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# How Syntactically Complex is L2 Academic Research Writing by Filipino Researchers across Disciplines?

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## Abstract

Syntactic complexity has received much attention in English for academic purposes (EAP) research. However, it remains an ignored area of EAP research in the Philippines. This study cross-examined syntactic complexity in research articles (RAs) authored by Filipino researchers (FRs) in Communication, Curriculum and Instruction, and Psychology. Major findings revealed that attributive adjectives, nominal prepositional phrases, and noun premodifiers most dominantly co-occurred across disciplinary RAs. A significant difference exists between the three nominal pre- and postmodifiers and other compressed and implicit and elaborated and explicit syntactic features. As such, Filipino-authored disciplinary RAs are characterized by a compressed and implicit discourse style. Therefore, L2 academic research writing by FRs regardless of the disciplines is syntactically complex with the use of the three compressed and implicit phrasal features. It is likewise filled with very dense packaging of information by the three nominal phrases. The study has practical implications for academic research writing instruction, academic research journals, and professional development training.

***Keywords:*** English for academic purposes, Filipino researchers, L2 academic research writing, syntactic complexity

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## 1. Introduction

In English for academic purposes (EAP), syntactic complexity has been a focus of research and has been considered as an index of writing quality in academic research writing across disciplines. It is "not a single unified construct" but can be viewed from different vantage points (Biber & Gray, 2016, p. 246; Bulté & Housen, 2012; Ortega, 2003; Pallotti, 2014). Biber and Gray (2016) have defined it as the increased use of embedded dependent phrases instead of embedded dependent clauses. Through this lens, researchers have proven that academic research writing regardless of disciplines is complex at the phrasal level and generally employs a compressed and implicit discourse style (e.g., Biber & Gray, 2010, 2011; Biber et al., 2011; Biber et al., 2016; Biber et al., 1998, 2021; Gray, 2015).

However, researchers had concentrated on syntactic complexity primarily in L1 academic research writing. L1 academic research writing differs from L2 academic research writing because the former includes L1 English writers while the latter involves L2 English writers. This difference does not necessarily mean that syntactic complexity research in L1 academic research writing lacks relevance to L2 academic research writing. In fact, academic research writing in L2 English nations like the Philippines traditionally conforms to the academic writing principles of L1 English countries like the UK and USA. Nevertheless, the number of L2 English users has exceeded the number of L1 English users around the world (Crystal, 2003, 2008; Jenkins, 2015), implying that more L2 English research writers participate in academic research writing. L2 English research writers are not L1 English research writers (Hernandez, 2022a; Hernandez & Genuino, 2022). Hence, previous researchers' claims about the syntactic complexity features of L1 academic research writing might not be quite suitable for L2 academic research writing. Thus, an important question that necessitates a definite answer is how syntactically complex L2 academic research writing by Filipino researchers (FRs) is across disciplines.

There is a need to probe syntactic complexity in L2 academic research writing by Filipinos for the following reasons. First, English is the Filipinos' institutional language for research and scholarly writing (Dayag, 2012, 2014); thus, syntactic complexity features used by FRs demand examination. Second, FRs frequently use syntactic complexity features in writing research articles to convey ideas (Hernandez, 2021); hence, their use of these features in academic research writing across disciplines needs investigation. Third, syntactic complexity features are





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especially common in academic research writing (Biber & Gray, 2010, 2011, 2016; Biber et al., 2016; Gray, 2015; Hutter, 2015; Malakhovskaya et al., 2021; Ruan, 2018; Wu et al., 2020; Yin et al., 2021); however, they are underexplored in L2 academic research writing in the Philippines. These justifications assert that exploring syntactic complexity in L2 academic research writing by FRs should be initiated.

This study explores syntactic complexity in L2 academic research writing by FRs in Communication (COM), Curriculum and Instruction (CI), and Psychology (PSY). To date, a limited amount of EAP research has examined syntactic complexity in L2 academic research writing particularly in the Philippines. Conducting this study is significant in two important ways. First, it may challenge either elaboration and explicitness or compression and implicitness as qualities of and could bare the actual discourse style in academic research writing. Second, its findings could serve as bases for enhancing academic research writing instruction, academic research journals, and professional development training (Ansarifar et al., 2018; Derakhshan, 2018; Fathi et al., 2019; Hernandez, 2021; Ruan, 2018; Yin et al., 2021; Wu et al., 2020) and may provide insights to improve teachers', students', and researchers' understanding about syntactic complexity features in academic research writing (Derakhshan & Karimian Shirejini, 2020; Ruan, 2018). These advantages of the current study signify theoretical and empirical significance in EAP research in the Philippines and in contexts where English is used as an L2. Therefore, this research cross-examined syntactic complexity in L2 academic research writing by FRs in COM, CI, and PSY. Specifically, it sought to answer the succeeding questions:

1. What are the most dominantly co-occurring syntactic complexity features of disciplinary research articles (DRAs) written by FRs?; and
2. What is the discourse style in DRAs authored by FRs?

## 2. Literature Review

### *2.1 Syntactic Complexity: Elaboration and Explicitness versus Compression and Implicitness*

Syntactic complexity can be viewed from different theoretical perspectives (Kuiken et al., 2019). Of all theoretical frameworks of such complexity, Biber et al.'s (1999,


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2021) framework of syntactic complexity is used in this study. Biber et al. (1999, 2021) explain that syntactic complexity is linked with elaboration and explicitness and compression and implicitness as two pairs of opposing goals and/or qualities of academic writing (Biber & Gray, 2010, 2016; Sawyer et al., 2008). Specifically, elaboration is linked to the use of dependent clauses (i.e., adverbial and complement clauses, relative clauses), resulting in the explicitness of meanings (Biber & Gray, 2016; Brown & Yule, 1983). Explicitness is the overt meaning relationship between syntactic constituents (Biber & Gray, 2016). For instance, the sentence, "I would *hope* **that we can have more control over them**" (Biber & Gray, 2016, p. 63), includes the verb controlled *that*-clause with *hope* as the controlling verb and **that we can have more control over them** as the *that*-clause. This clause provides elaboration, thus explicitly conveying the intended meaning of the verb, *hope*. In contrast, compression is associated with the use of dependent phrases (i.e., nominal premodifiers, adverbial, and nominal postmodifiers) in sentences and T-units, causing the implicitness of meanings (Biber & Gray, 2016). Implicitness refers to the less overt or covert logical relations between constituents (Biber & Gray, 2016). Hence, compressed and implicit structures such as noun premodifiers are difficult to process because of the absence of constituents that link the noun premodifiers and the head nouns (Biber & Gray, 2016; Halliday, 1993/1996; Ruan, 2018). For example, **trial transfer** *sessions* (Biber & Gray, 2016, p. 64) contain two consecutive noun premodifiers referring to the head noun *sessions*. However, **trial** could also be viewed as a premodifier for **transfer** rather than *sessions.* Phrasal structures like this reduce the precision of authors' intended meanings (Wu et al., 2020). They also contradict elaboration and explicitness, deterring the readability of written texts (Dolnicar & Chapple, 2015; Otto et al., 2011; Rottensteiner, 2010) in academic writing.

### *2.2. Research on Syntactic Complexity in Academic Research Writing*

Academic writing is difficult to learn (Makovskaya & Radjabzade, 2022; Nguyen & Suwannabubpha, 2021) by L1 and L2 English users. As a sub-register of academic writing, academic research writing is a research-based type of formal writing (e.g., research articles, theses, and dissertations) in educational institutions. While it plays a crucial role in the transmission of academic knowledge across disciplinary communities and is a way for scholars to establish credibility in their careers (Gray, 2015; Yakut et al., 2021), it is performed by both L1 and L2 English researchers


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who are responsible for L1 academic research writing and L2 academic research writing, respectively. On the one hand, research on syntactic complexity has focused more on L1 academic research writing across disciplines. For example, Biber and Gray (2010, 2011, 2016), Biber et al. (2016), Biber et al. (1999, 2021), and Gray (2015) have debunked the stereotype that academic research writing across hard and soft sciences (applied linguistics, astronomy, biology, ecology, education, history, medicine, philosophy, physics, physiology, psychology, political science, and science) is elaborated and explicit. These researchers claim that it relies heavily on attributive adjectives, noun premodifiers, and nominal prepositional phrases, making it syntactically compressed and semantically implicit. They add that syntactic complexity features vary across disciplines which proves Gray's (2015) and Hyland's (2006) assertion that academic written language differs according to disciplines as disciplines use linguistic resources in various ways. In addition, they contend that differences in language use exist as disciplines vary in research cultures, writing practices, and so on to achieve their communicative purposes (Esfandiari & Ahmadi, 2022; Gray, 2015; Hyland, 2007).

On the other hand, syntactic complexity studies have been extended to L2 academic research writing on the perspectives of academic English as a foreign language (EFL) and English as a lingua franca (ELF) research writing (e.g., Ansarifar et al., 2018; Ruan, 2018; Yin et al., 2021; Wu et al., 2020). Ansarifar et al. (2018), Ruan (2018), Yin et al. (2021) and Wu et al. (2020) point out that L2 academic research writing also conforms to phrasal complexity rather than clausal complexity. Specifically, Ansarifar et al. (2018) claim that attributive adjectives, noun premodifers, and nominal prepositional phrases are very frequent in RA abstracts authored by seasoned Persian researchers and dissertation and master's abstracts by new Persian researchers. Similarly, Ruan (2018) emphasizes that attributive adjectives are most dominant in Chinese writers' research article abstracts whereas *of*-phrases are most frequent in L1 English writers' research article abstracts. Comparatively, Yin et al. (2021) argue that more complex and coordinated phrases and less dependent clauses and non-finite verb phrases are consistently frequent in research article part-genres written by international publication researchers. In addition, Wu et al. (2020) assert that complex nominal phrases (e.g., adjective, prepositional, and appositive phrases) are factors that influence the occurrence of longer sentences in ELF research articles.


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## 3. Methodology

### *3.1. Research Design*

The study utilized descriptive research design to cross-examine syntactic complexity in L2 academic research writing by FRs across the three disciplines. Such design was used to unveil the most frequently co-occurring syntactic complexity features and the discourse style in Filipino-authored DRAs.

### *3.2. Data Sources and Data Selection*

Forty-two (42) published CI (14), COM (14), and PSY (14) research articles (195,335 words) were randomly sampled from Open Access (OA) Philippine research journals. Fourteen (14) as the number of research articles for each discipline was based on Hernandez's (2022a, 2022b) study. Research articles (RAs) were selected because they most depict academic research writing and are the chief register of academic written texts (Biber & Gray, 2016; Gray, 2015; Swales, 2004). The three disciplines were chosen because they are developing research fields in the Philippines (Hernandez, 2022a, 2022b; Hernandez & Genuino, 2022) and are the Philippine Commission on Higher Education's prioritized disciplines (Commission on Higher Education, 2009). OA journals across the Philippines were selected so that L2 academic research writing across the country could be represented. See Appendix A for the sampled OA Philippine journals. Table 1 shows the description of selected DRAs used in the study.

**Table 1**
*Description of Selected DRAs*

| Years | Discipline | Number of Texts | Tokens |
|---|---|---|---|
| 2009-2019 | Curriculum and Instruction | 14 | 63,889 |
| 2008-2018 | Communication | 14 | 66,761 |
| 2008-2018 | Psychology | 14 | 64,685 |
| Total | 3 | 42 | 195,335 |

To capture the syntactic complexity features of current L2 academic research writing by FRs, the DRAs were taken from a 10-year publication period (McEnery & Wilson, 2001). In selecting RAs, the study adapted Ruan's (2018) procedure by




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examining the authors' surnames and affiliations. To ensure that all authors are L2 English writers, surnames which are common in the Philippines and educational institutions which are found only in the Philippines were considered. Names which were ambiguous in identifying L2 English-user status were excluded. These measures were applied for RAs with single and multiple authors. Aside from the surnames that are native in the Philippines, other surnames of Filipinos resembling Chinese and Spanish surnames were also counted on the following grounds: First, many Filipinos, born and raised in the Philippines, are of Chinese origin (Senate of the Philippines, 2013); Second, the country was colonized by Spaniards for 333 years (Mabayo, 2019). Hence, Chinese and Spanish surnames have become part of or entrenched in Filipino culture, so it does not necessarily entail that the nationality of selected authors is questionable (Hernandez & Genuino, 2022). Other criterion like extensive foreign education was discounted because it is not usually disclosed in published DRAs. Although the selection procedure was not perfect, the researcher was confident that the three collected DRA datasets represent FRs as L2 English writers. The three datasets were compared and/or contrasted.

### *3.3. Data Analysis*

The study employed Biber et al.'s (1999, 2021) syntactic complexity framework, consisting of 11 elaborated and explicit (6) and compressed and implicit (5) syntactic features. This framework has been used in grammatical investigations of English academic texts (e.g., Biber & Gray, 2010, 2016; Gray, 2015). Table 2 shows the full suite of syntactic complexity features used as coding scheme to analyze syntactic complexity in DRAs.

**Table 2**

*Syntactic Complexity Features (Biber et al., 1999, 2021, pp. 103-978)*

| Syntactic complexity features | Examples |
|---|---|
| Elaboration and explicitness | |
| Finite complement clauses | *They believe* ***that the minimum wage could threaten their jobs.***<br>*He describes* ***how the National Committee is organized.***<br>*It is vitally important* ***that both groups are used to support one another.***<br>*The fact* ***that the two results are different shows that this order matters.*** |
| Non-finite complement clauses | *He upset you very much, and I hate* ***to see that.*** |





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| Syntactic complexity features | Examples |
|---|---|
| Elaboration and explicitness | |
| | *I started* ***thinking about Christmas.***<br>*It is convenient* ***to discuss these processes in two parts.***<br>*They say that failure* ***to take precautions against injuring others*** *is negligent.*<br><br>*But that would be a case of our having a competing or countervailing reason* ***that conflicted with our main positive reason for not killing or stealing.*** |
| Finite relative clauses | *The lowest pressure ratio* ***which will give an acceptable performance*** *is always chosen.*<br>*They all seemed to have relatives* ***who had been involved in scandals in London hotels.*** |
| Non-finite relative clauses | *Interest is now developing in a theoretical approach* ***involving reflection of Alfven waves.***<br>*It can be derived using the assumptions* ***given above****.* |
| Finite adverbial clauses | ***Because one did not know how accurately the clock had been ticking during the processes of weighing,*** *one could not know precisely the times at which movements of the shutter occurred between which the radiation was released.*<br>***If aggression and violence are part and parcel of what it means to be human,*** *then why is it that there exist societies where aggressive or violent behavior is conspicuous by its absence?*<br>*It is possible to separate one from the others,* ***though in certain situations one aspect may be more involved.*** |
| Non-finite adverbial clauses | *A little group of people had gathered by Mrs. Millings* ***to watch the police activities on the foreshore.***<br>***To succeed again*** *they will have to improve their fitness and concentration.* |
| Compression and implicitness | |
| Attributive adjectives | ***basic*** *processes,* ***social*** *status* |
| Nominal prepositional phrases | *a teacher* ***of philosophy****, a man* ***with a terrible recent history*** |
| Noun premodifiers | ***plastic*** *trays,* ***commission*** *sources* |
| Appositive noun phrases | *the mill (a term introduced by Babbage), Mr. Pyotr Luchinsky, the new first secretary* |
| Adverbial prepositional phrases | *He worked* ***in a shop…,*** *He retired* ***after three minor heart attacks…*** |

Each DRA dataset was analyzed using AntConc (Anthony, 2021) and LancsBox (Brezina et al., 2021) and manual coding. AntConc and LancsBox were utilized to locate the elaborated and explicit and compressed and implicit syntactic complexity features, respectively. The traced features were saved in Excel documents. As corpus tools can be inconsistent in coding linguistic features (Egbert et al., 2020),


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the researcher coded each syntactic feature in Excel files manually. The corpus tools cannot trace appositive noun phrases, non-finite complement clauses (e.g., *ing*-clauses), and non-finite relative clauses (e.g., *ing*- and *–ed* clauses); hence, they were hand-coded individually.

All the hand-coded syntactic complexity features were inter-coded independently by three qualified external coders. Two inter-coding sessions had taken place. On the first, the researcher and each coder separately discussed their judgments and identified different analyses. Resolutions were made until they arrived at unanimous decisions on their analyses. On the second after several days, they re-assessed their judgments until they reached a final decision. Inter-coding reliability calculated through Fleiss Kappa yielded 0.98 (almost perfect reliability agreement).

### *3.4. Statistical Treatments*

Each raw count of each syntactic complexity feature was normalized by dividing it to the tokens of each DRA dataset and then multiplied by 1,000, making the 11 syntactic features comparable (Biber et al., 1998; Biber & Gray, 2010, 2016; Biber et al., 2016; Gray, 2015). One-way ANOVA between groups was employed to determine whether significant difference exists between syntactic complexity features.

## 4. Results

This section presents the findings and their interpretations. Wherever applicable, results are compared and/or contrasted with the findings of related studies.

Figure 1 shows the ranking of the co-occurrences of the 11 syntactic complexity features. Of the 11 features, attributive adjectives (435.40) most dominantly occurred in the DRAs, succeeded by nominal prepositional phrases (356.53) and noun premodifiers (286.46). In contrast, non-finite complement clauses (85.45), finite complement clauses (69.40), finite relative clauses (51.40), non-finite relative clauses (33.23), finite adverbial clauses (12.14), and non-finite adverbial clauses (5.41) had relatively low frequencies. Overall, the three most frequently co-occurring nominal modifiers outnumbered the other syntactic complexity features


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across DRAs.

**Figure 1**

*Ranking of Syntactic Complexity Features*

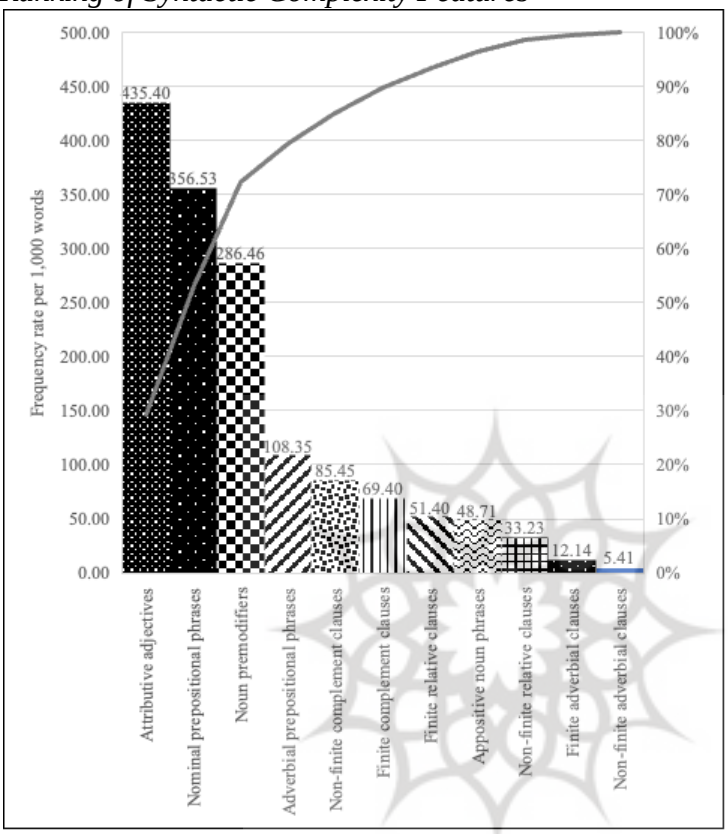






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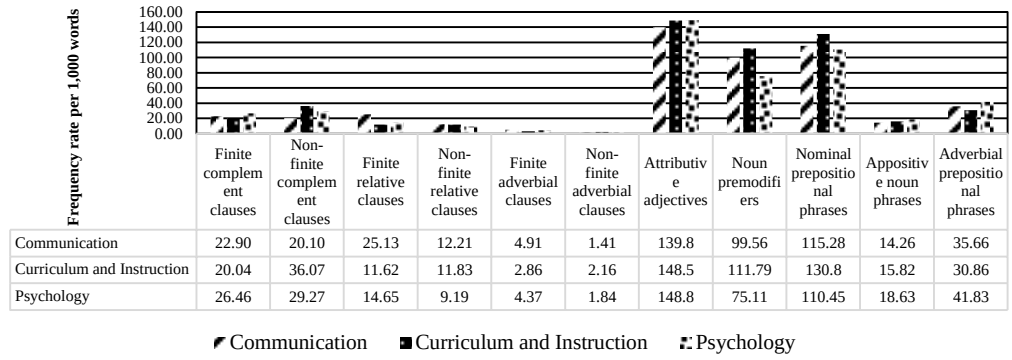
**Figure 2**

*Distributions of Syntactic Complexity Features*




| | Finite complement clauses | Non-finite complement clauses | Finite relative clauses | Non-finite relative clauses | Finite adverbial clauses | Non-finite adverbial clauses | Attributive adjectives | Noun premodifiers | Nominal prepositional phrases | Appositive noun phrases | Adverbial prepositional phrases |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Communication | 22.90 | 20.10 | 25.13 | 12.21 | 4.91 | 1.41 | 139.8 | 99.56 | 115.28 | 14.26 | 35.66 |
| Curriculum and Instruction | 20.04 | 36.07 | 11.62 | 11.83 | 2.86 | 2.16 | 148.5 | 111.79 | 130.8 | 15.82 | 30.86 |
| Psychology | 26.46 | 29.27 | 14.65 | 9.19 | 4.37 | 1.84 | 148.8 | 75.11 | 110.45 | 18.63 | 41.83 |

Figure 2 shows the distributions of the 11 syntactic complexity features in COM, CI, and PSY. Attributive adjectives, nominal prepositional phrases, and noun premodifiers' frequencies of use much exceeded the frequencies of other syntactic complexity features, proving that the three most co-occurring nominal modifiers were greatly distributed across DRAs. These results imply that L2 academic research writing by FRs across disciplines is full of compressed and implicit syntactic features and not of elaborated and explicit syntactic features.

To determine whether there is a significant difference on the frequencies of use between the syntactic complexty features, one-way ANOVA between groups was calculated. Table 3 shows that the syntactic complexity features were significantly different at the $p<.05$ level [$F$ (10,22)] = 122.48, $p$ = <.0], meaning that there exists a significant difference on the frequencies of use of the 11 syntactic features across DRAs.

**Table 3**

*One-way ANOVA between Groups*

| Source | Degrees of Freedom | Sum of Squares | Mean Score | *F*-Stat | *p*-value |
|---|---|---|---|---|---|
| Between Groups | 10 | 75807.46 | 7580.75 | 122.48 | 0 |
| Within Groups | 22 | 1303.88 | 59.27 | | |
| Total | 32 | 77111.34 | | | |

Post hoc Tukey HSD test revealed that comparison groups of syntactic complexity features were significantly different at the $p<.05$ level. Appendix B presents the detailed Post hoc Tukey HSD test results where 7 (attributive adjectives), 8 (noun premodifiers), and 9 (nominal prepositional phrases) show a significant difference from the rest of syntactic complexity features as denoted consistently by asterisks before and after the number representing each nominal modifier. In general, it can be deduced that the three nominal phrases depict L2 academic research writing by FRs.

The significant difference on the frequencies of use between the three leading nominal dependent phrases and other syntactic complexity features implies that DRAs authored by FRs use a compressed and implicit discourse style. Each compressed and implicit syntactic feature is presented in the following:

Attributive adjectives almost equally co-occurred in PSY RAs (148.8) and CI RAs (148.5) but occurred slightly lower in COM RAs (139.8). Their high recurrence in COM RAs resonates Biber and Gray's (2016) claim that they are very frequent in humanities academic research writing. Nevertheless, attributive adjectives are also very common in PSY and CI RAs, meaning that they are usually used in social science and education science academic research writing.

In DRAs, it was found that descriptors and classifiers (two classes of adjectives) exist. Descriptors (commonly gradable adjectives) assign "color, size/quantitative/extent, time, evaluative/emotive, or miscellaneous descriptive" identification to the head noun (Biber et al., 2021, p. 507). Classifiers (commonly non-gradable) "delimit or restrict a noun's referent, by placing it in a category in relation to other referents" and can be "relational/classificational/restrictive (e.g., additional, final), affiliative (e.g., Christian, English), or topical" (e.g., environmental, medical) (Biber et al., 2021, pp. 506-507). The following attributive adjectives are descriptors and classifiers from DRAs:

(1) stressful situations

D: E AB N

(2) foreign psychological studies

C: T C: T PR N (PSY RA)



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(3) academic achievement

C: T PR N

(4) appropriate instructional materials

D: MD C: T CO N (CI RA)

(5) mobile phones

C: R CO N

(6) stronger interpersonal relationships

D: MD C: R AB N (COM RA)

These examples show that single and multiple attributive adjectives may co-occur with the head nouns in DRAs. On the one hand, 1, 3, and 5 have single attributive adjectives: 1 from PSY RA contains the evaluative descriptor (D: E) 'stressful', premodifying the abstract noun (AB N) 'situations'; 3 from CI RA has the topical classifier (C: T) 'achievement', premodifying the process noun (PR N) 'achievement'; and 5 from COM RA contains the relational classifier (C: R) 'mobile', premodifying the concrete noun (CO N) 'phones'. On the other hand, 2, 4, and 6 contain multiple attributive adjectives: 2 from PSY RA has 'foreign' and 'psychological' (two Cs: T), premodifying the PR N 'studies'; 4 from CI RA contains the miscellaneous descriptive descriptor (D: MD) 'appropriate' and the C: T 'instructional', premodifying the CO N 'materials'; and 6 from COM RA has the D: MD 'stronger' and the C: R 'interpersonal', each premodifying the AB N 'relationships'. While two attributive adjectives co-exist before a head noun, they may also co-occur with noun premodifiers before head nouns, creating confusing meaning relations in a way that the attributive adjective either premodifies the noun premodifier or the head noun (Ruan, 2018), as illustrated in the following:

(7) maladaptive thinking patterns → patterns that relate with maladaptive thinking

C: R COG N AB/PR N

or maladaptive thinking patterns (PSY RA)



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(8) online content contribution → contribution that is classified as online content

C: R AB/PR N AB/PR N

or online content contribution (CI RA)

(9) multimodal discourse analysis → analysis that focuses on multimodal discourse

C: R AB/PR CO N

or multimodal discourse analysis (COM RA)

The co-occurrence of attributive adjectives and noun premodifiers above poses complicated meaning relations which could be troublesome especially to non-specialist readers (Biber & Gray, 2010, 2016). Specifically, 7, 8, and 9 from DRAs could have two meaning relations, as signaled by curved down arrows above. In 7 from PSY RA, the C: R 'maladaptive' premodifies the cognition noun (COG N) 'thinking'. This COG N premodifies the head noun 'patterns' (an abstract/process noun [AB/PR N]), or 'maladaptive' and 'thinking' individually premodifies 'patterns'. The same could be observed in 8 from CI RA and 9 from COM RA. In other words, attributive adjectives with noun premodifiers generate unclear meaning relations with the head noun unless they are paraphrased into elaborated and explicit clausal structures. Each example above could be equivalent to relative *that*-clauses (italicized): 'patterns *that relate with maladaptive thinking*' for 7; 'contribution *that is classified as online content*' for 8; and 'analysis *that focuses on multimodal discourse*' for 9. These instances demonstrate that although attributive adjectives assign specific descriptions to nouns so that nouns could be clearly understood (Wu et al., 2020), they may also foster implicit meanings when they co-occur with noun premodifiers (Ruan, 2018). While implicitness is common to all the three phrasal modifiers, nominal prepositional phrases sustain a balance between compression and explicitness (Biber & Gray, 2010, 2016; Wu et al., 2020).

Nominal prepositional phrases were also similarly frequent in DRAs. They



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occurred most frequently in CI RAs (130.8), succeeded by COM RAs (115.28) and PSY RAs (110.45). As with the close occurrences of attributive adjectives across the three disciplines, these results entail that nominal prepositional phrases are relatively frequent in education science, humanities, and social science academic research writing. These prepositional phrases carry less explicit meaning relations unlike their alternative clauses (Biber & Gray, 2010, 2016; Ruan, 2018). For example, the *in*- and *for*-phrases (italicized) below could have equivalent finite and non-finite dependent clauses (underlined):

(10) difficulty *in math subject* → math subject where students have difficulty

(11) a foundation *for sustainable development* → a foundation that is designed for sustainable development (CI RA)

(12) visual communicators *in the creative industry* → visual communicators that work in the creative industry

(13) support *for established authority and norms* → support that is intended for establishing authority and norms (COM RA)

(14) particular attributes *in a romantic partner* → particular attributes that are associated with a romantic partner

(15) a desire *for achievement goals* → a desire to achieve goals (PSY RA)

The *in*-phrases above have *wh*- complement clause and relative *that*-clause alternatives. Specifically, 10 from CI RA has a complement *where*-clause equivalent: 'math subject where they have difficulty'; 12 from COM RA and 14 from PSY RA have relative *that*-clause alternatives: 'visual communicators that work in the creative industry' and 'particular attributes that are associated with a romantic partner', respectively. The *for*-phrases above also have relative *that*-clause and noun controlled *to*-clause equivalents. Specifically, 11 from CI RA and 13 from COM RA have corresponding relative *that*-clause alternatives: 'a foundation that is designed for sustainable development' and 'support that is intended for establishing authority and norms'; 15 has a noun controlled *to*-clause alternative: 'a desire to achieve goals'.

Unlike *in*- and *for*-phrases with elaborated and explicit syntactic equivalents, *of*-phrases usually take *'s* genitives and noun premodifiers as another compressed and


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implicit alternatives (Biber & Gray, 2016). Likewise, the following *of*-phrases (italicized) across DRAs have equivalent noun premodifier and *'s* genitive alternatives (bolded):

(16) the level *of cross-cultural adaptations* → cross-cultural **adaptation** level (CI RA)

(17) the evaluation *of community newspapers* → community **newspapers'** evaluation (COM RA)

(18) the formation *of stable and healthy identity* → stable and healthy **identity** formation (PSY RA)

Specifically, 16 from CI RA and 18 from PSY RA take noun premodifier alternatives: '… **adaptation** level' and '… **identity** formation', respectively; 17 from COM RA has an *'s* genitive equivalent, '… **newspapers'** evaluation'. These compressed and implicit syntactic alternatives show that *of*-phrases are inflexible nominal prepositional phrases, and so make DRAs stably compressed and implicit. Another compressed syntactic feature in DRAs by FRs is noun premodifiers which express even more bewildering logical relations (Biber et al., 1999, 2021).

Unlike attributive adjectives and nominal prepositional phrases, noun premodifiers were most dominant in CI RAs (111.79), followed by COM RAs (99.56) but were least frequent in PSY RAs (75.11). It could be construed that education science and humanities academic research writing rely more on the use of noun premodifiers. Like the first two nominal modifiers, noun premodifiers make DRAs much more compressed and implicit as they also lack constituents which help in exposing the meaning relations between the premodifying noun and the head noun (Biber et al., 1999, 2021). The succeeding noun premodifiers have very dense packaging of information, thus promoting a variety of confusing meaning relations:

(19) peer support → support which comes from peers

N1 N2 (N2 which comes from N1)

(20) core competency items → items that identify core competencies

N1 N2 N3 (N3 that identify N1 N2)



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or core competency items (CI RA)

(21) communication situation → situation that deals with communication

N1 N2 (N2 that deals with N1)

(22) paper media layout designers → designers who create paper media layout

N1 N2 N3 N4 (N4 who create N1 N2 N3)

or paper media layout designers (COM RA)

(23) guidance counselor → counselor who provides guidance (to students)

N1 N2 (N2 who provides N1)

(24) performance avoidance goals → goals that are classified as performance avoidance

N1 N2 N3 (N3 that are classified as N1 N2)

or performance avoidance goals (PSY RA)

These noun premodifiers occur either in single nouns or in noun sequences. For single noun premodifiers, the nominal premodification clearly refers to the head noun. For instance, 19 from CI RA has 'peer' (N1), referring to 'support' (N2 [head noun]); 21 from COM RA contains 'communication' (N2), premodifying 'situation' (N2 [head noun]); and 23 from PSY RA has 'guidance' (N1), referring to 'counselor' (N2 [head noun]).

Like attributive adjectives juxtaposed with noun premodifiers, multiple noun premodifiers cause even more problematic meaning relations in the sense that they premodify another noun premodifier rather than the head noun, or each noun premodifier refers to the head noun (Biber & Gray, 2016; Ruan, 2018). In 20 from


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CI RA, 'core' (N1) premodifies 'competency' (N2) which refers to 'items' (N3 [head noun]), or each of the noun premodifiers refers to 'items' separately. The same could be analyzed in 24 from PSY RA where 'performance' (N1) premodifies 'avoidance' (N2) which refers to 'goals' (N3, [head noun]), or each of them premodifies 'goals'. Three successive noun premodifiers can pose more difficult meaning relations. For example, 22 from COM RA may have two different meaning relations. First, 'paper' (N1) and 'media' (N2) premodify 'layout' (N3), and 'layout' (N3) premodifies 'designers' (N4 [head noun]). Second, 'paper' (N1) and 'media' (N2) premodify 'layout' (N3); at the same time, 'media' (N2) and 'layout' (N3) premodify 'designers' (N4 [head noun]).

These complicated meaning relations could be clarified by elaborated and explicit relative *wh*- and *that*-clauses. On the one hand, 19, 22, and 23 are equivalent to 'support *which comes for peers*' (N2 which comes from N1), 'designers *who create paper media layout*' (N4 who create N1 N2 N3), and 'counselor *who provides guidance (to students)*' (N2 who provides N1) (all relative *wh*- clauses), respectively. On the other hand, 20, 21, and 24 can be alternated by 'items *that identify core competencies*' (N3 that identify N1 N2), 'situation *that deals with communication*' (N2 that deals with N1), and 'goals *that are classified as performance avoidance*' (N3 that are classified as N1 N2) (all relative *that*-clauses), respectively.

## 5. Discussion

With the dominance of attributive adjectives, nominal prepositional phrases, and noun premodifiers across DRAs, almost all sentences in L2 academic research writing by FRs across the three disciplines probably contain the three nominal modifiers. For instance, the following sentences from DRAs have recurrent attributive adjectives (bolded), nominal prepositional phrases (bracketed), and noun premodifiers (italicized):

(25) Additionally, one [of the *inclusion* criteria] of the participants]] is to have a minimum [of 1 *year relationship* duration] with their **married** partners]] and results showed that the mean [of the length] of the relationship] of the **female** *relationship* transgressors] with their **married** partners]]]] is 5 years. (PSY RA)

(26) …, the **computed** t-value [of *students learning* performance (2.507) and *school* performance (2.707)] were greater than the **critical** value [of 1.994 with df =





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70] at 0.05]] level [of significance], thus the **null** hypothesis of no **significant** difference [between the perception] of the students and teachers] on the effects] of absenteeism]]]] is rejected. (CI RA)

(27) The findings [of the study] can be associated to the results [of the studies [of Allen and Bourhis [11]]], which showed that a **significant** level [of *communication* apprehension] affected the *students'* **academic** performance. (COM RA)

The recurrence of the three embedded nominal modifiers shows that sentences in L2 academic research writing by FRs are syntactically complex with compressed and implicit nominal phrases. This claim corroborates Biber and Gray's (2010, 2016), Gray's (2015), Ruan's (2018), Wu et al.'s (2020), and Yin et al.'s (2021) assertion that the three nominal phrases are the most common syntactic complexity structures of academic research writing. Although the dominance of the three nominal modifiers reported in the related studies were generally similar to the results of the current study, this study also has disparity. First, the leading of attributive adjectives in this study differs from Biber and Gray's (2010, 2016) finding where noun premodifiers were more frequent than attributive adjectives. This contradiction may be associated to the disciplinary origin and academic English writers considered in this study and in their study. This research cross-examined RAs in COM, CI, and PSY while Biber and Gray (2010, 2016) analyzed RAs in biology, ecology, education, history, physiology, psychology, and medicine. In addition, it considered Filipinos as L2 English research writers whereas Biber and Gray (2010, 2016) involved L1 English research writers.

Second, the leading of attributive adjectives over noun premodifiers is also inconsistent to Wu et al.'s (2020) result. This discrepancy could be stemming from the different corpora that were analyzed in the two studies. This study cross-analyzed DRAs authored by FRs whereas Wu et al. (2020) examined the SciELF corpus (written by 10 different ELF writer clusters)–one of the components of the Written English as a Lingua Franca in Academic Settings (WrELFA) corpus, and RAs from the Corpus of Contemporary American English (COCA).

The compressed and implicit and elaborated and explicit syntactic features can be organized in a cline (Biber & Gray, 2016). Likewise, this study generates a continuum of the 11 syntactic complexity features, showing the most and least


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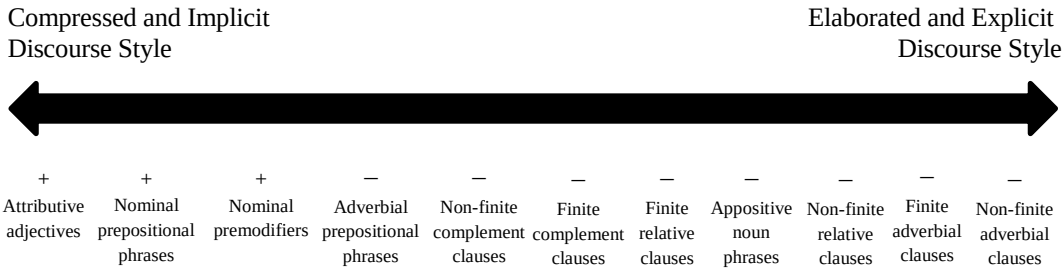
dominant syntactic complexity features vis-à-vis discourse and non-discourse styles of L2 academic research writing by FRs (Figure 3).

**Figure 3**

*Cline of Syntactic Complexity Features of L2 Academic Research Writing by FRs*




Unlike Biber and Gray's (2016) continuum, this cline includes plus (+) signs towards the left, signifying the most dominant syntactic complexity features (attributive adjectives, nominal prepositional phrases, and noun premodifiers) which represent compressed and implicit discourse style. In contrast, the minus (–) signs near halfway and towards the right represent the less frequent syntactic complexity features (from adverbial prepositional phrases to non-finite adverbial clauses)–most of which are elaborated and explicit syntactic features, depicting elaborated and explicit discourse style. Overall, the cline proves how syntactically complex L2 academic research writing by FRs across disciplines is. It is syntactically complex in a way that it relies heavily on the three most dominant nominal phrases, thus using a compressed and implicit discourse style.

## 6. Conclusion

Syntactic complexity in L2 academic research writing by FRs across disciplines is an underexplored area of EAP research. Therefore, this study examined syntactic complexity in L2 academic research writing by FRs in CI, COM, and PSY. It was found that attributive adjectives, nominal prepositional phrases, and noun premodifiers are the most frequently co-occurring syntactic complexity features. These nominal pre- and postmodifiers determine the compressed and implicit discourse style of DRAs written by FRs. Grounded in these findings, the study concludes that L2 academic research writing by FRs irrespective of disciplines is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syntactically complex at the phrasal level. Likewise, it is packed with very dense information with the use of the three most dominant nominal phrases.

This study may benefit academic research writing instruction, academic research journals, and professional development trainings especially in contexts where English functions as an L2. On teaching academic research writing, teachers should use published DRAs written by L2 English research writers (Hernandez, 2022a, 2022b) aside from those authored by L1 English research writers. They ought to use authentic examples of nominal modifiers based on a collection of DRAs since a corpus is a source of real-life language use (Giampieri, 2020). As compressed and implicit syntactic complexity features are frequently overlooked in academic writing pedagogy and are challenging to process especially by emerging academic writers (Biber & Gray, 2010, 2016), teachers need to allot more teaching-and-learning time for the three nominal phrases. Thus, academic research writing students could learn the discourse style in writing academic research and may improve their research writing skills. On research journals, publishers may need to be specific with the expected syntactic complexity features of and written discourse style for writing RAs. They can point this out in their submission/author guidelines. Hence, L2 English research writers may be guided on the syntactic complexity structures to use and so may write publishable RAs. On professional development, training centers may offer research publication courses. These courses should hone students and professionals across disciplines not only on research methods, data gathering tools, and statistical techniques but also on the appropriate syntactic complexity devices for writing research. Consequently, students and professionals may advance their research knowledge and academic writing skills at the same time.

While this study has contributed to the body of knowledge in L2 academic research writing and may have deepen and broaden ones' understanding about academic research writing particularly of FRs as L2 English writers, it also offers trajectories for future research. Future studies need to involve one-million-word corpus of DRAs; hence, findings could lead to stronger generalizations. Cross-analyzing the syntactic complexity features in L2 academic research writing from hard and soft sciences is also called for; thus, the discourse style across hard and soft disciplines could be unfolded. Comparing and contrasting syntactic complexity features in academic research writing with those in spoken academic discourses like


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conference presentations is equally important. It may give insights on the specific but different syntactic complexity features which students and professionals should use in writing research and presenting studies. These research routes, if considered, may further inform L2 academic research writing. Although the number of L2 English users has surpassed the number of L1 English users (Crystal, 2003, 2008; Jenkins, 2015), syntactic complexity remains an underexplored area of EAP research especially in the Philippines as an L2 English context. For this reason, more studies on syntactic complexity need to be endeavored outside the point of view of L1 academic research writing.





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## Appendices

### Appendix A

### Sampled OA Philippine Journals

Communication

*Antorcha, Asia Pacific Journal of Multidisciplinary Research, CNU Journal of Higher Education, FEU Communication Journal, International Journal of Education Research for Higher Learning, LPU Laguna Journal of Arts and Sciences, Plaridel, Recoletos Multidisciplinary Research Journal, Southeast Asian Media Studies, SPUQC Research Journal, The Paulinian Compass [The Asia-Pacific Journal on Compassion Studies]*

Curriculum and Instruction

*Alipato, Asia Pacific Higher Education Research Journal, Asia Pacific Journal of Education, Arts and Sciences, Asia Pacific Journal of Multidisciplinary Research, CNU Journal of Higher Education, Development Education Journal of Multidisciplinary Research, International Journal of Education Research for Higher Learning, JPAIR Multidisciplinary Research, MSEUF Research Studies, The Normal Lights*

Psychology

*Alipato, Antorcha, Asia Pacific Journal of Multidisciplinary Research, Asia-Pacific Social Science Review, COGNOSCERE: SPUQC Student Research Journal, JPAIR Multidisciplinary Research, Philippine Journal of Counselling Psychology, Philippine Journal of Psychology, Philippine Social Science Review, Plaridel, Tilamsik, The Normal Lights, WMSU Research Journal*



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## Appendix B

## Post hoc Tukey HSD Test Results

| Comparison Groups | Mean Difference | Standard Error | HSD | 95% Confidence Interval | | Critical Mean | *p*-value |
|---|---|---|---|---|---|---|---|
| | | | | Lower Bound | Upper Bound | | |
| 1 – 7* | 122.57 | 4.44 | 27.58 | 100.10 | 145.04 | 22.47 | $p < .00$ |
| 1 – 8* | 72.35 | 4.44 | 16.28 | 49.88 | 94.82 | 22.47 | $p < .00$ |
| 1 – 9* | 95.71 | 4.44 | 21.53 | 73.24 | 118.18 | 22.47 | $p < .00$ |
| 2 – 7* | 117.22 | 4.44 | 26.37 | 94.75 | 139.69 | 22.47 | $p < .00$ |
| 2 – 8* | 67.01 | 4.44 | 15.08 | 44.54 | 89.48 | 22.47 | $p < .00$ |
| 2 – 9* | 90.36 | 4.44 | 20.33 | 67.89 | 112.83 | 22.47 | $p < .00$ |
| 3 – 7* | 128.57 | 4.44 | 28.93 | 106.10 | 151.04 | 22.47 | $p < .00$ |
| 3 – 8* | 78.35 | 4.44 | 17.63 | 55.88 | 100.82 | 22.47 | $p < .00$ |
| 3 – 9* | 101.71 | 4.44 | 22.88 | 79.24 | 124.18 | 22.47 | $p < .00$ |
| 4 – 7* | 134.62 | 4.44 | 30.29 | 112.15 | 157.09 | 22.47 | $p < .00$ |
| 4 – 8* | 84.41 | 4.44 | 18.99 | 61.94 | 106.88 | 22.47 | $p < .00$ |
| 4 – 9* | 107.77 | 4.44 | 24.25 | 85.30 | 130.24 | 22.47 | $p < .00$ |
| 5 – 7* | 141.65 | 4.44 | 31.87 | 119.18 | 164.12 | 22.47 | $p < .00$ |
| 5 – 8* | 91.44 | 4.44 | 20.57 | 68.97 | 113.91 | 22.47 | $p < .00$ |
| 5 – 9* | 114.80 | 4.44 | 25.83 | 92.33 | 137.27 | 22.47 | $p < .00$ |
| 6 – 7* | 143.90 | 4.44 | 32.37 | 121.43 | 166.37 | 22.47 | $p < .00$ |
| 6 – 8* | 93.68 | 4.44 | 21.08 | 71.21 | 116.15 | 22.47 | $p < .00$ |
| 6 – 9* | 117.04 | 4.44 | 26.33 | 94.57 | 139.51 | 22.47 | $p < .00$ |
| 7* – 8* | 50.21 | 4.44 | 11.30 | 27.74 | 72.68 | 22.47 | $p < .00$ |
| 7* – 9* | 26.86 | 4.44 | 6.04 | 4.39 | 49.33 | 22.47 | $p < .00$ |
| 7* – 10 | 129.46 | 4.44 | 29.13 | 106.99 | 151.93 | 22.47 | $p < .00$ |
| 7* – 11 | 109.58 | 4.44 | 24.65 | 87.11 | 132.05 | 22.47 | $p < .00$ |
| 8* – 9* | 23.36 | 4.44 | 5.25 | 0.89 | 45.83 | 22.47 | $p < .00$ |
| 8* – 10 | 79.25 | 4.44 | 17.83 | 56.78 | 101.72 | 22.47 | $p < .00$ |


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|---|---|---|---|---|---|---|---|
| 8* – 11 | 59.37 | 4.44 | 13.36 | 36.90 | 81.84 | 22.47 | $p < .00$ |
| 9* – 10 | 102.61 | 4.44 | 23.09 | 80.14 | 125.08 | 22.47 | $p < .00$ |
| 9* – 11 | 82.73 | 4.44 | 18.61 | 60.26 | 105.20 | 22.47 | $p < .00$ |

*Note.* 1 – Finite complement clauses; 2 – Non-finite complement clauses; 3 – Finite relative clauses; 4 – Non-finite relative clauses; 5 – Finite adverbial clauses; 6 – Non-finite adverbial clauses; 7 – Attributive adjectives; 8 – Noun premodifiers; 9 – Nominal prepositional phrases; 10 – Appositive noun phrases; 11 – Adverbial prepositional phrases; The asterisk before or after the number means that the syntactic complexity feature significantly differs at the $p<.05$ level from another syntactic complexity feature to which it is compared.

## About the Author

**Dr. Hjalmar Punla Hernandez** is an applied linguist, an English language educator, and a licensed professional teacher. He handles language courses in the graduate and undergraduate levels at the University of the Philippines Los Baños, the Philippines. He earned his Ph.D. in Linguistics with Specialization in Applied Linguistics from the Philippine Normal University (PNU), the Philippines' National Center for Teacher Education. He served as founding President of the PNU Applied Linguistics and English Language Education Society from 2016 to 2019. His research areas include academic research writing, discourse analysis, English language education, English syntax, and world Englishes.



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