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Research Article

Variation in Academic Writing: A Corpus-Based Research on Syntactic Features across Four Disciplinary Divisions

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Abstract: This research investigates disciplinary variations using syntactic features in Pakistani academic writing (AW). The corpus of this research is developed from 160 dissertations across four disciplinary divisions and analyzed through AntConc. Results reveal heterogeneous and homogenous use of the said features. Heterogeneity is seen in relation to the frequency of different types of clausal, intermediate, and phrasal features. Regarding the homogeneity, results reveal that the highest and lowest used features are similar across the four disciplinary divisions. That is, clausal coordinating conjunctions and WH complement clauses (highest and lowest used clausal features), nouns and prepositional phrases (highest and lowest used phrasal features), and adverbs and noun+to-clauses (highest and lowest used intermediate features) are observed to remain the same across the four disciplinary divisions. These results conclude that Pakistani AW does not reflect disciplinary variation. The practice is contrary to the expert convention. Therefore, Pakistani academic writers are suggested to appropriately use the syntactic features as per the expert conventions in their disciplines.

Anahtar Sözcükler:
Akademik yazma, disiplinler arası çeşitlilik, uzman toplantısı, sözdizimsel karmaşıklık sözdizimsel özellikler

Akademik Yazmada Çeşitlilik: Dört Disiplinde Sözdizimsel Özellikler Üzerine Temel Alınan Bir Dil Kullanımı Araştırması

Özet: Bu araştırma, Pakistan akademik yazımında disiplinler arasındaki sözdizimsel özeliklerin kullanımındaki farklılıkları incelemektedir. Araştırmanın korpusunu dört farklı disipline ait bölümlerden üretilmiş olan toplam 160 lisansüstü tezden oluşturulmuş ve ilgili eserler AntConc aracılığıyla analiz edilmiştir. Bulgular, araştırmaya konu olan özelliklere ilişkin hem heterojen hem de homojen kullanımını ortaya koymaktadır. Heterojen kullanım, farklı türde cümle yapısı, ara düzey ve kelime öbekleri özelliklerinin sıklığına göre görülürken, homojen kullanımla ilgili sonuçlar ise en yüksek ve en düşük düzeyde kullanılan özelliklerin dört disipline ait bölümde benzer olduğunu ortaya koymaktadır. Bu bağlamda, cümlecik düzenleyici bağlaçlar ve WH tamamlayıcı cümleleri (en yüksek ve en düşük kullanılan yan tümce özellikleri), isimler ve edat tamlamaları (en yüksek ve en düşük kullanılan öbek özellikleri), zarflar ve isim + fiil tümceciklerin (en yüksek ve en düşük kullanılan ara düzey özellikler) dört disiplinde de aynı kaldığı tespit edilmiştir. Bu sonuçlar, Pakistan akademik yazımının disipline göre farklılık yansıtmadığını göstermektedir. Bu uygulama, ilgili disiplinlerin akademik yazımdaki uzmanlık kurallarıyla uyumlu değildir. Bu nedenle, Pakistanlı araştırmacıların sözdizimsel özellikleri kendi disiplinlerindeki uzmanlık kurallarına uygun bir şekilde kullanmaları önerilmektedir.

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1. Introduction

Academic writing (AW) proficiency is an essential element for the success of university-level students (Coates, 2020; Hu, 2007; Hyland, 2002a; Gardner, Nesi & Biber, 2018; Zorba, 2023; Zhu, 2004). It is achieved through mastery over the knowledge of linguistic elements that are influenced by a number of situational variables (e.g., genre, level, and discipline) (Hyland, 2002; Gardner et al., 2018; Zhu, 2004). Achievement of mastery over AW takes many years due to information packaging and structural features (Biber, Gray & Staples, 2016). Therefore, it poses a challenge even to the L1 speakers of English. The reason is that structural features are "not acquired naturally," and the L1 speakers never or rarely "produce the language of this type" (Biber, Gray & Poonpon, 2011, p. 29). In fact, AW involves a specialized language, and its expressions are far removed from everyday communication. Therefore, it can cause feelings of alienation among L1 and L2 students of English (Martin & Halliday, 1993). Thus, it is essential to have an understanding of the structural features that typically characterize AW to guide L1 and L2 students struggling to master AW in secondary, post-secondary, and English for academic purposes contexts (Elliott, 2019).

A complex noun phrase is a significant feature of AW. It comprises a head noun embedded by pre- and post-modifiers (Biber, 1989; Biber & Gray, 2010). Pre- and post-noun modifiers have been found to form 25 and 20% part of all noun phrases used in the AW, respectively (Biber, Johansson, Leech, Conrad & Finegan, 1999). Pre-modifiers are, thus, a significant part of the AW. Attributive adjectives, participial modifiers, and other nouns are pre-modifiers that form approximately 30% of all pre-modifiers used in the AW (Biber et al., 1999). The said pre-modifiers marked a substantial development in the 20th century AW for making AW an increasingly specialized register (Biber & Gray, 2016). Thus, pre-noun modifiers have emerged as essential features of AW for the students "work(ing) to join an academic community" (Elliott, 2019, p. 4). Similarly, nominalization (forming nouns from other parts of speech) is another essential feature of AW (Biber & Gray, 2021) that is used to increase cohesion and information density, reduce clausal processes to the noun, and (de)emphasize different parts of the text (Halliday & Matthiessen, 2014; Ravelli, 1988). The use of these forms has distinctly grown in AW in the 20th century with reference to creating complexity (Biber & Gray, 2016).

The awareness of complex noun phrases is "important for student writers as they work to acquire the language features of academic writing and their particular discipline of study" (Elliott, 2019, p. 4). Research (Biber, Gray & Poonpon, 2011) hypothesized development stages based on the use of complex noun phrases. Following Biber et al. (2011), seminal research (Parkinson & Musgrave, 2014) empirically studied the said stages in L2 AW. Parkinson and Musgrave (2014) were added to by a large body of research (e.g., Ahmad, Mahmood & Siddique, 2023; Ansarifar, Shahriari & Pishghadam, 2018; Biber, Gray, Staples & Egbert, 2020, 2021; Crossley & McNamara, 2014; Crossley, 2020; Durrant, 2022; Lambert, 2022; Lan, Liu & Staples, 2019; Lan, Zhang, Lucas, Sun & Gao, 2022; Li, Nikitina & Riget, 2022; Lu & Ai, 2015; Maamuujav, Olson & Chung, 2021; Martínez, 2023; Qin & Zhang, 2023; Pérez-Guerra & Smirnova, 2023; Saricaoglu & Atak, 2022; Staples & Reppen, 2016; Staples, Egbert, Biber & Gray, 2016; Thongyoi & Poonpon, 2020; Wang & Lowie, 2021) on AW characteristics, complexity, and development stages. However, it is also essential to "consider the linguistic variation that exists across the various disciplines under the larger umbrella of academic writing" (Elliott, 2019, p. 5). The reason is that discipline influences the determination of linguistic characteristics more than the cultural background and L1 of the writers. Therefore, academic writers from different disciplines show disciplinary

variations in the use of linguistic features (Ädel & Römer, 2012) that (the said variations) are also vital to consider in order to achieve learning objectives (Neuman, Parry & Becher, 2002). That is why this research aims to study disciplinary variation in the AW.

1.1. Literature Review

Past research has also reported disciplinary variations in AW. For example, Ädel and Römer (2012) studied highly advanced student writers' written discourse (written assignments) to see disciplinary variations in attribution and phraseological items. It was a corpus-based research. The results showed variations in the use of the said items. Hardy and Römer (2013) also investigated linguistic variations across four academic divisions: Arts and Humanities, Biological and Health Sciences, Physical Sciences, and Social Sciences, employing Biber Tagger to assign syntactic and grammatical tags to phrases and words. Results showed linguistic variations across the four divisions and the disciplines within those divisions. For example, the papers written by the students from the education and philosophy disciplines showed the frequent use of first, and second-person pronouns and verbs. In contrast, the papers written by the biology and physics students showed frequent use of attributive adjectives, long words, and nominalizations. In this way, student writings from biology and physics disciplines were observed to be more complex than those of education and philosophy. Another research (Staples et al., 2016) investigated the British Academic Written English corpus to see variations in grammatical complexity features across discipline, genre, and level. The results revealed apparent variations in using the said features across discipline, genre, and level. Similarly, Durrant (2017) investigated disciplinary variations of quad-grams (four-word sequences) employing quad-gram frequency lists. In this regard, 285 authors' corpora from 24 disciplines were obtained from the British Academic Written English corpus. A comparison of the overlap between quad-grams used by the writers across disciplines showed a high degree of homogeneity. Following Durrant (2017), Crossley, Russell, Kyle, and Römer (2017) investigated cohesive and lexical variations in the student writings from macro and micro disciplines of engineering and science represented in the Michigan corpus of upper-level student papers. The results showed noteworthy linguistic variations in the student writings from macro and micro disciplines of engineering and science. These results provide sufficient evidence for macro- and micro-disciplinary student writing variations.

Similar results with regard to the disciplinary variations of different features in the AW were reported in recent research conducted in the different countries of the world. For example, Uba (2020) investigated variations in the semantic categories of reporting verbs in the one million words corpus developed from 120 research articles from four academic disciplines (accounting, applied linguistics, engineering, and medicine). Results obtained through the analysis conducted at two levels revealed commonalities as well as differences in the use of reporting verbs across the four disciplines; that is, research articles from all four disciplines contained all three semantic categories (i.e., affirmatives, hedging, and neutrality) of the reporting verbs but with certain variations. Furthermore, using these verbs was higher in accounting and applied linguistics research articles than in engineering and medicine research articles. The research suggested raising awareness of different semantic categories of the reporting verbs among the students to improve the use of these verbs in AW. Kaidan, Jalilifar, and Don (2021) explored the use of nominalization in research articles from applied linguistics and physics disciplines. Results showed the significantly varied use of nominalization in the AW across both disciplines (i.e., AW from applied linguistics contained more nominalization markers than the AW from physics disciplines). Another research

(Eckstein et al., 2022) also investigated the variation of reporting verbs in the corpus prepared from research articles across six academic disciplines. The results showed wide variations in the number and type of the reporting verb used in the corpus. However, like Uba (2020), certain commonalities were observed using different reporting verbs. Another recent research (Szczygłowska, 2022) investigated the disciplinary variations in the preference for the use of epistemic lexical verbs in the different sections of research articles from medical and psychology disciplines. The results revealed variations in the use of specific epistemic lexical verbs.

In addition to the above-reviewed research, numerous studies reported variation using different metadiscourse markers in AW. For example, Dontcheva-Navratilova (2021) studied the engagement markers in AW from two academic disciplines (i.e., economics and linguistics) and reported the presence of cross-disciplinary variations. Dontcheva-Navratilova (2021) was followed by a comparative study (Seyri & Rezaei, 2021) on the corpora developed from the AW by the native and non-native writers of English from Hard and Soft science disciplines. The results showed disciplinary variation in using engagement markers in AW from the said disciplines. Similarly, Yuvayapan and Yakut (2023) investigated variations in the use of frame markers in AW and reported marked variations in using the said markers across four academic disciplines. Boginskaya (2022) investigated variation in the use of metadiscourse markers in research articles written by Russian authors from applied linguistics and engineering disciplines. The results obtained through qualitative and quantitative methods revealed variations in using four types of metadiscourse markers (i.e., attitude markers, boosters, hedges, and self-mentions) in AW produced by the Russian authors.

Moreover, some studies investigated disciplinary variation in the use of syntactic complexity features in the AW. For example, Dong et al. (2023) explored disciplinary variation in AW from 31 academic disciplines related to the four disciplinary groups employing qualitative and quantitative analysis methods. The results of this study also revealed significant variations in the AW in terms of coordination, length, phrasal sophistication, sentence complexity, and subordination across the disciplinary divisions and 31 academic disciplines. Pérez-Guerra and Smirnova (2023, p. 149) conducted rigorous research that empirically confirmed the notion that "linguistic complexity varies across disciplines" by exploring variations in the use of linguistic features in the professional AW across Hard and Soft science disciplines. Finally, some studies investigated variation from a multi-dimensional perspective. For example, Saricaoglu and Atak (2022) explored variation in lexical and syntactic features in the argumentative AW produced by the L2 learners of English from Turkey. The results showed apparent variations in syntactic features (i.e., finite complement clauses, passives, and the words used before the main verbs). Although this study mainly contributed to the understanding of a connection underlying the linguistic features and L2 writing proficiency, the contribution of this study is also considerable with reference to the variation in the use of syntactic features that are the subject of this present research. Thus, it is evident from the review of the above studies that disciplinary variation is an important characteristic of AW. Therefore, this research aims to study variation in the Pakistani AW, particularly using syntactic features (Table 2).

1.2. The Present Research

Several factors are said to affect the use of syntactic features in the AW, for example, observation period, learning context, and program level (Ortega, 2003); sentence length,

ellipsis, embedding, and register (Rimmer, 2006); and academic discipline (Biber & Gray, 2016). Furthermore, the research (see Biber, 2006; Biber & Gray, 2016; Gray, 2015) reported that writers of science research articles extensively use phrasal features more than Humanities and Social Sciences research article writers. Gray (2015) mainly confirmed that research article writers from different disciplines use phrasal features in different amounts. Such as prepositional phrases (as post-noun modifiers) and relative clauses were reported in the frequent use in history and physics academic writers, respectively. Similarly, Staples et al. (2016) reported variations in phrasal features across disciplines and genres (e.g., noun-noun sequences) were observed to be less frequently used in Arts and Humanities than in Physical and Life Sciences. Thus, it is clear that the use of syntactic features varies across different disciplines (e.g., applied linguistics, engineering, medicine, and psychology) (see Biber & Conrad, 2009). Therefore, this research aims to investigate the syntactic features (Table 2) in the AW produced by Pakistani Ph.D. student writers across four disciplinary divisions (Table 1) to see whether the said AW reflects disciplinary variation. This aim is motivated by the notions that Pakistani AW is required to be "fully described in terms of linguistic characteristics" (Azher, Ali & Mahmood, 2021, p. 49) and "explored in terms of linguistic variation" (Azher, Faiz, Izhar, Nisa & Ali, 2019, p. 258).

Previous research (Rubab, Mahmood & Arshad, 2019) on Pakistani AW investigated lexico-grammatical features (i.e., shell nouns) in the corpus developed from research articles from Natural and Social Sciences and reported apparent variations in the use of the said features (i.e., research articles from Social Sciences contained the shell nouns more frequently than the research articles from Natural Sciences). However, the recent research (Ahmad, Mahmood & Siddique, 2022) on the Pakistani L2 AW across two disciplinary divisions (i.e., Arts and Humanities and Life Sciences) showed different results from those of the past research (i.e., the results showed homogeneity in the use of phrasal features). Therefore, this research aims to confirm it in the Pakistani AW by adding two more disciplinary divisions (i.e., Physical Sciences and Social Sciences) and studying variation across four divisions of the academic disciplines. Furthermore, Ahmad et al. (2022) investigated the phrasal features only. This present research adds clausal and intermediate features (Table 2) to the phrasal features (as studied in (Ahmad et al., 2022) to see to what extent Pakistani L2 AW reflects variation in its use of syntactic features across disciplinary divisions.

2. Method

2.1. Research Design

This study is corpus-based descriptive research on L2 writing, which "has evolved into a well-established field of inquiry characterized by defined areas of interest, distinct methods of inquiry, and networks of conferences, journals and professional organizations for the dissemination of knowledge among practitioners" Hyland (2016, p. 116). Since the main aim of L2 writing research is to develop "pedagogical models for teaching L2 writing" (Hinkel, 2011, p. 523), L2 writing research is considered an exciting area of applied linguistics. It has significantly added to the development process of valuable approaches and frameworks for L2 written text analyses (da Silva Queiroz, 2019). However, this research is not concerned with developing or suggesting any pedagogical approach, framework, method, or model. Instead, it aims to describe the use of different syntactic features (Table 2) in the written texts produced by the writers of English as a second language. This aim is based on Perini's in da Silva Queiroz's (2019, p. 51) view of descriptive research, defined as "a systematic presentation of language facts – not the elaboration or validation of some specific language theory." In this way, this research is expected to motivate future applied linguistics

researchers to develop pedagogical approaches, frameworks, methods, and models for Pakistani L2 writers of English.

2.2. Linguistic Perspective

This research considers language as a unique human socio-cultural and cognitive phenomenon (Widdowson, 1996) that can be observed and described through various scientific methodologies. This perspective provides the ground for cognitive, functional, and socio-linguistic models. However, from a less strict approach, this perspective sees language being systematically organized and variable because of the communicative purposes and functional reasons leading to the development of syntactic structures that can be observed and analyzed (Biber, 2010). Thus, keeping this notion in view, this research aims to analyze syntactic features (Table 2) in the respective variable within the communicative contexts of their use in Pakistani AW.

2.3. Corpus of the Research

The corpus for this research is developed from dissertations (mainly for Ahmad, n. d., doctoral research from which this article has been extracted) written by Pakistani (L2) Ph.D. researchers across four academic disciplinary divisions (Table 1). Every disciplinary division comprised a further four sub-disciplines (Table 1). Ten dissertations from each discipline were included in the corpus of this research, mounted to the number of 40 dissertations per disciplinary division, thus totaling 160 dissertations from the four disciplinary divisions. The details of the corpus (which comprised more than 3.6 million words) can be seen in Table 1.

Table 1.

Details of Dissertations Forming the Corpus of Research

Disciplinary Divisions	Disciplines				No. of Dissertations	Sum	No. of Words
Arts and Humanities	History	Linguistics	English Literature	Philosophy	10 Each	40	1138455
Life Sciences	Food Sciences	Biology	Agriculture	Psychology	10 Each	40	768443
Physical Sciences	Physics	Engineering	Mathematics	Computer Science	10 Each	40	458320
Social Sciences	Law	Economics	Sociology	Politics	10 Each	40	1247972
					Sum Total	160	3613190

Source: Ahmad (n. d.)

2.4. Syntactic Features

This research utilized syntactic features (i.e., clausal, phrasal, and intermediate) identified in past empirical research (Biber et al., 2011, pp. 19-21). See Table 2 for the details.

2.5. Corpus Preparation

The corpus for this research was prepared from dissertations accessed from a free online available database called Pakistan Research Repository (PRR). PRR is hosted by the Higher Education Commission (HEC) of Pakistan and comprises a large number of doctoral-level dissertations composed by Pakistani writers. Corpus preparation was completed in four steps: (1) the dissertations (retrieved from PRR) were saved in Notepad files from PDFs; (2)

Notepad files were cleansed by removing title pages, preliminary pages, headers and footers, pictures, and graphs; tables, list of references and appendices; (3) cleansed files were coded as per the name of relevant academic disciplines by using Batch-Renamer tool, and (4) the renamed files (formed the corpus) were arranged in their relevant folders and were ready for processing in corpus tools for analysis.

2.6. Corpus Analysis

Corpus analysis, in this research, was completed in three procedural steps: (1) the corpus was tagged through MAT and TagAnt Taggers, and (2) the tagged corpus was processed in the AntConc software to find the frequencies and examples of different features (Table 2). For this purpose, different formulas (as used in Ahmad, n. d.) were applied. For example, attributive adjectives were searched through four formulas based on four descriptors: (bracketed with the relevant formula, i.e., *_DT *_JJ *_NN (Determiner + Adjective + Noun); *_DT *_JJ *_JJ *_NN (Determiner + Adjective + Adjective + Noun); *_DT *_JJ *_NOMZ (Determiner + Adjective + Nominalization); and *_DT *_JJ *_NN *_NN (Determiner + Adjective + Noun + Noun). This process provided the frequencies and examples of the said feature. (3) Finally, the frequencies were separately extracted in MS Excel sheets for presentation as results (Table 2) of this research.

3. Findings

This research aimed to see whether or not the Pakistani L2 AW reflects variation across disciplinary divisions in the use of syntactic features. Results (Table 2) showed heterogeneous as well as homogenous use of phrasal, clausal, and intermediate features in Pakistani AW across the four disciplinary divisions. The heterogeneity was seen in relation to the frequency of different types of clausal, phrasal, and intermediate features. For example, clausal coordinating conjunctions (a clausal feature found in the maximum frequency) were observed to occur in varied frequencies (i.e., 3436 times in Arts and Humanities, 3315 times in Social Sciences, 963 times in Life Sciences, and 656 times in Physical Sciences AW). Similarly, WH complement clauses (a clausal feature found in the lowest frequency) occurred 94 times in Arts and Humanities, 64 times in Social Sciences, 27 times in Life Sciences, and 43 times in Physical Sciences. These results align with the results reported by Biber and Gray (2021), Elliott (2019), Gray (2015), and Jalilifar et al. (2017), revealing discipline-based variations in the frequency of linguistic features (e.g., nouns).

A similar trend was observed in the use of phrasal features. For example, nouns (used in the highest frequency) were seen 338151 times in Arts and Humanities, 372069 times in Social Sciences, 161129 times in Life Sciences, and 162089 times in Physical Sciences. Prepositional phrases (used in the lowest frequency among phrasal features) were found to be 19860, 22724, 6796, and 8713 times in Arts and Humanities, Social Sciences, Life Sciences, and Physical Sciences, respectively. Similar heterogeneity was observed (Table 2) in the frequencies of intermediate features. Regarding the homogeneity, results revealed the highest and lowest used features to remain the same across the four disciplinary divisions. That is, clausal coordinating conjunctions and WH complement clauses (highest and lowest used clausal features); nouns and prepositional phrases (highest and lowest used phrasal features); and adverbs and noun+to-clauses (highest and lowest used intermediate features) were observed to remain the same across the four disciplinary divisions. In addition, the order of first, second, third, and so on highest used features (clausal and phrasal) was also observed to remain the same across the disciplinary divisions with certain variations in the use of intermediate features (see Table 2 for frequencies of the said features). These results are in

line with Ahmad et al. (2022). Ahmad et al. (2022) find Pakistani AW showing no considerable variation due to the frequent use of nouns across two disciplinary divisions (i.e., Arts and Humanities and Social Sciences). In contrast, this study finds Pakistani AW showing no considerable variation in the use of the said features across four disciplinary divisions (i.e., Arts and Humanities, Social Sciences, Life Sciences, and Physical Sciences). The highest and the lowest used features are the same across all four disciplinary divisions.

Table 2.

Use of Syntactic Features across Disciplinary Divisions

FEATURES	DISCIPLINARY DIVISIONS				
CLAUSAL FEATURES	Arts and Humanities	Social Sciences	Life Sciences	Physical Sciences	TOTAL
Finite adverbial clauses	1018	471	116	132	1737
WH complement clauses	94	64	27	43	228
Verb + that-clauses	130	214	79	60	483
Clausal coordinating conjunctions	3436	3315	656	963	8370
TOTAL	4678	4064	878	1198	10818
PHRASAL FEATURES					
Nouns	338151	372069	161129	162089	1033438
Attributive adjectives	61260	60476	26474	29233	177443
Pre-modifying nouns	48396	60271	29121	29817	167605
Nominalizations	49783	66453	21485	27416	165137
of genitives	21219	27386	10732	9768	69105
Prepositional phrases	19860	22724	6796	8713	58093
TOTAL	538669	609379	255737	267036	1670821
INTERMEDIATE FEATURES					
Adverbs	2204	2223	511	750	5688
Linking adverbials	6692	7064	2396	3128	19280
Extraposed Adjective + that clauses	59	52	11	21	143
Noun + that-clauses	1173	722	142	231	2268
WH relative clauses	505	383	85	163	1136
That relative clauses	4415	3117	926	1021	9479
Verb + to-clauses	2650	1544	399	602	5195
Desire verb + to-clauses	0	0	0	0	0
adjective + to-clauses	8	2	0	0	10
Noun + to-clauses	5285	6048	1271	1762	14366
Verb + ing-clauses	368	442	240	411	1461
Passive voice verbs	32	77	12	15	136
Passive nonfinite relative clauses	1860	2824	1085	1228	6997
TOTAL	25251	7078	24498	9332	66159

Source: Ahmad (n. d.)

4. Discussion

It is evident from the results (Table 2) that Pakistani AW reflects disciplinary variation only in the frequencies of the use of different features (i.e., clausal, phrasal, and intermediate). Thus, these results are different from the results of previous body of research (e.g., Crossley et al., 2017; Dong et al., 2023; Durrant, 2017; Elliott, 2019; Gray, 2015; Karakaya, 2017; Pérez-Guerra & Smirnova, 2023; Staples et al. 2016; Ward, 2007) that claims the existence of variation in the use of phrasal features across disciplines. In addition, these results seem

to stand alone from the basic notion (see Bulté & Housen, 2012; Norris & Ortega, 2009) that syntactic complexity is a strong reference to diversity, richness, and variety in writing.

Furthermore, the research (Biber, 2006; Biber & Gray, 2016; Egbert, 2015; Gray, 2015; Staples et al., 2016) also reported noteworthy variations in the use of phrasal features in AW across parameters (i.e., genres, registers, and disciplines). For example, academic writers of research articles from science disciplines were reported to use phrasal features more than the writers from the Humanities and Social Sciences disciplines. Similarly, another research (Biber & Gray, 2016; Gray, 2015) reported apparent disciplinary variation in AW using clausal and phrasal features, finding the use of phrasal features in sciences more than in the Humanities. Such differences related to disciplinary variations can be discussed by relating them to their communicative features (Staples et al., 2016). For example, Humanities is a disciplinary division in which "persuasion is more explicitly interpretative and less empiricist" (Hyland, 2008, p. 16). Therefore, the academic writers from the Humanities make relatively less use of phrasal structures. Building on this, Staples et al. (2016) argue "that any discussions of complexity in academic language production have to consider disciplinary and genre differences" (p. 4). It implies that the discipline (along with genre and register) is a critical variation parameter in using phrasal features in AW. However, the results of this research reflect otherwise. Table 2 shows Pakistani academic writers (from the Social Sciences and Arts and Humanities divisions) using phrasal features more than those of the Physical Sciences and Life Sciences disciplines. Such a difference in the use of phrasal features might be the result of certain factors. The critical factor (that can be mentioned in this regard) is the genre, i.e., the genre (studied in the above-discussed research) was either a research article or other professional texts. On the other hand, this research studied dissertations. Secondly, the research referred above (e.g., Staples et al., 2016) was conducted across the levels of education, whereas this research focused on one level, i.e., the highest level of education (doctoral level). Whatever the case may be, it has been extensively established that the discipline is an essential parameter of variation in the use of both clausal and phrasal features that have not been significantly observed in this research. In addition, it has also been established (through empirical research) that academic writers from different disciplines gradually shift towards the use of their discipline-specific norms with the increase in their level of education, and the said shift becomes maximum at the university level. However, the results of this research have not supported this trend.

This suggests that the AW, which "is a highly disciplinary-based practice" (Yuvayapan & Yakut, 2023, p. 110), "exists in a variety of disciplinary realizations" (Yakhontova, 2006, p. 154); contains clear (Elbow, 1991), and strong (Ädel & Römer, 2012; Durrant, 2015) variation across disciplines (Egbert, 2015; Li & Wharton, 2012), does not follow disciplinary conventions in reflecting variation in the use of syntactic features in Pakistan which (the variation) is caused because the different academic disciplines have different expectations (Cao & Hu, 2014; Paltridge, 2002) for knowledge production (Cao & Hu, 2014). Thus, it can be said that Pakistani AW is not expert-like in terms of disciplinary variation. In this way, the results of this research second the notion that Pakistani AW is "below the required level of language development" (Ahmad et al., 2023, p. 1).

5. Conclusion

This research investigated disciplinary variation in using different syntactic features in Pakistani AW. Results showed heterogeneous and homogenous use of phrasal, clausal, and intermediate features in Pakistani AW across the four disciplinary divisions (Arts and

Humanities, Social Sciences, Life Sciences, and Physical Sciences). The heterogeneity was seen concerning the frequency of different types of clausal, phrasal, and intermediate features. For example, clausal coordinating conjunctions and WH complement clauses (clausal features found in the maximum and minimum frequency, respectively), nouns, and prepositional phrases (phrasal features used in the highest frequency, respectively) were found in different frequencies across the four disciplinary divisions. Similar heterogeneity was observed in the frequencies of intermediate features.

Regarding the homogeneity, results revealed the highest and lowest used features to remain the same across the four disciplinary divisions. That is, clausal coordinating conjunctions and WH complement clauses (highest and lowest used clausal features); nouns and prepositional phrases (highest and lowest used phrasal features); and adverbs and noun+to-clauses (highest and lowest used intermediate features) were observed to remain the same across the four disciplinary divisions. In addition, the order of first, second, third, and so on highest used features (clausal and phrasal) was also observed to remain the same across disciplinary divisions with certain variations in the use of intermediate features. These results concluded that the Pakistani AW does not reflect disciplinary variation. The practice is contrary to the expert convention. Therefore, it is suggested that Pakistani academic writers become proficient enough in the appropriate use of different devices as per the expert conventions of the relevant disciplines.

A limitation of this research is that it only compared results across disciplinary divisions. Thus, this research could not compare disciplines (Table 1) within the disciplinary divisions. Therefore, the results of this research are not generalizable concerning the academic disciplines within the disciplinary divisions.

5.1. Implications and Suggestions

The results of this research have implications for the researchers, writers of English as a second language, and the teachers in that they (the researchers, writers, and teachers) have to work as members of their disciplinary communities. Therefore, the basic knowledge and understanding of the conventions of the relevant discipline is essential for them. Moreover, AW is a vital skill for students in higher education (Coates, 2020; Hu, 2007; Zorba, 2023); they should have a good knowledge of the conventions of this genre (Hu, 2007) notably, "in the appropriate use of disciplinary conventions" (Yuvayapan & Yaqut, 2023: 122) to become the successful members of a particular discipline community (Coates, 2020; Flowerdew, 2000). In this regard, this research proposes several measures. First of all, since different disciplines have different expectations (Cao & Hu, 2014; Paltridge, 2002), students from different disciplines must struggle to master the conventions of their respective disciplines. AW, in fact, "is not a single undifferentiated mass." Instead, it is "a variety of subject-specific literacies" (Hyland, 2002b, p. 352). In this sense, academicians need to know about the different linguistic devices compatible with their disciplinary communities' expectations (Işık-Taş, 2018). Secondly, the students must learn to make cross-disciplinary comparisons. It will help them see "a fuller picture of community-specific practices" (Hyland, 2008, p. 20). Lastly, knowledge in every discipline is created through grammatical, lexical, and rhetorical device constellations (Hyland, 2017). Thus, the students should also be able to know the use of these devices, particularly syntactic devices, appropriate for their disciplines. In this sense, the teachers can play a crucial role, particularly in sensitizing the academic writers about the AW expert conventions. Öztürk (2018) proposed an exciting method of sensitizing novice writers and postgraduate researchers by analyzing the different parts of research article

sections. The teachers could apply the same method to sensitize novice writers and postgraduate researchers about syntactic features characterizing different disciplines. Iddings (2008, p. 63) emphasized that the lexico-grammatical features "reflect the specific outlook and philosophy of each academic discipline"; therefore, the use of these features should be different as per the convention of each discipline. Iddings (2008) pointed out that AW teachers are typically trained in the Humanities disciplines. Therefore, they might lack awareness of the conventions of other disciplines. In this context, sensitization of the teachers is suggested regarding discipline-specific features.

Research and Publication Ethics Statement

This research was submitted as a part of the doctoral research approved by the Directorate of Advanced Studies at Government College University, Faisalabad, Pakistan, vide Letter No. GCUF/DAS/22/1539, Dated 21-11-2022, and complied with the research ethics rules imposed by the Higher Education Commission of Pakistan. The authors declare that there is no conflict of interest.

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