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This special issue compiles papers from the 48th Systemic Functional Congress (ISFC48 organised in March 2023 by the Systemic Functional Linguistics Association of Tunisia (SYFLAT) and the Laboratory of Approaches to Discourse (LAD-LR13ES15), under the auspices of the Faculty of Letters and Humanities at the University of Sfax. This special issue, which explores the theme of power and empowerment in relation to language and systemic functional theory, is divided into two volumes. The contributions in this first volume provide some reflections on SFL notions, which can empower both the theoretical apparatus and its application to different types of discourse. The papers in the second volume showcase how SFL language descriptions can empower pedagogical practices.

Academic Research

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A comparative study of substitution in chemical and anthropological magazine news and journal commentaries

Sabiha Choura

Abstract

Considered as a powerful language approach with "comprehensive descriptions" (Halliday 1964), Systemic Functional Linguistics (SFL) can empower practitioners in analyzing texts, being informative of the structural choices in a given linguistic context (Fontaine et al. 2013). Thus, SFL enables researchers to get deeper insights into how language is used in context and how generic and/or "disciplinary meaning" is construed (Moore et al. 2018). Seeing the importance of generic and disciplinary context in deciphering interlocking linguistic choices (Sellami-Baklouti 2013 & Choura 2019), this study attempts to investigate substitution, given its role in building textual unity and construing the information flow (Halliday & Hasan 1976). Although substitution has been studied in various genres including students' writings (Klimova & Hubackova 2014), scant attention has been given to its use across Commentaries and News, both of which communicate scientific knowledge but differ in information literacy. This study, therefore, aims to examine substitution in Commentaries and News across two disciplines, i.e. Chemistry and Anthropology, with a view to exploring how the choices of substitution are determined by (i) generic and (ii) disciplinary conventions. To this end, a corpus totaling 42536 words written by American authors is selected, and annotated, following Halliday and Hasan's model of grammatical cohesion (1976), and using the UAM CorpusTool. The analysis shows that genres and disciplines have a powerful impact on the choices of substitution. It also reveals that there is more preference for substitution in News than Commentaries and in Chemistry than Anthropology. The findings of this study may have pedagogical implications as it may empower teachers in developing writing course designs according to the specificities of the relevant genres and disciplines.

Keywords:

Substitution; Commentaries; News; Chemistry; Anthropology

Introduction

Systemic Functional Linguistics (Henceforth SFL) has been perceived as a powerful language approach with "comprehensive descriptions" (Halliday 1964) since it can empower practitioners in analyzing texts, interpreting them and providing descriptions of the

structural choices in a given linguistic context (Fontaine et al. 2013). A such, it enables researches to get deeper insights into how language is used in context and how generic and / or "disciplinary meaning" is construed (Moore et al. 2018). The relation of structure, meaning and context has been one of the major concerns of SFL, with the higher stratum of context motivating semantic construals that determine lexico-grammatical selections from the system (Halliday & Matthiessen 2014, 26). How the lexis and grammar are related and how they cement the different parts of a text contribute to the cohesive built-in of the text.

Considered as "a set of semantic resources for linking a sentence with what has gone before" (Halliday & Hasan 1976, 10), cohesion has received much attention in the literature, with a focus on different genres including IELTS Reading Passages (Wang 2022), Indonesian Textbooks (Lande et al. 2022), and Student Explanation Texts (Rizki et al. 2022). However, scant attention has been given to the analysis of grammatical cohesion and in particular substitution in Journal Commentaries (Henceforth JC) and Magazine News (Henceforth MN), both of which communicate scientific knowledge, but differ in a number of variables such as information literacy, lexis, purposes and the target audience (Parkinson & Adendorff 2004). Thus, the present research attempts to explore whether the choices of substitution are determined by the generic conventions of Commentaries and News or by the disciplinary specificities of Chemistry and Anthropology.

This paper comprises four sections in addition to the introduction and the conclusion. The introduction provides the background to the study. In the first section, substitution, as a grammatical cohesive device, is defined, with an emphasis on its place in the linguistic context and on its realizations. Section 2 reviews the notion of context in SFL and describes the two genres, i.e. Commentaries and News, and the two disciplines under study, i.e. Chemistry and Anthropology. Section 3 provides an account of the methodological design adopted in this research, the statistical tools and the scheme of analysis. Section 4 presents the findings coupled with the interpretations. Finally, the conclusion summarizes the main findings as well as the implications, and displays recommendations for future research.

1. Substitution in the linguistic system

SFL is construed along three lines of meanings, namely the interpersonal, the textual and the ideational (Halliday & Matthiessen 2014), with cohesion being perceived at the textual level (Halliday & Hasan 1976, 27). In fact, cohesion is not classified as a structural relation since it is "unrestricted by sentence boundaries, but it is rather seen as a presupposition of what has been mentioned beforehand" (Halliday & Hasan 1976, 14). That is, it offers the resources by which structurally unrelated linguistic devices become joined, building on the language user's semantic construal of the situation (Halliday & Hasan 1976, 27). Henceforth, these cohesive resources pertain to "the total meaning potential of the language, having a kind of catalytic function in the sense that, without cohesion, the remainder of the semantic system cannot be effectively activated" (Halliday & Hasan 1976, 28). As a semantic resource for meaning construal, cohesion can be "expressed through the stratal organization of language" (Halliday & Hasan 1976, 5), with the semantic stratum activating the lexico-grammatical choices which are, in turn, represented through orthographic or phonological forms (Figure 1).

Figure 1. Cohesion within the structural organization of language

meaning   (the semantic system)

wording   (the lexicogrammatical system, grammar and vocabulary)

'sounding'/writing   (the phonological and orthographic systems)
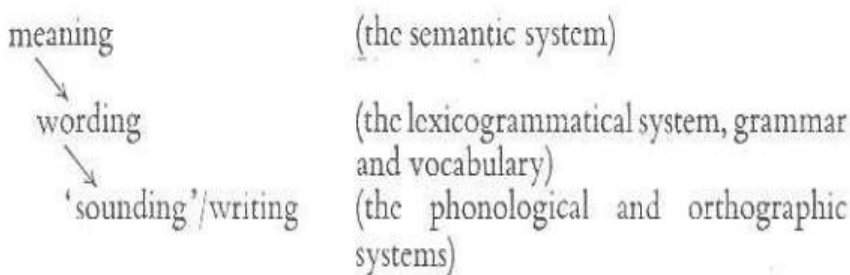
(Source: Halliday & Hasan 1976, 5)

Cohesion operates at two levels, namely grammatical cohesion and lexical cohesion; while grammatical cohesion refers to the structural organization of the message, lexical cohesion relates to the lexical content (Klimova & Hubackova 2014, 664). Grammatical cohesion involves reference, substitution and ellipsis, yet conjunctions lie in the borderline between grammatical and lexical cohesion (Klimova & Hubackova 2014, 664). Given that

scant attention in the literature has been given to grammatical cohesion and in particular to substitution, the present research attempts to give an in-depth analysis of this cohesive device.

At the linguistic level, substitution can be perceived as a relation of wording within the lexico-grammatical rather than the semantic system, since it expresses a link between different linguistic features, including "words or phrases" (Halliday & Hasan 1976, 89). That is, it forms structural links in discourse through replacing "a presupposed item" by another substitute form (Möller 2015, 32). Such a structural shift has semantic implications, with the substitute item representing "general, class identity but at the same time non-identity of the actual referent" (Möller 2015, 32). In other words, the substitute does not serve as a means to reiterate the antecedent, but it functions as a way to create specific types of relations, with particular stylistic effects. As Källgren (1978, 150) puts it, "[t]he content of a text is not merely an enumeration of referents; an important part of the content is the relations that the text establishes between the referents". The substitute item can, for instance, express a relation of contrast, whereby it refers to the same entity in the external world as is the antecedent, yet it implies a change in the state of affairs from an old entity expressed by the antecedent to a new entity conveyed by the substitute, as is illustrated in (E1):

E1. I lost my <u>boots</u>. Now, I have new <u>ones</u>. (Möller 2015, 33)

Substitution can be classified into three main categories, namely nominal, verbal and clausal, building on the grammatical function of the substitute (Halliday & Hasan 1976, 90). For instance, if the substitute replaces a clause, it is classified as clausal (Table 1).

Table 1: Substitution Types

Nominal Substitution	E2. She'll eat the grapes – especially the seedless ones.
Verbal Substitution	E3. I'd be happy to **help**, but I can't **do** Mondays
Clausal substitution	E4. Do you think **we'll get the grant**? Hope **so**.

(Source: Waring 2017, 49)

Since substitution contributes to the construction and the recreation of meaning, it represents an important structural device empowering academic writers in developing the message and conveying the intended stylistic effects. The choices of this structural device are hypothesized, in the present research, to change depending on context, namely from one genre to another and from one discipline to another.

2. Context: genres and disciplines

SFL builds on the argument that language functions within context, since it is "theorized, described and analyzed within an environment of meanings" (Halliday & Matthiessen 2014, 322). The context, thus, serves as the repository for semantically construing situations through lexico-grammatical selections (Halliday & Matthiessen 2014, 29). On the cline of instantiation, context ranges from the instance pole, i.e. the context of situation, to the potential pole, i.e. the context of culture (Halliday & Matthiessen 2014, 32-33). Along this cline, genre can be perceived as text type, given that it represents "a more particular, regularized social activity (or situation type) of an institution" (Mwinlaaru 2017, 6). The present research has taken, as its context, MN and JC, two genres which have received scant attention in the literature. Both MN and JC have played a major role in disseminating scientific knowledge, yet they have a different target audience, a fact which sets the ground for exploring whether generic conventions determine the choices of substitution devices.

MN, as a popular genre, attempts to disseminate the latest news and scientific discoveries (Sumner 2003, 87), yet, unlike academic journals, it addresses a larger readership, with less sophisticated jargon, less complex lexico-grammatical patterns and more appealing visual aids (Parkinson & Adendorff 2004). This genre, thus, aims at engaging more the readership, as it surpasses "the dryness of mere facts and enables readers to understand reality more simply and quickly" (Rodrigues Cardoso 2018, 2). Such distinguishing features may be attributed to the fact that this genre is created "to help busy readers with only limited reading time to learn of the most important (or at least interesting) news, trends, and people" (Sterling 2009).

Unlike MN, Journal Commentaries provide comments on previously published articles (Berterö 2016, 1). They represent an outlet for researchers to discuss the latest scientific discoveries and to bring their own views. For instance, in commentaries, authors are expected to be knowledgeable in their research fields and are "eager to present a new and/or unique viewpoint on existing problems, fundamental concepts, or prevalent notions, or want to discuss the implications of a newly implemented innovation" (Berterö 2016, 1). They may also reflect upon future research venues (Berterö 2016, 1). Thus, Journal Commentaries are likely to rely more on "academic evaluation" (Hyland & Diani 2009) than other genres including, for instance, research articles or abstracts, as authors invest more in negotiating their personas and developing their interpersonal relations in the community.

Generic conventions can be further fine-tuned according to the disciplinary specificities of each community since various disciplines are characterized by "different views of knowledge, different research practices, and different ways of seeing the world, and, as a result, investigating the practices of those disciplines will inevitably take us to greater specificity" (Hyland 2002, 389). The present research has selected two disciplines, namely Chemistry and Anthropology, with the first one pertaining to the hard domain of knowledge and the second one belonging to the soft domain. Knowledge in the hard domain is "more formalized" and can be codified, but knowledge in the soft domain is more tacit and cannot be easily formalized (Malhotra 2001, 217). Chemistry and Anthropology are two disciplines representative of the hard-soft continuum (Hyland 2004). While the hard/ soft distinction has received much criticism in the literature (Fortanet-Gomez 2013, 139), the present study aims at finding whether the different natures of the disciplines may account for differences in the distribution of substitution types.

3. Methodology

This study will investigate how authors of MN and JC cohesively develop their messages through the analysis of the grammatical realizations of substitution in Chemistry and Anthropology. To this end, two parallel sub-corpora representing MN and JC covering two disciplines, namely Anthropology and

Chemistry, are created, with 25 News and 15 Commentaries, published in 2022. The two sub-corpora are equalized in number, totaling 42 536 words. Only articles written by American authors are selected for the present research, following Wood's criteria (2001). That is, an article is chosen if the first author has an American surname and is affiliated with an American institution. The selected articles are taken from the Proceedings of the National Academy of the United States of America (PNAS), an indexed journal, and from Science News, an American magazine disseminating popular scientific articles to a wide readership.

The corpus is annotated for the choices of substitution using the computational software, i.e. the UAM CorpusTool (Version 6.2). Two layers of analysis are created, with the first one involving the genres and the disciplines and the second one being used for the identification and classification of substitution types (Figure 2).

Figure 2 : Layers of analysis
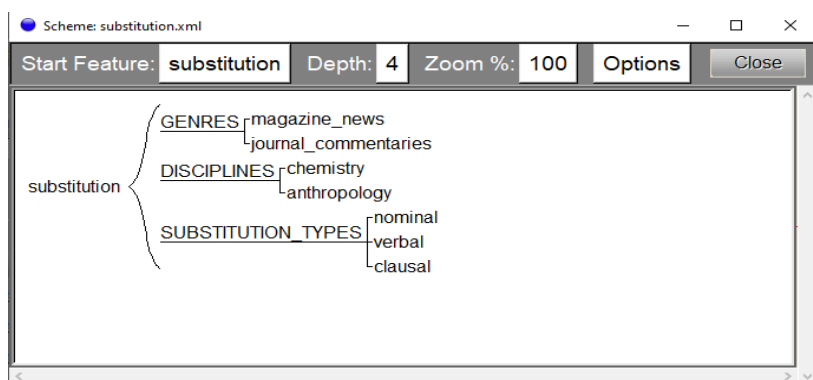
After annotating the corpus, an inter-rater reliability test consisting of 10 samples of substitution is sent to two researchers to validate the data. The results of the test have shown 90% agreement.

The UAM CorpusTool generates quantitative frequencies in the corpus as a whole and across sub-corpora, to which a statistical test is applied. In fact, the chi-square test is used to explore whether there is a correlation between genres and the choices of substitution on the one hand and between disciplines and these choices on the other hand. The quantitative findings are, then, interpreted to meet the research objectives.

4. Results and Discussion

The analysis is carried out at two levels, with the first one attempting to explore the extent to which the lexico-grammatical choices of substitution are determined by the generic conventions of MN and JC. As for the second level of analysis, it aims at studying whether these choices are also determined by disciplinary specificities.

4.1. A cross-generic analysis of substitution

A closer look at the distribution of substitution across MN and JC reveals that substitution is not as frequent as other grammatical cohesive devices including reference, ellipsis and conjunctions, as shown in Table 2.

Table 2: Frequencies of cohesive devices in News and Commentaries

	MN	JC
Substitution	45	19
Ellipsis	92	31
Conjunction	768	680
Reference	2254	1975

The results of the chi-square test indicate that there is an association between the genres and the cohesive devices including substitution. (The chi-square statistic is 29.597. The p-value is 0.000001. The result is significant at $p < .05$.). As indicated in Table 2, substitution is the least frequent cohesive device, a finding consistent with previous claims in the literature (Jayanti & Hidayat 2021; Suningsih et al. 2021; Sari et al. 2022), showing that this infrequency can be seen as a global probability since it goes beyond contexts.

Such an infrequency may be related to the higher cognitive load of substitution, as is explained through (E5):

*E5. "We now have a new powerful tool available for making organic molecules," **one** that can be drastically more efficient and greener than previous methods.*

In (E5), although the substitute "one" is postmodified by a relative that clause, its meaning can only be figured out with reference to the antecedent "a new tool available for making organic molecules". The language users should make more cognitive effort (Suningsih et al. 2021, 357) whereby they anaphorically construe the meaning of the antecedent and work out the link between both the antecedent and the substitute so as to ensure a sound understanding of the message. The lowest frequency of substitution may, thus, be attributed to the fact that it requires more cognitive processing of the message (Suningsih et al. 2021, 357), compared with references and conjunctions, and can lead to "both grammatical and lexical ambiguity" (Ali 2023, 745), which explains why authors avoid using them. This avoidance strategy can be accounted for by the generic conventions of MN and JC, both of which are presented in the written rather than oral format where the authors have recourse only to verbal cues to explain the message. That is, the authors cannot rely on non-verbal devices such as hand gestures to explain the relation between the substitute and the antecedent and to check the receivers' understanding of the message.

Another reason which may explain the infrequency of substitution compared with other cohesive devices is the indeterminacy of its meaning, as is revealed through (E6):

*E 6. Fried and Boxer (18) have developed the experiment and theory to understand how a polar vibrational probe molecule, such as **one** containing a nitrile group, can be used to determine the electric field in the space surrounding the probe molecule.*

In (E6), the substitute "one" is an indefinite pronoun, with an indefinite reference in the external world. It is "intrinsically uninformative because [its] semantic content is quite minimal in comparison to most other words" (Haspelmath 2004, 187). Considering that substitution is characterized by indefiniteness (Alarcon & Morales 2011, 120), it does not provide a solid ground for authors to support their arguments. Accordingly, the infrequency of substitution may reveal writers' intents "to be wordy to provide more evidence for arguments" (Alarcon & Morales 2011, 120) in MN and JC, in both of which writers attempt to convince the readership of the validity of their claims.

Across genres, the analysis has revealed that authors in MN draw more on substitution than those in JC. Given that substitution is viewed as a feature of spoken discourse as it is more likely to occur in conversations (Chimombo & Roseberry 2013), it serves more the interests of News writers since they operate within a popular genre. In fact, the MN genre is more characterized by orality rather than literacy, as is evidenced by the lower frequency of academic words compared with JC (Figure 3). In fact, the higher the number of academic words is, the higher the level of the literacy of the text is (Snow & Uccelli 2009, 112). Accordingly, the higher level of orality in MN may explain the higher frequency of substitution in this genre.

Figure 3: Academic Word Use (Generated by the UAM CorpusTool)
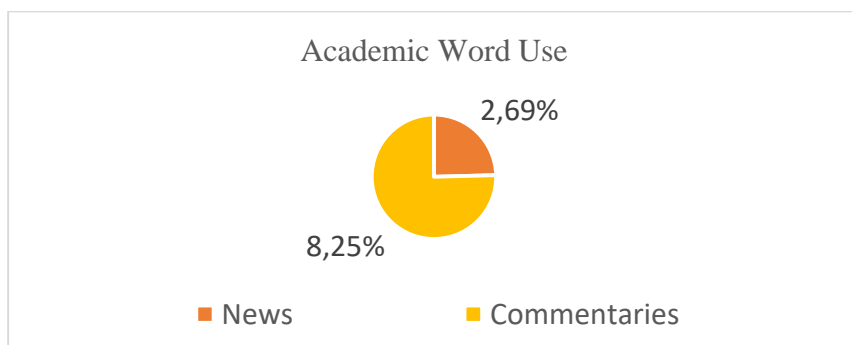
The general category of substitution is found to be correlated with MN and JC. Differences between the two genres are also noticeable at finer categories including the nominal, verbal and clausal types of substitution.

Table 3 shows that all the types of substitution are more frequent in MN than JC, with writers' preference for nominal substitution first, followed second by verbal substitution and third by clausal substitution.

Table 3: Substitution realizations across genres

Substitution type	MN	JC	Sig
Nominal	30	9	0,0039
Verbal	10	7	0,685
Clausal	5	3	0,626

The results of the chi-square test show that there is an association between the lexico- grammatical choices of nominal substitution and the two genres, namely MN and JC, yet the chi-square p value is not significant when it comes to verbal and clausal substitution. These findings partially run against previous studies claiming that associations between genres and lexico-grammatical choices are more visible at finer levels of delicacy (Choura 2019; Teich 1999) since significant relations are figured out only at one lower level of analysis. These insignificant statistical results may also be related to the low frequencies of verbal and clausal substitution in the present corpus, making it difficult to detect patterns and generalize the findings.

In both sub-corpora, nominal substitution is the most frequent cohesive device, a finding which may be related to a global probability in the English language. In fact, compared with other word categories, nouns represent "the most frequent lexical word class" (Biber et al. 2007, 65). It may also be accounted for by the nature of the scientific register where technical words are construed through nominalization (Halliday 2004, 127). Thus, nominal substitution may serve as an important device for replacing technical words and building textual cohesion, as is explained through (E7).

*E7. While most hydrogen bonds in water are weak, strong hydrogen bonds similar to the **ones** found in the bifluoride ions can form in water that contains excess hydrogen ions.*

In (E7), the nominal substitute "ones" replaces the noun phrase "hydrogen bonds" and, thus, it allows writers to avoid repeating technical words by extending the semantic domain of one phrase to another. Therefore, by opting for nominal substitutes, the writer utilizes less technical jargon. Across JC and MN, nominal substitution is more frequent in MN than JC. Given that substitution reduces the level of technicality, it allows authors in MN to appeal to a wider audience and comply with the specificities of MN, a popular genre targeting a greater number of readers and involving a lower degree of technicality than JC (Parkinson & Adendorff 2004).

Infrequent in both sub-corpora, verbal and clausal substitutions are slightly higher in MN than in JC. Examples of both substitution categories are provided:

*E 8. Proteins, which preserve in teeth and bones better than DNA **does**, contain amino acid sequences that distinguish between living and fossil species of various animals…*

*E9. The new data suggest that, for Lucy's species, "infant brain size [relative to that of an average adult] may have been proportionally even smaller than in human infants," says biological anthropologist Zachary Cofran of Vassar College in Poughkeepsie, N.Y., who did not participate in the new study. **If so**, that pattern would strongly point to an extended period of brain growth for A. afarensis.*

In (E8), the substitute "does" replaces the verb phrase "preserve in teeth and bones", consisting of a predicate and an adjunct of place. The verbal substitute is anaphoric in the sense that it refers to a previous verb phrase (VP). It is "a structural relation linking the presupposed to the presupposing clauses" (Halliday & Hasan 1976, 128). In (E9), to understand the meaning of the clausal substitute "if so", the reader needs to process the previous sentence. Even though verbal and clausal substitutions result in a more concise packaging of information, thus meeting the economy principle of language, it requires more cognitive effort to process these substitution types due to the long and complex structure to which the substitutes refer. That is, the longer the anaphoric structure is, the more difficult it is to understand the message. Given the higher cognitive load associated with these substitution types, they are unlikely to be used in JC and MN characterized by less complex structures (Parkinson & Adendorff 2004) than other forms of scientific knowledge dissemination like academic research articles and book reviews.

The study has shown that nominal substitution is the most preferred alternative for authors. Verbal and clausal substitutions are classified second and third, respectively. This finding corroborates Alarcon and Morales's study (2011) investigating undergraduate students' argumentative essays in Philippines. This finding is, however, inconsistent with Akmilia et al.'s research (2022) suggesting the reverse order when analyzing conference

papers. The present study findings are also partially consistent with Querol-Julián's analysis (2003) of English literary texts in which verbal substitution is the most highly present, followed by nominal substitution which is slightly less frequent and finally clausal substitution which is rated third but is more prominently present than it is in the current study. The discrepancies in the distribution of substitution types may be related to the nature of the genres under study. Compared with research articles and literary texts, JC may seem less demanding when it comes to literacy and the textual unity of discourse, which may be explained by the fact that it has a less prestigious position since it is perceived as a forum for knowledge negotiation (Lavid et al. 2012). Since this academic genre represents a space for presenting multiplicity of perspectives on a specific topic for the sake of defending the author's stance, verbal and clausal substitutions may not serve as suitable resources for argumentation and persuasion. That is, verbal and clausal types of substitution require more cognitive processing compared with nominal substitution since both of them encompass the replacement of more than one constituent and, thus, they may form a source of confusion and distraction for language users when used in JC to describe the variety of perspectives in the research community. These two types of substitution are also not frequent in MN, a genre presenting the latest scientific discoveries mainly addressed to an audience of laypersons (Parkinson & Adendorff 2004). This "inexpert" readership may face difficulties in decoding long structures and establishing connections between the substitute and the corresponding anaphoric structure.

To sum up, this subsection has revealed that there is an association between the choices of substitution and in particular nominal substitution and the generic conventions of JC and MN. These choices are to be explored in the next subsection for any association with disciplinary rituals.

4.2. A cross-disciplinary analysis of substitution

This subsection attempts to analyze the distribution of substitution types across disciplines. A close look at Table 4 reveals that substitution has an association with the two disciplines under study, namely Chemistry and Anthropology (The chi-square statistic is 14.166, p-value = 0.0026. The result is significant at p <

.05.). This finding gives credence to the claim that lexico-grammatical choices are associated with disciplinary rituals (Choura 2019).

Table 4: Frequencies of cohesive devices across Chemistry and Anthropology

	Chemistry	Anthropology
Substitution	42	22
Ellipsis	79	44
Conjunction	771	677
Reference	2164	2065

As indicated in Table 4, nominal substitution is more frequent in Chemistry than Anthropology, which may attributed to the limited number of variables in Chemistry. In fact, substitution has been shown to be a cohesive device which results in the indeterminacy of meaning and requires language users to work out semantic relations between the substitute and the anaphoric antecedent [See 4.1.]. It may, thus, better serve the purposes of writers in Chemistry. Writers in this hard discipline tend to measure relations "between a limited number of controlled variables" (Hyland 1998, 448), yet those in Anthropology, a soft discipline, are more likely to explore a variety of variables which are "more tenous[ly]" connected" (Hyland 1998, 448). Given that researchers in Chemistry tend to focus on a well-defined set of variables, processing substitution and working out connections between the substitute and the antecedent become easier for the readership.

Taken together, this subsection has demonstrated that substitution is associated with the disciplinary rituals of Chemistry and Anthropology. These two disciplines will be further analyzed for the distribution of substitutional types to explore whether they are also related to disciplinary rituals.

Table 5 shows that there is a correlation between the distribution of nominal substitution and the two disciplines. However, there is no significant correlation between the other finer levels of analysis, i.e. verbal and clausal substitutions, and disciplinary rituals.

Table 5: Distribution of substitution types across disciplines

	Anthropology	Chemistry	Sig
Nominal	12	27	0,0311
Verbal	5	12	0,1253
Clausal	5	3	0,4100

Nominal substitution is found to be more frequent in Chemistry than in Anthropology. This difference can be attributed to the way in which the variables are encoded in Chemistry, as is explained in (E.10):

E10. *Long-lasting blue is relatively rare among dyes, and this* ***one*** *is neither like the indigo (*SN: 9/14/16) *used in denim jeans nor an anthocyanin, such as those that show up in many flowers* (SN: 7/26/17).

In (E10), the reader cannot decode the meaning of the substitute "one" without going beyond the noun phrase "this one" and processing the noun phrase "Long-lasting blue" in the previous clause. Hence, the meaning of the nominal substitute cannot be locally processed. Considering that substitution is a grammatical cohesive device, the understanding of which transcends the local context of its occurrence and can be figured out only through going beyond phrasal, clausal or sentential boundaries, it can be better used to report implicit relations between variables in Chemistry. In Chemistry, through a well-designed methodology, researchers establish relations between variables and present "the fact of acts of research and their outcomes" (Hyland 2004, 72) to contribute to the existing body of knowledge in the literature since knowledge in this discipline is cumulative. The relations between the variables are, thus, likely to be encoded in a more implicit way. However, substitution may render the text more confusing in Anthropology, a discipline where "relations between variables cannot be presented as uncontroversial" (Choura 2019, 11). Therefore, rather than substitution, explicit reference for the variables may make the text more accessible to the readership.

The fact that verbal substitution in Chemistry is almost as twice as that in Anthropology may be related to the nature of enquiry in Chemistry, wherein results are the outcome of scientific experiments (Hyland 2004) and, thus, a detailed description of the researchers' actions is required to ensure that the results be

replicable. Considering that verbal substitutes take the form of "do" in different tenses in the present corpus, they are useful for reporting the researchers' actions. On the other hand, verbal substitution is not frequent in Anthropology, where knowledge does not come out of the results of laboratory experiments, but depends upon the researchers' argumentation and reasoning (Sellami-Baklouti 2011). This process of arguing becomes necessary in a discipline where knowledge is not cumulative but follows "reiterative routes" (Hyland 2004), making the process of the researchers' acceptance in the community contingent upon the researchers' own arguments and, therefore, grounded in the researchers' own subjectivity.

Clausal substitutes in Anthropology are more frequent than those in Chemistry, which may be attributed to the higher number of clause complexes in this soft discipline (Sellami-Baklouti 2011). Given that clause complexes relate to the interdependency of one clause on the other, clausal substitution may serve as a resource for writers to avoid redundancy through replacing subordinate clauses in clause complexes by clausal substitutes while at the same time shortening the sentence.

Conclusion

The study has shown that generic conventions and disciplinary specificities can determine the lexico-grammatical choices of substitution. These findings are in line with previous research on lexico-grammatical realizations (Sellami-Baklouti 2011; Choura 2019). This study has also revealed that nominal substitution is the most common form in the corpus. The frequency of nominal substitution may be related to the fact that it encompasses the substitution of a compact chunk of discourse rather than a long and complex structure and, therefore, recovering information from a previous context becomes an easier task for the readership. Across genres, nominal substitution is more frequent in MN where it plays an important role in decreasing the technicality level of the text and making it more familiar to the readership since it is a popular genre. Across disciplines, nominal substitution is more frequent in Chemistry, which may be explained by the lower number of variables and the implicit way of encoding variables in this

discipline characterized by methodological rigor and the cumulative nature of knowledge.

This study reveals that SFL is as a valid methodological approach to explore the lexico-grammatical choices in a given context and, thus, it can empower descriptive analyses of the linguistic system. It may also empower genre theories as it can enlighten writers about the conventions of each genre and discipline, which can help them comply with these norms and encourage them to operate not only within the "prestigious" academic research article genre but also within other relatively new genres like JC. The findings of this study can, in addition, further enhance developments in genre-based pedagogy as it may inform novice researchers and journalists enrolled in EAP courses about the generic conventions of MN and JC through explicit instruction and, therefore, improve their writing practices. They can, furthermore, empower Artificial Intelligence (AI) as they can contribute to developing models of genre detection and classification as well as models for automatically generating texts according to generic conventions. Interestingly, research on substitution in other genres such as Journal Perspectives and Book Reviews and other disciplines including Medical Science, Biology and Psychology can be more enriching, providing more insights into substitutional patterns in different contexts.

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