ISSN: 2716-9189 E-ISSN: 2676-1750
Journal of Studies in Language, Culture, and Society (JSLCS). (07) 01, 2024. (PP: 59-73)
Received: 29/04/2024 Accepted: 03/06/2024 Published: 30/06/2024

EXPLORING WRITING CHALLENGES IN RESEARCH ARTICLE INTRODUCTIONS ACROSS DIVERSE SCIENTIFIC DISCIPLINES WITHIN EDUCATIONAL SETTINGS

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Abstract

This study examines challenges faced by authors in crafting impactful introductions for research articles across diverse scientific fields within educational settings. Analysing 103 research articles written by non-native English speakers, we conducted a detailed error analysis, assessed readability scores, and explored correlations to identify specific writing difficulties unique to this critical section. While prevalent grammatical errors, such as article usage and subject-verb agreement, were identified, readability scores suggested a moderate to challenging level of comprehension. Significant variability in text complexity and writing styles was observed emphasising the need for tailored guidance to address individual author needs. While positive correlations were found between article usage and grammar accuracy, negative correlations emerged between paragraph length and sentence length. These findings contribute significantly to understanding writing challenges in research introductions, providing valuable insights for authors and educators. By improving the clarity and impact of research introductions, this study has potential applications in enhancing knowledge dissemination and supporting evidence-based decision-making across various sectors.

Key-words: Assessment Criteria; Error Analysis; Research Papers; Readability Scores; Text Complexity

How to cite the article :
Lahmer, M., & Benmachiche, A. (2024). Exploring Writing Challenges In Research Article Introductions Across Diverse Scientific Disciplines Within Educational Settings. *Journal of Studies in Language, Culture, and Society (JSLCS)7*(1), pp. 59-73.

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1. Introduction

Over the decades, researchers have thoroughly examined the structure of research articles across diverse fields. Numerous studies have delved into every section of these articles, scrutinising their internal structure and broader social impact. Researchers carefully analysed each part, beginning with the smallest section, the abstract (Martín, 2003; Pho, 2008; Samraj, 2005) and extending to larger sections, the introduction that sets the scene for the subsequent content (Ozturk, 2007; Samraj, 2002, 2005; Swales and Najjar, 1987; Swales, 1981, 1990, 2011), the methodology section that outlines the techniques and methods that will be used to conduct the research (Kallet, 2004; Smagorinsky, 2008), the results section that conveys the outcome of the study (Bruce, 2009; Williams, 1999) and the insightful discussions where results are interpreted (Holmes, 1997; Peacock, 2002).

In the realm of scientific writing, the introduction of an article holds great importance by captivating the audience and preparing them for the research expedition that follows. This critical section is not merely a formality but a key determinant of the overall impact and reception of your work (Cargill & O'Connor, 2021). The introduction acts as the entry point to your research, attracting your readers' attention and leading them into the core of your study (Shah, 2015). Its primary function is to provide essential context, explaining why your research is significant and how it fits into the larger academic landscape. Think of it as the "entrance gate to a city" (Armağan, 2013), offering a glimpse of what awaits within the article's pages. Similar to a funnel, the introduction starts with a broad overview and gradually narrows down to the specific focus of the study. It articulates the main problem addressed in the paper and outlines the approach taken by the author (Bellour 2021).

The exploration of research article introductions has been a focal point in various studies (Samraj, 2001), starting with Swales' influential work on the CARS model (1981, 1990). Numerous researchers (Samraj, 2002; Ozturk, 2007; Hirano, 2009) have employed this model to investigate introduction characteristics across academic fields and languages. Swales and Najjar (1987) delved into the inclusion of statements of principal findings (APFs) in research article introductions (RAs) in physics and educational psychology journals, while Gledhill (2000) analysed 150 cancer research introductions, highlighting common phraseology in scientific writing. Cortes (2013) expanded the analysis to lexical bundles, examining a diverse one-million-word corpus and identifying new qualities, thus enriching our understanding of research article introductions.

Idri (2015) emphasizes the foundational nature of language skills in foreign language learning, stating that "the four basic skills of a language are unavoidable in the process of learning a foreign language" (p. 272). This underscores the significance of core skills such as listening, speaking, reading, and writing in language acquisition, acknowledging the variability in their instructional sequence. Among these skills, writing holds particular importance in educational settings such as colleges, schools, and institutions (Shodieva, 2023).

Zeleke (2023) stressed the importance of writing as a language skill, particularly for English as a foreign language (EFL) students. Learning to write proficiently in a foreign language like English poses challenges, making effective EFL writing instruction crucial. Such instruction plays a significant role in assisting EFL students in addressing writing challenges efficiently and approaching writing tasks effectively. Moreover, Muxayyo (2023) underscores the complexity of writing as a cognitive activity, requiring simultaneous control of multiple variables. Understanding this complexity is crucial for educators and learners alike, as it informs effective strategies for developing writing proficiency.

While previous research studies significantly contribute to understanding the structure, features, and language use in research article introductions, a notable yet often overlooked area pertains to the writing challenges faced by authors, especially in crafting the pivotal introduction. Our current focus is dedicated to diagnosing the specific difficulties involved in constructing a compelling research article introduction, whether they be related to grammar, structure, vocabulary, or other aspects. This study aims to address a significant gap by specifically examining the diverse writing challenges in introductions across scientific fields. Remarkably, prior research has not explicitly probed into the inherent writing difficulties in these introductions. This unique focus distinguishes my study, marking a noteworthy contribution to the literature. By addressing this previously unexplored aspect, my research endeavours to shed light on and provide valuable insights into the often-overlooked realm of writing challenges within the context of research articles' introductions.

Investigating the writing challenges within research article introductions holds profound significance for the academic community. Learning and practicing writing is highly demanding because it involves mastering various skills such as language proficiency, understanding social and cultural language norms, grasping different types of writing styles, and having a good command of grammar, organization, and vocabulary (Rakhimova, 2023).

This study aims to uncover nuanced challenges faced by authors when crafting crucial introductory paragraphs, delving beyond the surface-level exploration of structure and language. Understanding the challenges in academic writing is crucial for several reasons. It provides valuable insights into the hurdles scholars face in communicating their work, assisting authors in overcoming issues related to explaining the purpose and importance of their research. Identifying and addressing these challenges empowers authors to enhance the clarity and impact of their introductions, thereby elevating the overall quality of scientific writing. Furthermore, the practical implications of this research extend to academic mentorship and training. By pinpointing common writing challenges, educators can tailor their guidance to address specific needs, assisting emerging scholars in honing their introductory writing skills. This not only facilitates the professional development of individual researchers but also fosters a culture of continuous improvement within the academic community.

2. Methodology

In this study, we analyzed the introductory sections of 103 research articles authored by researchers with English as a foreign language from 27 countries. The research papers were assessed using 26 qualitative and quantitative criteria. These papers covered a wide range of scientific disciplines, with agriculture taking the lead at 12% of the total sample. Other significant contributions came from renewable energy, literature, physics, chemistry, and computer science. Publication venues were similarly varied, with a notable spread across the UK (20 papers), the Netherlands (17 papers), the USA (12 papers), and Switzerland (12 papers). Interestingly, the access status of these papers also demonstrated diversity, with 72 classified as open-source, 15 closed-source, and 16 adopting a hybrid model. The data thus reflects a rich landscape of scientific inquiry, spanning diverse regions, topics, and accessibility models.

In assessing the quality and characteristics of the research papers, various criteria were employed, classified broadly as either quantitative or qualitative. Quantitative metrics encompass measurable attributes such as the number of paragraphs, words, and authors, as well as readability indices like Flesch-Kincaid, Gunning Fog, Coleman-Liau, and Automated Readability. Additionally, sentence length can be quantified for analysis. On the other hand, qualitative criteria involve linguistic elements, such as article usage, subject-verb agreement, tense consistency, sentence

structure, comma usage and splitting, technical jargon, redundancy, spelling, overuse of passive voice, random capitalization, overcapitalization, undercapitalization, and the incorporation of transitive words. Further qualitative considerations include gender attribution of the first author, the publication venue, the scientific field, and the open source status of the content. It is crucial to recognize that some criteria, like sentence length and readability indices, can straddle both quantitative and qualitative domains, contingent upon interpretation and analytical approach. These criteria can be broadly grouped into four primary classes:

- **Paper Information:** Open source status, publication venue, scientific field, and gender of the first author.
- **Vocabulary Issues:** Technical jargon, spelling, lack of transitive words, grammar errors, article usage, subject-verb agreement, tense consistency, overuse of passive voice, random capitalization, over-capitalization, and under-capitalization.
- **Structure Problems:** Number of paragraphs, number of words, number of authors, Flesch-Kincaid Index, Gunning Fog Index, Coleman-Liau Index, Automated Readability Index, sentence length, sentence structure, comma splitting, comma usage mistakes, and redundancy.

In the realm of academic writing, the assessment of text readability plays a pivotal role in ensuring effective communication with the audience. Various readability indices provide valuable insights into the complexity of written content, shedding light on the ease with which readers can comprehend the material. Among these, the Flesch-Kincaid Index stands out as a reliable measure, gauging the difficulty of a text based on factors such as sentence length, word usage, and syllable count. In this study, we delve into the application of the Flesch-Kincaid Index, examining its formula - Flesch-Kincaid Index = 0.39((total words)/(total sentences)) + 11.8((total syllables)/(total words)) - 15.59. Our analysis reveals a significant variation in index values across our dataset, indicating a diverse range of readability levels within research article introductions.

Additionally, we explore the Gunning Fog Index, which estimates the educational background required to comprehend a text upon the initial reading. Like the Flesch-Kincaid Index, the Gunning Fog Index underscores the broad spectrum of readability scores found in our dataset. The Coleman-Liau Index, a metric distinctive for its reliance on character count rather than syllables, further contributes to our understanding of text complexity. The formula - Coleman-Liau Index = 0.4[((total words)/(total sentences)) + 100((total complex words)/(total words))] - elucidates the diverse scores obtained, offering a unique perspective on the readability of research introductions.

Moreover, we investigate the Automated Readability Index (ARI), which, based on total characters, words, and sentences, provides yet another layer of insight into the intricacies of written content. The ARI formula - Automated Readability Index = 4.71((total characters)/(total words)) + 0.5((total words)/(total sentences)) - 21.43 - reveals a wide range of scores, emphasizing the variability in the complexity of the texts examined. Through this exploration of multiple readability indices, our study aims to contribute to a nuanced understanding of the readability challenges inherent in research article introductions, paving the way for informed improvements in scholarly communication.

Figure 1: Classification of Assessment Criteria

To ensure a comprehensive analysis, a combination of various methodologies was employed. Error analysis provided an overview of the dataset, utilizing measures such as minimum, maximum, average, median, frequency, and standard deviation to examine the distribution of error types, including subject-verb agreement, tense inconsistency, passive voice overuse, capitalization, and comma usage across different groups or subgroups. Additionally, a readability analysis assessed the ease of understanding by considering factors such as sentence length, word complexity, and sentence types. This paper utilized the Flesch-Kincaid, Gunning Fog, Coleman-Liau, and Automated Readability indices to evaluate the overall readability and complexity of article introductions. Furthermore, a correlation analysis explored potential associations between variables, such as investigating the correlation between the number of authors and readability scores. This aimed to discern whether a statistically significant relationship existed between the number of authors involved in an article and the overall readability and comprehension of its introductory section.

3. Results and Discussion

In this research, several key findings emerged regarding writing issues, readability, and correlations within research article introductions. The analysis of common writing errors identified article usage as the most prevalent grammatical issue, averaging 4.12 errors per article, followed by subject-verb agreement and tense consistency with averages of 1.27 and 0.99 errors per article, respectively. Technical jargon varied considerably, averaging 2.87 instances per article, while spelling errors were relatively infrequent at an average of 0.13 per article. Readability assessments indicated that the majority of articles fell within a moderate to moderately challenging range, with 80% having Flesch-Kincaid scores below 30, suggesting suitability for college-level readers. Gunning Fog Index scores, which also contribute to readability evaluations, predominantly ranged between 11 and 16. The correlation analysis highlighted strong positive associations between

factors such as the number of paragraphs and words, article usage, subject-verb agreement, and tense consistency, as well as between various readability indices. Conversely, negative correlations were observed between the number of paragraphs and sentence length, as well as between various grammatical and structural elements with sentence length. Moderate correlations emerged between sentence structure and issues such as redundancy, comma usage mistakes, and overuse of passive voice, as well as between grammar errors and structural problems.

Table 1.

Descriptive Statistics for Text Analysis Metrics of Research Articles

	Min	**Avr**	**Med**	**Max**	**Sum**	**Std Dev**
Number of Paragraphs	1	5.31	5	14	547	2.93
Number of Words	132	406	340	1939	41823	240.2
Article Usage	0	4.12	2	24	424	5.9
Subject-Verb Agreement	0	1.27	0	21	131	3.1
Tense Consistency	0	0.99	0	15	102	2.44
Sentence Structure	0	1.67	1	20	172	3.11
Comma Splitting	0	0.39	0	3	40	0.72
Comma Use Mistakes	0	1.1	1	11	114	1.45
Technical Jargon	0	2.87	2	18	295	3.267
Redundancy	0	1.54	1	6	159	1.35
Spelling	0	0.13	0	2	13	0.41
Overuse of Passive Voic	0	1.44	1	7	149	1.64
Random Capitalization	0	0.08	0	2	9	0.37
Over Capitalization	0	0.12	0	2	13	0.43
Under Capitalization	0	0.09	0	1	9	0.287
Sentence Length	0	3.83	2	24	395	5.5
Lack of Transitive Word	0	1.51	2	6	156	1.34
Total	0	1.41	0	24	2181	2.98

The results presented in the table reveal a range of strengths and weaknesses within the analyzed research articles. The average article contained 5.31 paragraphs and 406 words, suggesting a generally concise structure. However, the wide variation in paragraph and word counts (ranging from 1 to 14 paragraphs and 132 to 1939 words) highlights a lack of consistency in article formatting. In addition, the average word count of 406, with a standard deviation of 240.2, indicates variability in the length of the texts, emphasizing the importance of considering both brevity and detail in the examined documents.

Regarding grammatical errors, the study identified several prevalent issues in student writing, including article usage (4.12 errors per article, on average), subject-verb agreement (1.27 errors), and tense consistency (0.99 errors). These findings align with prior research by Miller (2005), who similarly highlighted article usage as a common grammatical error.

Additionally, the study observed an average technical jargon score of 2.87, with notable variability (standard deviation of 3.267) in the use of specialized language. This observation

supports Woodward-Kron's findings (2008), which emphasized the complex relationship between disciplinary vocabulary acquisition and knowledge development.

In a related study by Prayuda et al. (2023), error analysis revealed that students exhibited errors across four key aspects: omission, addition, misformation, and misordering. The analysis showed that nouns were the most error-prone category (22%), followed by pronouns (19%), adjectives (17%), verbs (14%), conjunctions (14%), adverbs (8%), prepositions (6%), and interjections (0.2%).

Together, these studies underscore the significance of addressing grammatical challenges in student writing and highlight the need for targeted interventions to enhance language proficiency and writing quality.

Notably, the average article in our dataset exhibited only 0.13 spelling errors, suggesting a high level of attention to orthographic accuracy. This contrasts with the findings of Blake (2021), who reported a significantly higher rate of spelling errors in a corpus investigation of scientific articles. Furthermore, an examination of grammatical elements such as subject-verb agreement and tense consistency, with average scores of 1.27 and 0.99, respectively, and standard deviations of 3.1 and 2.44, indicates potential areas for improvement in maintaining grammatical coherence. This aligns with the conclusions drawn by Navaz (2021), who underscored the significance of acquiring grammatical accuracy to improve the overall quality of written communication. These comparisons with previous studies underscore the relevance of the current research in contributing to the ongoing discourse on effective writing practices.

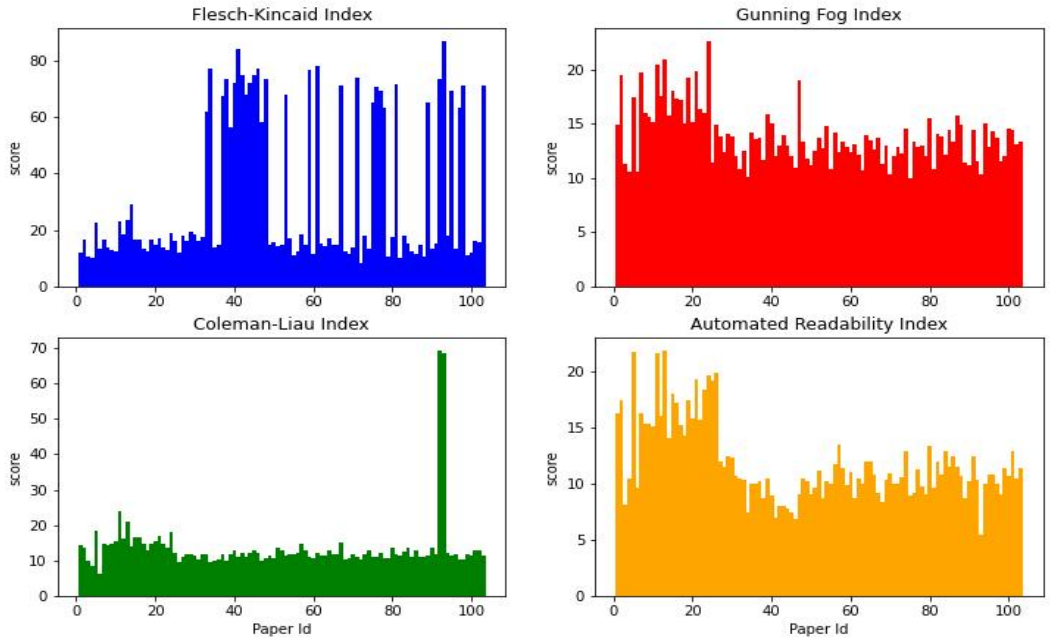

Figure 2: Comparison of Readability Indices (Flesch-Kincaid, Gunning Fog, Coleman-Liau, and Automated Readability Index Scores) across Scientific Papers

Based on the histogram results above, specifically from the Flesch-Kincaid Index bar, it is evident that around 80 percent of the analyzed introductory sections have an index score below 30. This implies that these texts pose a challenge and are best suited for college students. In contrast, the remaining 20 percent score above 60, indicating ease of comprehension, even for younger students.

Examining the Gunning Fog Index bar, approximately 95 percent of the analyzed introductory sections fall within the score range of 11 to 16, suggesting a moderate to moderately challenging level of readability. The remaining 5 percent score above 16, indicating a higher level of comprehension expected, more suitable for college students.

According to the Coleman-Liau Index, about 90 percent of the analyzed introductory sections have a readability score between 10 and 15, suggesting a moderate to moderately challenging level. Analyzing the Automated Readability Index reveals that most scores fall within the range of 10 to 15. A score between 10 and 12 implies suitability for a general audience, including high school students and most adults. Conversely, a score between 13 and 15 indicates potential difficulty for readers, typically more suitable for individuals with higher education levels, such as college students. The variability in readability scores suggests significant differences in the complexity and ease of understanding among the introductions of these research papers. This variability could be attributed to factors such as topic complexity, authors' writing styles, and the intended audience. The wide range of scores in each index indicates that while some papers may be accessible to a broader audience, others might require a higher level of education or familiarity with the subject matter to comprehend fully.

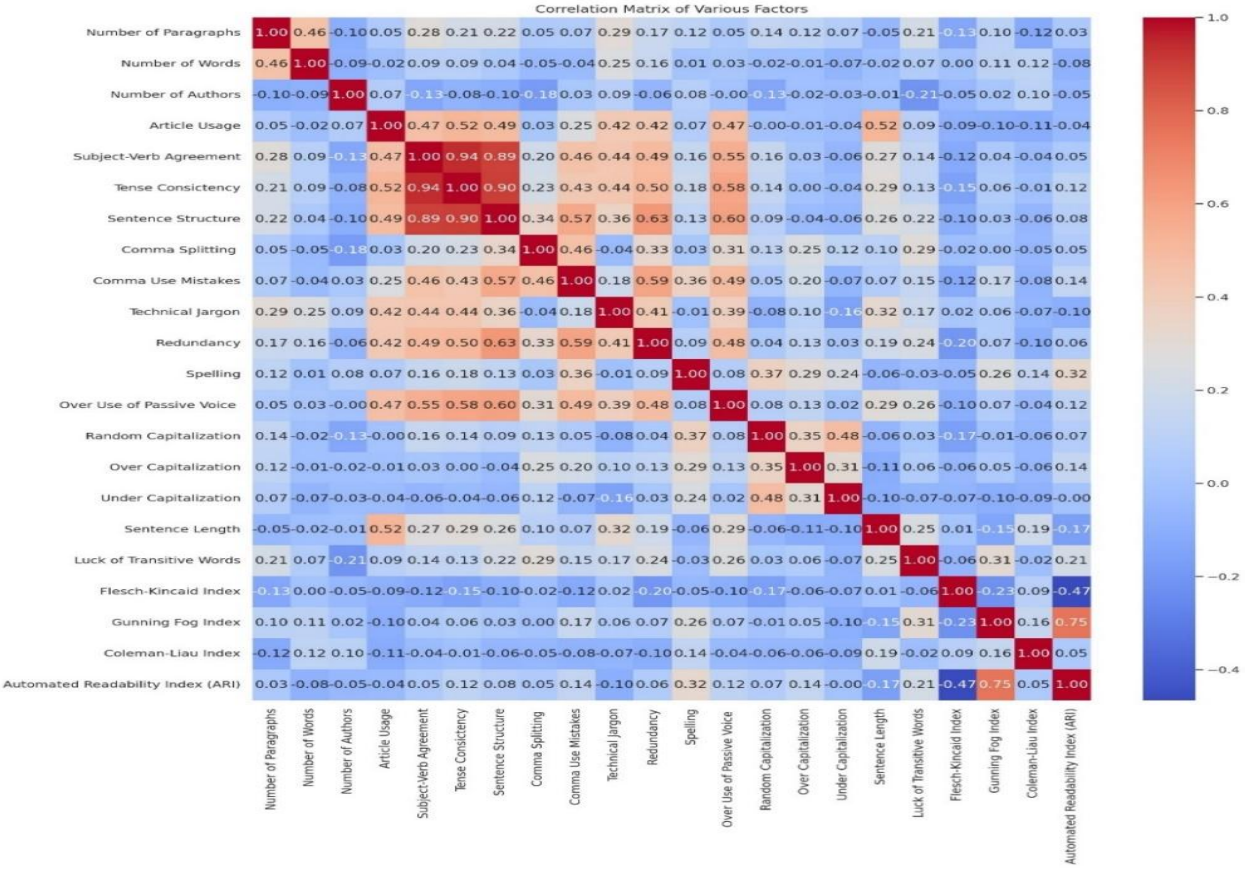

Figure 3: Exploring the Inter-connectedness: A Correlation Matrix of Assessment Criteria

These plots collectively provide insights into how the readability of research papers, as measured by these indices, has changed over time in your dataset. Such trends can be influenced by various factors, including changes in academic writing styles, the complexity of topics being researched, and evolving linguistic norms in scientific communication. The correlations between the factors in the matrix are represented by values ranging from -1 to 1. A correlation of 1 indicates perfect positive correlation, where an increase in one factor corresponds to an increase in the other. Conversely, a correlation of -1 signifies perfect negative correlation, where an increase in one factor is associated with a decrease in the other. A correlation of 0 suggests no correlation between the two factors.

The correlation results indicate the degree of association between various factors measured in the study. Positive correlations suggest that as one factor increases, another tends to increase as well, while negative correlations indicate that as one factor increases, another tends to decrease. A correlation of 1 or -1 signifies a perfect linear relationship, while a correlation of 0 suggests no linear relationship. Examining the matrix, the strongest positive correlations are observed among several factors. Notable relationships include the positive correlation of 0.46 between the number of paragraphs and the number of words, implying that longer texts tend to have more paragraphs. Similarly, the number of words exhibits a positive correlation of 0.47 with article usage, and article usage is positively correlated with both subject-verb agreement and tense consistency, with correlation coefficients of 0.47 and 0.94, respectively, indicating that a strong command of grammar and style is associated with proficient use of articles. Furthermore, tense consistency demonstrates a strong positive correlation of 0.57 with sentence structure, creating a chain of interrelated factors. This finding aligns with previous research on the interconnectedness of grammatical elements in written communication (Staples and Reppen, 2016).

The positive correlations continue, with varying strengths, encompassing factors such as comma splitting, comma use mistakes, technical jargon, redundancy, spelling, over-use of passive voice, random capitalization, over-capitalization, under-capitalization, sentence length, luck of transitive words, Flesch-Kincaid index, Gunning Fog index, and Coleman-Liau index. These correlations shed light on the interconnected nature of these linguistic and stylistic elements, consistent with prior studies examining the relationships among these writing attributes (Crossley, 2020). Positive correlations suggest that as one factor increases, another tends to increase as well, while negative correlations indicate that as one factor increases, another tends to decrease. A correlation of 1 or -1 signifies a perfect linear relationship, while a correlation of 0 suggests no linear relationship.

Conversely, the matrix reveals the presence of strong negative correlations between certain factors. Noteworthy negative associations include the correlation coefficients between the number of paragraphs, number of words, article usage, subject-verb agreement, tense consistency, sentence structure, comma splitting, comma use mistakes, and other factors with sentence length. For instance, the negative correlation coefficient of -0.28 between the number of paragraphs and sentence length implies an inverse relationship. In this context, it suggests that as the number of paragraphs increases, sentence length tends to decrease, and vice versa.

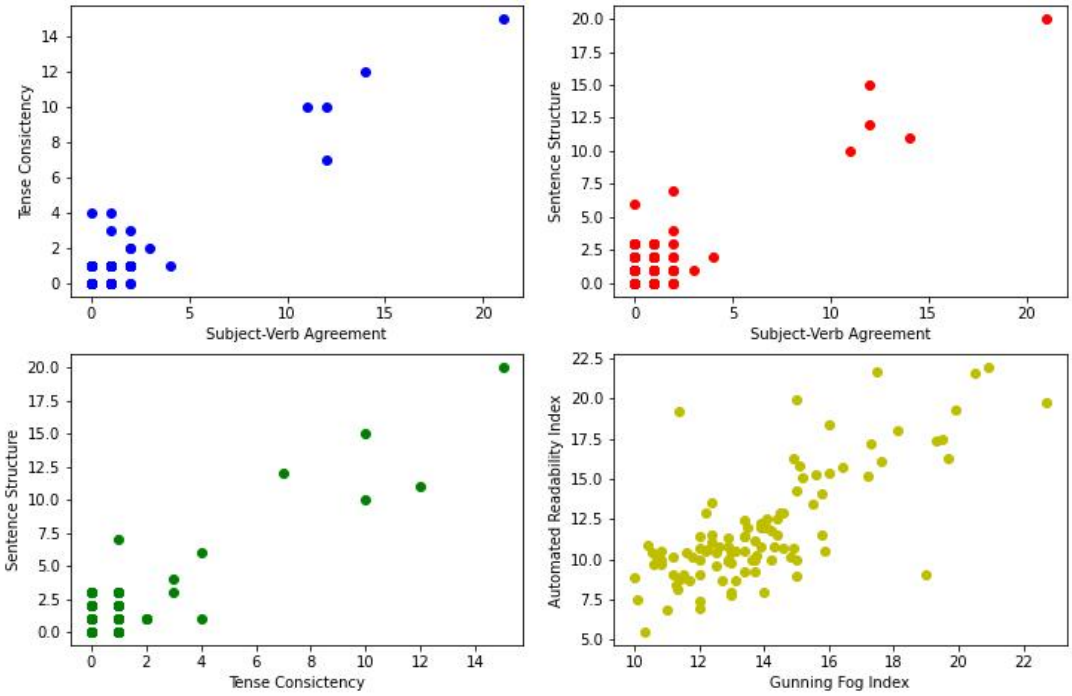

Figure: The Metrics' Strong Correlations

The presented correlation matrix in Figure 4 showcases robust associations among key elements of writing, specifically subject-verb agreement, tense consistency, and sentence structure. Notably, subject-verb agreement and tense consistency, both falling within the realm of grammar errors, exhibit a strong correlation, emphasizing a shared relationship in maintaining grammatical precision. Additionally, sentence structure, categorized as a structural problem, is significantly correlated with these grammatical aspects, further underscoring the interconnected nature of linguistic elements (Crossley, 2020).

Furthermore, the correlation matrix unveils a noteworthy association between two readability metrics: the Gunning Fog Index and the Automated Readability Index. This correlation emphasizes the connection between these indices, both of which contribute to assessing the ease of comprehension in written content (Batini and Scannapieco, 2018).

An intriguing observation within the matrix is the moderate correlation between sentence structure and various issues, including redundancy, comma usage mistakes, and the overuse of passive voice. This suggests that challenges in sentence structure may be linked to these specific stylistic concerns, indicating a multifaceted relationship between structural and stylistic aspects of writing.

While the matrix highlights significant correlations within the same class of variables, it also reveals some exceptions. Notably, when exploring correlations between different classes, a discernible moderate correlation emerges between grammar errors and structural problems. This finding suggests that issues in grammar, such as subject-verb agreement and tense consistency, are

moderately associated with challenges in sentence structure, indicating a broader interplay between grammatical and structural components in written communication.

In summary, the correlation matrix provides valuable insights into the intricate relationships among various writing elements. The identified patterns shed light on how different aspects of grammar, structure, and readability are interlinked, offering a nuanced understanding of the complexities involved in effective written communication, aligning with and extending previous findings in the field

The results of this study align with the observations of Ramzan et al., 2023, regarding the difficulties and challenges within student writing. The identified lack of coherence between sentences and paragraphs highlights the importance of seamless transitions to guide readers through a logical progression of ideas. Moreover, the limited lexical choices underscore the significance of a diverse vocabulary in fostering nuanced expression and enhancing overall writing quality.

The study's findings also emphasize the impact of grammatical errors, particularly in subject-verb agreement and pronoun-antecedent agreement, on sentence integrity and overall readability. These insights underscore the vital role of grammar skills in maintaining clarity and coherence in written communication. Educators should consider integrating transitional techniques and encouraging lexical exploration to address the identified challenges and enhance student writing quality. By focusing on these aspects, educators can facilitate more effective and engaging academic writing practices among students.

In a study conducted by Sulistyaningrum (2024), it provided practical advice for educators on supporting academic writing, particularly in English. It stressed the pivotal role of instructors and recommended a focused approach to English academic writing practices, highlighting language use as a significant challenge. To address formatting, errors, word choice, and grammar, educators were advised to enhance teaching methods by carefully selecting exemplary works as references. Incorporating articles into discussions on word classes was seen as beneficial for students to understand and analyze terminology and language components. While acknowledging the importance of word processors, the study recognized their limitations in replacing students' grammatical abilities. It called for further exploration of research tools to better understand how word processors can assist students, emphasizing the need for a comprehensive approach to tackle academic writing challenges effectively.

4. Conclusion

This study delved into the writing challenges faced by authors in crafting compelling research article introductions, specifically focusing on articles authored by researchers with English as a foreign language. By analyzing 103 introductions across diverse scientific fields, the research uncovered both strengths and weaknesses in the writing quality. The key findings of the study brought attention to areas that demand improvement. Notably, readability varied across introductions, with some being accessible to a wider audience, while others presented challenges that necessitated a higher level of education or familiarity with the subject matter. Additionally, notable deficiencies in grammatical accuracy were observed, particularly in article usage, subject-verb agreement, and tense consistency, highlighting the need for enhanced attention to these areas.

The analysis also revealed issues in sentence structure, including the prevalence of complex sentence structures and a lack of transitive words, both of which contributed to diminished readability in specific instances. The positive correlations observed between various factors

underscored the interconnectedness of linguistic and stylistic elements. For example, proficient use of articles was associated with strong grammar and style, while sentence structure was linked to both grammar and readability. Additionally, the study identified intriguing negative correlations, such as the inverse relationship between the number of paragraphs and sentence length.

This research makes a substantial contribution to the ongoing dialogue surrounding effective scientific writing practices. It achieves this by identifying and delineating specific writing challenges encountered by non-native English speakers when composing research introductions. Additionally, the study provides valuable insights into the intricate interplay among grammar, structure, and readability, shedding light on the multifaceted nature of these elements in scientific writing. Furthermore, it emphasizes the significance of balancing brevity and detail in the construction of introductions.

The practical implications of these findings extend to the realm of academic mentorship and training, as the research pinpointing common writing challenges offers actionable insights for guiding and supporting individuals navigating scientific writing in an academic context. Abdurasulova, (2024) found that Task-Based Learning is an effective teaching method for improving writing and speaking skills in EFL education. By involving students in real, purposeful tasks, TBL helps develop language abilities in meaningful situations, promoting engagement, motivation, and critical thinking. By carefully choosing tasks, preparing students, facilitating collaboration among peers, and encouraging reflection, teachers can empower learners to communicate proficiently and confidently in English, preparing them for success in academic, professional, and social contexts.

Further research could explore the effectiveness of interventions designed to address the identified writing challenges, potentially including targeted training programs or the development of special writing tools for non-native English speakers in the academic domain. By continuing to investigate and address these challenges, we can empower researchers to communicate their work effectively and contribute to a more inclusive and accessible scientific community.

Further research could also explore the effectiveness of interventions designed to address the identified writing challenges, potentially including targeted training programs or the development of specialized writing tools for non-native English speakers in the academic domain. By continuing to investigate and address these challenges, we can empower researchers to communicate their work effectively and contribute to a more inclusive and accessible scientific community.

Moreover, this research highlights how linguistic competence within academic English operates as a form of social capital. This study sheds light on how language proficiency and access to resources impacts participation and success within the scientific community, contributing to the understanding of language inequalities in academic settings, a key area of study in the sociology of language.

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