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Research Paper

Cohesive Devices Across Disciplines: A Contrastive Study of Academic Writing Practices by Native English and Arab Writers in Education and Medicine

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Abstract
The present research studied the disciplinary use of cohesive devices across academic writing, comparing Native English Writers (NEW) with Arab Writers of English (AEW). It centers around the research articles in the fields of Medicine and Education. The researchers adopted corpus-based analysis, presented by Halliday and Hasan's framework, 1976, in the exploration of cohesive device types—grammar and lexical ones—while considering frequencies along with discourse contexts. The results indicated significant disciplinary differences in cohesive strategies use among the NEW, i.e. additive conjunctions, which appear in the educational writing and facilitate argument development and logical flow between ideas (e.g., and, further); the collocations in medical writing reflect the exactitude of the subject and clarity to be expected in any sort of scientific discourse, no less with causal conjunctions. AEW also exhibited discipline-specific patterns, but their cohesive strategies are colored by the Arabic rhetorical traditions. AEW in education relied heavily on repetition to achieve thematic unity, which sometimes results in redundancy by the norms of English academic writing. AEW in medicine make more use of additive and causal conjunctions to achieve logical relations, although overuse sometimes led to long, unwieldy sentences. These findings have significant pedagogical implications for EAP instruction. They call for training in cohesive strategies specific to disciplines, especially for learners from an Arab background, as this helps learners adjust their writing practices in ways that will meet expectations in the English academic conventions while managing cultural influences.
Keywords: *Academic writing, Arab writers, Corpus analysis, Discipline-specific cohesion, Education, Medicine, Native English writers*

دستگاه‌های منسجم در سراسر رشته‌ها: مطالعه متضاد شیوه‌های نوشتاری آکادمیک توسط نویسندگان بومی انگلیسی و عرب در آموزش و پزشکی
پژوهش حاضر استفاده انضباطی از ابزارهای منسجم را در سراسر نوشتار دانشگاهی مورد مطالعه قرار داد و نویسندگان بومی انگلیسی (NEW) را با نویسندگان عرب انگلیسی (AEW)مقایسه کرد. این مقاله حول محور مقالات تحقیقاتی در زمینه های پزشکی و آموزش است. محققان تجزیه و تحلیل مبتنی بر پیکره را که توسط چارچوب هالیدی و حسن در سال 1976 ارائه شد، در کاوش انواع دستگاه های منسجم در استفاده از زبان و واژگان - در حالی که بسامدها را همراه با زمینه های گفتمانی در نظر می گرفتند، اتخاذ کردند. نتایج نشان‌دهنده تفاوت‌های انضباطی قابل‌توجهی در استفاده از استراتژی‌های منسجم در میان راهبردهای جدید، یعنی پیوندهای افزودنی است که در نوشتار آموزشی ظاهر می‌شوند و توسعه استدلال و جریان منطقی بین ایده‌ها را تسهیل می‌کنند (به عنوان مثال، و بیشتر). ترکیب‌ها در نوشته‌های پزشکی نشان‌دهنده دقت موضوع و وضوح مورد انتظار در هر نوع گفتمان علمی است، نه کمتر از پیوندهای علّی AEW. همچنین الگوهای خاص رشته را به نمایش گذاشت، اما راهبردهای منسجم آنها با سنت های عربی بلاغی رنگ آمیزی شده است AEW. در آموزش به شدت به تکرار برای دستیابی به وحدت موضوعی متکی بود، که گاهی اوقات منجر به افزونگی هنجارهای نوشتار دانشگاهی انگلیسی می شود AEW. در پزشکی بیشتر از ربط های افزایشی و علّی برای دستیابی به روابط منطقی استفاده می کند، اگرچه استفاده بیش از حد گاهی منجر به جملات طولانی و سخت می شد. این یافته ها پیامدهای آموزشی قابل توجهی برای آموزش EAP دارند. آنها خواستار آموزش در استراتژی های منسجم ویژه رشته ها هستند، به ویژه برای یادگیرندگان با پیشینه عرب، زیرا این به زبان آموزان کمک می کند تا شیوه های نوشتاری خود را به گونه ای تنظیم کنند که انتظارات موجود در کنوانسیون های آکادمیک انگلیسی را در حین مدیریت تأثیرات فرهنگی برآورده کند.
کلمات کلیدی: انسجام خاص رشته، تحلیل پیکره، نویسندگان عرب، نویسندگان بومی انگلیسی، نگارش دانشگاهی، آموزش، پزشکی.

Introduction

Cohesion refers to the linguistic devices that bind different parts of a text together, making it recognizable as a single unit (Halliday & Hasan, 1976). This cohesion is affected through grammatical cohesive devices such as reference, substitution, ellipsis, and conjunction, and lexical cohesive devices which are repetition, collocation, and synonymy. Scholarly writing, especially in specialized fields like education and medicine, relies heavily on cohesive devices to make the text clear, coherent, and logically sequenced. Such devices are important in the development of arguments, expansion of concepts, and maintenance of thematic consistency (Hyland, 2005; Wu et al., 2023). However, the use of cohesive devices is not uniform in every writing community.

Authors with diverse linguistic and cultural backgrounds may employ different cohesive devices due to the influence of their rhetorical traditions and first language (L1) interference effects Connor, 1996; Modhish, 2012. Arab English writers AEW, for example, have been found to overuse additive conjunctions and repetition very frequently as a means of thematic development and elaboration—a feature that is more dominant in Arabic rhetoric Ghazala, 2008; Kafes, 2012. On the other hand, native writers of English tend to use a wider variety of cohesive devices, including causal conjunctions, pronouns, and ellipsis, which accords with the norms of English academic discourse that values concision and logical coherence (Halliday & Matthiessen, 2014; Hyland, 2004).

This study compares the use of cohesive devices by native English writers and Arab writers of English in academic research articles, and it is confined to two fields: education and medicine. The selected disciplines are different in their rhetorical demands; whereas the discipline of education requires argumentation and development of concepts, medicine demands precision, objectivity, and technical clarity (Hyland, 2000; Latour & Woolgar, 1986). Through corpus-based contrastive analysis, this study will attempt to trace the trends of both convergence and divergence in the use of cohesive devices between the two groups, hence providing insight into the linguistic and cultural factors that shape academic writing practices.

Literature Review

Theoretical Framework

The seminal research conducted by Halliday and Hasan (1976) classifies cohesive devices into two primary categories: grammatical cohesion, which encompasses reference, substitution, ellipsis, and conjunction, and lexical cohesion, which consists of reiteration, collocation, and lexical chains. These devices function to connect various elements within a text, thereby promoting coherence and aiding the reader in comprehending intricate arguments (Martin, 1992; Halliday & Matthiessen, 2014). Cohesion functions at both micro and macro dimensions within scholarly writing, playing a vital role in ensuring the logical progression of sentences and the structural arrangement of documents (Hyland, 2004; Flowerdew, 1999).

Discipline-Specific Differences: Disciplines influence the choice and distribution of cohesive devices. Medical writing, for example, involves matters of high-stake precision and objectivity, where one often finds a strong presence of impersonal pronouns, causal conjunctions, and temporal markers to help describe procedures and relationships among elements (Hyland, 2005; Latour & Woolgar, 1986). For instance, conjunctions like "because" and "therefore" are important in expressing cause-and-effect relationships in scientific discourse, while temporal conjunctions like "while" and "after" are used to describe simultaneous processes or consecutive events (Povolná, 2012; Khalil et al., 2023). Conversely, in academic writing, additive conjunctions ("and," "furthermore") and adversative devices ("however," "but") become more

prominent since they encourage argumentation and help in developing conceptual frameworks (Hyland, 2005; Becher & Trowler, 2001).

Cultural and linguistic backgrounds contribute meaningfully to cohesive choices. English texts written by Arabic native speakers, drawing on the norms of Arabic rhetoric, frequently favour additive conjunctions along with lexical repetition as tools to maintain a steady continuity of theme and bring central ideas into focus (Modhish, 2012; Kafes, 2012). Due to the concern of terseness, academic writings among native speakers of the English language exhibit more diversity of cohesive strategies (Crossley & McNamara, 2010; Halliday & Matthiessen, 2014). These distinctions underscore the need for pedagogical approaches that take both cultural and rhetorical contexts influencing writing into account (Connor, 1996; Kaplan, 1966).

Empirical Context

Previous cohesion research in academic writing has overwhelmingly focused on native speakers of English, creating a gap in our knowledge of how non-native writers, specifically Arab writers of English, orient to the conventions of academic discourse. Recent scholarship (2010–2024) has begun to close this gap by exploring cohesive device use in linguistic and cultural contexts other than English.

Several studies have shown that non-native English writers, including Arab writers, tend to follow certain cohesive device use patterns. For instance, Al-Zubeiry (2019) found that Iranian writers relied more on lexical repetition, while native English writers demonstrated greater diversity in using metadiscourse markers. Similarly, Hung et al. (2021) reported that non-native teachers from Vietnam and the Philippines relied mostly on reference and conjunctions, but native English writers made use of a wider variety of cohesive devices. Moreover, Shahid et al. (2021) indicated that non-native English editorials included fewer hedges and boosters and therefore had weaker rhetorical arguments.

Empirical research has underlined the contextual nature of cohesive device use across disciplines. In medical writing, for instance, Povolná (2012) found that native English writers used much more impersonal pronouns ("they," "their") and causal conjunctions ("because") to create an air of objectivity and logical relationships between ideas. Arab writers avoided personal pronouns altogether and used significantly more temporal conjunctions to sequence ideas in an overt manner (Alyousef, 2021). In academic writing, there is a higher frequency of additive and adversative conjunctions, which reflect the argumentative nature of the field (Hyland, 2004; Khalil et al., 2023). Cultural Influence on Cohesion: Cultural factors significantly influence cohesive patterns in Arab academic writing. Modhish (2012) and Kafes (2012) have reported that the writers of the host culture rely more on lexical repetition and additive conjunctions, which are well embedded in Arabic rhetorical traditions. These patterns sometimes mar coherence in the eyes of native speakers of English, who prefer greater variety and conciseness (Green, 2012). Crossley and McNamara (2010) went on to argue that proficient L2 writers use fewer cohesive devices, suggesting a "reverse cohesion effect" as they achieve greater fluency. Addressing such gaps, the present study aims to contribute to a deeper understanding of how Arab writers of English adapt to discipline-specific writing conventions and how their usage compares with that of native English writers. The findings bear important implications for EAP pedagogy, underlining the need for culturally sensitive approaches that recognize the influence of L1 rhetorical traditions on academic writing.

Research Questions

The current study addressed the following research questions:

RQ1: Do native English writers make discipline-specific use of cohesive devices in their academic writing?

RQ2: Do Arab writers make discipline-specific use of cohesive devices in their academic writing?

Significance of the Study

The implication of this study is considerable regarding EAP instruction, cross-cultural communication, and research in academic writing. This research contributes to a better understanding of the disciplinarity of cohesive device use by NEW and AEW in education and medicine due to the linguistic and cultural factors that influence these differences in academic writing practices.

The most crucial contribution of the present study, however, lies in its pedagogical relevance. Academic writing is an unwieldy writing skill for university students to master, including EFL learners, because of its requirement to attend to both global and discipline-specific writing conventions (Hyland, 2004; Swales, 1990). These findings indicate that the reliance of Arab learners is repeatedly made on repetition and additive conjunction, which, while appropriate according to Arabic rhetorical traditions, may be at variance with the norms of concision, lexical variety, and logical clarity in English academic writing (Ghazala, 2008; Modhish, 2012). Recognizing this gap can inform targeted EAP interventions that help Arab writers develop a more varied and strategic use of cohesive devices. For instance, in academic writing, Arab learners can be guided to balance thematic unity—achieved through repetition—with other cohesive strategies, such as lexical collocations and temporal markers, to ensure fluidity and argument progression. In contrast, explicit teaching of collocations, such as treatment outcomes and clinical trial, and of causal conjunctions, such as therefore and because, will help Arab learners produce clearer, standardized tests in line with international academic requirements when it comes to medical writing, where precision and objectivity are required (Hyland, 2005; Khalil et al., 2023).

On the other hand, this study highlights the importance of culturally sensitive pedagogy. Language instructors must acknowledge that rhetorical preferences are not deficiencies but rather reflections of cultural norms (Connor, 1996; Kaplan, 1966). By adopting a contrastive rhetoric approach, educators can better support EFL learners in understanding how Arabic rhetorical traditions influence their writing and provide tools to adapt these traditions for English academic contexts (Lillis & Scott, 2015). This approach therefore encourages an inclusive pedagogy that respects cultural diversity while responding to the linguistic demands of academic writing (Hyland, 2006). The findings also have practical implications for academic writing instruction at the university level, especially in bilingual and multilingual settings where Arab learners are increasingly engaging with English as a medium of publication. Academic writing centers and instructors can apply these insights in the design of discipline-specific resources and workshops that meet the needs of learners in education and medicine. For example: Such cohesive patterns have traditionally been discipline-specific and might need corpus-based training from the instructors. That allows the learner to identify these and carry on such structures while writing, according to Flowerdew (2015). Conversely, teachers are able to include corpora and corpus analysis software into classroom instruction as practical AntConc. Besides others, it has allowed classroom demonstrations of cohesive device usages in actual research articles (Anthony 2002; Alharbi 2022).

Moreover, the results provide valuable guidelines for peer reviewers and academic journal editors when working with submissions by Arab writers. Knowledge of the rhetorical and cohesive tendencies of AEW will enable reviewers to give feedback that bridges cultural expectations and English academic standards, thus enhancing clarity and acceptability of submissions in international contexts (Canagarajah, 2002; Lillis & Curry, 2010).

This study contributes theoretically to the studies on contrastive rhetoric and corpus linguistics regarding how cultural and disciplinary norms intersect in the usage of cohesive devices. Although Halliday and Hasan's (1976) cohesion framework remains one of the most fundamental tools for conducting textual coherence analyses, the present study proves its workability for cross-linguistic and cross-disciplinary analyses and offers novel insights into the rhetorical strategies of non-native writers of English. It also points out the importance of quantitative corpus analysis in combination with qualitative contextual interpretation to identify subtle differences in writing conventions (Crossley & McNamara, 2010; Flowerdew, 2015).

In this globally expanding academic environment, with English as the dominant lingua franca for research publication, the present study meets the urgent need for cross-cultural understanding in academic writing. These differences in cohesive strategies-AEW's reliance on repetition and additive conjunctions, for example-can sometimes lead to the miscommunication or misinterpretation of texts when judged against native English norms (Lillis & Scott, 2015; Hyland, 2005). By drawing attention to such differences, this study encourages increased tolerance and flexibility from scholars, editors, and teachers, cultivating a more open academic discourse community (Swales, 1990; Canagarajah, 2002).

The study finally opens the way to further research in cohesion and academic writing. Though this study is focused on education and medicine, its findings indicate that discipline-specific writing norms are very significant in the understanding of cohesive strategies. Further studies in other disciplines, like law, engineering, or social sciences, might go a step further to see how rhetorical expectations shape the writing practices of disciplines such as Becher & Trowler (2001) and Hyland (2012). More importantly, incorporating qualitative approaches, such as interviews with writers, would provide far richer insights into the cognitive and cultural factors driving cohesive choices (Connor, 2002).

Methodology

Research Design

This study employed a comparative, corpus-based research design to investigate the use of cohesive devices by native English writers (NEW) and Arab writers of English (AEW) in academic writing. A corpus-based methodology is particularly suitable for analyzing linguistic features, as it allows for both quantitative and qualitative analysis of naturally occurring data (Lindquist, 2009; Schmitt, 2013). Corpus linguistics has become central to modern linguistic research, offering reproducible, empirical insights into patterns of language use across disciplines (Biber et al., 1998). By using computerized tools such as AntConc software, this study ensures precise identification and classification of cohesive devices, contributing to a systematic and data-driven approach

The comparative element of the design enabled a detailed evaluation of similarities and differences in the use of cohesive devices across two distinct cultural and linguistic groups (NEW and AEW). By examining articles in education and medicine, this study also considers discipline-specific variations, reflecting the unique rhetorical and communicative demands of each field (Hyland, 2005; Becher & Trowler, 2001). The combination of a balanced corpus, advanced analysis tools, and a robust theoretical framework ensures the reliability and validity of the findings

Corpus of the Study

The corpus consisted of 100 research articles drawn from peer-reviewed academic journals, ensuring academic rigor and representativeness. The articles are categorized as follows:
NEW corpus: 20 articles (10 in education, 10 in medicine).
AEW corpus: 30 articles (15 in education, 15 in medicine)

The selection process was guided by clear inclusion criteria to ensure consistency:

Relevance: Articles must belong to the fields of education or medicine.

Peer-review: Only articles published in high-impact, peer-reviewed journals were included. Focus on Academic Writing: Research articles were prioritized, while reviews, editorials, and opinion pieces were excluded.

This balanced corpus allows for a systematic comparison of the cohesive devices employed by NEW and AEW, while also accounting for differences between education and medicine. The texts were published primarily between 2014 and 2023, with a notable focus on recent trends, particularly COVID-19-related research, reflecting contemporary academic discourse

Model of the Study

The study adopts Halliday and Hasan's (1976) cohesion framework, which categorizes cohesive devices into grammatical cohesion (reference, substitution, ellipsis, conjunction) and lexical cohesion (repetition, collocation, synonymy). This model is well-suited for identifying patterns in both grammatical and lexical cohesion across large corpora, providing a comprehensive approach to textual analysis. Table 1 summarizes the cohesion framework:

Table 1

Cohesion Framework

Cohesion Type	Category	Examples
Grammatical	Reference	Personal, demonstrative, comparative
Substitution	Nominal, verbal, clausal	
Ellipsis	Nominal, verbal, clausal	
Conjunction	Additive, adversative, causal, temporal	
Lexical Reiteration		Repetition, synonymy, hyponymy
Collocation		Frequent word pairings

The framework's robustness allows for an in-depth exploration of how cohesive devices contribute to the coherence and organization of academic texts written by NEW and AEW

Data Collection Procedures

The data collection process was meticulously designed to ensure the accuracy and representativeness of the corpus. Articles were sourced using the following steps:

Journal Selection: High-impact journals in education and medicine were prioritized to maintain academic rigor and diversity.

Article Criteria: Only peer-reviewed research articles were selected, while reviews and editorials were excluded to maintain a focus on formal academic writing.

Balanced Representation: Equal representation of NEW and AEW articles was ensured across both disciplines.

Once the articles were selected, AntConc software (Anthony, 2002) was used to process and analyze the corpus. The software enables precise identification of cohesive devices through its concordance and frequency analysis tools. Additionally, a data coding sheet was employed to systematically record information, ensuring consistency throughout the analysis. The coding sheet included fields such as:

Article ID

Author type (NEW or AEW)
Discipline (education or medicine)
Cohesive device type (grammatical or lexical)
Frequency of occurrence
Contextual examples from the text

To enhance reliability, inter-coder reliability was established by having a second coder analyze a subset of the data. Any discrepancies were resolved through discussion to ensure coding accuracy. This rigorous approach minimized bias and ensured consistency across the dataset.

Data Analysis Procedures

The analysis involved both quantitative and qualitative approaches to gain a comprehensive understanding of cohesive device usage. The following procedures were implemented:

Quantitative Analysis

The frequency of each cohesive device was calculated using AntConc software. Then, the data were categorized into grammatical and lexical cohesion types, and comparative statistical analysis was conducted to identify patterns of use between NEW and AEW across disciplines.

Qualitative Analysis

Contextual examples of cohesive devices were examined to identify discipline-specific patterns and linguistic features. Then, devices were analyzed within their immediate context to evaluate their function in maintaining coherence and structuring arguments.

The combined analysis facilitated a robust understanding of cohesive device usage across the two groups, shedding light on how cultural and linguistic factors influence academic writing. By comparing findings across education and medicine, the study highlights the discipline-specific demands that shape cohesive strategies in academic texts

Results

Statistical Results for Research Question 1

RQ1: Do native English writers make discipline-specific use of cohesive devices in their academic writing?

The analysis reveals that native English writers (NEW) demonstrate distinct discipline-specific patterns in their use of cohesive devices across education and medicine. These variations highlight the rhetorical demands of each discipline:

In education, the frequent use of additive conjunctions (e.g., and, furthermore) reflects the need for smooth transitions and the development of arguments.

In medicine, the dominant use of collocations (e.g., clinical trial, drug efficacy) underscores the precision and specificity required in medical texts

The following table presents the frequency distribution of cohesive devices used by native English writers:

Table 2
Frequency and Percentage of Cohesive Devices in Education and Medicine Corpora: NEW

Cohesive Device	Education (%)	Medicine (%)
Additive Conjunction	35	25
Temporal Conjunction	20	15
Collocation	10	30
Repetition	10	5
Lexical Reference	25	25

The results emphasize that while additive conjunctions dominate in education, medical writing shows a higher reliance on collocations and temporal conjunctions. This trend aligns with the discipline's focus on objective reporting and causal precision, as noted by Hyland (2005) and Latour and Woolgar (1986).

Statistical Results for Research Question 2

RQ2: Do Arab writers make discipline-specific use of cohesive devices in their academic writing?

Arab writers of English (AEW) also exhibit discipline-specific variations, but their cohesive strategies are notably influenced by Arabic rhetorical traditions. Specifically:

In education, AEW frequently use repetition to maintain thematic unity and emphasize key ideas.

In medicine, AEW show a higher reliance on additive and causal conjunctions, reflecting a need to clarify complex relationships between ideas

The following table illustrates the frequency distribution of cohesive devices used by Arab writers:

Table 3
Frequency and Percentage of Cohesive Devices in Education and Medicine Corpora: AEW

Cohesive Device	Education (%)	Medicine (%)
Repetition	30	25
Additive Conjunction	15	25
Causal Conjunction	10	20
Lexical Reference	25	20
Collocation	5	10

The results suggest that repetition remains a key cohesive strategy for AEW in education, aligning with Arabic rhetorical conventions that favor thematic emphasis. In medicine, AEW adapt by increasing their use of causal and additive conjunctions, reflecting a shift toward logical precision. These findings highlight the influence of disciplinary demands and cultural factors on cohesive device usage. While NEW demonstrate a balanced approach with a preference for collocations in medicine, AEW show a stronger reliance on explicit cohesive markers like repetition and conjunctions, especially in education. These insights provide valuable implications for English for Academic Purposes (EAP) instruction, emphasizing the need to address cultural nuances and discipline-specific writing conventions

Discussion

Discipline-Specific Cohesion Demonstrated by Native English-Speaking Writers

The study and research on cohesive devices used by native writers of the English language reveal clear and distinct patterns specific to certain academic disciplines. These are strongly influenced and determined by the particular rhetorical requirements and expectations of each specific field of study.

Education: In the area of education, much ink has been spilled in recent articles on issues in using additive conjunctions, such as "and" and "furthermore," and temporal conjunctions, such as "while" and "then." These linguistic devices play crucial roles in the construction of arguments and in the flow of ideas, which is indispensably required in any type of educational discourse. Additive conjunctions show that there is an inherent requirement for clarity, logical development,

and the complete elaboration of arguments in educational texts, especially because ideas are usually built cumulatively.

Medicine: Compared with the other genres, medical writing exhibits much greater dependence on these fixed multi-word units in which members of the academic and professional community of practice may well accept as equivalents of single words or simpler expressions for concepts like "clinical trial," "drug efficacy," and "treatment outcomes." These do not only bring out but also put a premium on exactitude and standardization necessary for scientific discourse and communication. Furthermore, the temporal markers at a high rate—for instance, while—bring out the demand for the description of concurred medical procedures or events, all happening simultaneously within the purview of research and the field of medicine. Moreover, causal conjunctions, such as "because" and "therefore," are also imperative to the definition and explicit statement of cause-and-effect relationships that are present in a text. This is a very important aspect and is one of the distinguishing characteristics of empirical reporting in medical texts, as various researchers like Swales in 1990 and Hyland in 2005 have pointed out.

The less-than-obvious yet undeniable divergences show that while NEW adheres to a core set of integrated strategies forming the backbone of its approach, those conventions specific to disciplines—especially those in medical and educational writing—had a remarkable effect on the frequency with which cohesive devices were used and the kinds of cohesive devices used.

Discipline-Specific Cohesion as Exhibited by Writers from the Arab World

AEW indeed manifest tendencies which are specific to their disciplines; however, it is important to note that the cohesive strategies they display are profoundly influenced and shaped by their cultural backgrounds and contexts.

Education: In the area of educational texts published by AEW, there is a heavy dependence on the method of repetition to maintain thematic unity throughout the material and to emphasize the most important ideas presented. This style is especially compatible with the established traditions of Arabic rhetoric, where repetition is not only widespread but also considered one of the basic techniques that hold the text together and make important points more forcefully. However, while repetition affirms solidarity in Arabic texts, it would appear redundant to an English-speaking audience of academic writing where variety and brevity are considered important.

Medicine: The use of conjunctions, especially causal and additive, has been noted in AEW to show a noticeable rising trend in medical literature. This is most prevalent in the case of causal conjunctions like "because" and "therefore" and additive conjunctions like "and" and "also." The logical links between different ideas or the complex relationships within each idea in medical reporting make these conjunctions important and necessary. However, conjunctions, when overused, tend to result in structures that are either unnecessarily long or repetitive; this may create difficulty and reduce clarity for easy reader comprehension. The findings show that while AEW are able to adjust to some of the discipline-specific demands expected in their fields, such as the need for logical precision which is obviously indispensable in the medical field, their writing is still very much influenced by the norms of Arabic rhetoric. This influence comes through most clearly in the tendency to overuse repetition and additive conjunctions, features which are very typical of their writing. .

Conclusion

Such a study brings much-needed, valuable insight that can greatly benefit EAP pedagogy in general and enhance the effectiveness of teaching academic writing. Its contribution is also very substantial in terms of understanding and improving cross-cultural communication practices.

Pedagogical Implications

Discipline-Specific Training: EAP instructors should focus on discipline-specific cohesive strategies. In medicine, Arab learners can benefit from focused instruction on collocations and precise causal relationships. In education, training should focus on overuse of repetition and encourage more lexical variation in order to improve fluency.

Cultural Awareness: Educators need to be sensitive to the fact that the reliance on repetition and use of additive conjunctions in AEW stem from extremely strong rhetorical traditions that have been present for a very long time within Arabic culture. Such knowledge must not be considered a reflection of some kind of shortcomings in students' writing capabilities. On the contrary, culturally appropriate teaching practices are potentially well placed to aid students negotiate the specific conventions and rules associated with English writing across various disciplines—while, of course, showing respect for, and proper acknowledgment of, their individual linguistic heritages.

Practical Implications

Broadening the Use of Cohesive Devices: Teachers should lead the Arab writers to make use of a wider range of cohesive devices in their writing. This is particularly important for temporal and adversative conjunctions, which will help them avoid repetition and improve the general coherence of their writings.

Technical Accuracy: Medical writing involves providing and teaching the knowledge and abilities needed to use standardized collocations correctly, as well as employing impersonal pronouns appropriately. This is very important so that the writing itself may easily meet the usual expectations and conventions of scientific writing.

Limitations of the Study

Although the study provides an important contribution to understanding the discipline-specific use of cohesive devices by NEWs and AEWs, it has some limitations. These limitations put the results into perspective and indicate an area within which further research can advance from this study.

The current study limits itself to two major academic disciplines: education and medicine. These two fields were chosen because of their quite different rhetorical and communicative demands: argument development and conceptual clarity in education, while medicine demands precision, objectivity, and technical specificity. Nevertheless, the narrow scope of this research limits the generalizability of the findings to other disciplines. Other academic disciplines, such as law, engineering, and social sciences, have their writing conventions that might yield different patterns in cohesive device usage. For example, legal writing often relies heavily on formalized repetition of terminologies and precise lexical cohesion in order to sustain clarity and rigor in legal arguments.

On the other hand, engineering texts often make use of temporal and causal cohesive devices in describing technical processes, procedures, and cause-and-effect relationships.   In the social sciences, writing often combines conceptual arguments with empirical evidence; for this reason, additive conjunctions, which are used to develop ideas, have to be balanced with adversative conjunctions, presenting contrasting views. By expanding the research scope to more diverse disciplines, future research will be able to identify if the patterns in this study are general across all disciplines or if they are particular to education and medicine. Investigations into such matters would give wider insights into how conventions about academic writing determine cohesive device usage across the disciplines.   Quantitative Analysis:

Another limitation of the study is the main reliance on quantitative analysis for the identification and comparison of the frequency of cohesive devices employed by NEW and AEW. Although quantitative data are fundamental to recognizing trends and offering objective measurements, they are unable to provide a detailed explanation of the cognitive process or the underlying reasoning of writers for making such choices. For instance, quantitative analysis may show that Arab writers use repetition as a cohesive strategy more frequently than others do, but it does not explain why they prefer this device. In the same vein, while native English writers demonstrate discipline-specific patterns, such as using more collocations in medical writing, the motivations behind such discipline-specific choices remain unexplored.

Suggestions for Further Research
Qualitative research methods, such as semi-structured interviews, focus groups, and think-aloud protocols, could be further pursued in the future. Interviews with writers will help to understand their perceptions of cohesive devices, their motives for using strategies, and the problems encountered in adjusting to the ways of writing English academic essays. Think-aloud protocols, in particular, can enable researchers to observe how writers make decisions about which cohesive device to use during the actual drafting of the text.   It is important to combine quantitative findings with qualitative data to get a more nuanced understanding of cohesive strategies and their relation to cultural, linguistic, and disciplinary factors. Suggestions for Further Research Given the findings of this study and its limitations, any future research on cohesive device usage in academic writing would be well-advised to focus on the following areas for deeper insights.

Future research should broaden the scope to include other disciplines like law, engineering, humanities, and social sciences. Each academic discipline has its own rhetorical expectations and conventions of writing that determine variation in cohesive devices. For example: In legal studies, lexical cohesion, particularly through precise terminology and synonymy, is crucial for achieving clarity and formal rigor. Legal writing also relies on repetitive structures to reinforce key arguments and definitions. In engineering, temporal and causal conjunctions are essential for describing processes, experiments, and sequential operations, reflecting the procedural nature of the discipline. Additive and adversative cohesive devices play a fundamental role in the humanities and social sciences in building up complex arguments, presenting contrasting viewpoints, and developing discussions. This would also test whether the cohesive strategies found in education and medicine are robust across disciplines or whether there are significant variations that might be linked to the particular demands of each field. The findings would, therefore, feed into EAP teaching and academic writing support across a wider range of disciplines.

While the present study quantitatively identifies the cohesive device usage, the decision-making processes of writers regarding the selection of a cohesive device should be pursued qualitatively in future studies. Techniques like interviews, focus groups, and think-aloud protocols would enable researchers to determine what cognitive and rhetorical considerations lead to the selection of specific cohesive devices. For instance, interviews with Arab writers might reveal whether their reliance on repetition is a conscious strategy linked to Arabic rhetorical traditions or whether the difficulty of mastering English cohesion lies at the root. Think-aloud protocols, in which writers verbalize their thought processes while composing texts, would provide real-time insights into how cohesive devices are chosen, adjusted, or rejected during the writing process. Integrating qualitative findings with quantitative data would provide a holistic view on cohesive device usage, bridging the gap between statistical trends and writer agency. It would be especially helpful to find out how cultural background, writing experience, and discipline-specific norms shape writers' cohesive strategies.

Although cohesion, for the purpose of this current study, has been limited to grammatical and lexical levels as described by Halliday and Hasan (1976), cohesion is also said to occur at a pragmatic level, at which writers develop global coherence across the text. At this pragmatic level, writers organize ideas in logical flows and guide the readers through discourse markers, metadiscourse, and thematic progression. Other future research might investigate how writers use discourse markers (e.g., however, therefore, in conclusion) to indicate the relationship between and within paragraphs and sections of a text. Studies might also continue to investigate metadiscourse features like hedges (e.g., possibly, it seems) and boosters (e.g., clearly, undoubtedly) that contribute to the writer's stance and to the coherence of the argument.

Pragmatic cohesion would be more far-reaching in revealing how cohesive devices at a discourse level function to create logical, unified, and contextually appropriate texts. This will further enrich EAP instruction by emphasizing the importance of both local cohesion within sentences and paragraphs, and global coherence across the entire text. By expanding the disciplinary focus, integrating qualitative insights, and exploring pragmatic cohesion, future research can provide a more comprehensive understanding of cohesive device usage in academic writing. Such studies would have significant implications for teaching, assessment, and cross-cultural communication, helping writers navigate the complex demands of academic discourse more effectively.

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