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Research Article

Nominalization in Applied Linguistics and Medical Research Articles: Comparing Native and Non-native Academic Writers

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Abstract

Given the unquestionable significance of academic discourse in knowledge sharing, the present study investigates research articles published in high-ranked journals in two disciplines of Applied Linguistics and Medical Sciences. Considering the fact that abstract sections in a research article are factual representations of the details, they are of great importance. Moreover, academic writers attempt to publish more valued and engaging articles using numerous writing norms, a well-known way of which is Nominalization- transforming verbs, adjectives, prepositions, or conjunctions into nouns. The study follows genre analysis design and includes a corpus of 30 research articles in Applied Linguistics and 30 articles in medical sciences, half by natives and half by non-natives published between 2015 and 2024. Considering 4 main types of nominalizations, meticulous analysis and article-to-article comparison indicated higher frequency of verbal nominalization in all sets of articles and no statistically significant difference between native and non-native academic writers in both fields. However, there was a considerable difference between the deployment of nominalization between the academic writers in applied linguistics and medical sciences, the former outperforming the latter group. It is believed that the results of this study will help English for Specific- and for Academic Purposes practitioners in the inclusion of more writing instruction practices in their curriculum to raise greater awareness for the use of this technique.

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Introduction

Academic discourse, or what Liardét (2015) refers to as the "language of the academy," has come to receive greater scrutiny in recent years. More particularly, research articles (RAs) have been among the most frequently analyzed linguistic genre in academic works due to the fact that they are among prominent genres that share knowledge in research communities (Koutsantoni, 2006). As they may be inspected in terms of an abundance of variables covering writing conventions and the values of a discipline and research community, they can be considered an invaluable tool for genre studies. Considering the abstract and depersonalized nature of academic discourse (Ezeifeka, 2015), the degree to which writers adopt conventions which are appealing to the target audience will determine how well their work is capable of convincing readers of their ideas.

Among the abovementioned conventions, Grammatical Metaphor is a well-known phenomenon which can be a very helpful tool in academic texts to achieve objectification, abstractness and formality. In 1985, Halliday introduced the notion of Grammatical Metaphor (GM) in his work called Introduction to Functional Grammar (1985) based on Systemic Functional Linguistics (SFL). He attempted to expand the traditional view of metaphor to go beyond just variation in the lexis, or what he names lexical metaphor, to reach a broader and more comprehensive view which is created due to a variation not only in the wording but also in the grammar of a given expression in a language, a notion which led to the term "lexico-grammar". The term Grammatical Metaphor then is referred to the replacement of a particular grammatical class or structure with another (Halliday and Martin, 2005). There are two kinds of Grammatical Metaphor: Interpersonal Grammatical Metaphor and Ideational Grammatical Metaphor. Interpersonal Grammatical Metaphor includes metaphors of modality and metaphors of mood and the Ideational type, as the name implies, deals with action-oriented experiences as abstract entities (Martin & Rose, 2003) and can be sub-categorized into experiential and logical metaphors, which go hand in hand to build dense and formal expressions and facilitate the author's decision-making to prioritize the information by changing the class of the words.

The Journal of English Language Pedagogy and Practice
Vol. 17, No.35, Autumn and Winter 2024
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Among the different kinds of Ideational Grammatical Metaphor, Nominalization has been proved to be the predominant characteristic of GM (Fang, 2005) so 4 out of 13 types of IGM have been categorized as nominalization (Halliday & Matthiessen, 1999). They include quality nominalization, process nominalization, circumstance nominalization, and relator nominalization. Table 1 depicts the 4 types of nominalizations (Halliday & Matthiessen, 1999).

Table 1

Types of Nominalizations (Halliday and Matthiessen, 1999)

	Type	**Semantic Function**	**Grammatical Function**	**Lexico-grammatical Class**	**Example**
1		Quality to Entity	Epithet to Thing	Adjective to Noun	Unstable: Instability
2		Process to Entity	Event to Thing	Verb to Noun	Transform: Transformation
3		Circumstance to Entity	Minor Process to Thing	Preposition to Noun	With: Accompaniment
4		Relator to Entity	Conjunctive to Thing	Conjunction to Noun	If: Condition

It has been argued that academic language entails a high degree of nominalization (Kazemi, 2015) and there is a great tendency to use more nominalized terms on part of successful writers (Thompson, 2009). It also enriches the writer with a cohesive device, which leads to more academic-like texts. Changing any grammatical class to a noun and the freedom of nouns in moving within a clause (beginning, middle, and end) makes it possible to manipulate theme/rheme pattern to achieve cohesion. Put it simply, the author is provided with an opportunity to organize the discourse considering factors such as notions and causes (Eggins, 2004, p.95). Furthermore, in addition to

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encapsulating information, which is the main characteristic of nominalization generally, it leads to the creation of a perception as if the process is already established and has existed. More importantly, to meet the requirements of academic discourse, it contributes to more objectified discourse, which is moved away from a focus on the human doer (Behnam & Kazemian, 2013). Hence, conceptualization of a scientific activity as an object makes it more unquestionable (Bello, 2016), unchangeable and indisputable (Albentosa Hernández & Moya Guijarro, 2000)

The research articles' abstract sections are given special consideration because they play a key function in attracting the reader in and making the text seem worthwhile. Since they are "factual summaries" of the entire Ras (Bhatia, 1993), the audience are going to figure them more persuasive if they provide an abundance of information in just a few paragraphs. Additionally, the majority of journals set a specific word count for this section in their papers (an average of 200 up to 350 words), and researchers should be expected to summarize their work within that range. In an effort to meet the word requirements set by the journals, they must therefore utilize enclosed clauses. Nominalization enables the authors of the RAs to write texts that are more academically specialized and is an amazing means to assess language proficiency.

Many academics have investigated the use of nominalization in academic writing, especially in research publications. Nevertheless, despite the abundance of multidisciplinary comparative studies, there have not been many that compare medical and applied linguistics research articles written by native and non-native English speakers. In order to benefit teachers and students of English for Academic Purposes by introducing them to textual rituals and discursive practices specific to each discipline, the current study looks into the usage of nominalization in research papers.

Numerous researchers have examined Grammatical Metaphor and Nominalization from a wide range of perspectives, including those found in newspapers (Ren, 2021; Hasibuan,2006; Tabrizi & Nabifar, 2013) learners' written output (Liardét, 2013; Afifi, 2021; Cullip; 2000; Ngongo & Benu, 2020; Baratta, 2010), textbooks (Huang & Yu, 2021; Ferzhawana, et al., 2019; Kaneso, 2016; Jalilifar et al., 2014), novels (Seyedvalilu & Ghafoori, 2016), and emails

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Vol. 17, No.35, Autumn and Winter 2024
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(Memari, 2016). What's more intriguing is that English for Specific Purposes (ESP) and English for Academic Purposes (EAP) practitioners are paying more attention to the unquestionable role it plays in academic discourse. In order to accomplish this, a substantial body of literature examines the nominalization in specialised texts, academic works, and research articles.

Among the studies with a particular focus on nominalization in academic discourse, they were the object of the study carried out by Jalilifar, Alipour and Parsa (2014) who performed investigations on an applied linguistics book and a biology book as 2 distinct disciplines. They found no significant difference between the two books in terms of nominalization use. They also computed nominalization density and found the applied linguistic book denser than its biology counterpart. Moreover, applied linguists registered a higher tendency toward nominalization than other GM types, as compared to biologists.

In another study, Kazemian, Behnam and Ghafoori (2013) investigated nominalization and its role in scientific writings, employing Hallidayan Systemic Functional Grammar. Moreover, they explored different process types in their work. The analysis included 10 scientific texts taken from a number of well-known journals. Their analysis demonstrated a high frequency of nominalization and material and relational processes. Overall, the study highlights the importance of IGM in increasing the technicality and rationality of academic writings.

Moreover, an earlier study by Hadidi and Raghami (2012) analyzed a corpus comprising three political and three business texts. The study found that nominalization contributes to the abstractness and formality of the text. Likewise, the research by Kazemian (2014) highlights the significance of nominalization in science and in technicalizing and rationalizing, particularly contributing to "dominance, provocation, and persuasion toward an intended and specific objective" in politics (p.141). Another study by WANG and MENG (2017) also proved nominalization as very helpful in increasing objectivity, conciseness and coherence.

Closer to the corpus of this study, several studies focused on research articles. As an instance, Akanda (2021), investigating different sorts of nominalization in in 140 news articles on Bangladesh-China relations, found process nominalization

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and circumstance nominalization as the two most frequently used types, respectively. Ezeifeka (2011) also with an aim to explore 5 five randomly selected research abstracts written by undergraduates of the Department of English Language and Literature, Nnamdi Azikiwe University, Awka confirmed the role of nominalization in word economy and lexical density. Similarly, Ezeifeka (2015) verified the significance of nominalization in lexical packing.

Hadidi and Alimohammadi (2021), comparing research articles written by native English speakers and their non-native counterparts, found nominalization as the most widely-used type of grammatical metaphor by both groups. However, native speakers were reported to outperform non-native speakers.

Wenyan (2012) carried out a comparative to trace nominalization use in medical papers, 10 by native speakers and 10 by Chinese authors. The analysis set out to the measurement of the frequency of nominalization and lexical density. The comparison exhibited a higher nominalization used by native speakers of English which can be an indicator of their fluency in the language. The study also points out the role nominalization plays in the construction of coherent and logical texts in the medical discipline. The paper also calls the English writing teachers to shed more light on the importance of nominalization in academic writing in their courses. In a similar study by Mahbudi, Mahbudi and Amalsaleh (2014) to compare nominalization frequency and lexical density in 40 medical research articles, half of which were written by native speakers and half by Iranian scholars, the findings showed less nominalization deployment by Iranian writers. Arizavi, Namdari and Mousavi (2015) also investigated kinds of nominalization in discussion sections of 150 RAs written by Iranian and English writers in local and international Applied Linguistics publications. The findings represented a higher tendency in the international journals as compared with the local ones. More nominalization used in certain moves of the discussion sections was also reported in this research.

Park (2019) tried to analyze nominalization and verbalization in research papers by Korean and international authors considering disciplinary variation and L1 and L2 differences. He explored a corpus of two-million words in hard and soft sciences. Although there was a significant difference between the two fields in terms of verbalization frequency, no remarkable discrepancy was demonstrated

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concerning nominalization, claiming that "nominalization is no longer discipline sensitive" (p.65). In addition, research articles written by Vietnamese and native English writers were probed into by THAM and THI to find out "the similarities and differences in syntactic construction of nominalization" (p.398). The two groups of writers exhibited a great difference, with English authors outperforming the others.

Next earlier, Heidari Kaidan, Jalilifar and Don (2021) performed explorations to find out the occurrence of nominalizations in a sample of 134 research articles in the disciplines of physics and applied linguistics. The findings indicated a considerable difference between the two given fields- with applied linguists employing overall a higher proportion of nominalization as compared to their counterparts in physics. They also showed that nominalization type 2 was used differently from the other types. Besides, no significant difference was shown concerning different types of articles considering nominalization use in physics contrary to applied linguistics. They also attempted to suggest a list of 15 patterns of nominalization in the empirical studies of the two fields. In an earlier similar study, Jalilifar, White, and Malekizadeh (2017) described how different sorts of nominalization were used in 8 textbooks belonging to the fields of physics and applied linguistics. According to this research, in spite of the similarity in terms of first three kinds of nominalization, they were distributed in a different way considering each field.

Çakır and Kansu Yetkiner (2011) in an interdisciplinary study (social and natural sciences), probed into lexicogrammatical features and nominalization in Turkish abstracts and their English translations. The results demonstrated a higher degree of nominalization deployed by social sciences compared with natural sciences. Conclusively, they point out that the differences in academic communities may contribute to the use of different linguistic strategies including nominalization.

In addition, Agbaglo (2020) in his investigation of a corpus including 120 research articles, analyzed Applied Linguistics, Economics, and Biology RA abstracts. The study reported greater use of nominalization in Applied Linguistics than in other fields. The role of nominalization "ideationally, to create a

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Vol. 17, No.35, Autumn and Winter 2024
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taxonomy, interpersonally, to appraise, and, textually, to achieve cohesion" (p.3) was suggested through the analysis.

As can be seen, the research to date on nominalization in RAs has tended to focus on either interdisciplinary variations or the nationality differences of the authors. However, few studies have taken both these variations into account. This research sets out to explore nominalization deployment in two disciplines of Applied Linguistics and Medical Sciences, with a consideration of the NS and NNS writers.

This study seeks to address the following research questions:

1. Is there any significant difference in the frequency of deployment of nominalization in abstract sections of Applied Linguistics research articles (RAs) between those written by English native speakers and those written by their non-native counterparts?

2. Is there any significant difference in the frequency of deployment of nominalization in abstract sections of medical research articles (RAs) between those written by English native speakers and those written by their non-native counterparts?

3. Is there any significant difference between the deployment of nominalization in abstract sections of research articles written by the academics in the disciplines of Applied Linguistics and Medical Sciences?

Method

Procedure

To investigate the frequency of four types of nominalizations (Table 1) introduced by Halliday (1996), a corpus consisting 8,207 words including 30 Applied Linguistics research articles, fifteen of which were written by English native speakers and fifteen by non-natives, as well as 30 research papers in various domains of medical sciences (Nursing, Health, Cardiovascular, Immunology, Dentistry, Epidemiology, etc.), half written by native English speakers and half by non-natives was first collected from top-ranking (Q 1) SJR (SCImago Journal Rank) journals. SJR indicates the scientific influence of a journal and accounts for both the number of citations received by a journal and the importance or prestige

The Journal of English Language Pedagogy and Practice
Vol. 17, No.35, Autumn and Winter 2024
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of the journals where the citations come from. The papers were selected by semi-random sampling, which is a sampling technique in which the researcher selects randomly among initially sampled elements (Suba & Suba, 2015) -Q1 research papers in this study. Table 2 depicts the DOI (Digital Object Identifier) of the RAs, their publication year, journals from which they were chosen, accompanied by their SJR, and authors' nationality. They were then classified according to the nationality of the author. In cases with more than one writer, the first corresponding author has taken into consideration. The abstract sections of the articles were subsequently analyzed. To obtain how frequently they are used by the academic writers in these disciplines, the number of nominalizations per whole words for each group was estimated.

Table 2

Research articles properties (1-15: Applied Linguistics Native Speakers, 16-30: Applied Linguistics Non-native Speakers, 31-45: Medical Sciences Native Speakers, 46-60: Applied Linguistics Non-native Speakers)

The Journal of English Language Pedagogy and Practice
Vol. 17, No.35, Autumn and Winter 2024
DOI: 10.71586/jal.2024.10091186309

o.	Journal	SJR	Article Doi	Publication Year	Author's Nationality
1	Journal of Second Language Writing	2.606 (Q1)	https://doi.org/10.1016/j.jslw.2017.06.001	2017	U.S.
2	Language Learning	1.908 (Q1)	https://doi.org/10.1111/lang.12347	2019	U. S
3	Applied Linguistics	1.854 (Q1)	https://doi.org/10.1093/applin/amac030	2023	U. S
4	Language Teaching Research	1.738 (Q1)	https://doi.org/10.1177/13621688211004638	2021	USA
5	Mind and Language	1.626 (Q1)	https://doi.org/10.1111/mila.12081	2015	UK
6	Language Teaching	1.568 (Q1)	https://doi.org/10.1017/S0261444824000144	2024	UK
7	Journal of English for Academic Purposes	1.589 (Q1)	https://doi.org/10.1016/j.jeap.2015.03.005	2015	Canada
8	Language Teaching	1.568 (Q1)	https://doi.org/10.1017/S0261444824000120	2024	UK
9	ELT Journal	1.523 (Q1)	https://doi.org/10.1093/elt/ccab080	2023	UK
10	Bilingualism	1.425 (Q1)	https://doi.org/10.1017/S1366728915000218	2016	U.S.A
11	Annual Review of Linguistics	1.322 (Q1)	https://doi.org/10.1146/annurev-linguist-030514-124923	2015	U.S.A
12	Journal of Language and Social Psychology	1.246 (Q1)	https://doi.org/10.1177/0261927X15600732	2015	USA

13	Innovation in Language Learning and Teaching	1.245 (Q1)	https://doi.org/10.1007/s11049-018-9429-9	2018	USA
14	English for Specific Purposes	1.204 (Q1)	https://doi.org/10.1016/j.esp.2020.08.003	2022	USA
15	Language and Education	1.183 (Q1)	https://doi.org/10.1080/09500782.2018.1485694	2018	USA
16	Studies in Second Language Acquisition	2.124 (Q1)	https://doi.org/10.1017/S0272263119000056	2019	Chile
17	Research on Language and Social Interaction	2.258 (Q1)	https://doi.org/10.1080/08351813.2018.1485234	2018	Netherlands
18	TESOL Quarterly	1.888 (Q1_	https://doi.org/10.1002/tesq.3242	2024	Pakistan
19	Journal of Semantics	1.805 (Q1)	https://doi.org/10.1093/jos/ffab014	2021	France
20	Language, Culture and Curriculum	1.667 (Q1)	https://doi.org/10.1080/07908318.2021.1979577	2021	China
21	Neurobiology of Language	1.608 (Q1)	https://doi.org/10.1162/nol_a_00122	2020	Belgium
22	Journal of English for Academic Purposes	1.589 (Q1)	https://doi.org/10.1016/j.jeap.2022.101112	2022	China
23	Research Methods in Applied Linguistics	1.537 (Q1)	https://doi.org/10.1016/j.rmal.2022.100005	2022	Saudi Arabia
24	Studies in Second Language	1.455 (Q1)	https://doi.org/10.14746/ssllt.2018.8.3.6	2018	Austria

	Learning and Teaching				
25	Annual Review of Applied Linguistics	1.386 (Q1)	https://doi.org/10.1017/S0267190519000035	2019	China
26	International Journal of Bilingual Education and Bilingualism	1.341 (Q1)	https://doi.org/10.1080/13670050.2015.1061474	2017	Taiwan
27	Second Language Research	1.315 (Q1)	https://doi.org/10.1177/0267658318791651	2019	China
28	Innovation in Language Learning and Teaching	1.245 (Q1)	https://doi.org/10.1080/17501229.2017.1394307	2017	Iran
29	World Englishes	1.173 (Q1)	https://doi.org/10.1111/weng.12548	2023	Korea
30	Linguistic Typology	1.167 (Q1)	https://doi.org/10.1515/lingty-2022-0019	2024	Sweden
31	Nature Reviews Drug Discovery	22.399 (Q1)	https://doi.org/10.1038/s41573-024-00943-2	2024	USA
32	JACC: Heart Failure	5.724 (Q1)	https://doi.org/10.1016/j.jchf.2020.11.003	2021	USA
33	Circulation Research	4.903 (Q1)	https://doi.org/10.1161/CIRCRESAHA.123.322762	2023	USA
34	Pain	2.376 (Q1)	DOI: 10.1097/j.pain.0000000000000750	2017	USA
35	Journal for Immunotherapy of Cancer	3.728 (Q1)	DOI: 10.1186/s40425-018-0339-5	2018	USA
36	Journal of Autoimmunity	2.558 (Q1)	https://doi.org/10.1016/j.jaut.2018.04.003	2018	Australia

37	Journal of Physiology	1.708 (Q1)	https://doi.org/10.1113/JP273839	2017	USA
38	International Nursing Review	1.165 (Q1)	https://doi.org/10.1111/inr.12522	2019	USA
39	Annual Review of Public Health	5.440 (Q1)	https://doi.org/10.1146/annurev-publhealth-032315-021402	2016	USA
40	Medical Image Analysis	4.112 (Q1)	https://doi.org/10.1016/j.media.2015.04.013	2015	Canada
41	Autism in Adulthood	3.045 (Q1)	https://doi.org/10.1089/aut.2018.0054	2019	USA
42	JAMA Dermatology	3.203 (Q1)	https://doi:10.1001/jamadermatol.2019.3412	2020	USA
43	Alzheimer's and Dementia	3.226 (Q1)	https://doi.org/10.1002/alz.079585	2023	UK
44	Diabetologia	3.355 (Q1)	https://doi.org/10.1007/s00125-021-05617-x	2021	UK
45	JAMA - Journal of the American Medical Association	5.928 (Q1)	https://doi:10.1001/jama.2024.0821	2024	USA
46	Brain	4.689 (Q1)	https://doi.org/10.1093/brain/awz372	2020	China
47	Blood cancer discovery	4.640 (Q1)	https://doi.org/10.1158/2643-3230.BCD-20-0207	2021	Switzerland
48	Pharmacological Reviews	6.050 (Q1)	https://doi.org/10.1124/pharmrev.123.000928	2024	China
49	Biomedicine and Pharmacotherapy	1.493 (Q1)	https://doi.org/10.1016/j.biopha.2019.109129	2019	Iran
50	Sports Medicine	3.492 (Q1)	https://doi.org/10.1007/s40279-018-0898-0	2018	Switzerland

51	Eye and Vision	1.553 (Q1)	https://doi.org/10.1186/s40662-016-0058-2	2016	Saudi Arabia
52	Journal of Nutrition	1.098 (Q1)	https://doi.org/10.1093/jn/nxac103	2022	China
53	Journal of Nutritional Biochemistry	1.136 (Q1)	https://doi.org/10.1016/j.jnutbio.2019.108268	2020	China
54	Annual Review of Medicine	5.480 (Q1)	https://doi.org/10.1146/annurev-med-050715-104506	2017	Germany
55	Health Affairs	4.387 (Q1)	https://doi.org/10.1377/hlthaff.2015.0150	2015	China
56	Liver Cancer	3.599 (Q1)	https://doi.org/10.1159/000508568	2020	China
57	Gut Microbes	3.075 (Q1)	https://doi.org/10.1080/19490976.2018.1549420	2018	Switzerland
58	Clinical Microbiology and Infection	3.089 (Q1)	https://doi.org/10.1016/j.cmi.2018.11.002	2019	Netherlands
59	European Journal of Epidemiology	3.186 (Q1)	https://doi.org/10.1007/s10654-024-01134-4	2024	Germany
60	Bone Research	3.378 Q1	https://doi.org/10.1038/s41413-022-00224-x	2022	China

The Journal of English Language Pedagogy and Practice
Vol. 17, No.35, Autumn and Winter 2024
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Data Analysis

The data has been analyzed through Statistical Package for Social Sciences (SPSS) version 27. In particular, to determine the significance of the difference between groups, the independent samples t-test was employed. The comparison took place in terms of the overall number of nominalizations in each group, in addition to taking the frequency of each type into account. Ultimately, to reach intra-rater reliability, the analysis has been repeated in a fortnight interval. It has been proved to exist 0.98 Pearson's Product Moment Correlation between the two investigations.

Results

The corpus of this study includes four groups of articles: (1) Applied Linguistics RAs written by NSs, (2) Applied Linguistics RAs written by NNSs, (3) Medical RAs by NSs, and (4) Medical articles by NNSs. Each group is analyzed by considering the types of nominalizations. With a clause-by-clause analysis of a total of 8,207 words, each kind was identified and coded manually.

Each group includes 15 RA abstracts taken from the RAs published in high-ranked journals. In line with the objectives of the study, initially, the frequency of types and sub-types of nominalizations were estimated and followed by the calculation of the proportion of each type. Table 3 depicts the frequency and proportion of each type in the above-mentioned group of RAs.

Table 3

Frequency and proportion of each type of nominalization in RAs (Group 1: Applied Linguistics Native Speakers, Group 2: Applied Linguistics Non-native Speakers, Group 3: Medical Sciences Native Speakers, Group 4: Applied Linguistics Non-native Speakers)

Group	Whole Number	Frequency per Whole words	Frequency of Each Type (Number of each type / Total nominalizations)		Mean ± SD
1	365	0.15807	1	12.60%	0.0952 ± 0.0983

The Journal of English Language Pedagogy and Practice
Vol. 17, No.35, Autumn and Winter 2024
DOI: 10.71586/jal.2024.10091186309

			2	85.75%	0.8887 ± 0.1098
			3	1.36%	0.0124 ± 0.0297
			4	0.27 %	0.0035 ± 0.0135
2	479	0.18494	1	13.15%	.1387 ± 0.1182
			2	84.34%	0.8291± 0.1258
			3	1.87 %	0.0244 ± 0.300
			4	0.62%	0.0076 ± 0.0297
3	562	0.13112	1	15.12 %	0.1470 ± 0.0775
			2	83.80%	0.8399 ± 0.0751
			3	0.53%	0.0069 ± 0.0151
			4	0.53%	0.0060 ± 0.0297
	392	0.13601	1	9.43%	0.0939 ± 0.0848
			2	86.47%	0.8702 ± 0.0914
			3	1.27%	0.0093 ± 0.0093
			4	2.80%	0.0263 ± 0.0612

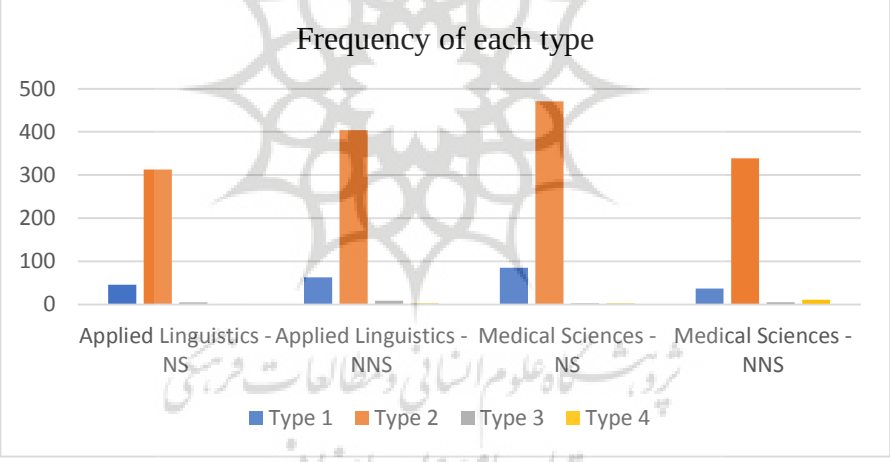

Figure 1 *Frequency of Nominalization types in each set of articles*

As can be seen from the provided data in Table 3 and Figure 1, nominalization type 2 (shift from process to entity or from a verb to a noun) seems to deployed by far more than its counterparts in all four groups of articles (over 82% in all groups). In addition, first type of nominalization which includes a move from quality to entity (adjective to noun) accounts for the second most frequent

The Journal of English Language Pedagogy and Practice
Vol. 17, No.35, Autumn and Winter 2024
DOI: 10.71586/jal.2024.10091186309

type in all given groups. With regards to the thirds type, while it is more frequently used in Applied Linguistics articles, that is not the case when it comes to medical sciences papers, where in those written by native speakers it shares the same percentage with the fourth type and in those by non-native authors type 4 nominalization outnumbered the third one.

The next part of analyses included comparing sets of articles two-by-two to track any statistical significance in terms of the overall number of nominalizations used in the abstracts section of the research papers. Table 4 illustrates the results of 'two independent samples t-test' conducted by Statistical Package for Social Sciences (SPSS) version 27.

Table 4

Results of 'two independent samples t-test'

Compared Groups	Group	M ± SD	t	df	Sig. (2-tailed)
1 and 2	1	0.1566 ± 0.0594	- 1.681	28	0.104
	2	0.1844 ± 0.0329			
3 and 4	3	0.1302 ± 0.0541	- 0.420	28	0.678
	4	0.1391 ± 0.0616			
2 and 4	2	0.1844 ± 0.0329	2.511	28	0.018
	4	0.1391 ± 0.0616			
1 and 3	1	0.1566 ± 0.0594	1.326	28	0.195
	3	0.1302 ± 0.0541			

As can be inferred, comparing groups 1 and 2, there can be seen no statistically significant difference in terms of the deployment of nominalization in the abstract sections of research articles between those written by native-speakers (M ± SD = 0.1566 ± 0.0594) and non-native speakers (M ± SD = 0.1844 ± 0.0329) (t (28) = -1.681, p = 0.104). Likewise, comparing the medical research articles by native (M ± SD = 0.1302 ± 0.0541) versus non-native authors (M ± SD = 0.1391 ± 0.0616), there is no significant difference between these two groups (t (28) = - 0.420, p = 0.678). Similarly, research papers published by native writers in both domains did not demonstrate any statistically significant difference (t (28)

The Journal of English Language Pedagogy and Practice
Vol. 17, No.35, Autumn and Winter 2024
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= 1.326, p = 0.195). On the contrary, with regards to non-native writers in both disciplines, Applied Linguistics scholars outperformed medical scientists in terms of nominalization usage (t (28) = 2.511, p = 0.018).

Table 5

Overall use of nominalization in research papers

Compared Groups	M ± SD	t	df	Sig. (2-tailed)
Applied Linguistics	0.1705 ± 0.0467	2.661	58	0.0100
Medical Sciences	0.1347 ± 0.0571			

According to table 5, to compare the overall use of nominalization in research papers in two disciplines, applied linguistics academic writers (M ± SD = 0.1705 ± 0.0467) demonstrated significantly higher (t (58) = 2.661, p = 0.0100) number of nominalizations than medical sciences academics (M ± SD = 0.1347 ± 0.0571).

Discussion

The study set out to determine whether using nominalization as a key element of academic discourse is a discipline-sensitive factor as well as considering the nativeness / non-nativeness of the contributing authors, with regards to two domains of Applied Linguistics and medical sciences. To this end, a corpus of including 8,207 words consisted of the abstract sections of research articles published in high-ranked journal in each discipline between years 2015 – 2024. The corpus involved four sets, each with 15 abstract sections, which was analyzed in terms of the number of instances of nominalization used. According to the findings of the study, verbal nominalization proved to be the most frequent type in all given sets of articles, which is in line with literature (Kazemi, 2015). Biber and Gray (2013) attributed this prevalence to the historical shift taken place in 20th century. By fewer processes being employed, the lexical density and information load of the nominal group would be risen (ONIPEDE & Naomi, 2023). Other underlying reasons can be an audience with highly specialized

The Journal of English Language Pedagogy and Practice
Vol. 17, No.35, Autumn and Winter 2024
DOI: 10.71586/jal.2024.10091186309

knowledge and a considerably informational purpose concerned with technical data (Biber & Gray, 2021).

To address the first research question, 30 research articles published in well-stablished applied linguistics journals underwent thorough analysis. According to the findings of the study, there was no statistically significant difference between the overall number of nominalizations used by native writers as compared with non-natives. This finding is in line with Kazemi (2015) who did not find any significant difference between Iranian and native scientific authors. However, the findings are in contrast with Arizavi et al, (2015) and Sayfouri (2010) who pointed out a greater proportion of nominalization in native academic writers' texts.

With regards to the second research question, 15 medical research papers published by native English speakers and 15 by non-natives were investigated in terms of the number of nominalizations used. This research did not find any significant difference between natives and non-native counterparts. Liardet (2016) explains this non-significant difference by how systematic and willful entry into genres, conscious education, and categorization into generic conventions will first blur the NS- NNS lines and then may lift Nominalization in NNS above normality of use in academic discourse. Other factors such as the role of the discipline in this issue are open to more study. Since scientific domains like medical sciences provide authors with predictable patterns of choices in meaning making and thus lead to less possibility of creativity in selecting the words to communicate, the similarity between Ns and NNs would bring us no surprise. Another possible explanation might be more training taking place in this field. This of course would benefit from more research.

As per the third research question, a significant difference was seen between the overall number of nominalizations used by academics in two disciplines, where applied linguists outperformed medical scientists. This finding is consistent with those of Jalilfar et al. (2018) who found more deployment of nominalization in applied linguistics corpus than medical discourse. Likewise, Heidari Kaidan, Jalilifar, and Don (2021) observed a higher proportion of nominalizations in the research articles of applied linguistics compared with those in physics. Moreover, Agbaglo (2020) reported greater use of nominalization in

The Journal of English Language Pedagogy and Practice
Vol. 17, No.35, Autumn and Winter 2024
DOI: 10.71586/jal.2024.10091186309

Applied Linguistics than in other fields such as Economics and Biology RA abstracts. Similarly, according to Heidari, Kaidan, Jalilifar, and Don, (2021), the outperformance of applied linguists might be due to the greater degree of abstraction involved in this discipline. They discuss that "in communicating scientific knowledge, linguists forge a series of arguments and discussions and reiterate them in the brief form of nominalization" (p.1). Then the difference, as they conclude, has its roots in the more polemic nature of linguists as academic writers and the more argumentative features of linguistics texts. Further work is required to establish this.

Nominalization has proved to be one of the best ways to reach academically valued discourse in a large diversity of disciplines. Its condensed and encapsulated nature in wording best fits the aims of composing a research article and publish in academic journals since in many of them there is a pre-determined limitation of words. Then packing a great deal of information into a single clause makes the language of an RA more nominally complex sentences than verb-heavy ones.

Despite a handful of studies being carried out on nominalization in academic writing, there has been a lack of research in which two key factors of disciplinary variation and being a native/non-native writer both are taken into account. The aim of the present study was to address the foregone gap. According to the findings of this study, no statistically significant difference was seen between native and non-native writers in the deployment of nominalization in the abstract parts of RAs. In addition, to an inter-disciplinary analysis, academic writers in applied linguistics outperformed their counterparts in medical sciences.

The findings of the study might provide helpful implications for curriculum developers and syllabus designers, especially for English for specific purposes (ESP) and English for medical purposes (EMP) practitioners. For one thing, it can clarify the various literacy demands in building disciplinary knowledge (Hood, 2011; Ravelli and Ellis, 2005). Then it has been recommended that linguistic practitioners in diverse disciplines can take the advantage of nominalization as part of their learning materials to enrich the students involved in ESP and EAP courses with valued norms of academic writing (Mahfudurido, Tallapessy, & Kusumayanti, 2021). This can begin with first decoding highly-

The Journal of English Language Pedagogy and Practice
Vol. 17, No.35, Autumn and Winter 2024
DOI: 10.71586/jal.2024.10091186309

nominalized texts to indicate the significance of the use of nominalization in reaching both clarity and economy in academic discourse (Biber & Gray, 2021) and objective and authoritative discourse (Jalilifar, et al., 2017). Furthermore, this awareness rising can enhance the acceptability of their articles and address the necessities determined by academic community (Jalilifar, et al., 2018). Moreover, teaching nominalization should take place in a systemic and explicit way to achieve advanced English literacy development (Afifi, 2021). To this end, teacher-training programs are of great importance. According to Afifi (2021), instructors need to be equipped with the knowledge of the ways discursive dimensions of language including nominalization function in well-established written discourse.

More interestingly, with an insight into the importance of summarizing as a crucial academic literacy ability, EFL and ESP learners can be taught in terms of how nominalization sub-types, and particularly verb nominalization, can pave the way to summarize academic knowledge more efficiently.

However, as Liardét and Black (2020) mention, instructors have to teach the learners not only the deployment of nominalization to reach greater density and coherence but they are supposed to be aware to evaluate the extent of condensation suitable for factors of context, delivery manner and presupposed stage of formality.

The findings in this thesis are subject to at least three limitations. First, the limited sample size, 60 RA abstracts, inevitably would affect the generalizability of the study. Secondly, the identification of nominalization types was carried out by one researcher, which may influence the internal reliability. Moreover, since the comparison took place considering only abstract sections, there may be a need to include further parts in the analysis. Future research can include a greater number of articles, so that it can benefit from a larger corpus. Furthermore, more than one researcher can take part in the identification and categorizing of the nominalization types to increase the reliability of the study. Besides, other parts of a research article can be involved in the analysis to reach more meticulous findings. In addition, more research needs to be done on the role of discipline in the use of nominalization. Ultimately, other kinds of academic discourses e.g. textbooks, manuals, lectures, and learner writings can be used to make an

interdisciplinary comparison regarding the use of different kinds of nominalization.

Declaration of interests: None

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The Journal of English Language Pedagogy and Practice
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Biodata

Farzaneh Kazemi is a Master's degree holder in English Language Teaching (ELT) from Tabriz University. She is teaching English at Iran Language Institute (ILI). Her areas of interest are language acquisition, applied linguistics, English language teaching, English for specific purposes, and English for academic purposes.

اسم سازی در مقالات تحقیقاتی زبانشناسی کاربردی و پزشکی: مقایسه نویسندگان آکادمیک بومی و غیر بومی

با توجه به اهمیت بی چون و چرای کلام آکادمیک در نشر دانش، پژوهش حاضر به بررسی مقالات پژوهشی منتشر شده در مجلات با رتبه بالا در دو رشته زبان شناسی کاربردی و علوم پزشکی می پردازد. با توجه به اینکه بخش چکیده در یک مقاله پژوهشی بازنمایی واقعی جزئیات مقاله است، این قسمت از اهمیت بالایی برخوردار است. علاوه بر این، نویسندگان آکادمیک در تلاش اند تا با استفاده از هنجارهای نوشتاری متعدد، مقالاتی با ارزش و جذاب تر منتشر کنند که یکی از روش های شناخته شده آن اسم سازی است. این مطالعه از طراحی تحلیل ژانر پیروی می‌کند و شامل مجموعه‌ای از 30 مقاله تحقیقاتی در زبان‌شناسی کاربردی و 30 مقاله در حوزه علوم پزشکی است که نیمی از آنها توسط نویسندگان بومیو نیمی توسط نویسندگان غیربومی، بین سال‌های 2015 تا 2024 منتشر شده است. تجزیه و تحلیل دقیق و مقایسه مقاله به مقاله، تفاوت آماری معنادار از لحاظ فراوانی اسم سازی فعلی در تمامی مجموعه مقالات و عدم تفاوت آماری معنادار بین نویسندگان دانشگاهی بومی و غیربومی در هر دو رشته را نشان داد. با این حال، تفاوت قابل توجهی بین استفاده از اسم سازی بین نویسندگان آکادمیک در زبان‌شناسی کاربردی و علوم پزشکی وجود داشت که گروه اول نسبت به گروه دوم برتری داشت. اعتقاد بر این است که نتایج این مطالعه به فعالان در عرصه زبان انگلیسی برای اهداف ویژه و آکادمیک در گنجاندن شیوه‌های آموزش نوشتن بیشتر در برنامه درسی خود کمک می‌کند.

کلمات کلیدی: اسم سازی، استعاره دستوری، زبان شناسی کارکردی سیستمی، کلام دانشگاهی، نویسندگان آکادمیک بومی، نویسندگان آکادمیک غیر بومی