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COMPRESSED AND IMPLICIT SYNTACTIC FEATURES OF L2 ENGLISH ACADEMIC RESEARCH WRITING BY FILIPINO RESEARCH WRITERS ACROSS DISCIPLINES: A CROSS-ANALYSIS

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Abstract. *Compressed and implicit nominal phrases as syntactic features of academic writing (Biber & Gray, 2010, 2016) are underexplored in L2 academic research writing. In this study, I cross-examined attributive adjectives, nominal prepositional phrases, noun premodifiers, and appositive nouns phrases in qualitative and quantitative research articles (RAs) authored by Filipino research writers (FRWs) across Applied Linguistics, Measurement and Evaluation, and Sociology, using Biber, Johansson et al.'s (1999, 2021) framework. Major results revealed that attributive adjectives, nominal prepositional phrases, and noun premodifiers extremely co-occurred across the disciplinary RA sub-registers. A significant difference exists between the three nominal phrases and appositive noun phrases. Nonetheless, their frequencies of use also differed in RA sub-registers across disciplines. In conclusion, the three leading embedded phrasal modifiers are universal and the most functional compressed and implicit syntactic features of the five disciplinary RA sub-registers. FRWs employ the three nominal phrases as they are much more flexible than appositive noun phrases. Overall, they characterize L2 academic research writing and make it a highly nominal academic written discourse regardless of its disciplinary origin and research nature. In line with these, the study's implications for academic writing pedagogy are emphasized.*

Key words: *compressed and implicit syntactic features, disciplinary research articles, Filipino research writers, L2 English academic research writing, nominal phrases*

1. INTRODUCTION

Academic research writing has been proven to be characterized by compressed and implicit syntactic features (Ansarifar, et al., 2018; Biber & Gray, 2010, 2016; Ruan, 2018; Wu et al., 2020), contrary to the stereotype that academic writing is elaborated and explicit. Compression is an academic discourse style to convey dense information in few words possible, bringing about implicitness of meaning or logical relations between the pre- and/or postmodifier and the head noun (Biber & Gray, 2016). In academic research writing, compression and implicitness are associated commonly with four phrasal

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modifiers–attributive adjectives, noun premodifiers (as premodifiers), nominal prepositional phrases, and appositive noun phrases (as postmodifiers) (Biber, Johansson, et al., 1999, 2021). These modifiers are embedded syntactic constituents of nouns, creating very dense packaging of information (Biber & Gray, 2010, 2016).

On the one hand, current research on compressed and implicit syntactic features has focused more on L1 English research writers (e.g., Al Fajri & Okwar, 2020; Biber & Gray, 2016; Biber, Gray et al., 2016; Cho & Lee, 2016; Gray, 2015; Hyland & Jiang, 2017; Kim & Crosthwaite, 2019; Lu et al., 2020). On the other hand, a scarcity of studies concentrating on L2 English research writers exists (e.g., Ruan, 2018; Wu et al., 2020; Yin et al., 2021). L2 English research writers include English users who use English as a second/foreign language (ESL/EFL) or English as a lingua franca (ELF) in writing academic research. As one of the L2 English research writers, Filipino research writers (FRWs) across disciplines employ compressed and implicit syntactic features (Hernandez, 2021); however, their use of these nominal phrases has been hardly explored in academic writing research. This gap indicates that the four nominal pre- and postmodifiers are underexplored compressed and implicit syntactic features in L2 English academic research writing especially in the Philippines.

Analyzing the compressed and implicit syntactic features in L2 English academic research writing is important because they benefit FRWs and other L2 English research writers to communicate with economy of expression, which is an important quality of academic research writing (Biber & Gray, 2010, 2016). Equally important, examining the four syntactic features has applied implications for academic writing pedagogy in the Philippines and other nations across the world where English is used as an L2. Therefore, this study cross-analyzes attributive adjectives, nominal prepositional phrases, noun premodifiers, and appositive noun phrases in L2 English academic research writing by FRWs across Applied Linguistics (AL), Measurement and Evaluation (ME), and Sociology (SOC).

2. LITERATURE REVIEW

2.1. English as the language of academic research

English is the universal language of research in contexts where English is used as an L1 or L2. Research scholars use it to disseminate scientific knowledge across disciplinary discourse communities and nations (Flowerdew, 2013; Lillis & Curry, 2016; Menghini, 2017; Paltridge, 2013). In fact, most of the scholarly publications are written in English. On the one hand, 95% of research (indexed in International Scientific Indexing [ISI]) in natural sciences are published in English; 90% of research (indexed in ISI) in social sciences are also published in English (Flowerdew, 2013; Lillis & Curry, 2010). On the other hand, 67% of research (indexed in Ulrich's Periodicals Directory) is published in English (Flowerdew, 2013; Lillis & Curry, 2010). Despite these figures, it cannot be claimed that these studies were written by L1 English users only because the number of L2 English users has exceeded the number of L1 English users across the world (Crystal, 2003, 2008; Jenkins, 2015). With this claim, I argue that academic research writing is largely populated by L2 English research writers like FRWs.

In 1899, English was entrenched in the Philippines when the Thomasites (first American teachers of Filipinos) taught Filipinos about the language. After their short stay in the country, Filipino teachers took over them and began teaching English to Filipinos.

At present, Filipinos use English as their L2 in various language domains (e.g., education, business, science) and different communication contexts. For example, they use English as the institutional language in writing and publishing academic research (Dayag, 2012, 2014). Philippine state universities and colleges require their graduate and undergraduate students to write research in English to earn academic units and complete their degrees. Likewise, most Philippine research journals expect their potential authors to submit their research written in English, among other languages (Hernandez, 2021). FRWs write and publish their research in English so that their works could attain a wider readership. Hence, Filipinos assimilate English as obligatory language in academic research writing.

2.2. Academic research writing across disciplines and research articles

Academic writing is a formal written register in academic institutions and scholarly publications, the main means of knowledge circulation across academic disciplines, and a key for researchers to earn credibility in their professions (Gray, 2015; Yakut et al., 2021). Researchers have examined academic writing by L1 English research writers with the notion that the grammatical features of academic registers differ from one discipline to another (e.g., Biber & Gray, 2016; Gray, 2015; Hyland, 2006, 2008; Hyland & Jiang, 2017); likewise, various disciplines employ grammatical devices in different ways (Gray, 2015; Hyland, 2006). Flowerdew (2013, p. 307) emphasizes that this “situated characteristic” takes place in disciplinary discourse communities whose language use varies as academic fields are diverse in their writing practices, research cultures, knowledge productions, and academic principles (Hyland, 2007). Nevertheless, differences in language use, especially in terms of the compressed and implicit syntactic features, have often been underexplored in L2 academic research writing by FRWs across disciplines.

Since it is a research-focused register of academic writing, the research article (RA) represents academic research writing (Biber & Gray, 2010, 2011; Biber, Gray et al., 2016; Gray, 2015). Swales (2004) elucidates that the RA has gained the utmost recognition and has become the master scholarly text in academic written discourse across disciplines. By definition, RAs are learned written informational texts which report scientifically and newly produced content, knowledge, or perspective (van Enk & Power, 2017). Gray (2015) has classified RAs into qualitative, quantitative, and theoretical sub-registers according to the research paradigms in the hard sciences (natural and physical sciences [e.g., Medicine, Physics, etc.]) which focus on empirical methods and experimentations, and in the soft sciences (behavioural and social sciences, and humanities [e.g., Applied Linguistics, Communication, Philosophy, etc.]) which concentrate on the scientific examination of human behaviors and perceptions, among others. Gray (2015) describes that qualitative RAs elucidate observed qualitative data and use qualitative research designs (e.g., content analysis, grounded theory, phenomenology, etc.) in fields like Communication and Psychology; quantitative RAs explain quantitative data and employ quantitative research designs (e.g., descriptive, causal-comparative, experimental, etc.) in disciplines like Biology and Engineering; and theoretical RAs examine qualitative data and discuss theories or approaches in fields like Philosophy and Political Science. Biber (1988), Biber and Gray (2010, 2016), Biber, Johansson et al. (1999, 2021), Gray (2015), Hutter (2015), Ruan (2018), Wu et al. (2020), and Yin et al. (2021) claim that attributive adjectives, nominal prepositional phrases, noun premodifiers, and appositive noun phrases are ubiquitous in academic research writing; however, these nominal phrasal modifiers are infrequently explored in disciplinary RA sub-registers.

2.3. Compressed and implicit syntactic features

Attributive adjectives, nominal prepositional phrases, noun premodifiers, and appositive noun phrases are the most prevalent compressed and implicit syntactic features of academic research writing (Biber & Gray, 2010, 2016; Biber, Johansson et al., 1999, 2021). However, studies of these nominal phrases frequently center on L1 English academic research writing (e.g., Biber & Gray, 2010, 2011, 2016; Biber, Gray et al., 2016; Gray, 2015; Halliday, 1993/1996; Hutter, 2015). Biber and Gray (2010, 2011, 2016), Biber, Gray et al. (2016), Gray (2015), and Hutter (2015) deflated the stereotype that academic writing is full of elaborated and explicit syntactic features. They found that academic research writing across hard and soft disciplines (applied linguistics, communication, education, history, philosophy, psychology, political science, sociology, astronomy, biology, ecology, medicine, physics, physiology, and science) heavily relies on nominal phrases and not clauses. Halliday (1993/1996) points out that these nominal phrases are challenging to comprehend because of their lack of syntactic constituents (Biber & Gray, 2010, 2016) and of their complicated meaning relations (Ruan, 2018). For instance, **information technology company** contains two consecutive noun premodifiers (**information** and *technology*) referring to the head noun (company); however, **information** could be seen as a premodifier for *technology* rather than the head noun company.

Comparative to the findings of the preceding research, other studies of nominal phrases had concentrated on L2 English academic research writing, more specifically academic EFL and ELF research writing (e.g., Ansarifar et al., 2018; Hernandez, 2021; Ruan, 2018; Wu et al., 2020; Yin et al., 2021). Ansarifar et al. (2018) discovered that noun premodifiers, attributive adjectives with noun premodifiers, and nominal prepositional phrases had the highest frequencies of use in RA abstracts of Persian expert research writers and the dissertation and master's abstracts of Persian novice research writers. Similarly, Hernandez (2021) determined that the four nominal phrases co-occur in RAs written by Filipino researchers in education sciences, humanities, and social sciences. Likewise, Ruan (2018) revealed that these phrasal modifiers are frequent in RA abstracts of Chinese and L1 English research writers in applied linguistics. Moreover, Wu et al. (2020) identified that these noun phrases are dominant in humanities, science, and social science academic ELF writing. Furthermore, Yin et al. (2021) showed that recurrent nominal phrases comprise RA genres by professional and emerging Chinese academic research writers. Although these studies were grounded in L2 English academic research writing, only Ansarifar et al. (2018) and Ruan (2018) focused solely on nominal pre- and postmodification. In addition, only Hernandez (2021) considered L2 English academic research writing by FRWs as L2 English users. Overall, none of them attempted at exploring the four compressed and implicit nominal phrases alone in disciplinary RA sub-registers authored by FRWs.

There is a need to cross-examine the compressed and implicit syntactic features in disciplinary RAs authored by FRWs because of the following reasons: first, FRWs across disciplines frequently employ the four nominal phrases in writing and publishing RAs (Hernandez, 2021); thus, their use of these nominal phrases in academic research writing deserves analysis; second, English is the Filipinos' institutional language in research writing and publication (Dayag, 2012, 2014); hence, the four nominal phrases used by FRWs warrant investigation; third, the four English nominal phrases are characteristic syntactic structures of academic writing (Biber & Gray, 2010, 2011, 2016; Biber, Gray et al., 2016; Gray, 2015; Hernandez, 2021; Hutter, 2015; Malakhovskaya et al., 2021; Ruan,

2018; Wu et al., 2020; Yin et al., 2021); however, they are often ignored syntactic features of academic research writing in the Philippines; and finally, no research has been published, cross-analyzing the four compressed and implicit syntactic features in qualitative and quantitative disciplinary RAs authored by FRWs. These reasons strongly justify that research on the four compressed and implicit syntactic features in L2 English academic research writing should be undertaken.

3. OBJECTIVES OF THE STUDY

In this research, I cross-analyzed attributive adjectives, nominal prepositional phrases, noun premodifiers, and appositive noun phrases in L2 English academic research writing by FRWs in AL, ME, and SOC. Specifically, I sought to identify the compressed and implicit syntactic features which most frequently co-occur across the disciplinary RA sub-registers and determined whether these syntactic features significantly differed from other syntactic features.

4. METHOD

4.1. Research design, data sources, and data collection

Hereby, I used descriptive research design to cross-analyze the four nominal phrases in L2 English academic research writing by FRWs across the three disciplines. The data sources were 42 published RAs (with 179,673 tokens) consisting of 14 RAs per discipline which I randomly selected from Open Access (OA) Philippine research journals. Following Gray's (2015) RA sub-classifications, I categorized them into five RA datasets, adopting Gray's (2015) qualitative and quantitative RA sub-registers: (1) qualitative AL; (2) quantitative AL; (3) quantitative ME; (4) quantitative SOC; and (5) qualitative SOC (see Table 1). ME has no qualitative RA sub-register because most of the research designs employed in ME research are quantitative (Hernandez, 2021). I chose OA journals so that L2 English academic research writing can be represented across the Philippines and considered AL, ME, and SOC because these are in-demand research disciplines in the country. Disciplinary RAs published in a 10-year period were considered as this study is a synchronic cross-analysis. Table 1 shows the randomly selected disciplinary RAs in the study.

Table 1 Randomly selected disciplinary RAs

Years	Discipline	No. of RAs per Disciplinary Sub-register				RA <i>f.</i>	Overall Tokens
		QUAL	Tokens	QUAN	Tokens		
2010-2018	AL	7	27,189	7	30,088	14	57,277
2011-2019	ME	7		7	55,889	14	55,889
2009-2019	SOC	7	35,445	7	31,062	14	66,507
Total	3	21	62,634	21	117,039	42	179,673

The OA journals selected for this study are hereby listed:

1. Applied Linguistics

Alipato: A Journal of Basic Education; Asian Journal of English Language Studies; Asia-Pacific Journal of Multidisciplinary Research; Asia Pacific Journal of Education, Arts and Sciences; CNU Journal of Higher Education; International Journal of Education Research for Higher Learning; Journal of Educational and Human Resource Development; JPAIR Multidisciplinary Research; MSEUF Research Studies; Pamalandong; Philippine Journal of Linguistics; Philippine ESL Journal; Tilamsik Journal of Research of the College of Arts and Sciences; The Normal Lights; The RAP Journal; UNP Research Journal; WMSU Research Journal

2. Measurement and Evaluation

Asia-Pacific Journal of Multidisciplinary Research; Asia Pacific Journal of Maritime Education; CNU Journal of Higher Education; Development Education Journal of Multidisciplinary Research; Educational Measurement and Evaluation Review; Harvest, ISU-Cabagan Journal of Research; JPAIR Multidisciplinary Research; LPL Research Journal; Philippine Journal of Counseling Psychology; SMCC Higher Education Research Journal; The Assessment Handbook; MSEUF Research Studies; TIP Research Journal; UIC Research Journal; UNP Research Journal

3. Sociology

Alipato: A Journal of Basic Education; Asia Pacific Journal of Education, Arts and Sciences; Asia-Pacific Journal of Multidisciplinary Research; Asia-Pacific Social Science Review; CNU Journal of Higher Education; DANYAG: Journal of Humanities and Social Sciences; ARETE International Journal of Liberal Arts, Education, Social Sciences and Philosophical Studies; JPAIR Multidisciplinary Research; LPU Laguna Journal of Multidisciplinary Research; Luz Y Saber; Nursing Research Journal; Pamalandong; Philippine Journal of Social Sciences and Humanities; Philippine Social Science Review; Recoletos Multidisciplinary Research Journal; Social Sciences and Development Review; The Paulinian Compass [The Asia-Pacific Journal on Compassion Studies]; UNP Research Journal

FRWs' nationality and affiliation are important considerations in the selection of the disciplinary RAs. To ascertain that the disciplinary RAs are authored by FRWs, I analyzed the writer's last names and academic institutions. That is, I considered the last names which are typical in the Philippines and institutions which are traceable only in the Philippines, adapting Ruan's (2018) study. I compared and/or contrasted the five disciplinary RA groups as separate datasets.

4.2. Data analysis

I utilized Biber, Johansson et al.'s (1999, 2021) framework of the four syntactic structures associated with compressed and implicit written academic discourse style. The framework has been repeatedly employed in grammatical studies of academic English (e.g., Biber & Gray, 2010, 2016; Gray, 2015). Table 2 shows the four compressed and implicit syntactic features with examples.

Table 2 Compressed and implicit syntactic features (Biber, Johansson et al., 1999, 2021)

Four nominal phrases	Samples
Attributive adjectives	thorough implementation, important changes, special process (Biber, Johansson et al., 2021, pp. 508, 512)
Nominal prepositional phrases	turbulence in lasers and other optical systems , the possibility of a death wish (Biber, Johansson et al., 2021, pp. 629, 962)
Noun premodifiers	glass windows, pencil case, women algebraists, irrigations water (Biber, Johansson et al., 2021, p. 584)
Appositive noun phrases	both types of eggs (diapause and non-diapause), Kinetics Technology International (KIT), Vaclav Havel, the dissident playwright (Biber, Johansson et al., 2021, pp. 600, 632, 634)

This framework was used as coding scheme. To code the four nominal phrases in each disciplinary RA dataset, I used LancsBox (Brezina et al., 2021) and manual coding. Through LancsBox, I traced attributive adjectives, nominal prepositional phrases, and noun premodifiers by using smart searches – ADJECTIVE for attributive adjectives, NOUN for noun premodifiers, and PREPOSITIONAL PHRASE for nominal prepositional phrases, and saved them in Excel files. However, I had to do manual coding because corpus tools can be inconsistent in analyzing grammatical features (Egbert et al., 2020). For instance, adjectives may be used as attributive or predicative; prepositional phrases may be used as nominal or adverbial in sentences. Of the four nominal phrases, only appositive noun phrases needed to be hand-coded alone because they cannot be located by LancsBox.

Three qualified inter-coders separately analyzed all the coded nominal phrases. Two rounds of inter-coding occurred. In the first, each coder and I met together and discovered opposing judgments. We resolved these contradictions by conducting more discussions until we achieved unanimous decisions. In the second, we reassessed our judgments until we reached final decision. Inter-coder reliability computed through Fleiss Kappa yielded 0.97, an almost perfect reliability agreement.

4.3. Statistical treatments

For the raw frequencies of nominal phrases to be directly comparable, I normalized the frequency count of each nominal phrase by the total number of words of each disciplinary RA sub-register and then multiplied each frequency count by 1,000. This calculation was based on corpus-based studies (e.g., Biber & Gray, 2010, 2016; Biber, Gray et al., 2016; Gray, 2015; Hutter, 2015). Then, each normed frequency rate was divided into the tokens of each disciplinary RA sub-register to compute for the percentage equivalents (Cheusheva, 2021). One-way ANOVA between groups was also utilized to identify whether particular nominal phrases are real compressed and implicit syntactic features of L2 English academic research writing.

5. FINDINGS AND DISCUSSION

This section presents the results and their interpretations. Main results are compared and/or contrasted with the findings of related studies wherever possible.

Of the four compressed and implicit syntactic features, attributive adjectives succeeded by nominal prepositional phrases, and then noun premodifiers had the highest frequencies of use across the five disciplinary RA sub-registers (see Fig. 1). Although this finding supports Ansarifard et al.'s (2018) and Ruan's (2018) claim, it is disparate to Biber and Gray's (2010, 2016) result that nominal prepositional phrases are more dominant than attributive adjectives. Such discrepancy is relatable to the English users and disciplines considered in their study and in the current study. On the one hand, Biber and Gray (2010, 2016) analyzed RAs in a variety of disciplines (science/medicine, education, psychology, history, biology, ecology, and physiology), whereas I explored qualitative and quantitative RAs from AL, ME, and SOC. Second, Biber and Gray (2010, 2016) considered L1 English research writers, while I involved FRWs as L2 English research writers. Such result is also inconsistent with Wu et al.'s (2020) finding that noun premodifiers are more frequent than attributive adjectives. This discrepancy could be associated with the different data sources that Wu et al. (2020) and I considered. Wu et al. (2020) used SciELF which is one of the components of the Written English as a Lingua Franca in Academic settings corpus and COCA (Corpus of Contemporary American English). SciELF consists of (unedited) RAs from 10 ELF writer clusters (Finish, Czech, French, Chinese, Spanish, Russian, Swedish, Italian, Portuguese, and Romanian), whereas the corpus of this study comprised of disciplinary RAs authored by FRWs.

To identify whether the three leading phrasal modifiers truly depict L2 English academic research writing, I ran one-way ANOVA between groups which revealed that the three phrasal modifiers were significantly different at the $p < .05$ level [$F(3,16) = 100.92, p < .05$]. This result indicates that there is significant difference on the use of the four compressed and implicit syntactic features. Post-hoc Tukey HSD test yielded that the means between and among the four nominal phrases were significantly different: attributive adjectives ($M = 68.31, SD = 7.47$), nominal prepositional phrases ($M = 46.16, SD = 7.87$), noun premodifiers ($M = 57.95, SD = 3.83$), and appositive noun phrases ($M = 8.68, SD = 1.30$); nominal prepositional phrases ($M = 46.16, SD = 7.87$), noun premodifiers ($M = 57.95, SD = 3.83$), and appositive noun phrases ($M = 8.68, SD = 1.30$); and noun premodifiers ($M = 57.95, SD = 3.83$) and appositive noun phrases ($M = 8.68, SD = 1.30$). From these results, attributive adjectives, nominal prepositional phrases, and noun premodifiers show a significant difference from appositive noun phrases on their frequencies of use, hence strongly indicating that the three syntactic features characterize L2 English academic research writing by FRWs.

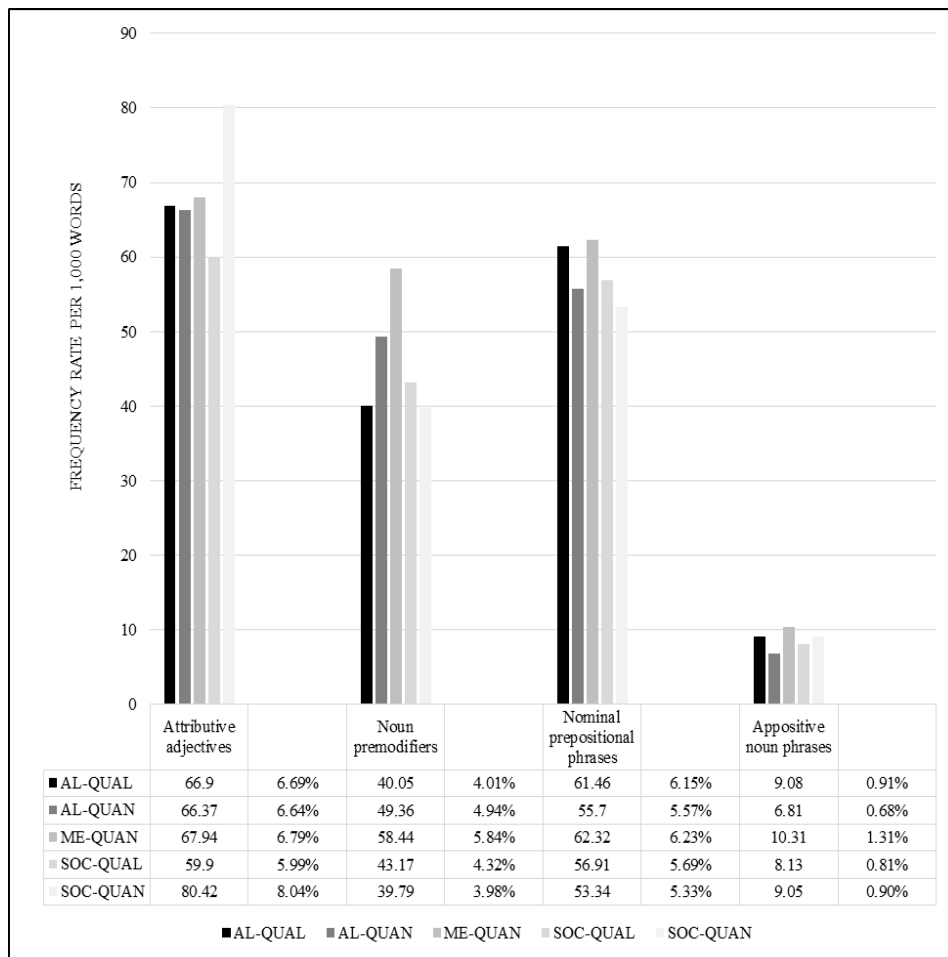


Fig. 1 Frequencies of use of compressed and implicit syntactic features

As shown in Fig. 2, the three leading nominal modifiers are plotted much higher than and very distant from appositive noun phrases. These placement and distance strongly indicate that the three nominal modifiers extremely determine L2 English academic research writing.

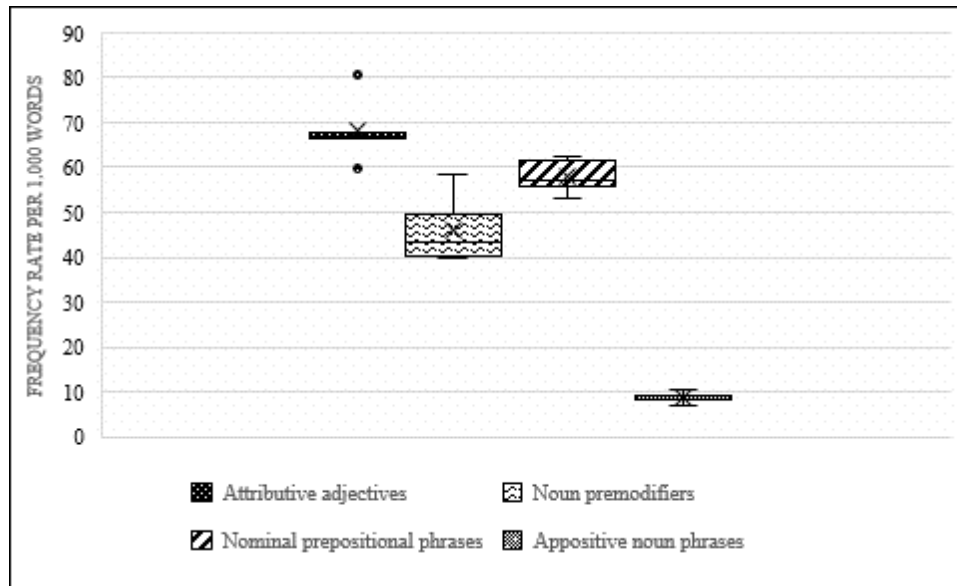


Fig. 2 Distribution of compressed and implicit syntactic features

As the three nominal phrases topped in frequencies of use, they are probably repeatedly used in almost all sentences across the disciplinary RA sub-registers. For example, extract 1 contains recurring attributive adjectives (bolded), nominal prepositional phrases (bracketed), and noun premodifiers (italicized).

- (1) Remittance [in forms [of money and **symbolic** exchange]] is moderately perceived as a form [of **social** capital.] Receiving *material* gifts gives them satisfaction; although, gestures [of love [between **migrant** parents and **left-behind** children]] are low. These results show that their **high** level [of *family social* capital] is the sum [of their experiences [of bonding [through **emotional** connection and **meaningful** and *quality* interaction]]] but less on the aspect [of remittances.] [Quantitative SOC]

While a significant difference exists between the three nominal phrases and appositive noun phrases, each phrasal modifier had different frequencies of use across the five disciplinary RA sub-registers, hence supporting Gray's (2015) assertion that linguistic differences exist within RA sub-registers across disciplines. In the following sections, each compressed and implicit nominal modifier is discussed.

5.1. Attributive adjectives

Attributive adjectives occurred most dominantly in quantitative SOC RAs (80.42, 80.04%) which is far greater than attributive adjectives in quantitative ME RAs (67.94, 6.79%), qualitative AL RAs (66.9, 6.69%), and quantitative AL RAs (66.37, 6.64%) with almost equal frequencies of use. However, they were least frequent in qualitative SOC RAs (59.9, 5.99%). These findings show that attributive adjectives are especially more

common in quantitative research writing in SOC but are less common in qualitative research writing in the same discipline. In addition, they are comparatively common in quantitative research writing in ME and qualitative and quantitative research writing in AL. As attributive adjectives ranked first among the four nominal phrases, the five disciplinary RA sub-registers are compressed and implicit primarily through attributive adjectives. In my data analyses, I found that attributive adjectives across disciplinary RAs can be descriptors or classifiers for the head nouns (e.g., extracts 2 to 11). On the one hand, descriptors (Ds) identify “color (e.g., white, blue), size/quantity/extent (e.g., large, deep), time (e.g., new, young), and emotion/evaluation (e.g., important, excellent), and miscellaneous descriptions (e.g., complex, optimistic)” and are “typically gradable” (Biber, Johansson et al., 2021, pp. 506-507). On the other hand, classifiers “delimit or restrict a noun’s referent, by placing it in a category in relation to other referents” and are “typically non-gradable” and are “relational/classification/restrictive (e.g., direct, main), affiliative (e.g., Philippine, English), or topical (e.g., legal, sexual)” (Biber, Johansson et al., 2021, pp. 506-507). These descriptors and classifiers provide specifications to the head nouns of different types (Biber, Johansson, et al., 1999, 2021), making the latter clear to understand (Ruan, 2018), as in:

- (2) sexual partners,
C: T AN N
- (3) rapid secondary socialization [Quantitative SOC]
D: E C: R AB/PR N
- (4) appropriate items,
D: MD CO N
- (5) significant indirect effects [Quantitative ME]
D: E C: R PR N
- (6) phonological changes,
C: T AB/PR N
- (7) particular linguistic features [Qualitative AL]
C: R C: T AB N
- (8) same pronunciation [N],
C: R PR N
- (9) strategic instructional materials [Quantitative AL]
C: T C: T CO N
- (10) democratic supervision,
C: T PR N
- (11) supportive younger siblings [Qualitative SOC]
C: T D: TI AN N

For example, 2 in quantitative SOC RA has the topical classifier (C: T) ‘sexual’ specifying the head noun ‘partners’ (an animate noun [AN N]). Similarly, 4 in quantitative ME RA contains the miscellaneous descriptor (D: MD) ‘appropriate’ identifying ‘items’ (a concrete noun [CO N]); 8 in quantitative AL RA has the relational classifier ‘same’ (C: R) specifying ‘pronunciation’ (a process noun [PR N]). These illustrate single attributive adjectives, premodifying nouns across the disciplinary RAs. Two attributive adjectives of same or different semantic categories may also co-occur to premodify a head noun. For instance, 7 in qualitative AL RA has the C: R ‘particular’ and

the C: T ‘linguistic’ (both classifiers), premodifying ‘features’ (an abstract noun [AB N]). In contrast, 3 in quantitative SOC contains the evaluative descriptor (D: E) ‘rapid’ and the C: R ‘secondary’ (the first is a descriptor; the second is a classifier), premodifying ‘socialization’ (an abstract/process noun [AB/PR N]). The same can be observed in 5. Likewise, 11 contains the C: T ‘supportive’ and the time descriptor (D: TI) ‘time’ (the former is a classifier; the latter is a descriptor), individually referring to ‘siblings’ (an AN N).

However, attributive adjectives also convey intricate meaning or logical relationships when they co-exist with noun premodifiers in a way that an attributive adjective could be perceived as the premodifier to the noun premodifier or as the premodifier to the head noun (Ruan, 2018) (e.g., extracts 12 to 16). Due to their compressed form, attributive adjectives’ meaning relations to the head nouns become implicit. This implicitness stems from the absence of syntactic elements between them and the head nouns but could be made explicit by elaborated syntactic features (Biber & Gray, 2010, 2016; Ruan, 2018), for example, relative *that* clauses (italicized), as in the following:

- (12) sustainable conservation strategies or
 C: T AB/PR N PR N
 sustainable conservation strategies [Quantitative SOC]
 versus strategies *that sustain conservation*
- (13) different achievement goals or
 D: R P N AB N
 different achievement goals [Quantitative ME]
 versus goals *that are achieved differently*
- (14) favorite library books or
 D: E PL N CO N
 favorite library books [Qualitative AL]
 versus favorite books *that are found in the library*
- (15) optimistic teaching behaviors or
 D: MD PR N AB N
 optimistic teaching behaviors [Quantitative AL]
 versus behaviors *that show positive teaching*
- (16) principal river basins or
 C: R PL N CO N
 principal river basins [Qualitative SOC]
 versus basins *that are principally in the form of rivers*

These attributive adjectives either premodify the noun premodifiers next to them or the head nouns (as indicated by the curved down arrows) which may cause confusion at least to a non-expert reader (Biber & Gray, 2010, 2016) in each of the three disciplines. For example, two interpretations can be considered for extract 15: first, ‘optimistic’ premodifies ‘teaching’, while ‘teaching’ premodifies the head noun ‘behaviors’; second, both ‘optimistic’ and ‘teaching’ together premodify ‘behaviors’. The relative *that* clause in ‘behaviors *that show positive teaching*’ could clarify the meaning relationship between the two nominal premodifiers and the head noun. While such compression and implicitness exist in attributive adjectives, less compression and implicitness were observed with nominal prepositional phrases.

5.2. Nominal prepositional phrases

Although nominal prepositional phrases succeeded attributive adjectives, they were still far more frequent than appositive noun phrases as noun postmodifiers indicating that they are very much common phrasal postmodifiers in L2 English academic research writing. They were most frequent in quantitative ME RAs (62.32, 6.23%) but least frequent in quantitative SOC RAs (53.34, 5.33%). However, they had relatively closed occurrences in all disciplinary RA sub-registers: quantitative ME RAs (62.32, 6.23%); qualitative AL RAs (61.46, 6.15%); qualitative SOC RAs (56.91, 5.69%); quantitative AL RAs (55.7, 5.57%); and quantitative SOC RAs (53.34, 5.33%). This slant suggests that nominal prepositional phrases are used similarly in all the five disciplinary RA sub-registers. These phrases form complex sequences and multiple embeddings (Biber, Johansson et al., 1999, 2021) which I observed especially in *of*-phrases (as illustrated in extracts 17 to 21 across disciplinary RA sub-registers).

(17) assessment of the current model of general education [Quantitative ME]

assessment →
of the current model →
current model →
of general education

(18) explicit instruction of the writing conventions of the method section for sub-discipline-specific kind of writing [Qualitative AL]

explicit instruction →
of the writing conventions →
writing conventions →
of the method section...
kind →
of writing

- (19) one of the historical markers of the priceless ancestral heritage of the Philippines [Qualitative SOC]

one →
of the historical markers →
the historical markers →
of the priceless ancestral heritage →
the priceless ancestral heritage →
of the Philippines

- (20) the levels of self-efficacy of practicing teachers [Quantitative AL]

the levels →
of self-efficacy →
self-efficacy →
of practicing teachers

- (21) high level of meaningful and frequent socialization of left-behind children [Quantitative SOC]

high level →
of meaningful and frequent socialization →
meaningful and frequent socialization →
of left-behind children

These complex nominal *of*-phrases contain two to four phrasal embeddings. For instance, 17 has two *of*-phrases. The first *of*-phrase (*of the current model*) is embedded in the head noun *assessment* and the second *of*-phrase (*of general education*) is embedded in the first *of*-phrase's prepositional object *model*. In contrast, 18 contains three *of*-phrases. The first *of*-phrase (*of the historical markers*) is embedded in the head noun *one*; the second *of*-phrase (*of the priceless ancestral heritage*) is embedded in the first *of*-phrase's prepositional object *markers*; and the third *of*-phrase (*of the Philippines*) is embedded in the second *of*-phrase's prepositional object *heritage*. With these multiple embedded *of*-phrases in the disciplinary RA sub-registers, L2 English academic research writing could be construed to have full such phrasal modification because prepositional phrases headed by *of* are the most common nominal prepositional phrases in academic research writing (Biber & Gray, 2016). In addition, *of*-phrases are frequently the syntactic variant of *s'* genitives and/or noun premodifiers (Biber & Gray, 2016; Biber, Johansson et al., 1999, 2021), indicating that *of*-phrases lack alternative elaborated and explicit syntactic features. Thus, they maintain compression and implicitness. Unlike *of*-phrases, *in*- and *for*-phrases normally have relative *that* and *wh*- clauses and noun-controlled *that*-clauses (italicized) as their elaborated and explicit syntactic alternatives, as shown in extracts 22 to 31.

- (22) performance in the professional subjects →
performance that students have in their professional subjects

- (23) rationale for any future revisions →
rationale that is subject for any future revisions
 [Quantitative ME]

- (24) competition in the professional world →
competition which happens in the professional world
- (25) framework for the NHIJ academic writers →
framework that is used by NHIJ academic writers
 [Qualitative AL]
- (26) breadwinners in the family →
breadwinners who support the family
- (27) agenda for the rehabilitation, improvement and sustainability →
*agenda which are prepared for rehabilitation, improvement
 and sustainability*
 [Qualitative SOC]
- (28) common errors in their written reports →
common errors that students commit in their written reports
- (29) importance for written communication →
importance that weblogs have for written communication
 [Quantitative AL]
- (30) involvement in community life →
involvement that children value in their community life
- (31) implications for social adjustment →
implications that social capital have for social adjustment
 [Quantitative SOC]

Specifically, 23 and 25 have relative *that* clauses; 24, 26, and 27 have relative *which* and *who* clauses as their elaborated and explicit syntactic equivalents; and 22 and 28 to 31 have alternative noun-controlled *that*-clauses. These elaborated and explicit features make the meaning relationships between the head noun and *in*- and *for*-phrases overt. Given such elaborated and explicit syntactic alternatives, *in*- and *for*-phrases are less reduced syntactic structures unlike *of*-phrases which lack elaborated and explicit syntactic alternatives. Being second to attributive adjectives in terms of frequencies of use across disciplinary RA sub-registers, nominal prepositional phrases are proven as the most common phrasal postmodification particularly in L2 English academic research writing. This claim corroborates Biber and Gray's (2016) finding that prepositional phrases are the most recurrent nominal postmodification.

5.3. Noun premodifiers

As with nominal prepositional phrases, noun premodifiers occurred most in quantitative ME RAs (58.44, 5.84%) but occurred least in quantitative SOC RAs (39.79, 3.98%). Nevertheless, they had closed frequencies in quantitative AL RAs (49.36, 4.94%), qualitative SOC RAs (43.17, 4.32%), and qualitative AL RAs (40.05, 4.01%). The dominance of nominal prepositional phrases and noun premodifiers in quantitative ME RAs show that ME academic research writing employs extremely dense packaging of information. Of the three disciplines, ME could be considered a hard science as it usually deals with quantifiable outcomes of individuals' performances (Hernandez, 2021), corroborating Biber and Gray's (2010, 2016) finding that noun premodifiers are most common in hard science disciplines (e.g., biology, ecology, medicine, and physiology). Noun premodifiers in other disciplinary RA sub-registers were relatively common,

substantiating Biber and Gray's (2016) claim that they are frequent in social science academic writing. Like attributive adjectives and nominal prepositional phrases, noun premodifiers make the disciplinary RA sub-registers highly compressed and implicit because of the absence of function words which help reveal the meaning relationships between the premodifying noun and the head noun (Biber, Johansson et al., 1999, 2021). The following single noun premodifiers (where N1 stands for the single noun premodifier and N2 refers to the head noun) and multiple noun premodifiers (where N1 stands for the first noun premodifier, N2 for the second noun premodifier, and N3 for the head noun) have very compact information packaging, and thus convey different confusing meaning relations.

- (32) factor structure → *factor/s that consist/s the structure*
 N1 N2 (N2 is made of N1)
- (33) distribution requirement model → *model for required distribution*
 N1 N2 N3 (N3 is for the purpose of N1 and 2)
 or distribution requirement model
- [Quantitative ME]
- (34) reading performance → *performance about reading*
 N1 N2 (N2 is about N1)
- (35) story grammar knowledge → *knowledge about the story grammar*
 N1 N2 N3 (N3 is about N1 and N2)
 or story grammar knowledge
- [Quantitative AL]
- (36) work hours → *hours for work*
 N1 N2 (N2 is for the purpose of N1)
- (37) identity integration problems → *problems about identity integration*
 N1 N2 N3 (N3 is about N1 and N2)
 or identity integration problems
- [Qualitative SOC]
- (38) vowel shift → *X produces another vowel*
 N1 N2 (N1 is the object of the process in N2)
- (39) tense sequence errors → *errors about tense sequence*
 N1 N2 N3 (N3 is about N1 and N2)
 or tense sequence errors
- [Qualitative AL]

- (40) age group → *a group that is categorizable by age*
 N1 N2 (N2 is classifiable by N1)

- (41) community church activities → *activities in the community church*
 N1 N2 N3 (N3 takes place in N1 and N2)
 or community church activities
-

[Quantitative SOC]

The inexplicit meanings of these noun premodifiers become exposed when they are paraphrased into either relative *that* clauses, sentence, or nominal prepositional phrases. For example, 32 has *factor/s that consist/s the structure* (a relative *that* clause) (N2 is made of N1). Similarly, 38 has *X produces another vowel* (a sentence) (N1 is the object of the process in N2). In addition, 36 has *hours for work* (a nominal prepositional phrase) (N2 is for the purpose of N1). Like extract 36, 34 also has an alternative nominal prepositional phrase (*performance about reading*). For single noun premodifiers like these, their point of reference clearly point to their head nouns. However, like multiple attributive adjectives, multiple noun sequences which premodify a head noun express even more baffling meaning relations (e.g., extracts 33, 35, 37, 39, and 41) in the sense that the N1 either premodifies the N2 or the head noun (N3). Like attributive adjectives, these noun premodifiers could also cause difficulty at least to non-expert readers (Biber & Gray, 2010, 2016) in the three disciplines. Overall, the implicit meaning relations that noun premodifiers have in disciplinary RA sub-registers show that L2 English academic research writing uses a compressed discourse style.

5.4. Appositive noun phrases

Of the four dependent phrases, appositive noun phrases had the least frequencies of use. Despite their low occurrences, appositive noun phrases occurred closely frequently in the five disciplinary RA sub-registers: quantitative ME RAs (10.31, 1.31%); qualitative AL RAs (9.08, 0.91%); quantitative SOC RAs (9.05, 0.90%); qualitative SOC RAs (8.13, 0.81%); and quantitative AL RAs (6.81, 0.68%). With these almost equal findings, it could be said that appositive nouns phrases are still relatively present across the five disciplinary RA sub-registers. Appositive noun phrases are two co-referential noun phrases where the second noun phrase provides an identification or description to the first noun phrase (Biber & Gray, 2010, 2016), as exemplified in extracts 42 to 46:

- (42) higher order thinking skills (HOTS) [Quantitative ME]

- (43) comprehension part, a stage of the academic discourse [Qualitative AL]

- (44) abortion (75% or 68 respondents), exhibitionism (71% or 65 respondents), prostitution (70% or 64 respondents), orgies or group sex (70% or 64 respondents), phone sex (66% or 60 respondents), anal sex (65% or 59 respondents), homosexual sexual encounters (64% or 58 respondents), voyeurism (59% or 54 respondents), cybersex (58% or 53 respondents), and the use of sex toys (55% or 50 respondents) [Quantitative SOC]

(45) Episcopal Commission on Lay Apostolate (ECLA) [Qualitative SOC]

(46) localized curriculum (locality-based reading/teaching materials)
[Quantitative AL]

Extracts 42, 43, and 45 illustrate the most common types of appositive noun phrases (Biber & Gray, 2016). Specifically, 42 and 45 follow the NP + (ACRONYM) pattern where the acronyms (HOTS) and (ECLA) assign a very reduced version of the first noun phrases ‘higher order thinking skills’ and ‘Episcopal Commission on Lay Apostolate’, respectively. In contrast, 43 illustrates NP + , + NP pattern where the second noun phrase ‘a stage of the academic discourse’ describes the first noun phrase ‘comprehension part’. Although these appositive phrases contain implicit meaning relationships, the second noun phrase could bear more specialized meanings especially when it has indirect referential association to the first noun phrase (Biber & Gray, 2016). For example, 44 and 46 exemplify NP + (NP) pattern. Extract 44 has parentheses containing the percentages and the numbers of research participants who selected the entity represented in the first noun phrases (i.e., abortion..., exhibitionism..., prostitution..., etc.); extract 46 also has parentheses containing ‘locality-based reading/teaching materials’ as components of ‘localized curriculum’ which is the first noun phrase. Since appositive noun phrases had low occurrences across the disciplinary RA sub-registers, it can be construed that not all compressed and implicit syntactic features equally characterize L2 English academic research writing by FRWs across disciplines.

6. CONCLUSION AND IMPLICATIONS

Research on compression and implicitness in L2 English academic research writing has been an uncharted area of study in academic writing research especially in the Philippines. Therefore, I cross-examined the compressed and implicit syntactic features in L2 English academic research writing by FRWs in AL, ME, and SOC. In particular, I determined the most frequently co-occurring compressed and implicit syntactic features in disciplinary RA sub-registers and identified whether these syntactic features significantly differed from other syntactic features. Accordingly, attributive adjectives, nominal prepositional phrases, and noun premodifiers had the highest frequencies of use across disciplinary RA sub-registers, and they significantly differed from appositive noun phrases as revealed by one-way ANOVA between groups with Post-hoc Tukey HSD. In conclusion, the three nominal phrases are universal and the most functional compressed and implicit syntactic features of L2 English academic research writing, and so are much more flexible than appositive noun phrases. As it is characterized by the three compressed and implicit syntactic features, L2 English academic research writing is an extremely nominal written academic discourse regardless of its disciplinary origin and research nature. The study has applied implications for academic writing pedagogy especially in the Philippines and in nations where English is used as a second/foreign language or as a lingua franca.

Academic writing pedagogy concentrates primarily on teaching materials preparation, academic writing instruction, and academic writing assessment. On materials preparation, academic writing textbook writers need to incorporate the three compressed and implicit syntactic features as language foci of the content or skills lessons in writing academic

research. Textbook writers ought to include examples of the three nominal phrases based on a large corpus of qualitative and quantitative disciplinary RAs. Hence, academic writing teachers and students in the graduate and undergraduate levels could be informed of what to teach and what to learn and advanced academic writing could be more contextualized (Hernandez, 2020). On instruction, academic writing teachers need to allot longer learning time for the three nominal phrases because these phrases are difficult especially for beginning academic writers (Biber & Gray, 2010, 2016). Students in the three disciplines need to be immersed with more consciousness-raising activities and writing exercises which emphasize economy of expression and concentrate on meaning relations aside from grammatical forms. Thus, they may develop or enhance their ability to write academic research texts using a compressed and implicit discourse style. On assessment, academic writing teachers need to provide more feedback on students' use of the three compressed and implicit syntactic features, among others. Thus, students across the three disciplines may produce more quality research texts, reflecting the phrasal characteristics of L2 English academic research writing.

This study has contributed knowledge to academic writing research in the Philippines and contexts where English is a second/foreign language or is a lingua franca. However, it also offers research opportunities. Future studies may cross-examine the four compressed and implicit syntactic features in disciplinary RAs authored by other ESL/EFL/ELF research writers to determine whether there is a significant difference of use between the three contexts of academic research writing. Cross-analyzing the nominal phrases in RAs in hard sciences like geology, mathematics, and statistics and other soft sciences like literature, philosophy, and political science must be undertaken to differentiate the compressed and implicit discourse style in hard and soft disciplines. Exploring this discourse style in occluded academic writing sub-registers such as research proposals may uncover the specific nominal phrases that characterize them. Other dependent phrases such as adverbials equally deserve cross-analysis in disciplinary RAs. These research directions could provide more positive implications for academic writing pedagogy particularly in ESL/EFL/ELF contexts. It may also inform academic research journals across AL, ME, and SOC and other disciplines. As attributive adjectives, nominal prepositional phrases, noun premodifiers, and appositive noun phrases are under-researched compressed and implicit syntactic features in L2 English academic research writing, more studies of the four nominal phrases in disciplinary RA sub-registers require investigations.

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JPAIR Multidisciplinary Research (<https://philair.ph/publication/index.php/jpair/index>)

LPU Laguna Journal of Multidisciplinary Research (<https://lpulaguna.edu.ph/journal-multidisciplinary-research/>)

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