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A Comparative Study of Abstract Length and Relative Clause Usage in Abstracts of Educational Research Articles: Anglophone vs. Turkish Non-Anglophone

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Abstract Abstracts in research articles (RAs) serve a critical role in summarizing key findings and capturing readers' interest. However, linguistic strategies employed in abstracts can vary significantly based on authors' linguistic and cultural backgrounds. Accordingly, this study investigates differences in relative clause usage and abstract length between Anglophone and Turkish non-Anglophone authors in education research article abstracts (RAAs). Using a corpus of 106 RAAs, with 56 authored by Anglophones and 50 by Turkish non-Anglophones, descriptive statistics and log-likelihood (LL) analysis were applied to examine these linguistic features. Findings reveal that Turkish authors tend to produce slightly longer RAAs, although with greater variability, likely influenced by inconsistent journal guidelines. In contrast, Anglophone authors use relative clauses more frequently and favor non-reduced forms significantly more than their Turkish counterparts, reflecting differing syntactic preferences and stylistic conventions. These results underscore the impact of linguistic background on academic writing practices, highlighting the need for targeted interventions to support non-native English-speaking authors in achieving greater clarity and conciseness. Practical implications include the development of instructional resources to enhance the syntactic efficiency of abstracts, which is critical for improving their acceptance in international journals. Limitations of the study, such as the exclusion of multi-authored papers and the focus on unstructured abstracts, suggest avenues for future research.

Keywords Abstracts, Anglophone Authors, Length, Non-Anglophone Authors, Relative Clauses, Research Articles

1. Introduction

A substantial body of literature has explored various aspects of academic writing; researchers have examined diverse language features across different academic genres, such as academic vocabulary in essays [1, 2], reports [3, 4] and reflective writing [5, 6]. Additionally, research articles (RAs) have been a focus of investigation, with scholars exploring various sections within RAs [7-9]. Of particular interest is the abstract, which constitutes a distinct genre in academic writing due to its unique function, structure, and linguistic characteristics compared to RAs [10].

Well-crafted abstracts are highly informative and captivate the reader's interest, compelling them to delve deeper into the research presented [11]. Consequently, the abstract is often considered the most crucial section of the paper, prompting authors and publishers to pay extra attention to crafting effective summaries. However, scholars from different linguistic backgrounds might approach this genre differently. Therefore, it is essential to

investigate the linguistic strategies employed by native and non-native English authors. This is particularly relevant for those striving to enhance scholars' academic writing skills in English. Thus, the current investigation is important for improving the readability, clarity, and overall quality of research article abstracts (RAAs), which are essential for effectively summarizing and promoting research findings.

Abstracts must be concise yet thorough, fitting within specified word limits while effectively summarizing detailed research. Journals normally have specific guidelines regarding general structure and limits of RAAs. The complexity of research, the discipline's norms, and linguistic choices also influence abstract length. Understanding these factors helps authors craft abstracts that meet editorial standards and enhance reporting quality. Additionally, insights into length variations can aid non-native English speakers in improving their abstract writing, ensuring their work is accessible and comprehensible to specialized audiences.

Also, the identification of differences in relative clause usage between native Anglophone and (Turkish) non-Anglophone authors can allow educators to develop targeted interventions to help create more concise and effective abstracts. This is particularly important given the challenges that non-native speakers face, as highlighted by [12] and [13], such as increased difficulty and lower satisfaction when writing in a second language. Such approach could lead to the development of resources and training programs tailored to address these differences, thereby promoting fairness and equality in academic publishing. Research by [14] and [15] on linguistic disparities reinforces the need for such targeted support to ensure that non-native English speakers can produce high-quality academic work.

While extensive research exists on various linguistic features in academic writing, relative clauses have not been thoroughly examined. The current study specifically addresses this gap by analyzing the frequency and usage patterns of relative clauses in RAAs, providing a detailed understanding of how these structures are employed by different author groups. Prior studies, such as those by [16, 17], have noted the importance of relative clauses but did not focus extensively on their usage in abstracts. Similarly, previous research [18, 19], has highlighted general differences in academic writing but has not specifically focused on relative clauses.

Considering all of the above, the current study sought answers to the following questions:

1. Is there a significant difference in the length of education RAAs by Anglophone authors compared to those authored by Turkish non-Anglophone authors?
2. What are the differences in the overall frequency and percentage of relative clause usage between native Anglophone and Turkish non-Anglophone authors in education RAAs?
3. How does the use of reduced and non-reduced relative clauses vary between native Anglophone and Turkish non-Anglophone authors?

2. Literature Review

2.1. Importance of Abstracts in RAs

The American Psychological Association (APA) [20, p. 38] defines an abstract as "a brief, comprehensive summary of the contents of [a research] paper." It serves as "a valuable tool to communicate the most important elements of the methods and results of a research study" [21, p. 2]. An abstract functions as a standalone document, allowing readers to quickly grasp the essential points of the research without needing to read the entire paper [22]. An abstract often serves as readers' first contact with the article, influencing their decision to read the full paper [20]. One key characteristic of a good abstract is conciseness, requiring authors to be brief while providing informative sentences [20], succinctly summarizing how the study was conducted, its findings, and implications for practice [21]. Achieving conciseness can be facilitated by structuring the abstract around key questions such as the study's rationale, aims, methods, results, and implications [21].

Authors can also employ various linguistic features to achieve conciseness, including the active and passive voice, past tense, present simple tense, verbs, noun phrases, and personal pronouns. One linguistic feature that has received relatively limited attention from researchers is relative/adjective clauses [16], which are "… subordinate clause[s] that modif[y] a head noun in the main clause, with their main function being to restrict the possible set of individuals, objects, events, etc., to the subset the author intends to mention" [23, p. 58].

Although only a small number of researchers have investigated the use of relative clauses in research articles [24-26], authors may have strategic reasons for choosing them [26]. For example, relative clauses can be particularly important in research article abstracts, where strict word limits apply, as they provide authors with "an efficient and economical means of conveying material succinctly" [17, p. 22]. They enable authors to include essential or additional information about a subject without adding extra sentences or words. Specifically, -ed participle in reduced relative clauses [27] allows for compact packaging of information, contributing to the overall conciseness of the abstract. Moreover, relative clauses help avoid redundancy by consolidating related ideas into a single sentence, eliminating the repetition of grammar items like the subject and object in separate sentences. Additionally, they maintain focus on the main subject of the sentence while providing supplementary information, ensuring that the abstract remains tightly focused on the research topic and key findings. Finally, relative clauses contribute to the clarity of the abstract without unnecessary repetition or

verbosity.

2.2. Length of RAAs

Several factors influence the length of RAAs. The most significant factor is journals' guidelines and word limits, which often dictate the maximum length allowed for abstracts. Adherence to these constraints necessitates conciseness and efficiency in summarizing the research. Although the word limit for an abstract can vary, editors may exhibit leniency towards abstracts that are slightly under the word limit, provided all necessary elements are included. In contrast, they tend to be more stringent when the abstract exceeds the prescribed length [11].

Another significant factor is the complexity of the research itself. More intricate studies with extensive methodologies and multifaceted results may require longer abstracts to adequately convey essential information. The discipline and specific subfield of research also play a role; fields that require detailed descriptions of experimental procedures or theoretical frameworks may result in longer abstracts [22]. For instance, Guo and Iribarren [28] found in their study on Cancer Nursing Research that abstracts with higher word counts generally exhibited superior reporting quality. They note that structured abstracts, which typically contain more words, mandate the inclusion of specific information. This requirement can help authors provide more comprehensive details, corroborating previous research on abstracts in psychology [29]. On the other hand, Nature, a prestigious journal renowned for publishing exemplary peer-reviewed research across various scientific and technological disciplines, imposes a word limit of 150 words for its abstracts. Certain academic fields, such as Medicine and Experimental Psychology, may adhere to more structured formats for the Abstract section, which can influence the requisite word count [12]. The education journals investigated in this study impose word limits on abstracts, typically between 150 and 300 words, with the non-Anglophone ones allowing higher word counts. This underscores the importance of adapting the approach to abstract writing, as journals often have their own distinct audiences, styles, and guidelines.

Moreover, the linguistic choices made by the authors, such as the use of relative clauses and other syntactic structures, can impact abstract length. For instance, relative clauses, the focus of the current paper, allow for the inclusion of additional information without significantly increasing word count, thus facilitating conciseness [17].

Another factor that can affect abstract length is the authors' proficiency in English and their familiarity with academic writing conventions. Non-native English speakers might produce longer or more variable abstracts due to challenges in concise expression and adherence to norms. Earlier studies have observed a tendency among Turkish authors of education research articles in English to extend their sentence structures through the incorporation of a higher frequency of complex and compound-complex constructions, a practice that may not invariably be warranted [19]. Lastly, the intended audience and purpose of the abstract influence its length; those intended for a broader audience, in interdisciplinary journal in particular [30], may need to be more detailed to ensure clarity and comprehensibility, whereas those aimed at specialists might be more succinct and focused on specific findings [31].

2.3. Relative Clauses

While it is challenging to identify a fixed set of properties for relative clauses [16], various approaches have been taken to classify them. One such approach is based on the grammatical function of their head in the relative clause [32]. According to this classification, the head noun can serve different roles depending on its syntactic and semantic context. To give an example, heads can function as subjects, objects, or possessives within the relative clause, influencing both the structure of the clause and its interpretation. On the other hand, Cowan [33, p. 421] categorizes relative clauses based on restrictiveness. He defines a restrictive relative clause as "one that serves to restrict the reference of the noun phrase modified" while "[a] nonrestrictive relative clause adds information about the noun modified." The latter type "provide[s] background information or expressive evaluation about a referent that is already identified and hence does not need any more referential specification" [34, p. 164]. An example of the former from the corpora of the current study is, "Quality of writing for students *who chose a topic* at time 1 and not at time 2 did not differ." An example of the latter, on the other hand, is as follows: "… the author employs the combination of a critical policy analysis, *which derives* from critical social research …"

Reduction is a notable phenomenon observed in relative clauses. This involves "the deletion (and often concomitant syntactic alteration) of certain elements of a relative clause, the result of which does not change the meaning of the clause in any way" [25, p. 203]. Such reduction serves to provide additional information about the main subject of the sentence in a concise manner, thereby reducing the word count. An example from the Anglophone corpus of the current study is, "…this systematic review, *conducted using the PRISMA guidelines*, sought to identify the primary drivers and barriers…" [35, p. 1748]. In this sentence, the relative clause "conducted using the PRISMA guidelines" provides additional detail about the nature of the systematic review. By reducing the relative clause from "which was conducted using the PRISMA guidelines," the sentence becomes more streamlined and easier to read while still conveying the essential information. Taken together, these exemplify how reduced relative clauses in academic writing help condense information [36].

2.4. Challenges Faced by Non-native Speakers in Academic Writing

The English language, often hailed as 'the language of

science' [37], is widely utilized for academic publications. While native speakers (NSs) may seem to have an advantage in publishing RAs in English, non-native speakers (NNSs) have been argued to produce RAs on par with their NS counterparts [18]. However, NNSs face several challenges in this endeavor; Englander [12] found that writing in English for NNSs is, on average, 21% more difficult than writing in their mother tongue. Similarly, Hanauer et al. [13, p. 136] observed "significant differences between L1 [native tongue] and L2 [foreign language] science writing with an increased burden for L2 science writing consisting of an average increase of 24% in difficulty." They argue that this linguistic disparity creates an injustice, placing an additional burden on NNSs. Although many NNSs are able to overcome these challenges and successfully publish in English-language journals, they often do so with greater anxiety and less satisfaction compared to writing in their native language [13]. These difficulties are typically related to vocabulary, syntax, organization, and methodological issues. The first two factors are likely to affect sentence length and, consequently, the overall length of an abstract composed by NNNs.

Comparative analyses have revealed differences in the use of certain linguistic features between NSs and NNSs in academic writing. For example, Chinese NNSs were found to use hedges and boosters less frequently than British NSs in expressing doubt and certainty [14]. Similarly, Turkish NNSs were less inclined to use personal pronouns for authorial voice and tended to employ shorter sentences compared to Anglophone authors [15, 19]. Additionally, the reasons for using personal pronouns differed between non-Anglophone and Anglophone authors [38]. In terms of reporting verbs, NSs were more likely to use direct quotations than NNSs, potentially indicating their proficiency in handling linguistic materials produced by other authors [39]. Furthermore, NSs exhibited a higher frequency of informality in academic writing, including the use of first-person pronouns, anaphoric pronouns, split infinitives, listing expressions, and contractions [40].

Among possible differences, the aforementioned disparities in the use of language features between NSs and NNSs in academic writing are just a few. To alleviate the challenges faced by NNSs and support their international publishing endeavors, further research is crucial at the micro level, examining individual linguistic tendencies and cultural backgrounds [41]. Drubin and Kellogg [37] suggest that the persistent dominance of English as the primary global language in scientific discourse indicates that significant change in the near future is unlikely. They argue that improving communication within the international scientific community and promoting scientific advancement rely on addressing the challenges faced by non-native English speakers. The present study aims to contribute to this endeavor by focusing on a seemingly advanced language feature, namely relative clauses, which aligns with the argument for a better understanding of how individual differences impact academic writing among NNSs [41]. This emphasis on linguistic tendencies and cultural contexts is essential for addressing the challenges faced by NNSs, as it recognizes that their writing practices cannot be generalized solely based on the differences observed at a broader level.

3. Method

3.1. Selection of Corpora

This study analyzed 106 education RAAs[1] divided into two corpora: (a) 56 RAAs authored by Anglophone writers, containing 11,608 words, and (b) 50 RAAs by Turkish authors using English as a lingua franca, containing 10,774 words. The total corpus consisted of 358,068 running words.

To ensure a reliable comparison between the two corpora, particular attention was given to selecting papers written by Turkish authors affiliated with Turkish institutions at the time of publication. Articles co-authored by non-Turkish authors were excluded from the Turkish corpus. A similar approach was employed in compiling the Anglophone corpus. Although verifying the authors' actual identities was practically impossible, various factors such as authors' full names, affiliations, and other pertinent information were considered.

Special care was taken to select abstracts of a similar nature; specifically, structured abstracts with multiple subheadings (such as objectives, methods, results, and conclusions) were excluded from the study to ensure uniformity in the analysis. This approach aimed to reduce variability in formatting and content organization, facilitating a more direct comparison of linguistic features across the two corpora. The presence of distinct sections could influence language use and the construction of relative clauses differently than in unstructured abstracts. Thus, selecting abstracts of a similar nature was intended to create a more controlled environment for examining the linguistic characteristics relevant to the research focus.

[1] I have two main reasons for focusing on this particular field. Firstly, on a personal level, as an education scholar who is not a native English speaker, I often write research articles in English without giving much thought to my linguistic choices. I initiated this research to become more conscious of the stylistic elements in my own writing. Secondly, as a scholar who teaches rhetoric and discourse, this will also enable me to better meet the needs of my students.

Table 1. Journals included in corpus

Journals		Number of Research Abstracts
Anglophone corpus	International Journal of Early Years Education	10
	Journal of Educational Psychology	10
	British Journal of Educational Technology	10
	Journal of Research in Science Teaching	10
	Language Teaching Research	10
	Second Language Research	6
Non-Anglophone corpus	Education and Science	10
	Pegem Journal of Education and Instruction	10
	Boğaziçi University Journal of Education	10
	Contemporary Educational Technology	10
	Limitless Education and Research	10
	Total	*106*

Additionally, attention was given to the publication dates to identify the most recent trends in scholarly publishing, with the selected articles being published between 2021 and 2024.

RAAs published in open-access journals were included in this study. Nonetheless, it was ensured that all selected journals were peer-reviewed, resulting in the inclusion of 106 peer-reviewed education journals. See Table 1.

3.2. Analysis

Through a norming session, an independent researcher and I separately identified the relative clauses in the two corpora, achieving an interrater agreement of 92%. We then compared our results and discussed the relatively few differences until we reached a consensus. Descriptive statistics, such as frequencies and percentages, were employed to describe the data sets. To compare the two corpora, log-likelihood (LL) similarity was utilized to assess how certain linguistic features—specifically, relative clauses, which are the focus of this study—were used differently in the abstracts of Anglophone and Turkish authors. Following Rayson et al. [42], an LL value of 3.84 or higher was considered significant at the $p < 0.05$ level. By applying this threshold, I aimed to ensure that the identified differences were statistically meaningful, thereby enhancing the reliability of the conclusions.

Additionally, the comparison of word counts (length of RAs) was conducted using a t-test, which is a statistical method used to determine if there are significant differences between the means of two groups. A significance level of $p < 0.05$ indicates that there is less than a 5% probability that the observed differences are due to chance, providing confidence that the differences identified are meaningful and not a result of random variation.

4. Results

The first research question investigated whether there is a significant difference in the length of education RAAs authored by Anglophone writers compared to those authored by Turkish non-Anglophone writers. The results of the data analysis pertaining to this question are presented in Table 2.

According to Table 2, the native corpus exhibits RAA lengths ranging from a minimum of 91 words to a maximum of 352, with a mean length of 207 words and a standard deviation of 53.4. In contrast, the non-native corpus, shows RAA lengths varying from 105 to 469 words, with a mean length of 215 words and a higher standard deviation of 81.5.

This data reveals several critical points. Firstly, the mean length of RAAs in the non-native corpus (215 words) is slightly higher than in the native corpus (207 words), suggesting that, on average, non-native speakers tend to produce longer RAAs than native speakers. Secondly, the range of RAA lengths is broader in the non-native corpus, spanning from 105 to 469 words, compared to 91 to 352 words in the native corpus. This broader range indicates that non-native speakers exhibit greater variability in the length of their RAAs. Additionally, the substantially higher standard deviation of RAA lengths in the non-native corpus (81.5) compared to the native corpus (53.4) further underscores this greater variability among non-native speakers.

Table 2. Word count comparison of RAA lengths

	Min	Max	$\bar{x}$	SD	t	p*
Anglophone (N=56)	91	352	207	53.4	0.6185	0.2687
Non-Anglophone (N=50)	105	469	215	81.5		

Table 3. Relative clause profiles

	Anglophone corpus		**Non-Anglophone corpus**			
	#	**%**	**#**	**%**	**LL**	**p**
Reduced	94	0.81	100	0.93 -	0.90	0.0000
Non-reduced	104	0.90	65	0.60 +	6.41	0.0000
Overall	198	1.71	165	1.53 +	1.05	0.0000

However, despite these observed differences, the results of the t-test, with a t-value of 0.6185 and a p-value of 0.2687, indicate that the differences in mean RAA lengths between the native and non-native corpora are not statistically significant.

The second research question examined the differences in the overall frequency and percentage of relative clause usage between native Anglophone and Turkish non-Anglophone authors in education RAAs. The third research question investigated how the use of reduced and non-reduced relative clauses varies between native Anglophone and Turkish non-Anglophone authors. The results for these questions are presented in Table 3.

As shown in Table 3, the native corpus contains 198 relative clauses (1.71% of 11,608 words), while the non-native corpus has 165 relative clauses (1.53%). This suggests a higher usage of relative clauses in the native corpus. Using the log-likelihood (LL) similarity measure, an LL value of 1.05 was obtained. Since a value of 3.84 or higher is required for significance at $p < 0.05$, this indicates no statistically significant difference in relative clause usage between the two corpora, despite the p-value of 0.0000.

Regarding the use of reduced relative clauses, the native corpus contains 94 such clauses, making up 0.81% of its total words, while the non-native corpus features 100 reduced relative clauses, accounting for 0.93%. The lower percentage in the native corpus signifies an underuse of reduced relative clauses relative to the non-native corpus. The LL similarity measure yielded an LL value of 0.90. Since an LL value of 3.84 or higher is needed for statistical significance at the $p < 0.05$ level, the LL value of 0.90 falls below this threshold, suggesting no significant difference in reduced relative clause usage between the two corpora. Although a p-value of 0.0000 typically denotes a highly significant result, it contradicts the LL value in this context, indicating no significant difference.

The examination of non-reduced relative clause usage shows that the native corpus includes 104 non-reduced relative clauses, representing 0.90% of its 11,608-word corpus. In contrast, the non-native corpus contains 65 non-reduced relative clauses, which constitute 0.60%. The higher percentage in the native corpus suggests an overuse of non-reduced relative clauses compared to the non-native corpus. Utilizing the LL similarity measure, an LL value of 6.41 was obtained. As an LL value of 3.84 or higher is considered significant at the $p < 0.05$ level, this value indicates a statistically significant difference in the use of non-reduced relative clauses between the two corpora. The p-value of 0.0000 further supports this conclusion, signifying a highly significant difference.

5. Discussion

The current study compared the length of education RAAs authored by native Anglophone and Turkish non-Anglophone authors, as well as the use of relative clauses in these RAAs. The results revealed key differences in the length of abstracts and the frequency and type of relative clauses used, providing insights into the linguistic strategies employed by these two groups of authors.

The analysis related to the length of abstracts indicated that the mean length of RAAs was slightly higher for Turkish non-Anglophone authors (215 words) compared to native Anglophone authors (207 words). This finding, although not statistically significant, aligns with prior research suggesting that non-native English speakers often produce longer and more variable sentence structures in academic writing [19] with a possible effect on the overall length of their abstracts. The increased length of abstracts in the non-Anglophone corpus might also be due to the non-native authors' limited vocabulary, which can lead to the use of longer phrases to explain concepts that native speakers might express with a single word or shorter phrase. Turkish non-Anglophone authors' restricted use of lexical variety in RAAs was also documented by [43], noting their tendency to utilize higher frequency words (i.e., words that appear more commonly in language use) as well as comparatively limited ability to use appropriate collocations and lexico-grammatical patterns. Additionally, non-native speakers might be less familiar with concise

grammatical structures and may use more words to ensure their message is clear. Indeed, past research showed that non-Anglophone authors tend to favor conceptual elaboration more, often using passive constructions and dense abstract noun phrases to achieve this [44], a practice that can add to number of words in a given sentence. They may also avoid using more complex sentence structures like relative clauses, which can lead to longer explanations [17].

Another factor is the variations in academic norms in different cultures, with some encouraging authors to be more verbose and elaborate [45]. Non-native speakers might follow these norms even when writing in English, resulting in extended texts. Related to this is some authors' tendency to translate from their native language. When thinking in their native language, non-native speakers might translate their thoughts directly into English, resulting in longer or more sentences, as different languages often have different ways of expressing ideas concisely. Furthermore, non-native speakers might over-explain or provide additional context to ensure they are understood or emphasize their points [46, 47]. This tendency might also lead them to use redundant phrases for emphasis and clarity. Tikhonova and Mezentseva [48], however, warn that verbosity goes beyond being a mere stylistic choice; it significantly affects how easily a text can be read, understood, and how well it keeps the reader's interest. For the author, verbosity can undermine the clarity and effectiveness of their communication. For the audience, on the other hand, it can create frustration and hinder their ability to absorb and retain information.

The broader range and higher standard deviation of abstract lengths among Turkish authors suggest greater inconsistency, which appears to be a result of the differences in the journals' instructions related to word-count in the abstracts. Indeed, of the six Anglophone journals investigated in this study, five required a word limit of 200 words, and one required 250 words. However, the requirements for the Turkish non-Anglophone journals varied greatly: one required a maximum of 150 words, two required 250 words, one required 300 words, and the last one had no word limit at all. The variability in Turkish journals' guidelines likely contributed to the inconsistency observed in abstract lengths, as authors must adjust their writing to fit a wide range of specifications. Such disparities can also impact the overall quality and coherence of the abstracts, making it challenging for Turkish authors to develop a consistent writing style.

When it comes to the frequency of relative clause usage, native Anglophone authors used a higher overall percentage of relative clauses (1.71%) compared to their Turkish counterparts (1.53%). This overuse by native speakers could be attributed to their greater familiarity with employing syntactic structures to enhance clarity and conciseness in writing [17]. Although no statistically significant difference was found between the data sets (LL = 1.05), native authors tended to use relative clauses more frequently to pack information efficiently into their abstracts [22, 33]. It is highly possible that this helped reduced the length of their abstracts by enabling them to convey information succinctly and efficiently [17]. Not only does this efficient use of language aid in meeting word limits but it also improves the readability and coherence of their abstracts, making them more accessible to the academic community. In the Anglophone corpus, qualitative analysis revealed instances where authors employed multiple relative clauses within a single sentence. One example is as follows:

> In a study conducted across an urban school district, we tested a classroom-based intervention in which students were taught online evaluation strategies drawn from research with professional fact checkers.

The three underlined instances of relative clauses in this sentence add specificity and detail to the intervention being described, explaining the origin of the online evaluation strategies. They enrich the sentence by providing context and background information, enhancing the reader's understanding of the study's methodology and approach. Overall, the relative clauses employed contribute to the clarity and coherence of the sentence.

If this example were paraphrased in the following way, splitting it into four separate sentences, each without any relative clauses, various problems would arise.

> We conducted a study across an urban school district. There, we tested a classroom-based intervention. In that intervention students were taught online evaluation strategies. These strategies were drawn from research with professional fact checkers.

First of all, the repetition of subjects like 'intervention' and 'strategies' impedes conciseness, making the sentence awkward. Additionally, the original sentence is fragmented into shorter, disconnected phrases, leading to a lack of flow and coherence. This lack of cohesion prevents effective connection between different parts of the sentence, resulting in a disjointed structure. Moreover, simplifying the content likely leads to the loss of important details and nuances present in the original sentence. Finally, with the absence of relative clauses, the word count increases significantly.

Also, the use of reduced relative clauses did not show a statistically significant difference between the two groups (LL = 0.90) although non-Anglophone authors appeared to utilize them more often. The lack of a statistically significant difference could indicate that reduced relative clauses are equally accessible to both groups as a tool for conciseness [27]. In contrast, non-reduced relative clauses were significantly more common among native authors (0.90%) than Turkish authors (0.60%), with a difference at a statistically significant level (LL = 6.41, $p < 0.05$). This suggests that native speakers might be more adept at integrating non-reduced relative clauses, along with reduced clauses, into their writing to provide detailed information without the risk of ambiguity or excessive

wordiness [19] [25, 26]. The authors may have chosen non-reduced clauses for formality purposes, perhaps believing that research papers, as an academic genre, demand greater adherence to traditional grammatical structures and conventions. Master [25], who investigated the use of relative clauses in computer science and engineering geology, found no use of reduced forms. He interprets this as the authors' possible perception that reduced relative clauses are too informal for a research article. The authors, whose abstracts were investigated in the current study, might also have made this choice due to concerns about ambiguity, particularly when the intended referent is not immediately clear. Non-reduced relative clauses help clarify ambiguity by explicitly stating the relationship between the noun and the modifying clause. Temperley [49, p. 464], too, points that "Ambiguity avoidance … operate[s] at a 'strategic' level, influenced by general considerations of syntactic structure, but not by lexical distinctions or pragmatic factor." Additionally, the preference for non-reduced clauses could stem from stylistic considerations; incorporating both reduced and non-reduced relative clauses can enrich the stylistic variety and texture of the writing. Kallan [50] reiterates this by noting that a mixture of long and short utterances helps increase readability. This, as a result, engages the reader more successfully.

6. Conclusions

This study sheds light on the differences in relative clause usage and abstract length between Anglophone and Turkish non-Anglophone authors in education RAAs. Overall, the results showed that, on average, Turkish authors wrote slightly longer RAAs than their Anglophone counterparts. Additionally, Anglophone authors utilized relative clauses more often, demonstrating a notably higher percentage of non-reduced relative clauses than Turkish authors.

Turkish authors aiming to have their papers accepted by internationally reputable journals and expand their reach to a global audience must familiarize themselves with standardized formats and styles. This includes adhering to specific language conventions, citation practices, and formatting guidelines. The increased visibility gained in this manner allows for greater recognition and acknowledgment of their contributions to their field.

While non-native speakers face challenges in achieving the same level of syntactic efficiency as native speakers, focused instructional strategies can help bridge this gap, ultimately improving the quality and readability of their academic writing. The observed differences suggest a need for targeted training in the use of relative clauses to help Turkish authors achieve greater conciseness and clarity in their abstracts. To this end, several things can be done in workshops and training sessions. For instance, participants can benefit from analyzing well-crafted relative clauses found in academic literature. Additionally, collaborative writing exercises can be employed, allowing participants to give feedback on each other's use of relative clauses. Educators could also focus on enhancing the understanding and application of both reduced and non-reduced relative clauses, emphasizing their role in maintaining sentence coherence and efficiency. A succinct and precisely crafted abstract greatly improves a non-native writer's chances of gaining acceptance within their discipline's research community, ultimately increasing their visibility and impact.

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