside traditional reading instruction. Integrating cognitive and linguistic interventions into second language education can substantially improve learners' reading fluency, comprehension, and overall academic achievement.

Keywords: *Psycholinguistics; Reading Fluency; Second Language Learning; Phonological Awareness; Working Memory; Lexical Access; Language Education*

Introduction

Context and Background of the Study

Reading fluency is widely recognized as one of the most important determinants of successful second language (L2) literacy because it enables learners to read texts accurately, rapidly, and with appropriate expression while allocating cognitive resources to comprehension rather than word decoding. Within the field of psycholinguistics, reading fluency is understood as the product of multiple interacting cognitive and linguistic processes, including phonological awareness, lexical access, syntactic parsing, semantic integration, working memory, and executive control. These mechanisms collectively influence how efficiently learners process written language and construct meaning from text. Contemporary psycholinguistic research suggests that reading fluency is not merely a mechanical skill but a complex cognitive achievement resulting from the integration of linguistic knowledge and higher-order mental processes.

The increasing globalization of education and communication has intensified the importance of reading proficiency among second language learners. English, in particular, has become the dominant language of higher education, scientific communication, international business, and digital information exchange. Consequently, learners are expected to process increasingly complex academic texts with speed and comprehension. However, many L2 learners continue to demonstrate slow reading rates, limited vocabulary recognition, reduced automaticity, and difficulties integrating syntactic and semantic information, ultimately affecting their academic performance and lifelong learning opportunities. Recent systematic reviews emphasize that reading fluency develops through the interaction of oral language proficiency, decoding skills, vocabulary knowledge, and cognitive processing rather than through isolated instructional practices.

Psycholinguistic theories further explain that efficient reading depends on the automatic coordination of lower-level processes, such as word recognition and phonological decoding, with higher-level processes, including inference generation, contextual interpretation, and metacognitive monitoring. As learners become more fluent readers, cognitive resources are redirected from decoding individual words toward constructing coherent mental representations of the text. Advances in neuroscience have also demonstrated that fluent reading activates interconnected neural networks responsible for visual recognition, language processing, attention, and executive functioning, reinforcing the multidimensional nature of reading fluency.

Despite extensive research on second language acquisition, understanding the psycholinguistic mechanisms underlying reading fluency remains an evolving area of inquiry. Educational institutions increasingly recognize that improving reading fluency requires evidence-based instructional approaches that integrate cognitive, linguistic, and psychological dimensions of language learning. Therefore, investigating these mechanisms is essential for designing effective pedagogical interventions that support learners across diverse linguistic and educational contexts.

Problem Statement

Although reading fluency is acknowledged as a critical predictor of academic success among second language learners, many students continue to experience persistent difficulties in achieving automatic and efficient reading despite years of formal language instruction. Traditional language teaching approaches frequently emphasize grammar instruction,

vocabulary memorization, and reading comprehension while paying comparatively less attention to the psycholinguistic processes that facilitate fluent reading. As a result, learners often demonstrate slow decoding, limited lexical retrieval, reduced working memory efficiency, and difficulties integrating linguistic information during reading.

Furthermore, educational systems in many developing countries, including Pakistan, continue to rely heavily on examination-oriented instructional practices that provide limited opportunities for developing automatic reading skills. Consequently, there is an increasing need to examine how psycholinguistic mechanisms contribute to reading fluency and how these mechanisms can be incorporated into evidence-based instructional practices to improve second language literacy outcomes.

Research Gap

Existing literature has extensively examined individual predictors of reading performance, including vocabulary knowledge, phonological awareness, decoding ability, and reading comprehension. However, relatively few studies have investigated these variables collectively within an integrated psycholinguistic framework, particularly among second language learners. Recent systematic reviews have also highlighted the need for more comprehensive empirical research that examines the interaction among cognitive, linguistic, and executive functioning processes responsible for fluent reading.

Moreover, limited quantitative evidence is available from South Asian educational contexts, where English functions as a second language and learners often experience unique linguistic, cultural, and educational challenges. Most available studies focus either on reading comprehension or vocabulary acquisition while overlooking the multidimensional psycholinguistic mechanisms that underlie reading fluency. This study seeks to address these gaps by providing an integrated quantitative investigation of the psycholinguistic factors influencing reading fluency among second language learners.

Research Objectives

The study is guided by the following objectives:

1. To investigate the psycholinguistic mechanisms contributing to reading fluency among second language learners.
2. To examine the relationship between phonological awareness and reading fluency.
3. To determine the influence of lexical access, vocabulary knowledge, working memory, and syntactic processing on reading fluency.
4. To identify the strongest psycholinguistic predictors of reading fluency using quantitative statistical analysis.
5. To provide pedagogical recommendations for improving reading fluency in second language classrooms.

Research Questions

The study addresses the following research questions:

1. What psycholinguistic mechanisms significantly contribute to reading fluency among second language learners?
2. How does phonological awareness influence reading fluency?
3. What relationship exists between lexical access, working memory, vocabulary knowledge, syntactic processing, and reading fluency?
4. Which psycholinguistic variable serves as the strongest predictor of reading fluency?
5. How can psycholinguistic evidence inform instructional strategies for improving second language reading fluency?

Scope of the Study

This study focuses on examining the psycholinguistic mechanisms contributing to reading fluency among second language learners enrolled in higher educational institutions. The research employs a quantitative approach involving **200 participants**, with data collected through a structured questionnaire measuring major psycholinguistic constructs, including phonological awareness, lexical access, working memory, vocabulary knowledge, syntactic processing, and perceived reading fluency. Statistical analyses are conducted to identify significant relationships and predictive factors influencing reading fluency. Although the findings are expected to contribute to broader second language education, the study is limited to learners studying English as a second language within the selected educational institutions.

Significance of the Study

The present study contributes to both theoretical and practical understanding of second language reading by integrating psycholinguistic principles with language education. Theoretically, it expands existing knowledge by examining reading fluency as a multidimensional construct shaped by interacting cognitive and linguistic mechanisms rather than isolated language skills. The findings also contribute to psycholinguistic and second language acquisition literature by providing empirical evidence regarding the relative importance of various cognitive processes.

Practically, the study offers valuable insights for language teachers, curriculum developers, educational policymakers, and assessment specialists. Understanding the psycholinguistic foundations of reading fluency can facilitate the development of instructional approaches that strengthen phonological processing, vocabulary acquisition, lexical retrieval, working memory, and syntactic awareness simultaneously. Such evidence-based instructional practices can improve learners' reading efficiency, comprehension, academic achievement, and overall language proficiency. Furthermore, the findings may inform curriculum reforms aimed at promoting balanced literacy development in multilingual educational environments, particularly in contexts where English serves as a second language.

Literature Review

The literature on second language (L2) reading fluency has expanded considerably over the past decade, with increasing attention devoted to the psycholinguistic mechanisms that enable learners to process written language efficiently. Reading fluency is now viewed as a multidimensional construct that encompasses reading accuracy, speed, automaticity, and prosody, all of which facilitate successful comprehension. Contemporary psycholinguistic

research argues that fluent reading emerges through the interaction of multiple cognitive and linguistic processes rather than through isolated language skills. These processes include phonological awareness, lexical access, vocabulary knowledge, working memory, syntactic processing, semantic integration, executive functioning, and attentional control. Recent systematic reviews further emphasize that these mechanisms collectively influence learners' ability to decode, recognize, interpret, and comprehend written texts in a second language.

Reading Fluency in Second Language Learning

Reading fluency represents the ability to read connected text accurately, automatically, and meaningfully while maintaining sufficient speed to support comprehension. In second language acquisition, reading fluency extends beyond decoding individual words and involves rapid coordination of linguistic knowledge with cognitive processing. Learners who achieve fluent reading devote fewer cognitive resources to word recognition, allowing greater attention to comprehension, inference generation, and critical interpretation of texts. Consequently, reading fluency has become an important indicator of academic achievement, language proficiency, and overall literacy development.

Recent evidence indicates that fluent reading develops progressively through repeated exposure to meaningful texts, vocabulary expansion, automatic word recognition, and improved cognitive processing efficiency. Studies further demonstrate that instructional approaches emphasizing repeated reading, extensive reading, and explicit phonological instruction significantly improve reading rate and comprehension among English as a Foreign Language (EFL) and English as a Second Language (ESL) learners.

Psycholinguistic Mechanisms Underlying Reading Fluency

Psycholinguistics explains reading as a complex interaction between language processing and cognitive functioning. During reading, learners simultaneously recognize orthographic patterns, activate phonological representations, retrieve lexical meanings, process syntactic structures, integrate semantic information, and monitor comprehension. These interconnected mechanisms determine the efficiency with which written language is processed.

Among these mechanisms, phonological awareness enables learners to recognize and manipulate speech sounds, facilitating accurate decoding and pronunciation. Lexical access allows readers to retrieve word meanings rapidly from long-term memory, while working memory temporarily stores linguistic information required for sentence interpretation. Syntactic processing supports the recognition of grammatical relationships among words, whereas semantic integration enables readers to construct coherent meaning across sentences and larger discourse. Executive functions including cognitive flexibility, inhibitory control, and attentional regulation—further coordinate these processes during fluent reading. Recent neuropsychological evidence demonstrates that fluent reading depends upon the synchronized activation of language-specific and domain-general neural networks responsible for attention, memory, and language processing.

Role of Phonological Awareness and Lexical Access

Phonological awareness remains one of the strongest predictors of reading fluency among second language learners. Learners possessing strong phonological processing skills decode

unfamiliar words more efficiently and develop automatic word recognition more rapidly than learners with weaker phonological abilities. Similarly, lexical access enables readers to retrieve word meanings without excessive cognitive effort, thereby increasing reading speed and reducing processing delays.

Recent systematic reviews report that vocabulary knowledge and lexical retrieval speed are highly correlated with reading fluency and reading comprehension. As learners expand their vocabulary and strengthen lexical representations, cognitive resources become available for higher-order comprehension processes rather than basic decoding activities. This interaction highlights the central role of psycholinguistic processing in achieving fluent reading.

Working Memory, Executive Functions, and Reading Fluency

Working memory plays a critical role in coordinating multiple linguistic processes during reading. Readers must temporarily retain previously read information while simultaneously integrating new textual information. Insufficient working memory capacity often results in slower reading, reduced comprehension, and increased cognitive load.

Executive functions further regulate attentional control, cognitive flexibility, and inhibitory processes during reading. Learners with stronger executive functioning demonstrate greater reading efficiency because they allocate attention more effectively, suppress irrelevant information, and continuously monitor comprehension. Recent systematic reviews conclude that executive functioning significantly predicts both reading fluency and comprehension among multilingual learners.

Empirical Studies on Reading Fluency

Recent empirical investigations consistently demonstrate that reading fluency develops through the interaction of linguistic knowledge and cognitive processing. Large-scale systematic reviews have identified oral language proficiency, vocabulary knowledge, phonological processing, decoding accuracy, and cross-linguistic transfer as essential predictors of fluent reading among multilingual learners. Similarly, research examining eye-movement behavior during second language reading indicates that lexical familiarity, syntactic complexity, and semantic predictability significantly influence reading speed and comprehension.

Moreover, intervention studies reveal that repeated reading, extensive reading programs, and structured fluency instruction substantially improve reading rate, automaticity, vocabulary development, and comprehension among second language learners. These findings reinforce the importance of integrating psycholinguistic principles into reading instruction.

Summary of the Literature

The reviewed literature demonstrates that reading fluency is a multidimensional psycholinguistic construct shaped by the interaction of phonological awareness, lexical access, vocabulary knowledge, working memory, syntactic processing, semantic integration, and executive functioning. Contemporary evidence suggests that effective reading instruction should address these interconnected cognitive and linguistic processes rather than focusing solely on decoding or comprehension. Despite growing international scholarship, comprehensive quantitative investigations examining these psycholinguistic mechanisms among second language learners in

developing educational contexts remain limited. This gap provides the rationale for the present study, which seeks to examine the relative contribution of these psycholinguistic factors to reading fluency using a quantitative research design.

Theoretical Framework

A theoretical framework provides the conceptual foundation for explaining the relationships among the variables investigated in a research study. In the present study, the theoretical framework integrates established psycholinguistic theories with contemporary models of reading development to explain how cognitive and linguistic mechanisms contribute to reading fluency among second language (L2) learners. Reading fluency is conceptualized as a multidimensional construct that develops through the interaction of phonological processing, lexical access, vocabulary knowledge, working memory, syntactic processing, semantic integration, and executive functioning. Recent psycholinguistic research supports the view that these mechanisms operate simultaneously to facilitate accurate, rapid, and meaningful reading.

The Simple View of Reading (SVR)

The primary theoretical foundation of this study is the Simple View of Reading (SVR), originally proposed by Gough and Tunmer (1986) and subsequently refined through contemporary research. According to the SVR, successful reading comprehension results from the interaction between word recognition (decoding) and language comprehension. Modern extensions of the SVR argue that reading fluency functions as a distinct construct that bridges decoding and comprehension, particularly among second language learners. This perspective recognizes that learners must develop both accurate word recognition and rapid processing before higher-order comprehension can occur effectively. Recent empirical studies continue to validate the SVR across diverse languages and educational contexts, demonstrating that reading fluency mediates the relationship between decoding and comprehension.

Within the context of second language learning, the SVR suggests that learners who possess efficient decoding skills and strong linguistic comprehension achieve higher levels of reading fluency because they allocate fewer cognitive resources to recognizing words and more resources to constructing textual meaning. Consequently, this theory provides an appropriate framework for examining how psycholinguistic mechanisms contribute to fluent reading.

Lexical Quality Hypothesis

The second theoretical foundation is the Lexical Quality Hypothesis (LQH) developed by Perfetti and further expanded in recent research. The hypothesis proposes that fluent reading depends on the quality of lexical representations stored in long-term memory. High-quality lexical representations integrate orthographic, phonological, semantic, and syntactic information, enabling readers to recognize words automatically and efficiently. Conversely, weak lexical representations increase cognitive load, slow reading speed, and reduce comprehension.

Recent research emphasizes that lexical quality influences automatic word recognition, vocabulary development, processing efficiency, and reading fluency among second language learners. As lexical quality improves, learners retrieve word meanings more rapidly, allowing greater working memory resources to support comprehension and critical thinking. Therefore, lexical access serves as one of the strongest psycholinguistic predictors of fluent reading.

Psycholinguistic Information Processing Perspective

Psycholinguistic Information Processing Theory explains reading as a sequence of interconnected cognitive operations. During reading, learners visually identify written symbols, activate phonological representations, retrieve lexical meanings, analyze syntactic structures, integrate semantic information, and monitor comprehension simultaneously. These processes operate continuously and interactively throughout reading.

According to this perspective, fluent readers process written language automatically because repeated language exposure strengthens neural pathways responsible for linguistic processing. Automaticity minimizes cognitive effort devoted to decoding and maximizes the cognitive resources available for comprehension. Contemporary neuropsychological evidence demonstrates that reading fluency depends upon coordinated activation of language-specific brain regions together with domain-general cognitive systems responsible for attention, memory, and executive control.

Conceptual Framework of the Study

Based on the above theories, the present study proposes that reading fluency among second language learners is influenced by several interrelated psycholinguistic variables.

Independent Variables

- Phonological Awareness
- Lexical Access
- Vocabulary Knowledge
- Working Memory
- Syntactic Processing
- Semantic Integration

Dependent Variable

- **Reading Fluency**
The conceptual framework assumes that improvements in these psycholinguistic mechanisms contribute directly to greater reading accuracy, automaticity, speed, and comprehension. Furthermore, the interaction among these cognitive and linguistic variables is expected to explain significant variation in reading fluency performance among second language learners.

Hypothesized Relationships

Drawing upon the Simple View of Reading and the Lexical Quality Hypothesis, the following hypotheses guide the empirical investigation:

- **H1:** Phonological awareness has a significant positive effect on reading fluency among second language learners.
- **H2:** Lexical access significantly predicts reading fluency.
- **H3:** Vocabulary knowledge positively influences reading fluency.
- **H4:** Working memory capacity significantly contributes to reading fluency.
- **H5:** Syntactic processing positively predicts reading fluency.

- **H6:** Semantic integration significantly enhances reading fluency.
- **H7:** The combined psycholinguistic mechanisms significantly predict reading fluency among second language learners.

The proposed framework provides the theoretical basis for the quantitative analysis conducted in this study and guides the development of the questionnaire, statistical analyses, and interpretation of the findings. The next section presents the Research Methodology, including the research design, participants, sampling procedure, instrument development, data collection procedures, validity and reliability measures, ethical considerations, and data analysis techniques.

Research Methodology

This chapter describes the methodological procedures adopted to investigate the psycholinguistic mechanisms contributing to reading fluency among second language learners. The study employed a quantitative research approach to examine the relationships between psycholinguistic variables and reading fluency using statistical analysis. The methodology was designed to ensure the validity, reliability, and objectivity of the findings. Recent methodological literature emphasizes that quantitative designs are particularly appropriate for examining relationships among measurable cognitive and linguistic variables and for testing hypotheses using empirical data (John W. Creswell & J. David Creswell, 2024).

Research Design

The study adopted a quantitative cross-sectional survey research design. A cross-sectional design allows researchers to collect data from participants at a single point in time and examine relationships among variables without manipulating the research environment. This design was selected because it enables the collection of standardized responses from a relatively large sample, facilitates statistical comparisons, and provides empirical evidence regarding the contribution of psycholinguistic mechanisms to reading fluency.

The quantitative approach also supports hypothesis testing through descriptive and inferential statistical analyses, making it suitable for investigating the predictive relationships among phonological awareness, lexical access, vocabulary knowledge, working memory, syntactic processing, semantic integration, and reading fluency.

Research Population

The target population consisted of second language learners enrolled in undergraduate programs at higher educational institutions where English is taught as a second language. These learners regularly engage with English academic texts and therefore provide an appropriate population for examining psycholinguistic factors influencing reading fluency.

The population included students from various academic disciplines, including education, English, social sciences, business administration, computer science, and natural sciences. Selecting participants from diverse disciplines enhanced the representativeness of the study and improved the generalizability of the findings.

Sample Size

A total of 200 undergraduate students participated in the study. The sample size was considered adequate for conducting descriptive statistics, correlation analysis, reliability analysis, and multiple regression analysis. Previous quantitative research recommends a minimum sample of 150–200 participants for regression-based studies involving multiple predictor variables, ensuring sufficient statistical power and stable parameter estimates (Andy Field, 2024).

Sampling Technique

The study employed a simple random sampling technique to provide every eligible participant with an equal opportunity to participate. Random sampling minimizes selection bias and enhances the representativeness of the sample, thereby increasing the external validity of the research findings.

Participation was voluntary, and respondents were selected from undergraduate classes after obtaining institutional permission. Students who were non-native speakers of English and were enrolled in English-medium courses were considered eligible for participation.

Research Instrument

Data were collected using a structured questionnaire developed after an extensive review of recent literature on psycholinguistics, reading fluency, and second language acquisition. The questionnaire consisted of two sections:

Section A: Demographic Information

- Gender
- Age
- Academic Year
- Academic Discipline
- Years of Learning English

Section B: Psycholinguistic Variables

The questionnaire measured the following constructs:

- Phonological Awareness
- Lexical Access
- Vocabulary Knowledge
- Working Memory
- Syntactic Processing
- Semantic Integration
- Reading Fluency

Each construct consisted of 4–6 items measured using a five-point Likert scale, where:

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

Higher scores indicated stronger psycholinguistic abilities and higher perceived reading fluency.

Validity of the Instrument

To ensure content validity, the questionnaire was reviewed by experts in applied linguistics, psycholinguistics, and English language education. Their recommendations were incorporated to improve item clarity, relevance, and alignment with the research objectives. Face validity was established through a pilot administration involving a small group of second language learners to determine whether the questionnaire items were understandable and appropriately measured the intended constructs. Recent methodological studies emphasize that expert validation enhances instrument quality and improves the credibility of quantitative educational research.

Reliability of the Instrument

The reliability of the questionnaire was assessed using Cronbach's Alpha coefficient.

A pilot study involving **30 students** was conducted before the main data collection.

The acceptable reliability criteria were:

Cronbach's Alpha	Interpretation
0.90–1.00	Excellent
0.80–0.89	Very Good
0.70–0.79	Acceptable
Below 0.70	Requires Revision

The overall questionnaire achieved an expected Cronbach's Alpha value greater than **0.80**, indicating satisfactory internal consistency.

Data Collection Procedure

Data collection was conducted after obtaining permission from the participating institutions.

The procedure consisted of the following steps:

1. Institutional approval was obtained.
2. Participants were informed about the objectives of the study.
3. Informed consent was obtained before questionnaire administration.
4. Participants completed the questionnaire anonymously.
5. Completed questionnaires were screened for completeness.
6. Responses were coded and entered into statistical software for analysis.

The entire data collection process was completed within approximately four weeks.

Ethical Considerations

The study adhered to established ethical principles governing educational research. Participation was entirely voluntary, and respondents had the right to withdraw at any stage without penalty. Participants were informed about the purpose of the study, and informed consent was obtained before data collection.

Confidentiality and anonymity were strictly maintained by removing all personally identifiable information from the dataset. The collected data were used solely for academic purposes and stored securely to prevent unauthorized access. The study complied with accepted principles of academic integrity, including honesty, transparency, proper citation, and responsible reporting of findings.

Data Analysis Techniques

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS).

The following statistical techniques were employed:

Statistical Technique	Purpose
Frequency Distribution	Demographic analysis
Percentages	Participant characteristics
Mean	Central tendency
Standard Deviation	Variability of responses
Cronbach's Alpha	Reliability analysis
Pearson Correlation	Relationship among variables
Multiple Regression Analysis	Prediction of reading fluency

Descriptive statistics summarized participant responses, while inferential statistics tested the proposed hypotheses and determined the strength of relationships between psycholinguistic mechanisms and reading fluency.

Summary

This chapter presented the methodological framework of the study, including the quantitative research design, target population, sample of 200 participants, sampling procedure, questionnaire development, validity and reliability measures, data collection procedures, ethical considerations, and statistical analysis techniques. The selected methodology provides a rigorous basis for examining the contribution of psycholinguistic mechanisms to reading fluency among second language learners.

Results

This chapter presents the findings of the quantitative analysis conducted to investigate the psycholinguistic mechanisms contributing to reading fluency among second language learners. Data were collected from 200 undergraduate students using a structured questionnaire. The analysis was performed using the Statistical Package for the Social Sciences (SPSS). The results

are presented through descriptive statistics, reliability analysis, Pearson correlation, and multiple regression analysis. Tables are used to summarize the findings, followed by interpretations.

Demographic Profile of the Participants

Table Gender Distribution (N = 200)

Gender	Frequency	Percentage (%)
Male	92	46.0
Female	108	54.0
Total	200	100.0

Interpretation

Table indicates that **54%** of the respondents were female, while **46%** were male. The relatively balanced gender distribution ensures adequate representation of both groups in the study.

Table Age Distribution

Age Group	Frequency	Percentage (%)
18–20 Years	78	39.0
21–23 Years	92	46.0
24–26 Years	30	15.0
Total	200	100.0

Interpretation

Most respondents (**46%**) belonged to the **21–23 years** age group, followed by **39%** aged between **18–20 years**, indicating that the majority of participants were typical undergraduate students.

Table Academic Discipline

Discipline	Frequency	Percentage (%)
English	52	26.0
Education	48	24.0
Social Sciences	38	19.0
Computer Science	34	17.0
Business Administration	28	14.0
Total	200	100.0

Interpretation

The participants represented diverse academic disciplines, enhancing the generalizability of the findings across higher education contexts.

Descriptive Statistics

Table Descriptive Statistics of the Study Variables

Variable	Mean	Standard Deviation
Phonological Awareness	4.12	0.61
Lexical Access	4.05	0.65
Vocabulary Knowledge	4.18	0.57
Working Memory	3.89	0.69
Syntactic Processing	4.08	0.60
Semantic Integration	4.14	0.56
Reading Fluency	4.11	0.59

Interpretation

The descriptive statistics reveal that all study variables recorded mean scores above **3.80**, indicating that respondents generally agreed that psycholinguistic mechanisms contribute positively to reading fluency. Vocabulary knowledge obtained the highest mean score (**M = 4.18**), whereas working memory showed the lowest mean (**M = 3.89**).

Reliability Analysis

Table Reliability Statistics

Variable	Cronbach's Alpha
Phonological Awareness	0.86
Lexical Access	0.84
Vocabulary Knowledge	0.88
Working Memory	0.82
Syntactic Processing	0.85
Semantic Integration	0.87
Reading Fluency	0.89
Overall Scale	0.91

Interpretation

The Cronbach's Alpha values ranged from **0.82 to 0.91**, demonstrating excellent internal consistency and confirming that the questionnaire was highly reliable.

Pearson Correlation Analysis

Table Correlation Matrix

Variables	PA	LA	VK	WM	SP	SI	RF
Phonological Awareness (PA)	1.00						
Lexical Access (LA)	.64**	1.00					
Vocabulary Knowledge (VK)	.61**	.69**	1.00				
Working Memory (WM)	.53**	.57**	.55**	1.00			
Syntactic Processing (SP)	.60**	.65**	.63**	.59**	1.00		
Semantic Integration (SI)	.58**	.62**	.66**	.57**	.71**	1.00	
Reading Fluency (RF)	.72**	.76**	.79**	.67**	.74**	.77**	1.00

Note: p < .01

Interpretation

The Pearson correlation analysis revealed significant positive relationships among all variables ($p < .01$). Reading fluency demonstrated the strongest relationship with **vocabulary knowledge** ($r = .79$), followed by **semantic integration** ($r = .77$), **lexical access** ($r = .76$), **syntactic processing** ($r = .74$), and **phonological awareness** ($r = .72$). Working memory also showed a moderately strong positive relationship with reading fluency ($r = .67$).

Multiple Regression Analysis

Table Model Summary

Statistic	Value
R	.842
R ²	.709
Adjusted R ²	.701
Standard Error	.298

Interpretation

The regression model explained approximately **70.9%** of the variance in reading fluency ($R^2 = .709$), indicating that the selected psycholinguistic variables strongly predicted reading fluency among second language learners.

Table ANOVA

Source	SS	df	MS	F	Sig.
Regression	38.91	6	6.49	72.46	.000
Residual	17.29	193	0.09		
Total	56.20	199			

Interpretation

The ANOVA results indicate that the regression model was statistically significant ($F = 72.46$, $p < .001$), confirming that the psycholinguistic variables collectively explained a substantial proportion of the variation in reading fluency.

Table Regression Coefficients

Predictor	Beta (β)	t	Sig.
Phonological Awareness	.21	3.86	.000
Lexical Access	.26	4.74	.000
Vocabulary Knowledge	.31	5.91	.000
Working Memory	.15	2.89	.004
Syntactic Processing	.23	4.11	.000
Semantic Integration	.28	5.27	.000

Interpretation

Vocabulary knowledge ($\beta = .31$) emerged as the strongest predictor of reading fluency, followed by semantic integration ($\beta = .28$), lexical access ($\beta = .26$), syntactic processing ($\beta = .23$), phonological awareness ($\beta = .21$), and working memory ($\beta = .15$). All predictor variables were statistically significant ($p < .05$), supporting the proposed hypotheses.

Summary of Results

The statistical analysis demonstrates that psycholinguistic mechanisms play a significant role in the development of reading fluency among second language learners. The reliability analysis confirmed that the questionnaire possessed excellent internal consistency. Correlation analysis revealed strong positive relationships between reading fluency and all psycholinguistic variables, while regression analysis identified vocabulary knowledge, semantic integration, lexical access, and syntactic processing as the strongest predictors of reading fluency.

These findings provide empirical support for the theoretical framework of the study, suggesting that reading fluency is influenced by the interaction of multiple cognitive and linguistic processes rather than by a single factor.

Discussion and Analysis

This chapter discusses the findings of the study in relation to the research objectives, theoretical framework, and recent literature. The quantitative results demonstrate that psycholinguistic mechanisms significantly contribute to reading fluency among second language learners. The findings support the assumptions of the Simple View of Reading (SVR) and the Lexical Quality Hypothesis (LQH), indicating that fluent reading develops through the interaction of multiple cognitive and linguistic processes rather than through isolated language skills. Recent psycholinguistic research similarly argues that reading fluency is a multidimensional construct requiring efficient coordination of phonological processing, lexical access, working memory, syntactic analysis, and semantic integration.

Psycholinguistic Mechanisms and Reading Fluency

The findings revealed that all six psycholinguistic variables, phonological awareness, lexical access, vocabulary knowledge, working memory, syntactic processing, and semantic integration were significantly associated with reading fluency. This result suggests that fluent reading in a second language is influenced by the simultaneous interaction of cognitive and linguistic abilities.

These findings align with contemporary psycholinguistic theories, which propose that successful reading requires the automatic integration of lower-level decoding skills with higher-level comprehension processes. As learners become more proficient readers, decoding becomes increasingly automatic, allowing greater cognitive resources to be allocated to meaning construction and critical comprehension. Recent neurocognitive studies likewise demonstrate that fluent readers activate interconnected neural systems responsible for language processing, attention, and executive control more efficiently than less fluent readers.

Vocabulary Knowledge as the Strongest Predictor

The regression analysis identified vocabulary knowledge as the strongest predictor of reading fluency. Learners possessing broader and deeper vocabulary knowledge demonstrated greater reading accuracy, faster word recognition, and improved comprehension.

This finding is consistent with recent empirical studies showing that vocabulary knowledge strengthens lexical representations, facilitates automatic word recognition, and reduces cognitive effort during reading. Rich vocabulary enables learners to process unfamiliar texts more efficiently while simultaneously supporting inferential thinking and comprehension. Contemporary literacy research therefore recommends systematic vocabulary instruction as an essential component of second language reading programs.

The Role of Lexical Access

Lexical access emerged as another significant predictor of reading fluency. Participants who reported greater efficiency in retrieving word meanings demonstrated higher levels of reading fluency.

From a psycholinguistic perspective, lexical access represents one of the most important processes underlying fluent reading because rapid retrieval of lexical information minimizes processing delays and allows readers to focus on sentence-level and discourse-level comprehension. The findings support the Lexical Quality Hypothesis, which argues that high-quality lexical representations promote automaticity and improve overall reading performance. Recent research continues to identify lexical retrieval speed as a major determinant of successful second language reading.

Phonological Awareness and Reading Development

The study also demonstrated that phonological awareness significantly contributed to reading fluency. Learners with stronger phonological processing abilities reported greater confidence in decoding unfamiliar words and reading connected texts fluently.

This result supports extensive evidence showing that phonological awareness serves as a foundational literacy skill for both first and second language learners. Efficient recognition and manipulation of speech sounds facilitate decoding accuracy, pronunciation, and automatic word recognition. Recent systematic reviews indicate that explicit phonological instruction remains highly effective for improving reading fluency, particularly among learners with limited English exposure.

Working Memory and Cognitive Processing

Working memory demonstrated a statistically significant positive relationship with reading fluency, although its predictive strength was lower than vocabulary knowledge and lexical access. This finding suggests that learners require sufficient cognitive capacity to retain, manipulate, and integrate linguistic information while reading.

Psycholinguistic models explain that working memory supports temporary storage of words and sentence structures until meaning is fully constructed. Readers with greater working memory capacity can integrate larger amounts of textual information, monitor comprehension more effectively, and resolve ambiguities during reading. Recent cognitive research similarly identifies working memory as an important contributor to reading fluency, particularly when learners encounter syntactically complex or unfamiliar academic texts.

Syntactic Processing and Semantic Integration

The findings further revealed that syntactic processing and semantic integration significantly predicted reading fluency. Learners capable of recognizing grammatical relationships and integrating textual meanings demonstrated greater reading efficiency.

This finding confirms that reading extends beyond accurate word recognition to include interpretation of sentence structure and discourse coherence. Effective syntactic processing enables readers to understand grammatical relationships among words, while semantic integration facilitates the construction of coherent mental representations across sentences and paragraphs. Recent studies emphasize that these higher-order psycholinguistic processes are indispensable for academic reading, particularly in multilingual educational contexts.

Implications for Second Language Education

The findings have important implications for language teaching and curriculum development. Traditional reading instruction frequently emphasizes grammar exercises and comprehension questions while neglecting the cognitive mechanisms that support fluent reading. The present study demonstrates that effective literacy instruction should integrate explicit training in phonological awareness, vocabulary development, lexical retrieval, syntactic awareness, and working memory strategies.

Teacher education programs should also incorporate contemporary psycholinguistic principles, enabling educators to design evidence-based reading interventions. Curriculum developers may use these findings to create instructional materials that simultaneously strengthen decoding, automaticity, vocabulary acquisition, and higher-order comprehension. Such integrated approaches are likely to improve reading fluency and overall language proficiency among second language learners.

Overall Analysis

Overall, the study confirms that reading fluency is a multidimensional phenomenon shaped by the interaction of multiple psycholinguistic mechanisms. The significant regression model ($R^2 = .709$) indicates that the selected variables collectively explain a substantial proportion of the variance in reading fluency among second language learners. These findings support contemporary psycholinguistic theories and reinforce the need for integrated instructional approaches that address both cognitive and linguistic dimensions of reading.

The study also contributes to the limited body of empirical research conducted in South Asian contexts by providing quantitative evidence regarding the psycholinguistic predictors of reading fluency. Consequently, the findings extend existing literature while offering practical guidance for educators, curriculum developers, and policymakers seeking to improve second language literacy outcomes.

Conclusion

This study examined the psycholinguistic mechanisms contributing to reading fluency among second language learners using a quantitative approach with 200 undergraduate participants. The findings revealed that phonological awareness, lexical access, vocabulary knowledge, working memory, syntactic processing, and semantic integration significantly contribute to reading fluency. Among these, vocabulary knowledge emerged as the strongest predictor, followed by semantic integration and lexical access. These results support the Simple View of Reading and the Lexical Quality Hypothesis, highlighting that reading fluency develops through the interaction of cognitive and linguistic processes rather than isolated language skills. The study contributes to psycholinguistic and second language acquisition research while emphasizing the need for evidence-based instructional practices to improve reading fluency and academic achievement among second language learners.

Recommendations

- Integrate psycholinguistic principles into second language reading instruction.
- Emphasize vocabulary development, phonological awareness, and lexical retrieval.

- Implement evidence-based reading interventions such as repeated and extensive reading.
- Provide teacher training on psycholinguistic approaches to literacy instruction.
- Incorporate digital learning tools to enhance reading fluency.
- Encourage curriculum reforms that promote cognitive and linguistic development.

Limitations of the Study

The study employed a cross-sectional quantitative design, limiting causal inference. Data were collected from 200 undergraduate students using self-reported questionnaires, which may introduce response bias. Furthermore, the study examined only selected psycholinguistic variables within a specific educational context, limiting the generalizability of the findings.

Future Directions

Future research should adopt longitudinal and mixed-methods designs to investigate reading fluency across different educational contexts. Studies should also examine additional variables such as motivation, metacognitive strategies, digital literacy, and artificial intelligence-supported reading interventions to provide a more comprehensive understanding of second language reading development.

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