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Genre analysis of English article abstracts in Ecuadorian and North American journals: A contrastive study

Ph.D. Dissertation

by

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ABSTRACT

In the era of online searches and digital libraries, the importance of research article abstracts (RAAs) is perhaps unquestionable. As a result, cross-linguistic research, particularly in the field of corpus linguistics has received considerable attention as it explores how scholars introduce their studies in a convergent genre, namely abstract. A significant body of research has addressed the variation of abstracts in terms of content and structure across languages and disciplines. The current dissertation compares abstracts published in North American and Ecuadorian journals (NA&EJ), considering humanities and sciences. The corpus analysis consisted of 240 abstracts written in English: 120 in North American and 120 in Ecuadorian journals. Sentences were the unit of analysis. The top-down and bottom-up approaches identified the rhetorical moves and drew the boundaries between them. The English corpora went through software-driven text analysis. The L2 syntactic complexity analyzer (L2SCA) gauges the syntactic complexity while the Lextutor vocab-profile measures the lexical richness of abstracts. It used the SPSS statistical tool to analyze the output of the linguistic analyzers. Results showed an emergent rhetorical organization of eight moves with four recurrent moves in abstracts of NA&EJ. There was significant variability in the overall sentence complexity, amount of subordination, and degree of phrasal sophistication between NA&EJ. Notwithstanding, though there was variability in the means of syntactic complexity in NA&EJ abstracts, no statistical differences were found between fields and between the four syntactic dimensions across disciplines at the level of significance ($\alpha = .05$). There were differences between the lexical density and lexical sophistication, but not in the proportion of lexical diversity. This study has shown that although abstracts in NA&EJ followed a similar rhetorical structure, the frequency of the moves varies across disciplinary fields. Even though abstracts in NA&EJ used extensive vocabulary and diverse types of sentence structure, resemblant linguistic outcomes and cohesive means emerged regardless of their publishing context and disciplines. This study affords valuable insights to investigate the recurrent rhetoric, lexical and syntactic structure used in abstracts. Ideally, research outcomes will uncover the actual use of language to discuss linguistic implications and provide pedagogical applications for academic writing.

Key words: rhetorical moves, research article abstracts, syntactic complexity, lexical richness

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Dissertation declaration

I declare that the present dissertation is my individual and original work under the supervision of Dr. Márta Lesznyák. I also state that I haven't submitted any part of this work for any other degree or award or any other qualification with my name at this university or any other institution. All previous studies were cited and referenced in this thesis. Apart from the due references, this dissertation is my own work. Some parts of this text shall appear in my publications that were done concurrently with my dissertation.

I agree that this final version of my thesis is made available on the university's research repository, the research engines, and the university.

Szeged, 27-03-2023

Rodrigo Tovar Viera

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CHAPTER I

INTRODUCTION

1.1 Context of the Study

English language skills, particularly writing abilities are today fundamental to academic and non-academic success (Hyland, 2018). It has gained the attention of graduate students, researchers, and policymakers who interact with each other across nations and cultures (Connor, 2004; Connor & Rozycki, 2013). In the globalized world of scientific communication and information explosion (Swales & Feak, 2009), accurate writing either in the first (L1) or in the foreign language (FL) has been strictly linked to the capacity of conveying complex ideas in an ease and precise way. Writing accurate texts is, according to Brumfit (1984), the usage of linguistic structures and the control that these structures are grammatically produced in the text. Clearness in producing accurate language comprises some agreement on the appropriate frames of reference for certain fields of discourse, and this suggests the arrangement of more or less intelligible schemes, as long as they are considered useful conventions (Brumfit, 1984). The importance of writing grammatically correct structures cannot be underestimated for other dimensions, such as discursive practices; rather both build and give meaning to the text. That is why academics across disciplines, on one hand, value grammatical accuracy in assessing written competence. While in academic circles, in contrast, it is part of the assessment criteria applied to accept or reject manuscripts.

Support for such a view, writing accurately, therefore, helps not only to disseminate information but also to publish scientific literature that reports the advancement of science on empirical and theoretical studies. It is well known then that "the emergence of English as a scholarly lingua franca and the cross-border movement of spreading knowledge" has led to some scholarly and non-scholarly writers learning "new literacy and more specifically new discourse practices" to internationalize their research studies and place them among the academic discourse communities (Hyland, 2018: 384). As English has long become an international language, much research on the usage of English in academic and professional contexts has been undertaken. It is estimated that approximately 2.220,000 studies on research articles (henceforth RAs) have been published in English, over 67% of the scientific information in English is published in academic journals and that 90% of RAs written in another language includes English abstracts. The hierarchical use of English in the local or international arena, today, is evident. Indeed, the number of scientific papers written by non-Anglophone speakers and published in non-Anglophone speaking countries is on increase day-to-day

(Ferguson et al, 2011). Thus, in the last two decades, research has documented that in the science and humanity fields, English accounts for 90.7% and 82.5% of the publications respectively. All these indicate that with a growing number of studies published every year (in the last decade approximately 222 thousand RAs), English has evolved as the language for the scaffolding of scientific knowledge within the academia.

Research on scientific discourse has gone beyond the description of scientific written products (e.g., Hyland, 2000, 2004; Banks, 2008; Halliday & Martin, 1993) up to the analysis of particular disciplines (e.g., Lorés, 2014 on sociology; Suntura & Usaha, 2013 on applied linguistics) and genres (e.g., Swales 1981, 1990, 2004), not only to characterize its variation, but more widely, the language use as such. Halliday and Martin (1993: 8) argue that scientific discourse in particular highlights "the constructive potential use of language as a whole". As is known, "among many possible alternatives to represent scientific knowledge" (e.g., books, theses, dissertations, lectures), RAs became the most valuable sources of information about social practices within discourse communities (Halliday & Martin, 1993: 31). In other words, scientific discourse written in English has a predominant production over the publications worldwide. The relative merit placed to scientific discourse has increased extensively the proportion of RAs and the abstracts written in English across disciplines and fields. Even journals publishing articles in many languages other than English accompany the articles with the English translated version of the L1 abstracts (Kafes, 2012). This is mostly because research article abstracts (from now on RAAs) have gradually become an integral part of the RAs. In this way, RAAs are considered today as a mandatory component for most local or international scientific journals. Abstracts, therefore, due to the amount of scientific knowledge published annually, function as selective sieve shakers. In general, abstracts show readers that "the paper as a whole is worth reading and has something new to report" (Hyland, 2000; Tovar, 2019: 75).

Accordingly, a considerable amount of literature has often been focusing on analyzing RAAs from various aspects and interests within academic discourses (Swales & Feak, 2018). For example, the rhetorical organization (Can et al., 2016; Lorés, 2004; Hyland, 2000), and their linguistic realizations, including syntactic complexity (e.g., Ai & Lu, 2013; Lee, 2018) and factors affecting their syntactic complexity (e.g., Lu & Ai, 2015; Ortega, 2003), lexical richness (e.g., Laufer & Nation, 1995; Meara, 2005; Crossley et al., 2016), and the writing quality (e.g., Yang et al., 2015; Lu, 2017). Most of these contrastive studies have documented that prior L2 knowledge comes to influence the ways of arranging ideas and producing information in English. Furthermore, studies on the surrounding publication context have shown different composing patterns and linguistic variation (e.g., Kafes, 2012; Martín-Martín,

2013; Hyland & Tse, 2005; Lorés, 2014; Loutayf, 2017; Hyland, 2015). These works have collectively brought useful insights for "reflecting upon a variety of aspects of academic writing, ranging from style to some cultural, and rhetorical trends" (Swales & Feak, 2018: 1), by highlighting how generic structures follow discursive practices and how these practices influence the rhetorical selection and use of language.

Despite the large number of published studies, RA abstracts to date, particularly in Ecuador, continue being a neglected part-genre in the field of applied linguistics among discourse communities. This is because abstracts are sometimes considered written compositions as the result of cutting and pasting text from the sections of the RAs. Such an erroneous perception makes abstracts of not much research interest, undervaluing their communicative function, and, as a result, some writers are unaware of the potential effect that abstracts have in introducing readers to the scope of the paper. Though a considerable amount of literature has been published in Latin America (e.g., Tapia and Burdiles, 2012; Parodi, et al. 2014; Quintanilla, 2016) on the discourse and pragmatic analysis (Beke, 2008) and lexico-semantic relation (Venegas, 2006) of texts, up to now, data about the analysis of RAAs is limited in Ecuador. In general, less research has concentrated on analyzing RAAs written in English or Spanish (e.g., Garcia-Calvo, 1999; Stagnaro, 2015). This research gap is one of the central motivations for the present study. Another primary motivation for this study is gained insight into the rhetorical organization and linguistic realizations of English RAAs in direct comparison with North American and Ecuadorian journals (henceforth NA&EJ). These two motivations thus shape the main goals of this research, as described in Section below (1.3).

1.2 Statement of the Problem

As stated above, there is a large body of research reporting variation in the written production of RAAs between disciplinary fields, and languages. Nonetheless, differences and common grounds in the rhetoric and linguistic realizations of the abstracts published in NA&EJ have not yet been established. Although the researcher has conducted pilot studies to explore the feasibility of the comparison and found out diversity in following Hyland's rhetorical move model, such findings need to be generalized in large corpora (e.g., Tovar, 2018; 2019, Tovar et al., 2019; Tovar 2020). These pilot studies allow the researcher to conclude that abstracts from most scientific areas (education, sociology, electronics, and agronomy) follow the same, or at least very similar, scientific written structures by including cohesive connectors and linkers.

Research on this type of scientific discourse (abstracts), therefore, is noteworthy, either for the representation of this variation or using language as such. In the context of researching

scientific discourse published on journal research article abstracts, the focus was on how abstracts are to be positioned in a broader linguistic area. For instance, abstracts to Swales (1990) and Hyland (2004) are an important *part-genre* of RAs. Jordan (1991: 508), meanwhile, classifies them as a restricted genre, limited in extent, within the *wider genre of description*. Lorés (2004:), by contrast, describes abstracts as a genre in itself that currently shares the sections of the RAs but varies in its rhetorical structure. In the same way, Martín-Martín (2013, 2003) defines genre as the *context of culture*, wherein language is used to express ideas. In addition to this, while Hyland (2004) understands genre as *schema*, Swales (1990: 58) states that a genre "comprises a class of communicative events where its members share some set of communicative purposes".

Although, behind this literature, there is no "agreement on the concept of genre itself" (Hyland 2009: 26), those approaches constitute the scaffolding of the context for linguistic studies to address the issue on the linguistic relationships between RAAs. Accordingly, this PhD dissertation, in particular, shifted from how the rhetorical structure of abstracts is organized (e.g, Hyland, 2000, 2004; Martín-Martín, 2003; Lorés, 2004) to the linguistic realizations of those structures (e.g., Hyland, 2018; Lorés, 2014; Ortega, 2003; Martín-Martín, 2005), and how the rhetorical organizations and their linguistic realizations (e.g., Van Bonn & Swales, 2007; Tankó, 2017; Pho, 2008;) differ with their respective context of publications, as of North American and Ecuadorian journal abstracts (hereinafter NA&EJs).

1.3 Research Objectives

Well-structured abstracts written in English in today's global emergence of scientific communication have a decisive and significant impact on knowledge dissemination. Abstracts themselves, as Hyland (2004: 83) pointed out, have been a "rather neglected social artifact of disciplinary life". That is the case of Ecuador in particular, where an analysis comparing abstracts between disciplines and fields has been largely ignored by the linguistic and applied linguistic research. Informed by the scarce literature on this topic, the dissertation is considered necessary to act as a cornerstone for further research in these disciplinary fields in Ecuador. Therefore, the study is designed to compare English research article abstracts (education, sociology, electronics, and agronomy) published in NA&EJ along various lines (move structure, syntactic structure, and lexical sophistication) and across disciplines (humanities and sciences). In particular, to achieve the main goal, the current dissertation follows the specific objectives: (1) First, it defines the frequent rhetorical move structure and the recurring cohesive means associated with the cohesion of rhetorical moves used in NA&EJs across disciplines; (2)

Then, it describes the syntactic complexity of NA&EJs in the four disciplines. (3) Finally, it establishes the lexical sophistication of abstracts between NA&EJ across disciplines. Based on the cross-linguistic analysis, this dissertation discusses linguistic implications for writing abstracts of scientific papers.

1.4 Significance

The current research is based on corpus linguistics and applied linguistics because its results could be associated with closing one of the research gaps in Ecuador (comparing NA&EJs), and setting up implications (didactic and pedagogical) about one of the most difficult English language teaching problems for Spanish-speaking students (writing structured abstracts and academic texts). The research findings guide to figure out that the writing of Journal abstracts could be different in terms of move structure, syntactic structure, and lexical sophistication across disciplines (humanities and sciences) and publication context (North America and Ecuador).

The comparative study using corpora across disciplines allows for seeing the way that English as a lingua franca (EFL) is used by speakers of different mother tongues for whom the English language is the means of inter-community communication (Seidlhofer, 2011: 7). Thus, based on the results, we can discover, perhaps, differences and similarities, or document linguistic and pedagogical implications related to the rhetorical organization, syntactic structure, and lexical sophistication of RAAs published in NA&EJ. The results of the comparative analysis between NA&EJs not only report linguistic implication such as possible rhetorical, syntactic, and lexical variation, but also provide pedagogical implications for material developers and language instructors to consider when teaching English for practical and theoretical purposes.

Academic writing, as mentioned by Swales (1990, 2004) and Hyland (2000) in their pioneering studies, could be effectively taught using a writing model that integrates frequent rhetorical structures (or emergent moves) and patterns of the preferred lexical and grammatical choices taken from a corpus analysis. Writing models, then, are necessary when learning a second language and even when writing in the native one. In this sense, templates containing rhetorical and composing patterns can help language users to develop skills when writing short texts (in this dissertation, abstracts) and, later, longer related documents such as Ras, as suggested by Hyland (2000). This is doable because abstracts are physically embedded in the research articles and share structural similarities (Holtz, 2011: 175). This assertion is, according to Salager-Mayer (1990), quite clear-cut and compelling, emphasizing that an abstract should

embody the basic intellectual structure of the entire paper and include the moves "which are fundamental and obligatory in the process of scientific inquiry and patterns of thought" (p.370).

However, writing in another language is difficult; it requires knowledge of (national/international) standard scientific writing conventions. Particularly in Ecuador, which is the context of this research, most university students have organizational and grammatical skill difficulties with scientific texts (e.g., Perez, 2020; Villavicencio et al. 2018; Tamayo and Cajas, 2020; León and Rosero, 2018). For example, Tamayo and Cajas (2020), and León and Rosero (2018) evidenced students' difficulties in writing. On the one hand, students cannot write complex sentences, so the register used in their texts is basic and repetitive (Tamayo & Cajas, 2020). On the other, some students have problems understanding the steps needed to develop the text (León & Rosero, 2018). So, the use of writing models could help universities and language instructors in Ecuador to deal with:

> […] the need to reduce the high incidence of students with a low level of writing performance, their lack of skill to elaborate a short paragraph and even to build a sentence; this is to say, that their writings lack coherence and cohesion because of their *poor knowledge regarding the steps to be followed along the writing process* as it can be evidenced in the grading files. (León & Rosero, 2018: 39)

Among many factors affecting the production of written texts, Brown (2014) mentions that English language competence, which embraces lexical and grammatical competence and paragraph organization, influences the writing of accurate texts. The current research does not intend to analyze university students' writing papers to show their writing problems when producing those texts because there are already many types of research studies in Ecuador concerning this topic; good examples of this kind of research are Merchan, Carrasco, and Soto (2015) and the British Council (2015). In those research manuscripts, the researchers evaluate writing problems at all educational levels, including the university level; the results led the authors to conclude that writing proficiency in English is low in Ecuador. In the same way, Romero (2020) noted that EFL students reported difficulties in reading comprehension because their lexical knowledge is less than 1000-word families plus academic word list. According to Hu and Nation (2000: 405), this text coverage would affect the comprehension and production of various academic texts at different levels. She suggests the necessity of designing teaching strategies that contribute to improving academic writing and reading comprehension skills.

Although there are no final solutions to develop writing skills, guidelines that follow conventional teaching procedures, similar to the premises of Swales' theory and Hyland's move model, could be useful for novice writers in Ecuador and perhaps all over Latin America.

1.5 Research Questions

This thesis dissertation is designed to address differences and similarities in the rhetorical organization (moves) of RAAs and their linguistic realizations. To achieve this goal, the study follows a quantitative approach, which is structured in three main contrastive analyses of the corpus produced in NA&EJs. The first part concerns the rhetorical structure of abstracts across disciplines in NA&EJ, including move patterns and cohesive means displayed throughout the moves. It answered the following main research questions (RQ):

1. Does the rhetorical structure of English RAAs published in North American journals vary from those of the Ecuadorian ones? If they have no variation, what is the most frequent move structure in NA&EJs across the four disciplines, considering humanities and science fields?
2. What are the cohesive means observed in English RAAs which introduce moves and helps to hold moves cohesion in NA&EJs throughout the four disciplines, considering humanities and science fields?

The second part refers to the linguistic realizations of NA&EJs, namely the syntactic complexity (so-called structure). This analysis gauges the length of the production unit, amount of subordination and coordination, and degree of phrasal sophistication of abstracts when announcing the whole text. It aims at answering the following general questions:

3. Are there any significant differences between English RAAs published in North American journals and those published in Ecuadorian ones, considering the types of sentences and average sentence length?
4. Are there any significant syntactic structure (type of sentences) differences between English RAAs published in North American journals and those published in Ecuadorian ones, considering the humanities and science fields? If so, what are those differences?

The third part of the linguistic realizations relates to the lexical richness (so-called sophistication) of NA&EJs. This study measures the lexical variation (LV), lexical density (LD), and lexical sophistication (LS); the specific research questions here are the following:

5. Do English RAAs published in North American journals show higher or lower lexical richness than those published in Ecuadorian ones? If so, in what lexical indices do they differ from their Ecuadorian counterparts?

Finally, the functional analysis of the genre abstract for pedagogical applications and suggestions when writing abstracts of scientific papers discusses the following main question:

6. How could the linguistic and rhetorical move analysis be considered in the process of teaching English for Specific Purposes? If so, what possible linguistic and didactic suggestions could be proposed for writing abstracts of scientific papers?

1.6 Organization of the Dissertation

This doctoral dissertation is divided into five chapters. The first chapter briefly establishes the scope of the research, introduces issues on investigating academic written texts, describes the research objectives and significance, and define the research questions in carrying out the study.

Chapter two sets the scene by grounding an overview of the theoretical and empirical literature in some arenas related to the current doctoral dissertation, highlighting the genre theory in terms of research background and theoretical support, which are the basis for the dissertation and constitute the umbrella for the analysis of RAAs from the four different disciplines and two fields.

Chapter three reports on details the quantitative research methodology employed in the contrastive study. It presents the background of the result-oriented procedures by describing the research design, data, and sources of the data. Here, special emphasis is placed on explaining data collection methods and techniques for a quantitative analysis.

Chapter four presents the quantitative research outcomes obtained from the quantitative data analysis. These findings constitute two parts; the first part provides the research results concerning the rhetorical organization of RAAs in both Anglophone (North America) and non-Anglophone (Ecuador) publishing contexts. Part two describes the linguistic realizations of RAAs in NA&EJ across the four disciplines mentioned in previous chapters. This analysis reports the syntactic complexity of RA abstracts, on the one hand, and the lexical richness of those texts, on the other. This chapter is an overview of the research studies about rhetorical structure, syntactic complexity and lexical richness, parts of the chapter were published by Tovar (2018, 2019, 2021, 2022a, 2022b, Tovar et al. 2019).

Finally, Chapter five summarizes the relevant and significant research findings. It discusses the research outcomes from a quantitative perspective. Then, it defines linguistic implications (didactic and pedagogical), outlining didactic ideas, tips and suggestions for writing accurate academic texts. The quantitative analysis and writing suggestions respond to the main research questions about the rhetorical organization and linguistics realizations of RAAs addressed in the current Ph.D. dissertation. This chapter ends defining the limitations of the dissertation study and, finally, drawing conclusions and implications for further research on the genre RAAs, particularly in Ecuador.

CHAPTER II

REVIEW OF THE LITERATURE

Theoretical background

2.1 Introduction

The major goal of the doctoral dissertation is to analyze the rhetorical organization and the linguistic realizations of abstracts in scientific papers. A synthesis of relevant previous theories and studies is the stepping-stone of understanding perspectives and beliefs about the construction of RA abstracts. Thus, this chapter aims to review the basis of conceptualization in writing abstracts in academic scenarios (in a foreign or second language), describing the rhetorical move models, the linguistic knowledge including syntactic complexity (grammatical patterns), lexical richness (lexical choice), and cohesive means that encompass the head building blocks of written compositions (Hyland, 2002).

2.2 Conceptualizations of academic writing

Academic writing, on one hand, is like technology: it contains a set of sources and skills that must be functionally practiced and learned through experience, exposure, training, instruction and, overall, purpose. Stating that academic writing is like technology implies the only way that people learn to write is through conscious effort and much practice of the rhetorical conventions. Although the structure of the text itself contributes to, or is inferred from, the reader's perceived coherence, it should not be interpreted only by the set of formal structural patterns of organization, rather than from its social and cultural contexts.

Writing, on the other side, according to Hyland (2002: 48) is a way of socially constructing information by "expressing a culturally recognized purpose, reflecting a particular kind of relationship and acknowledging an engagement in a given community." In this way, writing, beyond the linguistic knowledge (e.g., lexicon and grammar) and discourse conventions (e.g., genre and structure), is a communicative act that reflects sociocultural practices adopted in specific contexts. Thus, writing reflects consensus on composing patterns employed in social and culture-specific contexts either in the mother tongue (L1) or in a foreign language (FL).

Accordingly, Grabe and Kaplan (1996: 239) underline the writing aspects in which L2 and L1 writers may show significant differences: (1) organizational preferences; (2) approaches to argument-structuring; (3) approaches to incorporating material from text into writing (e.g. style); (4) perspectives on reader-orientation, on attention-getting devices and on estimates of

reader knowledge; (5) uses of cohesive discourse markers –in particular, markers that are less facilitative and create weaker lexical ties; and (6) the ways over linguistic features of the text are used: for instance, "less subordination, more conjunction, less/more passivation, less noun-modification, less lexical variety, predictable syntactic structure and a simpler style" (Hyland, 2002: 55), which together influence and contribute to writing variation. From the facets of writing discussed in this section, the writing itself, and formal aspects of writing, deserve attention. It is because writers from different lingua-cultural backgrounds, and with a culture-specific educational training, at some point, show preference to certain forms of textual organization.

Writing is often considered as the most challenging of the four skills to be acquired because of its complex nature (Hapsari, 2011). Complexity, as suggested by Skehan (1996), refers to "the stage and elaboration of the underlying interlanguage system" (p. 46) wherein the communicative process becomes "more complex due to the use of an elaborated and structured language" (p.47). Some academics, particularly inexperienced writers have indicated that they face challenges and feel the need for a formal support structure to keep the writing momentum going (c.f. McGrail et al., 2006). Such challenges are seen as the restructuring process in producing arguments and statements that meet writing standards of the target language in terms of content, style and structure. However, writing quality is not limited to learning certain language features and mastering those dimensions. In essence, mental processes (i.e., memorizing words, lexical and grammatical choices), and other factors such as disciplinary affiliations may influence on the process of producing either spoken or written languages (Nosratinia, Abbasi, & Zaker, 2015: 21). Aside from the factors mentioned above, "self-regulation, self-esteem, creativity, and willingness to communicate" are one of the areas that constitute the individual differences and have huge impact in mastering language skills, as writing (c.f. Dörnyei, 2005: 162-211).

Although writing accurate texts, as defined above, is challenging, the appropriate rhetorical and lexical-grammatical choices allow to produce readable texts, rich in content and structure. This overview highlights the relevance of English command-writing conventions.

2.2.1 **Academic writing as a consecutive-innovative process.**

Academic writing, as stated above, is the professional discursive praxis resulting from the use of textual typologies, which integrates a progressive-consecutive and descriptive composition, to spread new ideas, possible theories, results, and advances and innovations in science. The latter, innovations, in this dissertation, is defined as the means to "introduce a new idea or to

re-introduce an old idea, perhaps in a new way or context"; that is to say, it "introduces, re-articulates, or creatively juxtaposes theories or practices, especially those not currently or commonly used" within a particular context (Bridgeford, Kitalong & Selfe, 2004: 5). Supported by the definition that puts emphasis on ideas and context, this Ph.D. study sees innovation as rhetorical and linguistic realizations that follow and adapt to particular stylistic situations, each with its own exigencies, affordances, conventions, preferences, and available means of persuasion.

Innovation, then, in academic writing plays an important role; it offers intellectual excitement and practical principles which are often transferable "across different disciplinary areas, time periods, and cultures" (Tierney & Lanford, 2016: 1). Thus, potential innovative ideas, in my contention, include (but are not limited to) the disciplines, genres, writing conventions, and discourse practices in local and international scientific communities. These are because the curriculum, teaching practices, guidance, pedagogies and professional development adapt to or maintain standard conventions for effective English writing. And, consequently, it provides learners with an understanding of the core elements for practicing writing, such as rhetorical situation, process, and conventional genres. In this way, Boden (2019) supports the view that most faculty members (e.g., researchers, practitioners, and scholars) who innovate "effectively improve their practice as well as identify and deconstruct pedagogical processes (p.859), benefiting both learners and educational settings.

Considering advances and innovations in science as the basis for professional development, Ecuadorian scholars (experienced and inexperienced) face pressure for publishing their studies internationally in English-language journals with high quality editorial standards. That is why academic writing programs in Ecuador feel the necessity to improve professional performance at the graduate or undergraduate level. Catalyzed by this reality, McGrail et al. (2006: 33-34) claim that most institutions of higher education (and Ecuador is not the exception) are interested in developing structured interventions to increase the writing for publication and ensure the visibility of research results at the international level. From this view, much of the research on academic writing has proposed innovative ideas to develop new ways of doing things and improve existing ways of doing things "in the hope of providing practical recommendations for educating novice scholars" (Zhang & Cheung, 2018: 84).

This brief overview outlines how advances and innovations in research contribute to the development of science, providing linguistic or pedagogical implications applicable to many areas, as in the field of academic writing, particularly in research on written texts, for example.

2.2.2 Accuracy in academic writing

Writing accurate texts, as defined above, focuses on the linguistic structures and the controlled production of those structures used in the target language. In linguistic terms, accuracy accounts for "the extent to which the language produced conforms to the target language norms", in terms of lexical, morphological, and syntactic indices (Skehan & Foster, 1997: 232). Skehan (1996: 46) describes accuracy as a linguistic feature related to learners' ability to handle levels of interlanguage complexity that they have reached when rephrasing utterances. That is, how the text, regardless of its orthography and content, is easily understandable for a wide audience (Fellner & Apple, 2006). Accuracy, then, refers to the grammatical knowledge, taking into account the contexts and uses of the structures in a text. In this sense, accuracy is, according to Skehan and Foster (1997), the ability to produce written or spoken texts free from errors when using the target language to communicate something. In this view, accuracy is the result of conscious attention to the target language structures rather than an unconscious restructuring process (Wolfe-Quintero, Inagaki, & Kim, 1998: 34). Nonetheless, accuracy, in many ways, can encompass both unconscious (implicit) and conscious (explicit) forms of knowing language.

Accuracy, in Wolfe-Quintero et al. (1998: 34), can be a continuum from the more implicit to the more explicit knowledge of language. In fact, better explicit knowledge of certain language forms influences self-control of "language production, including conscious editing of writing", such as language choices that are consciously re-structured. Accuracy as 'freedom of errors' therefore depends on or is the result of writers' language knowledge, being able to notice some types of errors and correct them through a conscious or unconscious process. Wolfe-Quintero, et al. (1998: 35) points out that writing accurate texts (error-free production) goes hand-in-hand with the increase in fluency (the number of words produced with faster rate and greater length) and in complexity (lexical and grammatical variety). Based on the aforementioned, Skehan and Foster (1997) alert researchers that there may be trade-offs between complexity, fluency, and accuracy, in the sense that the more complex the structures, the less accurate utterances produced by learners; as well as the faster they produce language that is not implicitly constructed, the more errors they may have in the text.

In the attempt to measure accuracy of writing, Wolfe-Quintero et al. (1998) provided a comprehensive list of fixed lexical parameters to measure the frequent syntactic indices used in texts. According to the authors (1998: 12-15), accuracy could be gauged by the frequency of occurrence of word errors or error types within a production unit (e.g., error-free T-units), by ratios (e.g., error-free T-unit per sentences) or by accuracy indices (e.g., error index). Most of

the measures listed in the dimensions of accuracy frequency (frequency of word errors), accuracy ratios (occurrence of errors in writing) and accuracy indices (number of lexical errors) significantly correlate to second language proficiency development. However, most of these measures, for example error-free T unit (EFT), error-free T units per T unit (EFT/T), and error per T ratio (E/T), according to Wolfe-Quintero et al. (p.37), need a great deal of further study since they reported to be non-linear in some research (e.g., Sweedler-Brown, 1993; Rifkin & Roberts, 1995; Arnaud, 1992). For a further analysis about accuracy in writing read Wolfe-Quintero et al (1998, Chapter III, pp. 32-69). Writing accurate texts is one of the most common difficulties that this study presupposes among Ecuadorian writers. Such a claim is supported by the studies of Perez (2020), Villavicencio et al. (2018), Tamayo and Cajas (2020), León and Rosero (2018), Romero (2020), and Merchan et al. (2015), just to mention a few.

2.2.3 Research on written texts

In the last decade, text (and also discourse) analysis has become an area of increasing interest in linguistic research. However, since texts by their nature encompass the use of a complex language system, their analysis is complex and challenging as such. The text analysis then results complex because it may comprise several communicative functions and, as such, its interpretation depends not only on the processing of language itself (content) but also on the social structures where it is placed (context).

In this part, due to the interchangeable use of the term *text* and *discourse* found throughout the literature, an elaboration of their uses is essential (cf., Beaugrande, 1997: 61). For example, Cook (1989: 6) and Widdowson (1996: 127) point out that a text is a product of discourse, while discourse is a product-process leading to the text. Sanders and Sanders (2006: 597-598), meanwhile, state that the term discourse is commonly used to refer to both spoken and written language whereas the term text is connected to the written compositions. In accordance with Sanders and Sanders' distinction, as the present contrastive analysis focuses on RA abstracts written in English, in this dissertation study, the term text is used when referring to RAAs.

2.2.3.1 The Ecuadorian context: Rationale

At the university level, there are many kinds of texts students have to write (e.g., reports, essays, research projects, and so on). In Ecuador, particularly when learning English as a foreign language, most university programs include courses in English for specific purposes (ESP), all for the aim of teaching certain vocabulary and language elements to develop professional skills

and academic writing. So, one of the most remarkable syllabus contents is writing of scientific texts, such as RAAs and later longer texts as research articles.

Reform movements in education have been constant in Ecuador. Such reforms highlight the need for some education departments, particularly in the higher education system, to work "hard to improve English language learning in their institutions" (Espinosa & Soto, 2015: 13). Out of the four skills, writing has deserved much attention for practitioners and school administrators. That is why most university programs teach English as a foreign language for academic purposes. Indeed, educational politics in Ecuador have positioned English as a compulsory language at all scholarly levels and as a prerequisite before a degree of higher education is conferred (LOES, 2017; LOEI, 2015). Thus, the central concern focuses on developing English language skills to place university graduate students at a more competitive level in the labor market. Some of these issues outlined above were discussed by Acosta and Cajas (2018: 101), arguing that:

> Ecuador is one of these seven countries that have been in the frontline of EFL implementation in all levels of education. In its efforts to teach English from a clear and well-founded basis, most universities and the Ministry of Education, the office in charge of basic education to children aged 6 until 17 years old, have referenced the CEFR as framework for curricular planning and implementation. Students' progress and promotion are denoted by advancements in levels from A1 to B2. In higher education, majority of universities require students to achieve B2 level before a degree is conferred to them. In public schools, the Ecuadorian government has made it mandatory to teach children English in the second grade hoping that after 12-year completion of basic education, they would reach B1 level. The offering of English based on the CEFR is not exclusive to formal education. Many institutes and technology schools also offer English to increase students' employability when they finish their course or program. There are also companies that offer short training in English to students who are interested to improve their level before entering the university. Generally, English is considered a priority among foreign languages taught in Ecuador and the view that it is a globalizing tool justifies the need to teach it.

Due to the complexity and multifaceted nature of the English language conventions, it is not without difficulties when defining the knowledge and linguistic competence. Thus, in Ecuador, the English language proficiency index (EF EPI, 2020) and the English proficiency index for schools and universities (EF EPI-s, 2019), reported low levels according to the standards of the Common European Framework of References for languages –CEFR. Additionally, the proficiency of writing in English has been described by the British Council (2015) as intermediate in the Ecuadorian educational university level. This means that students in Ecuador need a lot of guidance at university levels when writing any text; so, following didactic models to write in English could contribute to solving some of these needs. It is not

only adequate but necessary in the country. This writing requirement is endorsed by the British Council (2015: 36). When assessing language knowledge and proficiency, it found the following:

> participants were more confident in their acquisition skills (reading and listening) than in their production skills (writing and speaking). Only a small share of respondents (11%) considered themselves to be advanced or fluent in reading, writing, and speaking English. Participants were least comfortable with their speaking skills, with almost half (46%) rating their skills as poor/basic and a further 38 per cent classing their skills as intermediate. Respondents reported similar but slightly better proficiency in writing, and the skill respondents were most confident in was reading.

Writing in a foreign or second language mainly involves linguistic knowledge and "the way language is used to communicate and to achieve purposes in particular situations" (Hyland, 2015: 6). Learners, therefore, need to know how to write grammatically correctly and how to use that knowledge in different contexts for effective communication. However, writing for a communicative purpose of the text is perhaps demanding for both native and non-native English speakers (Feak & Swales, 2012). In the case of Ecuadorian Spanish-speaking authors, even for experienced writers, the writing of academic texts (as abstracts and research articles) in English constitutes a challenge since the rhetorical and linguistic conventions of the English language are generally far from those of Spanish language.

In this part, the dissertation study takes applied linguistics research, as an interdisciplinary field, to make reference to the linguistic implications in students' language-related writing skills needs already found by Ecuadorian researchers and discussed in the previous chapter (e.g., Cabrera et al. 2014; Cabrera & Castillo, 2014; Escudero & Fuertes, 2017; Barriga et al. 2017; Cando et al. 2017; Abata et al. 2017; Rodas & Colombo, 2018; Chamba et al. 2019; Tamayo & Cajas, 2020; Romero, 2020). Hyland (2014a: 393) claimed the necessity to generate the means to aid the writing practice of novice writers —university students— who must write texts in English with academic interests and publishing purposes. Accordingly, the research could be extended to the field of teaching academic writing, in the following sense:

> For EAP practitioners this means that they seek to accurately identify and describe the particular linguistic preferences, discourse features and communicative practices used in specific academic contexts so they can be taught to students and relayed to academics seeking to publish in English. (Hyland, 2014a: 393)

Writing academic genres, as abstracts and later research articles, in essence, means developing an understanding that "academic writing depends on writer's projection of a shared professional context and the construction of effective social interactions" traditionally fulfilled in scientific discourses (Hyland, 2014b: 109). Because academic genres and preferred patterns

of argumentation differ within cultures and languages, the study concerns the probable interdisciplinary variations on how texts (abstracts in our case) organize their structure and content. In pursuit of complying with Hyland's (2014a) suggestions in developing academic writing skills from the E-AP context, the research accounts for the linguistic and rhetorical practices academically accepted in the two scientific discourse communities (sciences and humanities) across the four disciplines under study.

2.2.3.1.1 Rationale of the chosen disciplinary fields: English in Ecuador

The "emergence of English as a global lingua franca" has resulted in it being taught above other languages and used in most of the scientific fields all over the world (Graddol & Meinhof, 1999: 1). In 2012, the Ecuadorian Ministry of Education standardized a new national English curriculum and a series of amendments that would be supervised by a recently created English department in the ministry. Among its purposes, priority was given to generating equality in the learning of English in the public and private educational spheres; this to improve the way and quality of teaching (British Council, 2015). Although in Ecuador, specially, English is studied as a foreign language, it has gained the predominant use to communicate in academic and non-academic environments. Currently, most institutions, particularly at higher education, require that students as part of their degree programs gain a certificate of proficiency in a language. That is why most undergraduate and graduate students at universities in Ecuador are enrolled in language courses, English being the language chosen by the majority of students to fulfill this academic requirement. English, therefore, is one of the determinants of professional development and employment in most fields of work.

The research motive of selecting sociology, education, electronics, and agronomy disciplinary fields as the foci of this dissertation is justified because they are the professional areas with the most job opportunities in this South American country (INEC, 2018) and interest in the higher education system. These disciplines are connected to global high-tech and scientific production that significantly impact research. Since Ecuador's (2008) constitutional reforms, there have been a growing number of scholarly publications in science, social science, and humanities to almost 19.075 in April 2022; for further analysis, search Scimago (https://www.scimagojr.com). Thus, research accounted for soft sciences (6.136) and hard sciences (12.939) increased over the last decade. Currently, research on education (894) and electronics (3,779) have been the cornerstone for higher education administrators and educational policymakers to seek academic research processes that link university research locally and internationally.

Consequently, the emergence and positioning of English as the language of disseminating scientific knowledge has led some Ecuadorian students (and writers) to learn new writing conventions and discourses in English. The latter, discourses, to place their research studies within the academic discourse communities. English, therefore, is one of the most frequent languages used for academic purposes in the world's literary outcomes (Hyland, 2018), and Ecuador is not on the sidelines. Hence, as the result of the impulse of 2008 Constitutional Reforms in Ecuador, the innovation, promotion, scientific development, and spreading of knowledge in these scientific fields have been in increase. That is why Ecuadorian researchers have been compiling global scientific and technological production research for the past ten years to benefit from scholarly promotion. In addition, the disciplinary selection of the four mentioned above are related to the subjects of teaching writing in EAP at the Technical University of Cotopaxi. That includes undergraduate and graduate programs; moreover, these knowledge areas share common or similar syllabuses at this university. In Ecuador, many universities offer careers related to these areas, as well as similar content programs. Thus, research in these areas is considered valuable in this country.

2.2.3.2 Rationale of the chosen disciplinary fields: English as an international language

The use of English as the language of international scientific communication to announce research on humanities and sciences (so-called macro-areas) creates, among many other sociopolitical, industrial, innovative and philosophical conditions, the necessity to investigate how RAs published in high quality 'North American' journals organize their abstracts. Thus, the central research motive of selecting humanities (in this case education and sociology), together with sciences (electronics and agronomy disciplines), is because during the last two decades they have probably been the most promoted macro-areas of publishing in English. It is the case that "more than 95% of indexed natural science journals and 90% of social science journals use all or some English" (Lillis & Curry, 2010: 9; Lorés, 2016a: 54), and, as result of such language choice, the proportion of publication in English is on the increase.

Research published in education and sociology journals, particularly in North America, accounts for abstracts that describe the essence of the manuscript. These abstracts present the pathbreaking works for considering research in policy, teacher education, and all areas of sociology to forge new ways of understanding the social and teaching practices at the national and global levels. In the same way, research published in electronics and agronomy journals calls for informative rather than descriptive abstracts. They provide the platform for researchers and scholars worldwide to exchange the latest findings, which are directly connected to generate

scientific knowledge and technological innovations. The examination of these disciplines allows us to broaden the awareness and analysis of how scientific discourse is "presumably having an influence on the rhetorical re-configuration of one of the most common academic genres, the abstract" (Lorés, 2016a: 57)

With this in mind, the current dissertation attempts to investigate "the written rhetorical forms that may emerge when English is used as an international language" or lingua franca (ELF) of academic communication (Lorés, 2016a: 57), in which speakers from different linguistic and cultural backgrounds (similects) may be involved (Connor & Rozycki, 2013: 429). Rhetorical structure, therefore, may be one of those features open to find variation and change, as a result of 'similects virtual contact' among ELF users. The virtual scenarios concern the non-face-to-face contact with compositions available in the printed media (Braunmüller & House, 2009). Therefore, the strongest influence of different cross-cultural divergences when writing in English can be seen in textual organization and preferred rhetoric (Seidlhofer, 2011), as is the case in international academic publishing contexts (Lorés, 2016a)

2.2.3.3 English, the lingua franca of inter-community communication

As stated above, English as an international language or a global lingua franca of communication between speakers whose L1 language is different has, in many economic and educational arenas and in scientific disciplines, been gaining momentum. In the educational field, for example, it has been the means for professional development, and, in the scientific arena, it has been the language for disseminating and sharing knowledge across researchers and discourse communities. This international or global status of English led to important interpretations to be taken into the current dissertation account. For example, "as a global lingua franca, the legitimate speakers of English are no longer exclusively the native-English speakers" (Marlina & Xu, 2019: 1) or the so-called speakers from "*inner-circle countries*" where English is the native language (Kachru, 1990: 1). This, in Marlina & Xu's (2019: 1) point of view, supports the claim that "speakers of English also come from '*outer-circle countries*' where English is an institutionalized language" (L2) as well as from "*expanding-circle countries* where English is a foreign language" (FL), as in the case of Ecuador. (c.f. Kachru, 1990: 5-9)

That is why "within communicative exchanges between speakers of English from different linguacultural backgrounds" (Marlina & Xu's (2019: 2), variations in the extent to which it is used make a novel phenomenon for research. Thus, it is unquestionable that "these three circles certainly bring sense to English linguistic diversity; and let us not underestimate

(as some scholars tend to do) the resultant cultural diversity" (Kachru, 1990, 5). In fact, English linguistic diversity, related to rhetoric and style, could be the result of variations in the actual use of language in distinct multilingual and multicultural communicative contexts. These contexts, perhaps, could be the reason why English is a "language with diverse and complex pronunciations, discourse and pragmatic conventions, and cultural conceptualizations" for the meaning-making (Marlina & Xu, 2019: 1).

English, therefore, recognized as a global means of inter-community communication, makes emphasis in the strategies that speakers use to negotiate meanings. In such an international communication context for exchanging meanings, English norms and conventions are relevant and important "to ensure mutual intelligibility and effective communication among English" users of the language (Marlina & Xu, 2019: 2). According to this perspective, information displayed in a text must covey a clear and precise meaning. However, it is necessary to clarify that the differences (e.g., in lexical, syntactic strategies) found in intercultural communicative settings, may not be conceptualized as inferiors to those of native English speakers (NEs), but as variants of the language (Marlina & Xu, 2019). The statement above, here, is not about rejecting the relevance of NEs standards, but about raising the awareness of language variation and advocating the right choice of English varieties that suit the text and context.

2.3 Brief description of the emergence of abstracts in research articles

With the first scholarly journal, entitled the Philosophical Transactions of the Royal Society published in English in Europe, approximately in 1665, research articles became the most scientific knowledge produced among scientific discourse communities. In this part, Biber and Conrad (2009: 157) state that this journal represents the "most influential record of scientific research during the seventeenth and eighteenth centuries" by initiating the practice of reporting on scientific knowledge following conventions. Unlike research articles, abstracts were initially integrated as part of the RAs in the sixties. Since then and for the progressive emergence of RAs in the numbers of publication annually, abstracts in English are now required for most scientific and academic journals. The value of abstracts attached to RAs has increased considerably; they provide readers with the road map to select what is or is not worth reading. In other words, they function as business cards to sell the complete paper.

Although the structure of RAs has varied throughout the years of production, its actual structure such as introduction, methodology, results, discussions, conclusions, and references became a common feature among scholars (Swales 1990: 114). Such structure or format was

mostly introduced in abstracts of scientific papers from medical disciplines during the 1960s (Swales and Feak, 2009: 1). Initially, abstracts of research articles were playing a second role, but as stated above, they are now essential when searching for the scope of the manuscript. Abstracts, therefore, because of their conciseness and clear-cut format specifications (Hyland, 2004, Lorés, 2004), have become business cards of their authors. This is mainly because they are "vehicles for communicating research findings" and key sources for "literature reviews, research paper reviews, grant proposals", and corpus analyses (Swales and Feak, 2009: ix-x).

Even though RAAs are considered as condensed text, they vary in their communicative function, rhetorical organizations, and their linguistic realizations. The function of abstracts in scientific discourse has gone from "distillation" (Swales 1990: 179), to "act as a report in miniature" (Jordan 1991: 507), "stand-alone mini-text" (Huckin, 2001: 93), and summary (Kaplan et al. 1994: 405), up to "selective representation of the exact knowledge of an article's content" (Hyland 2004: 64) and "navigation tools, essential time-savings and information-managing devices" (Lorés, 2016b:135). Much research on the rhetorical organization of abstracts (e.g., Hyland 2004; Martín-Martin 2003, 2005; Salager-Meyer 1990), thematic structure (e.g., Lorés 2004, 2016b), and lexical and grammatical choices based on selective linguistic features have contributed to the rhetorical and linguistic characterization of abstracts in scientific texts.

This analysis provides a brief panorama on the emergence of abstracts in RAs, which is not complete in extent. So, for further comprehension on this topic, explore the studies of Biber and Conrad (2009), Swales (1990, 2004), Swales and Feak (2009), Banks (2008), Halliday and Martin (1993), Halliday (2004b), and Hyland (2009).

2.3.1 Abstracts and writing standards

Abstracts of journal research articles conform to writing standards that could be internal (journal requirement for paper submission) or external (disciplinary affiliations to which the paper attempts to respond and possible authorial textual preferences). As stated previously, abstracts are condensed and concentrated versions of the full text of the research manuscript. Abstracts should be, in this sense, as representative and detailed as possible within the standard requirements laid down by the journal to which the paper is intended to be submitted. Although some journals vary in the way abstracts should be written (that is the case of the journals under study), most journals request that abstracts follow a fixed format structure within a word count of, typically, between 200-250 words. The sections universally used in structured abstracts are the background, methods, results, and conclusions; nonetheless, new headers and other sections

with analogous reference can be found. For example, new headers such as recommendations and implications derived from conclusions, or the section introduction or background may be used simultaneously by presenting the scope of the research followed by the objective. heading introduction instead of background. or findings instead of results or products. Limitations are sometimes included to close the abstracts.

Abstracts, as an independent and stand-alone (that is, well-structured and informative) section of the manuscript, are used by the journal editor or copyeditor to decide the fate of the article and to choose appropriate reviewers (Bavdekar & Gogtay, 2015). These academic brokers, such as editors, copyeditors, and proofreaders, sometimes work as "gatekeepers that exert control on what can or cannot be published" (Lorés, 2016b: 55). Therefore, publishing in English is, according to Hyland (2015: 45), "more than a choice; it has come to designate research of a high academic quality deemed worthy of a place in globally accessible peer-reviewed journals". The fact here is that all writing published internationally is, by definition, for an international audience, where English is not necessarily their first language.

Despite the fact that abstracts, as a self-contained document, reflect the content of the main text and act as a "real trailer" of the whole article, linguistic and cultural differences (disciplinary affiliations, as well) between users of English as a lingua franca for scientific communication (Connor, 2004) indirectly affect the textual organization and preferred rhetoric displayed in those texts (Seidlhofer, 2011). It is undeniable, then, that different first language backgrounds, disciplinary affiliations, as well as degrees of publishing experience (Hyland, 2015) significantly contribute to shaping the rhetoric and style of abstracts. In this way, Hartse and Kubota (2014), considering the commitment to pluralize L2 writing in English, stated that "in high-stakes writing, lexical and grammatical variation from standard English is being noticed by native and non-native English speakers alike, and it can quickly lead to sentences and texts being perceived as deficient" (p.73). This claims the idea that variations connected to the way knowledge is presented is not only conceptualized through rhetorical practices and specific linguistic features, but through L1 backgrounds and cultural contexts (Hyland, 2015).

The research study here adheres to Hyland's (2004c: 64) view that "genre knowledge comprises an awareness of variation –an understanding that deviations are acceptable to the extent that they do not cancel out function or appropriateness". This is in the sense that genres are open to a certain degree of variation or regularities in regards to content, organization, rhetoric and style kept throughout the publication process. Regarding the publishing processes, the websites of the journals under study offer an "author instruction pack" for manuscript preparation. They require potential authors to adhere to the formal requirements and general

guidance when submitting a paper. Otherwise, the submission cannot be processed and will not be received by the journal office. Accordingly, the American journal of education, for example, claims for abstracts that include the following specifications:

> Up to 250 total words, must include the following sections (bold): purpose, research methods/approach, findings, and implications. No references or endnotes in the abstract. Optionally, at the end, you may also include up to 5 keywords or phrases. (https://www.journals.uchicago.edu/journals/aje/instruct)

While the American journal of sociology, on the other side, requests that abstracts have the following:

> Should be as close to 100 words as possible. Include a research question or puzzle, identify the data, and give some indication of your findings. […] giving an accurate and efficient statement of your project is likely to increase your chances of enlisting their aid. Unfocused, verbose abstracts may make it harder to place your paper with referees. (https://www.journals.uchicago.edu/journals/ajs/instruct)

These illustrate the fact that texts written by users of English should conform to the rhetorical English writing conventions. Nonetheless, as genres are open to variation, new structures may be displayed, "which are the results of the interaction and contact between English and their L1" (Lorés, 2016a: 58). Based on this final claim, the current study attempts to describe differences (or trends) between the genre RAAs published in NA&EJ.

2.4 Genre Analysis

Swales (1990) points out a genre is "a class of communicative event" which engages interactions using language (p.58). That is, a genre is "a type of text or discourse designed to achieve a set of communicative purpose" (Swales & Feak, 2009:1). Swales' (1990) genre analysis theory of English in academic and research settings has been the source for the analysis of text and types of texts, for instance narrative, informative, descriptive, literary, and academic texts. Swales (1990: 1) argues that "genre-centered approach offers a workable way of making sense of the myriad communicative events that occur in the contemporary English-speaking academy". Genre analysis, then, is devoted to identifying the communicative purpose of the texts in academic discourses. Swales (1990: 2) considers it can "build a bridge between English for specific purposes/applied discourse analysis on the one side, and L1 writing/composition on the other" to achieve a deep understanding of the construction of discourses within the academy.

The approach supported by Swales (1990) to comply with some research studies is focusing on rhetorical structures and their linguistic realizations that tend to be repeated in texts of specific genres, by taking into considerations not only the internal dimensions of the texts but also the external, social dimensions of writing contexts. In other words, within discourse

analysis, the text is not only seen as a final product; it is also seen as the *reservoir* of knowledge, "in which speakers from different lingua-cultural origins are involved" (Lorés, 2014a: 57). Indeed, the genre-related approach enlightens comparing texts produced in different countries to study the similarities and differences across scientific discourse communities.

Hyland (2009: 25) outlines that in the genre analysis, "a range of tools and attitudes to texts, from detailed qualitative analysis of a single text to more quantitative counts of language features" are the analytical elements in the interpretation and discussion of texts. To put it in another way, genre analysis refers to "the study of situated linguistic behavior in institutionalized academic or professional settings" (Bhatia 2002: 22). In the genre analysis, sentences are the basic unit of the analysis which contains several clauses and, as a result, numerous communicative purposes (Swales, 1990; Bhatia 1993). On the basis of Swales' (1990, 2004) works and genre definition, the analysis of academic writing, particularly in the areas of ESP encompasses the identification of rhetorical structure and composing patterns (e.g., Hyland, 2000; Lorés, 2016b; Martín-Martín, 2003), by describing the realizations of the intended communicative purpose within the academic discourses.

As stated previously, genre is a type of communicative event, normally classified by its content, language, purpose and form, in which language is the focus of the analysis. In essence, genre analysis investigates the discursive features used in the communicative event (e.g., reports, articles, letters), aiming to provide readers with the rationale of those features in terms of writers' interests and institutionalized agreements (Swales, 1990). Taking the content and structure as important components of writing, corpus linguistic research has been carried out to describe the types of information used in abstracts across disciplines (e.g., Hyland, 2000, 2004; Hartley & Sydes, 1997; Lorés, 2004; Can et al, 2016; Busch-Lauer, 2014; Leong, 2016) and in different genres (e.g., Jordan, 1991; Swales, 1990; 2004; Burgess & Cargill, 2013).

2.4.1 Research article abstracts

In the era of online searches and digital libraries, the importance of RA abstracts is perhaps unquestionable. As a result, cross-linguistic research, particularly in the field of English for Academic Purposes (EAP), has received large attention as it has explored how scholars document their research outcomes in a convergent genre, namely abstract (Hyland, 2004; Hartley & Betts, 2009; Swales 2004; Bathia, 1993). Out of these studies, additional ones arose linguistic implications and pedagogical applications connected to writing instructions for L2 writers (Lorés, 2004). Accordingly, research on the content of abstracts and the appropriateness of those communicative functions suggests "standards for regulating the content and format of

abstracts" (Hartley & Betts, 2009: 2010). A typical abstract is about 150–250 words —although lengths can vary depending on the journal and paper type. Abstracts, in some way, reflect the writing conventions established or practiced in different discursive communities, but sometimes, they are neither exact in wording nor understandable to a wide audience. This is because writers sometimes consider the abstract as a postscript –something that can be done as a collage of the sections after the full manuscript is written.

Contrary to this misconception, abstracts have now become the leading independent section in the dissemination of scientific knowledge. An abstract therefore is a short and complete summary of the content of the full article. It enables readers to navigate through the content of the paper quickly to determine if the text is worth reading. According to the Publication Manual of the American Psychological Association (2010: 25-27), an abstract is readable when it is:

> (1) Accurate, ensuring that it reflects the purpose and content of the manuscript, and not including information that does not appear in the body of the paper; (2) Self-contained, defining all abbreviations, acronyms, spelling out names, defining unique terms and paraphrasing rather than quote; (3) Concise, making each sentence maximally informative, containing the most important points, concepts, finding, or implications; (4) Non-evaluative, reporting rather than evaluating, not adding or commenting of what is in the body of the text; (5) Coherent and readable, writing in clear and vigorous prose, using verbs rather than the noun equivalents, preferring the active rather than the passive voice, employing the present tense to describe results with continuing applicability or conclusions drawn, the past tense to describe specific variables manipulated or tests applied and the third person rather than the first person.

Since abstracts are an important part of scientific articles, they must be consistent, clear, and concise, and not produced as a simple collage of sections, in such a way that they present accurate contents, maintaining a balance between excessive detail and vague information. Based on the above, scientists and professionals, due to the explosive growth of information, must be updated on the latest advancements in research. Nonetheless, they only put emphasis on those abstracts that they consider relevant in content and structure. Although the construction of abstracts is classified by the content and structure presented in the text (c.f. Section 2.4.2), their communicative function is to carry "meaning and gains its communicative force only by displaying the patterns and conventions of the community for which it is written" (Hyland, 2009: 34). Abstracts, therefore, are mini-research articles or research article summaries that follow writing conventions. Such conventions, according to Feak and Swales (2012), are useful in developing academic writing skills and understanding the intended audience, and the purpose of the paper and academic genre.

2.4.2 Classification of abstracts

As a text, research article abstracts are written passages that form a unit, regardless of their length. To Halliday and Hasan (1976: 2), "the text is a semantic unit, a unit of meaning" where the structural integration existing within the parts of a text is different from the one which exists between a sentence or a clause. Abstracts as mini text, based on their content, are classified in descriptive and informative (Jordan 1991), indicative and informative (Swales, 1990), indicative-descriptive whilst the structural ones in structured and unstructured (Hartley & Sydes, 1997).

Descriptive –indicative– abstracts, on the one hand, guide readers on the content of the manuscript, indicating the theme, purpose, and methods without going into details. They lack informing on results and conclusions (Lorés, 2004). As a result, readers require accessing to the whole article to gain knowledge on its relevance; length in abstract text ranges between 100 to 150 words. These abstracts are well-matched for review articles or books. Informative abstracts, on the other hand, condense accurate data of the complete paper, following the IMRaD structure (introduction —including the aim of the work, methodology, results, and discussion). That is, they usually discuss in-depth the different sections of the article and are normally found in RAs (Hartley & Betts, 2009). They are written in less than 250 words, evidencing the questions: what, how, and why was the work done, what was found, and what is the significance of the outcomes? The indicative-informative abstracts, on the contrary, condense the information content by combining descriptive abstract information with conclusion (Tankó, 2017).

Hyland (2004) considers that RA abstracts are selective representations that attempt to give readers concise and precise information. Beyond representations, abstracts are independent texts whose structural organization varies. Structured abstracts, for example, announce the core of the complete work by presenting it in sections, as of background, aim, method, result, and conclusion. These sections are contained in paragraphs, in a narrative way; the complete abstract is written in 250 words. Such abstracts are commonly found in medical and clinical journals. Unstructured abstracts, by contrast, are written in a single paragraph in length, and there are no divisions between each section as formulated in structured ones. Accordingly, sentences or clauses may correspond to the sections of the composition. In this way, the presence of linguistic signals (e.g., this paper investigates, results show, twenty subjects were surveyed, etc.) helps readers infer such sections. However, it is suggested that the content, order, and sequence of such sections follow the format of structured abstracts.

In general, although abstracts typically range from 150-250 words, journals' editors delimited the length. Aside from these operationalized distinctions, Hyland (2004) and Lorés

(2004) highlight that those abstracts are further distinguished from one another in terms of purpose, rhetorical structures, persuasion, intent, and their linguistic realizations. So, RA abstracts are relevant corpora for conducting linguistic research, enhancing writing skills, and introducing university students to the writing standards of the research community. The table below summarizes the characteristics of each abstract:

Table 1. Abstracts and their features

	Types of abstracts			
Descriptive/Indicative	Informative	Indicative-informative	Structured	Non-structured
***Theme** ***Purpose** ***Methods** **-100-150 words in length** **-Optimal for review articles**	*Introduction (+ objective) *Methodology *Results *Discussion -250 words in length	*Theme *Purpose *Methods *Conclusions	*Background *Aim *Method *Result *Conclusion -250 words in length -Paragraph for each section -Most common in medical journals	-Follow the format of structured ones -No divisions between each section -One paragraph in length

Note: *Sections presented in each abstract. **Source**: Tovar (2021)

2.4.3 Move structure of research article abstracts

Abstracts as a "part-genre" of scientific papers (Swales, 1990; Hyland, 2004; Swales and Feak, 2009) include sections or rhetorical patterns, which Swales' (1990) original work calls *moves*. Swales (2004) defines moves as a "discoursal or rhetorical unit that performs a coherent communicative function in a written or spoken discourse" (p.228). Swales highlights that "although they have sometimes been aligned with a grammatical unit such as a sentence, utterance, or paragraph, at one extreme, they can be realized by a clause; at the other one by several sentences" (p.229). Moves are considered types of information that help readers to recognize how the discourse is organized in a specific genre across various disciplines.

A move is, therefore, a functional unit that illustrates the organized piece of a discourse and the linguistic features that constitute its content. Although a move can be constituted by one or more sentences of variable extension, it works as a valuable source to investigate text structures which could guide to reveal "the cultural causes and consequences of linguistic and rhetorical differences across languages", disciplines, and discourse communities (Van Bonn & Swales, 2007: 95). Consequently, according to their communicative functions, moves can outline the rhetorical or textual organization of any type of text. That is, moves show the communicative purpose of the texts, by attesting disciplinary writing conventions, in terms of frequency, order, and stability.

In the early rhetorical studies, Swales (1990: 141) proposed a three-move structure, as "establishing centrality, establishing a niche, and occupying the niche" to define the introduction section of the RAs. Later, Bathia (1993) introduced a four-move schema that incorporated new sections: introducing the purpose, method, result, and discussion. Afterward, Dos Santos (1996) and Hyland (2000) suggested five-moves; Dos Santos included new segments in the move structure, such as "situating the research, presenting the research, describing the methodology, summarizing the results, and discussing the research" (p.485). Such a structure detailed Hyland's more general structure of introduction, purpose, method, product, conclusion. The similarities between Hyland's and Dos Santos' model proved the rhetorical move organization of most of the abstracts was parallel.

Within the same research interest, Swales and Feak (2004) formerly advised five elements represented by background, aim, method, result, and conclusion; these are the first characteristic patterns of what we previously called *structured abstracts*. This pattern is frequently used in most sciences yet they are not common in engineering and the physical sciences. Hyland (2000) states that it is not hierarchically generalized that most RAs contain informative abstracts which address the communicative purpose like structure ones. Hyland's stance allows expecting possible differences in abstracts from diverse disciplinary fields and, eventually, different linguistic and cultural backgrounds (Connor, 2004: 300).

2.5 Theoretical Base

2.5.1 The rhetorical move model

The approach of rhetorical moves and steps, coined by Swales (1990, 2004), has had great relevance in the study of the rhetorical organization of academic texts around the world. Swales' (1990) original purpose was to analyze and describe the introduction of scientific article structures to establish regularities in this genre. As stated above, moves are "discoursal and rhetorical units that perform a coherent communicative function" (Swales, 2004: 228) and help readers understand how information content is organized throughout the text. Each of the moves that appear in a text has a specific communicative purpose; it is associated with a discursive unit that contributes to the general purpose of the genre. Based on Swales' (1990) proposal, a lot of research has been developed concerning the analysis of academic genres, both in the communicative purposes and rhetorical strategies used. Examples of this research are Hyland (2000), Parodi (2014), Dos Santos (1996), Bathia (1993), and Swales and Feak (2009).

Regarding the structure of the research article abstract, Bathia (1993) initially proposed a four-move pattern. Later, Hyland (2000), Dos Santos (1996), and Swales and Feak (2004)

proposed an additional move in which the author places the research from a theoretical framework to present the context and motivation of the research work. The move analysis is undoubtedly a recurrent theory for the study and characterization of discursive genres and, in many cases, for *didactic-pedagogical purposes* (Swales, 1990). Swales and Feak's (1994) empirical work is also recognized as a *guide for academic writing* and the construction of research articles.

The CARS (Create a Research Space) move model proposed by Swales (1990 and previous works dated 1981, 1984) has been extensively used for the categorization of discursive genres and the analysis of moves and steps. Multiple studies confirm this by following its theoretical and methodological principle when describing the organization of texts and their sections. Samples of these investigations are Shinta, Effendi and Ekaning (2018), Parodi (2014), Suryarini (2013), Lorés (2004, 2014, 2016), and Martín-Martín (2003, 2005, 2013), just to mention a few. These studies, due to the discipline or sociocultural context, reported rhetorical and discursive variation. The CARS model, then, is one of the relevant theoretical and methodological foundations employed in the genre analysis of texts across disciplines in soft and hard sciences. CARS's successful rhetorical and functional analysis has been proven to be adequate in 122 different genres of various research works, as in those of Weissberg and Buker (1990), Hyland (2004, 2005, 2009, 2014b), and many others.

One of the terms coined by Swales (1990, 2004) and Swales and Feak (1994) is the *niche*. This word was a metaphor, taken from Ecology, which means a microenvironment where a particular structure can grow and spread. In Swales' case, a niche was a context wherein a piece of research made good sense (Swales & Feak, 1994: 175). This metaphor worked very well to describe a package of elements that fulfill a role within a given microenvironment (section). That textual structure included the introduction, the methodology, the results, or discussion; all these parts were observed in different genres. Swales' (1990, 2004) and Swales and Feak's (1994) interests on the analysis of moves consisted of the description of the texts of a particular genre through the categorization of the rhetorical structure of such genre.

Initially, the CARS model was designed to describe the introduction section of RAs. However, the model has been used for the analysis of different sections of a genre or the analysis of full texts, including genres such as the project proposal or the essay. According to the literature review, there is no research that gives information about an organized and complete rhetorical review of all kinds of texts and all the scientific fields including in the move analysis. On the contrary, there are still many fields and genres to study, which justifies the current research. Table 2 below presents the CARS model, through which we can identify recurring

features of rhetorical move order, move cycling, and lexico-grammatical or syntactic features, among other elements.

Table 2. CARS model

Moves and Steps	
Move 1 Establishing a territory	
Step 1	Claiming centrality (The writers highlight the interest of their work) and/or
Step 2	Making topic generalizations (the writers describe what is known about their research topic) and/or
Step 3	Reviewing items of previous research (The writers cite other authors to reinforce the importance of their research)
Move 2 Establishing a niche	
Step 1 A	Counterclaiming (Criticism of the work points of any previous work) or
Step 1 B	Indicating a gap (Indication of possible gaps regarding previous work) or
Step 1 C	Question-raising (Asking direct or indirect questions) or
Step 1 D	Continuing a tradition (The writer presents his/her work as a continuation of previous research topic)
Move 3 Occupying the niche	
Step 1 A	Outlining purposes (Indication of the main purposes of the study) or
Step 1 B	Announcing present research (Description of the main feature of the study)
Step 2	Announcing principal findings (Presentation of the main results)
Step 3	Indicating RA structure (Description of the content or structure of the rest of the article)

Source: Swales (1990: 141)

In essence, the model is articulated to determine the rhetorical-discursive and lexical-grammatical patterns of genres (Swales, 1990, 2004). The CARS model also reveals the way the writer creates the rhetorical space of the introduction of texts belonging, for example, to genres such as the scientific research article or the thesis. This rhetorical space is constituted, according to the CARS model, by three functional or move units that serve specific purposes. Through the first move, the writer establishes the general theme of the study; with the second move, the purpose and the research problem —within the field of study— and with the third move, the writer specifies the objectives and methodology of the work.

Swales created the CARS model in 1990 and updated it in 2004; in the second edition, the author reduced the number of steps in move 1, and he included the background and the theoretical framework. Concerning the theoretical framework, it was no longer restricted to step 3 (move 1) because the author argued that that step could be present anywhere in the introduction and throughout the article. Swales also condensed move 2 from four steps to two and introduced an optional one. Finally, Swales renamed move 3; he called it '*presenting the present work'.* The number of steps within this move increased to seven; the author considered they are sometimes mandatory and optional (Swales, 2004). Below, the reviewed CARS model can be seen:

Table 3. CARS model reviewed

Review of CARS model
Move 1 Establishing a territory (citations required) Via Topic generalizations of increasing specificity [Possible recycling of increasingly specific topics]
Move 2 Establishing a niche (citations possible) Via Step 1A – Indicating a gap. or Step 1B – Adding to what is known. Step 2 – (optional) presenting positive justification
Move 3 Presenting the present work (citations possible) Via Step 1 – (obligatory) Announcing present research descriptively and/or purposively Step 2* – (optional) Presenting RQs or hypotheses Step 3 – (optional) Definitional clarifications Step 4 – (optional) Summarizing methods Step 5 – (PISF**) Announcing principal outcomes Step 6 – (PISF) Stating the value of the present research Step 7 – (PISF) Outlining the structure of the paper

Source: Adapted from Swales (2004: 230-232)

Swales (2004) proposed an alternative model to the CARS model; through it, the author considered both the advances made by himself in his research and those carried out by various authors. The reviewed CARS model proposed by Swales in 2004 included an alternative CARS model. It has been applied with great success in the rhetorical-functional analysis of introductions of scientific research articles, carried out in the context of non-English-speaking cultures. Swales called this model the Open A Research Option (OARO) model; its structure is the following:

Table 4. OARO model

Open a research option model
0. ***[Attracting the Readership]*** **Optional opening** **1.** ***Establishing Credibility*** **(one or more of the following four):** a. **Sharing background knowledge** b. **Justifying need for research per se** c. **Presenting interesting thoughts** d. **Introducing general goal** ***2. Offering a Line of Enquiry*** a. **Discussing current problems** b. **Expressing interest in an emerging topic** ***3. Introducing the Topic***

Source: Swales (2004: 224)

Finally, Swales (2004) presented the most important differences between the OARO and CARS models. The author argued that this proposal captures the distinctions between the audience of the scientific research article in English and other languages belonging to non-English-speaking cultures. Swales (2004) led his studies in cultures other than English-speaking cultures and the globalization phenomenon or cultural hybridization; his thought was featured in the introductions of his articles. The following Table condenses the differences between the OAR model and the CARS model:

Table 5. OARO model and CARS model differences

OARO model (open a research option)	CARS model (create a research space)
Non-antagonistic positioning	Antagonistic positioning
Directed to social fields	Directed to scientific fields
Small discursive communities	Large discursive communities
For non-English speaking cultures	For English-speaking cultures
To analyze non-sectioned or unconventional structures	To analyze Conventional structures

Source: Swales (2004)

In general terms, Swales' (1990, 2004) model examined texts into rhetorical and functional segments. Such functions constitute the rhetorical units that fulfilled the purpose of the genre. This model emerged in the educational context of the ESP approach. At present, the contrastive rhetoric, including move analysis, seeks to improve the teaching-learning processes of academic writing in non-native English-speaking students or those students who do not belong to a defined discursive community. Thus, the notion of moves proposed by Swales (1990) allows the current study to identify the rhetorical move structure of abstracts as a part-genre of research articles. Such analysis provides the possibility of establishing a complementary textual organization and structuring model that would contribute to the process of writing academic texts in English, particularly in a non-English-speaking Ecuadorian context. The research adopts a mixed position to determine the extension and borders of rhetorical units based on three fundamental factors: (a) the consideration of lexical and grammatical features, (b) the observation of the content, and (c) the evaluation of the rhetorical units by expert judges. This position follows the complementary ascending/descending methodological approach applied in Swales' work.

2.5.2 Hyland's contribution to rhetorical move analysis

In Hyland's move model (2000), the author suggested that in the introduction of a text, the writer of a paper contextualizes the research and explains the reasons that motivate the work.

Both the introduction and the background intend to situate the author's study in the research space. In general, Hyland reorganized Swales' model summarizing that proposal to five moves with their main purpose or intention. The following Table presents moves and their functions.

Table 6. Hyland (2000) five move model

MOVE	FUNCTION
INTRODUCTION	Establishes the context of the paper and motivates the research or discussion.
PURPOSE	Indicates purpose, thesis, or hypothesis, outlines the intention behind the paper.
METHOD	Provides information on design, procedures, assumptions, approach, data, etc.
RESULT (PRODUCT)	States main findings or results, the argument, or what was accomplished.
CONCLUSIONS	Interprets or extends results beyond scope of paper, draws inferences, points to applications or wider implications.

For creating the five-move model, Hyland (2000) investigated 800 research abstracts across eight fields in soft and hard sciences; thus, this model shows to be more powerful to analyze the rhetorical move structure in abstracts of scientific articles. So, Ken Hyland (2000) in Chapter 4 sets the construction of the five-move model that involves the following steps:

Move 1. Introduction: a move that establishes context of the paper and motivates the research.

Step 1. Arguing for topic prominence,

Step 2. Making topic generalizations,

Step 3. Defining terms, objects, or processes, and

Step 4. Identifying a gap in current knowledge.

Move 2. Purpose: a mode that indicates purpose, thesis, or hypothesis, and that outlines the intention behind the paper.

Step 1. Stating the purpose directly.

Move 3. Method: this move provides information on design, procedures, assumptions, approach, data, etc.

Step 1. Describing the participants,

Step 2. Describing the instruments or equipment, and

Step 3. Describing the procedure and conditions.

Move 4. Product: a move that states main findings or results, the argument, or what was accomplished.

Step 1. Describing the main features or properties of the solution or product.

Move 5. Conclusion: the final move that interprets or extends results beyond the scope of the paper, draws inferences, points to applications, or wider applications.

Step 1. Deducing conclusions from results,

Step 2. Evaluating the value of the research, and

Step 3. Presenting recommendations.

Abstracts as a part-genre of RAs are the type of text extensively analyzed using Hyland's (2000) move schema (e.g., Zhang et al., 2012; Suntara &Usaha, 2013; Li & Pramoolsook, 2015; Darabad, 2016). The introduction and purpose move in Hyland's (2000) model fully cover the communicative function of the text units, while these two moves are not clearly stated in the models proposed by Bhatia (1993) and Swales (1990). Therefore, Hyland's (2000) model as illustrated in Table 6 (above) is the most suitable model for the present study. According to Hyland, abstracts capture the fundamental ideas and parts of the complete article; therefore, writers should organize them accurately to center the main assertions and introduce themselves as proficient researchers in scientific community fields. Nonetheless, inexperienced and non-native English-speaking writers show little attention to the rhetorical conventions of abstracts (Hyland, 2000). This notion presupposes the identification of the rhetorical moves and the linguistic conventions that accompany them, which is a complex activity; it is even more so if the writing of this type of text is in a second language. Indeed, "even in one's native language, learning to write is something like learning a second language; no one is a 'native speaker' of writing" (Leki, 1992: 10).

To facilitate the writing of RA abstracts in English, non-native authors of this language should know the rhetorical organization they use in the scientific area in which they work. But to be able to understand and produce such condensed texts, novice writers must first become familiar with the structure and organization of such shorter manuscripts. Thus, the rhetorical organization of abstracts together with their linguistic realizations and conventions provide writers with the prior knowledge to, subsequently, write longer texts, possibly research articles. This is due to the strong relationship and similarities between their structures (Lorés, 2004).

According to Hyland (2000, 2004), the analysis of abstracts is so important, considering its functions, applications, and helpfulness in disseminating the knowledge. Following Hyland's argument, researchers continue examining rhetorical variation in RA abstracts written in English and published either in national and international journals or in languages other than English (e.g., Pho, 2008; Lorés, 2014; Martín-Martín, 2003; Suntara and Usaha, 2013). In general, Hyland proposed a model to identify the rhetorical organization of abstracts and the linguistic elements that accompany them. This move model is immensely helpful for

inexperienced and novice writers to familiarize themselves with conventions to organize abstracts of scientific papers and develop writing skills in English. Thus, it is necessary to determine how the combination of steps can form a rhetorical move in a RA abstract and how the "structural organization of academic texts reports preferred ways of communicating intentions" in certain disciplines under study (Martín-Martín, 2013: 333). Therefore, identifying the typical rhetorical organization and stylistic features employed in English-speaking discourse communities allows for discovering differences or similarities in the construction of NA&EJs.

2.6 Text in discourse analysis

How the communicative function of language, either written or spoken, is structured and used in academic discourses has been extensively studied by many linguists from different perspectives and approaches (e.g., Van Dijk, 1980; Beaugrande & Dressler, 1981; Lakoff 1990; Langacker, 2008; Matthiessen & Halliday,1997; Halliday & Hasan, 1976). This communicative function is carried out within a text. To Halliday and Hasan (1976), the "text is a semantic unit, a unit of meaning, but not of form", which is used "to refer to any spoken or written passage as a unified product and process" (p.2). A text, then, is the result of the lexical and grammatical choices in the actual use of language. Indeed, the text is "a product in the sense that it is an output and a process in the sense of semantic choice" (p13) and a process since it is the result of using the conventions and linguistic system of the language in a specific context.

Van Dijk (1980: 17) defines the text as "a structural, generative-transformational and functional system of sentences". Van Dijk highlights that "language must account not only for sentences made through the utterances, but also for the relations between sentences" (p.9) that leads to a text wherein the meaning is implicit. By contrast, Tárnyková (2009: 22) perceives texts as "social spaces in which two fundamental social processes simultaneously occur: cognition and representation of the world, and social interaction". This implies that texts result from a social and rational construction; that is, the social setting and the abstract processes drive to the meaning of the text. Beaugrande and Dressler (1981: 25) state that a text is a "communicative occurrence which meets seven standards of textuality to make a text to be communicative". The authors establish that "cohesion, coherence, intentionality, acceptability, informativity, situationality and intertextuality" (p.32-127) are the basis for a text being considered text. *Texture* refers to cohesive relations between sentences producing meaning by the presence of both the referring items and the items that they refer to. That condition "is what distinguishes texts from something that is not a text and derives its texture from the fact that it

works as a unit for its environment" (Halliday and Hasan 1976: 2); such texture is fulfilled throughout cohesion.

A text, therefore, is a means of communicating meanings (Beaugrande & Dressler, 1981) and a process and product of human interaction (Halliday & Hasan, 1976). The authors claim that linked to the text concept is that of texture, so "the concept of texture entirely expresses the property of being a text" Halliday and Hasan (1976: 2). Halliday and Hasan (1976) stated that the structural integration existing within the parts of a text is different from those that exist between a sentence or a clause; thus, the relation of the text with the clause or the sentence is not of size, but of realization. As a text, the RA abstract is then a written passage that forms a unit, regardless of its length. Abstracts, in general, can be considered texts because they fulfill Halliday's (1976: 1) criterium: "The word TEXT is used in linguistics to refer to any passage, spoken or written, of whatever length that does form a unified whole". Based on the text theory of Halliday and Beaugrande and Dressler, this dissertation took cohesion as the standard of textuality to analyze the cohesive means used in abstracts of scientific articles.

2.6.1 Cohesion

Cohesion is a property of discourse in which emerges both the morphosyntactic rules of a language and the semantic associations to establish relations between elements of a text. The purpose of cohesion is to ensure thematic progression, with the least processing effort, in the process of linking the different sentences that make up a discourse.

Beaugrande and Dressler (1981: 25) defines cohesion as "the way the components of the surface text or the exact words people see or hear, are mutually connected within sequence". Cohesion, therefore, relies on lexical and grammatical dependencies link to provide order in meaning and use in the text. Thus, the cohesion of text refers to the relationship between the meaning and grammar. In this way, Halliday and Hasan (1976: 4) point out that "cohesion occurs where the interpretation of some element of discourse is dependent on that of another". That is, "one presupposes the other, in the sense that it cannot be effectively decoded except by recourse to it" (p.4). The authors (1976) argue that cohesion is the set of linguistic relations of meaning that every language has to link one part of the text. Such relation differentiates text from non-text and interrelates the substantive meanings of the text with each other. They also highlight that cohesion is not concerned with what the text means; rather, it is concerned with "how a text is best regarded as a semantic unit" (p.2).

Halliday and Hasan (1976: 12) considered that the relationships between those linguistic elements are called ties, and there are several types of them: "reference, substitution, ellipsis,

conjunction, and lexical cohesion", among which we can count repetition. The grammatical system establishes referential and sequential unions between the elements of the text. The referent can be a name, a phrase, a sentence fragment, a sentence, or a whole statement. This frame of reference is backwards or forwards; when it is an anaphora it makes a previous reference; if it is a cataphora it makes and refers ahead to the referent. Because it is a "semantic relationship —like all the components of the semantic system—" cohesion is also carried out on the lexical and grammatical structure, so some forms of cohesion occur through grammar and others through vocabulary (Halliday & Hasan, 1976: 6).

Cohesion is considered an overall process that unifies the text as a whole. This procedure is within a micro and macro textual process which helps to hold text unity across the grammatical and semantic union. In this study, cohesion, especially in RAAs, is considered as the process which maintains the texture of each part of the text and the whole text. Thus, when going on from one part of a text to the following, discourse markers (e.g., textual and/or interpersonal) and connectors function as the cohesive devices that guide the process of understanding written texts. Cohesive devices then allow readers to understand what follows or what was previously written by establishing a relational illustration of the texts (Halliday & Hasan, 1976). Based on the stated above, the current dissertation addressed the analysis of conjunctive elements, including additives, adversatives, causals, and temporals, which function as cohesive devices that create semantic relations within the sentences themselves.

2.6.2 Cohesive ties

Cohesive ties help to link together structurally independent sentences while producing any text. Different mechanisms of cohesion have been identified in languages. The best-known classification is of Halliday and Hasan (1976: 4); these authors proposed the following five cohesion mechanisms: (1) reference, (2) substitution, (3) ellipsis, (4) conjunction, and (5) lexical cohesion.

The reference belongs to the semantic level, and it can function in a sentence as: (a) personal when using subjective pronouns to refer to an element of the text, (b) demonstrative when we use adverbs of place to indicate the location of an element, and (c) comparative when we use comparatives to correlate the qualities of an idea or element in the text. The reference can be situational when there is an exophora or external reference to the text, or contextual when there is an endophora or internal reference in the text. Endophora and exophora divided into anaphora and cataphora explore the following recurrence: the first one (anaphora –backward reference) emerges when there is a previous reference to a section or an idea in the

text, and the second one (cataphora –forward reference) links an element to a later idea or component of the text.

Concerning **the substitution** process, it corresponds to the grammatical level; it deals with three types of substitution processes called nominal, verbal, and phrasal. The classification of substitution is identic to the ellipsis one; **ellipsis** is a process that also occurs in the grammatical level. Ellipsis can also be nominal, verbal, and phrasal which led Halliday and Hasan (1976) to consider it as a kind of a zero-element substitution.

Regarding **conjunction**, it happens at the semantic level, and it can appear in different lexical forms by using different types of linkers such as additive, adversative, causal, and temporary linkers. Additives work as cohesive elements that add information to the texts, while adversatives express opposition or contrast between two statements that share semantic relations of succession in time. Causals introduce a statement that occurs because of something performed previously. Temporals represent a performative sequence, the relation between the theses of the two successive sentences.

About **lexical cohesion**, it also functions at the lexical and grammatical level and includes two lexical features: reiteration and placement. On the one hand, a reiteration is a form of cohesion based on synonyms, for example when we use *the cur* instead of *the dog.* It can also be present in the usage of general terms, for example when we say *the animal* instead of *the dog*. On the other hand, the placement refers to the usage of words that appear in similar contexts, that is when a group of semantically related words rises in two close sentences; this gives the text cohesive force. Lexical reiteration occurs between forms that have referential similarities, while placement happens when forms, that belong to the same semantic field, exclude referents. These five forms of cohesion form the textuality of the texts.

The premises of Halliday and Hasan's (1976) theory allow to examine the linguistic realizations of the RAAs and the linguistic signals to define the rhetorical move structure. This analysis characterizes the grammatical constituents and the semantic mechanisms of each move. The cohesive ties, discussed above, for instance, those of grammatical aspects (reference, substitution, ellipsis, conjunction), according to Halliday (1976), construct and keep the relations of meaning that exist within the text. Accordingly, a number of studies on corpus linguistics have been investigating the effect of cohesive devices in text comprehensibility. For example, the studies of Crossley, Yang, and McNamara (2014b), Gernsbacher (1990), Crossley and McNamara (2011) have shown that a gain in the textuality of the texts lead to a better textual interpretation and understanding of the content. In this way, Halliday and Hasan (1976: 4) point out that "cohesive ties make possible to analyze the texts and give a systematic account

of their cohesive properties" by making them more readable. Nonetheless, the effect of using cohesive cues is subject to the level of knowledge since its facilitative effect could be stronger in low-knowledge readers and lower in high-knowledge readers (McNamara et al., 1996). Thus, in the attempt to reach a comprehensive understanding of how texts from various genres are produced, corpus linguistics (a system of methods and principles) is the scaffolding for the analysis.

2.7 Corpus linguistics

With the development of high technology, a large number of written or spoken texts has become the matter of the analysis in linguistics studies. Today, online and printed texts are taken as real texts to illustrate the textual structures of the language. Accordingly, the emergence of technology, for example automatic text analyzers, allowed for examining the language used in context. The core of this argument is that according to Sinclair (1992: 19), "they can show us things that we may not already know and even things which shake our faith quite a bit in established models, and which may cause us to revise our ideas very substantially". The fact is that authentic text analyzers lead researchers and practitioners to quantitatively (and even qualitatively) explore authentic texts on a large scale.

Thomson and Hunston (2006: 2) points out, "a corpus is a large collection of texts that are used as the basis for language description". Corpus linguistics, therefore, is the empirical analysis of language by using large representative samples of tangible texts produced across disciplines. Accordingly, corpus linguistics embraces a set of "methodologies for studying language" (Leech, 1992: 106) that "underpin the general principle of functional variation in language" (Halliday, 2006: 294). Although corpus linguistics studies are far from completely generalizing the findings, they described the frequent occurrence of linguistic features in the actual use of the language. That is to say, the collection of texts will never represent the wholeness of language, but it certainly illustrates the use of language and its variability. In this way, Leech (1992: 107) highlights the functionality and primary contribution of corpus linguistics at analyzing texts:

> […] corpus linguistics, analyzes the actual patterns of use in natural texts; it utilizes a large collection of natural texts, known as a "corpus", as the basis for analysis; it makes extensive use of computers for analysis, using both automatic and interactive techniques; it depends on both quantitative and qualitative analytical techniques […]; it concentrates on linguistic performance and not on linguistic competence; it focuses on the linguistic description of language instead of linguistic universals. (p.107)

From this point of view, corpus linguistics as the methodology for text analysis has been considered adequate to use in lexical, syntactic, rhetorical, and linguistic information. This is

because the corpus of texts, either spoken or written, is the initial source to exemplarily evidence language structure and variation on a large scale. However, corpus linguistics is not the definitive methodology in the present dissertation, but it is used as a complement to reinforce other approaches. The core of this dissertation on abstracts lies in the analysis and interpretation of quantitative data obtained from the corpus of written texts across disciplines.

2.7.1 Linguistic realizations

The theory related to the study of linguistic realizations is Halliday's (2004) systemic functional linguistics (SFL). This theory relies on the examination of naturally occurring languages. It examines instances of language in the form of text and describes probabilities of cohesive constructions in texts. As stated above, corpus linguistics is the methodology to analyze the linguistic realizations of authentic texts (Thomson and Hunston, 2006). At this core, Halliday (2006: 294) points out that "corpus linguistics makes possible to quantify the lexical and grammatical features among different registers to interpret the kind of variation as a redistribution of probabilities". Additionally, Reiter and Dale (1995: 12) declared that "linguistic realization is the process of applying the rules of grammar to produce a text which is syntactically, morphologically, and orthographically correct". The authors encourage using SFL during the analysis of texts, as this approach has "the basis in natural language generation research" (Reiter & Dale, 1995: 82). To put it in another way, "there is a natural affinity between systemic theory and corpus linguistics" (Halliday, 2006: 293); in such a way, both make the possibility of consolidating composing patterns through complementary qualitative analyses.

In the systemic functional linguistics theory, register refers to the set of "linguistic features associated with a configuration of semantic-situational" traits (Halliday & Hasan,1976: 22). Halliday and Hasan (1976) acknowledged the register as the pragmatic aspect of textual cohesion. Thus, the notion of the register is related to three aspects that define the context of the situation and the situational features of the text. These aspects are the field, the mode, and the tenor. The first one corresponds to the total context, the purpose, and the subject-matter of the text; the second one contains the function, the channel that can be oral or written, and the genre such as narrative, among others; finally, the last one makes references to the type of roles of the participants. The central task of using Halliday's theory is not observing the grammatical chain of elements, which "converts an input structure into a sentence", but rather perceiving how the writer "makes a series of increasingly fine-grained choices" (Reiter & Dale, 1995: 82), which control keeping paragraphs cohesion and the moving step process.

In a genre analysis, the register drives to investigate "what situational factors determine what linguistic features" are employed in the text (Halliday 1978: 32). According to this, the semantic-situational configurations (register) vary, and the forms of cohesive relationships can differ, too. For example, the texture in informal conversations is different from the texture of written texts. At this part of the analysis, the register depends on the topic, the medium, the motives, and the roles appropriate to situational features and contexts. In the case of RA abstracts, the record is formal and academic; therefore, it is necessary to become familiar with this type of genre and its characteristics at understanding how the texture is produced. Thus, there has been much research on abstracts of scientific articles documenting differences in the lexical and grammatical choices when constructing written discourses (Lorés, 2004; Hyland, 2004).

2.7.1.1 Syntactic complexity

Another approach related to linguistic realizations is the notion of syntactic complexity of texts. Ortega (2003) and Wolfe-Quintero et al. (1998) defined syntactic complexity as the range of variation and sophistication in the production of grammatical forms within second language writing. Syntactic complexity in writing has been granted as an "important construct in second language research" and teaching since it predicts "the growth of L2 learners' syntactic repertoire" (Ortega, 2003: 492). Syntactic complexity as an explicit and varying component in text difficulty includes syntax (Tovar, 2022: 1). Frantz et al. (2015: 388) thereby stated that "grammar contributes to the meaning of the text and grammatical meaning impacts reading comprehension". This point of view states that grammar, to some extent, is responsible for the construction of meaning in academic texts. Thus, measures for the analysis of syntactic complexity "in writing research in second and foreign languages" (Tovar, 2022: 1) have been proposed as indicators for characterizing text accessibility or difficulty (Lu, 2011), readability (Graesser et al., 2014), and the target rhetoric and linguistic structure used in academic writing by learners across proficiency levels (Ortega, 2003: 493).

Lu (2010, 2011), based on the measures suggested in Wolfe-Quintero et al. (1998) and Ortega (2003), proposed 14 dimensions as the micro-indices of text complexity. Lu (2011) described complexity in L2 writing production by making references to the (1) length of the production unit. In this scale, he also included (2) the amount of subordination, (3) the amount of coordination, and (4) the degree of phrasal sophistication as the macro-measures to quantify syntactic complexity. The table below provides a comprehensive summary of the measures and their definitions.

Table 7. Syntactic complexity features

MEASURE	DIMENSIONS	CODE	DEFINITION
Length of production unit			
	Mean length of sentence	MLS	# of words / # of clauses
	Mean length of T-unit	MLT	# of words / # of sentences
	Mean length of clause	MLC	# of words / # of T-units
Amount of subordination			
	Clauses per T-unit	C/T	# of clauses / # of T-unit
	Complex T-units per T-unit	CT/T	# of complex T-units / # of T-units
	Dependent clauses per clause	DC/C	# of dependent clauses / # of clauses
	Dependent clauses per T-unit	DC/T	# of dependent clauses / # of T-units
Amount of coordination			
	Coordinate phrases per clause	CP/C	# of coordinate phrases / # of clauses
	Coordinate phrases per T-unit	CP/T	# of coordinate phrases / # of T-units
	T-units per sentences	T/S	# of T-units / # of sentences
Degree of phrasal sophistication			
	Complex nominals per clause	CN/C	# of complex nominals / # of clauses
	Complex nominals per T-unit	CN/T	# of complex nominals / # of T-units
	Verb phrases per T-unit	VP/T	# of verb phrases / # of T-units
	Clauses per sentences	C/S	# of clauses / # of sentences

The proposed scale of Lu (2010) involves computing L2 writing production from the patterns of syntactic structures frequently used in the text. In an effort to address this argument, corpus linguistic studies have been conducted to explore differences in syntactic complexity in L2 production (e.g., Lu & Ai, 2015; Ai and Lu 2013; Ortega, 2003; Yang et al. 2015; Norris and Ortega, 2009; Bulté and Housen, 2012; Kuiken and Vedder, 2019). The results of most of these contrastive studies further support the idea that the source language (L1) and the prior knowledge of the target language (L2) impact the ways of organizing and arranging information in texts written in English. Data from previous research recognized that the four indices of measuring syntactic structures vary in both academic and argumentative written texts and between (non-) native writers of the target language. Thus, structuring information allows for describing "possible differences between the writing compositions of the two groups of scientific discourse communities" under study (Tovar, 2022: 2).

Kuiken and Vedder (2019), for example, found variation in the syntactic complexity of L2 written production across authors from different proficiency levels and cross-linguistic differences on syntactic indices between the target and source language. These findings confirmed Norris and Ortega's (2009: 560) hypothesis that with a greater proficiency in the L2 language, non-proficient learners tend to employ more complex and compound sentences. By contrast, at more advanced L2 proficiency levels, a decline of syntactic complexity can be detected. It is the case, for instance, "that expert speakers and more experienced writers tend to express complex ideas more simply than novice ones" (Lambert and Kormos, 2014: 6). Regarding L2 proficiency, the exploratory studies of Lu (2011) and Lu and Ai (2015) reported that the length of the production unit decreasing and the degree of phrasal sophistication increasing depended on writers' linguistic competence. Ai and Lu (2013), instead, found no

significant differences between L2 proficiency levels. Although variations between L2 proficiency levels in few studies are not found to be significant, results from a growing body of literature confirm the syntactic shift-pattern of Wolfe-Quintero et al. (1998), wherein there is a decline in coordinating sentences at higher levels of competence in favor of subordinating ones and, similarly, a decrease in subordination in favor of phrasal complexity at higher levels.

As stated above, complexity is a multifaceted construct; it is hypothetically different from related views as of "advanced levels of language development and maturity", and competence (Norris and Ortega, 2009: 564). In this way, the present study recognizes language complexity in "objective and quantitative terms as the number of discrete components that a language feature or a language system consists of, and as the number of connections between the different components" (Bulté and Housen, 2012: 24). Syntactic complexity, then, is considered objective and quantitative in terms of learner-independent factors (i.e., communicative load, occurrence of language features in the text). Thus, the complexity of a linguistic feature is one of the sentence structure indicators that accounts for processing or learning difficulty (Bulté and Housen, 2012). In general, learner-independent factors influence the ease or difficulty with which certain linguistic features of a text can be learned and processed. Therefore, the current Ph.D. dissertation examined to what extent English RA abstracts, both in North American and Ecuadorian journals, exhibited greater syntactic complexity.

2.7.1.2 Lexical richness

Lexical richness refers to writers' ability to identify, classify and efficiently use extensive and varied vocabulary in particular texts (Lewis, 1993); in simple words, it concerns the presence and quality of diverse words. Thus, lexical richness assesses the quality of texts by measuring the diversity, sophistication and types of words commonly used in the composition. Initially, Arnaud (1984) followed the analysis of written texts using the concept of vocabulary richness –*number of different words in tokens used in a text*. Then, Laufer and Nation (1995) adopted and defined the term lexical richness as an attempt to "quantify the degree to which a writer is using a varied and large vocabulary" in written compositions (Laufer and Nation, 1995: 307).

Accordingly, lexical richness is determined on the measurements of a) lexical variation (LV: distribution of diverse words), b) lexical sophistication (LS: distribution of advanced words), and c) lexical density (LD: distribution of content words) (Read, 2000). Thus, LV analyzes the quantity of varied words in a text; it accounts for the Type-token ratio (TTR) relationship and bases the examination on the ratio of distinctive words (type) in comparison with the total number of tokens. LS describes the proportion of relatively unusual or specialized

terms in a text (Read, 2000). LD generally refers to the percentage of content words compared to the function words. These three dimensions have been widely used in corpus linguistics research to explore the distribution of lexical items in academic texts by using data-driven text analyzers, for example, the vocabprofile analyzer of Tom Cobb 2006.

Much research carried out from different approaches in the fields of linguistics and corpus linguistics recognize the significance of analyzing the lexical profile and vocabulary richness in L2 writing (e.g., Nation, 2000, Nation, 2001, Schmitt, 2000, Laufer & Nation, 2001). Most of the previous studies were reported to be consistent sources for further research and to have a more complete understanding of L2 writers' lexical production. With much focus on writing standards and journal publication requirements for publication, researchers and junior researchers are paying much attention to the writing quality of texts to document commonalities or differences (e.g., Šišková, 2012; Djiwandono, 2016; Schmitt, 2000; Durrant 2014). In the international context, research on vocabulary richness suggests that academic texts written by authors whose English is not in their minds vary from those of whose L1 is English, in aspects of lexical and grammatical choices (e.g., Lee, 2018; Douglas, 2019; Ha, 2019; Lee, 2017; Crossley et al., 2016; Meara, 2005; Tankó, 2017; Van Bonn & Swales, 2007; Sánchez, 2020). Factors such as word choice, sentence structure, and punctuation that influence such variation could be associated with authors' different linguistic and cultural backgrounds, and L2 linguistic competence (Connor, 2004). In general, preceding research on lexicon and vocabulary evidences that "the vocabulary of English (and other languages interpreted by different linguistic levels) is far from being homogeneous" (Tovar, 2022: 224).

When analyzing academic texts written in English, Laufer and Nation (1995) reported that this type of genre varies in the occurrence of the high-frequency words (1000 and 2000) and low-frequency words (academic and off-list). Similarly, Djiwandono (2016) compared texts produced by novice and expert writers and discovered significant differences in word distribution, sophistication, and diversity. These findings suggest that in general lexical richness is a "relevant indicator of English writing proficiency level" (Ha, 2019: 4) since it determines the production of quality texts. Therefore, writing ability "significantly correlates with standardized measures of academic writing proficiency" (Douglas, 2012: 8) such as vocabulary knowledge and "high- and low-frequency lexical choices" in sentence structures (Douglas, 2019: 143). Although "there are many factors that contribute to writing quality, vocabulary has been identified as an important variable" throughout texts (Douglas, 2019: 145). This argument recognized that the range and degree of sophistication of syntactic structures play an important role in second language (L2) writing production and research (Ortega, 2003). Thus, if the text

is correctly linked lexically and grammatically, it will be comprehensive and much easier to follow. Consequently, the core of research on lexical richness is to describe the quality and varied lexical entries used in texts published in different disciplines and editorial contexts.

2.7.1.3 Relationships between rhetoric and linguistic realizations

Hyland, (2004), in his book *Disciplinary Discourses*, highlights that previous analyses of the abstracts have identified a rhetorical macro-structure, which, in general terms, corresponds to the organization of the paper itself. It is the intertextual link to the attached article. Similarly, Van Dijk (1977: 143), in his book *Text and context,* states the following:

> Macro-structure level of a text is the organization […] micro-structure level, it is related to the semantic structure of the sequence of sentences (*syntactic component*) […] macro-structures are related to the micro-structures as we briefly called semantic structure of the sequence of sentences.

According to Van Dijk (1977), the "role of macro-structures lies in the production and comprehension of the discourse" (p.55) and in the organization of information in the memory. Thus, macro-structures have linguistic manifestations, showing high-level properties of sequence of propositions. On the contrary, micro-structures, as evidence of semantic properties, are syntactic forms and lexical entities, wherein the "sequence of sentences" expresses the "semantic representations" and the attributes of those representations (p.143).

From the stated above, the relationship between rhetorical organization and linguistic realizations of written texts (in our case RA abstracts) is in the instantiation of the macro-structures, moves, and the micro-structures, compositional elements, that is, syntactic and lexical choices, which allow to describe the semantic representation of the moves, as in the example below:

> The main purpose of the study is to examine vocabulary knowledge in pre-service English teachers. (Education text)
>
> Macro-structure = Purpose Move, Rhetorical organization
>
> Micro-structure = Present tense, Linguistic realizations (compositional element)

The example above illustrates that the frequency and occurrence of the individual moves, to some extent, can be categorized by exemplary linguistic signals (e.g., The main purpose of) that help to identify rhetorical organization. Therefore, rhetoric encompasses both the pragmatic arrangement of the macro-textual level (moves and steps) and the linguistic selection of the micro-level. A move, thereby, is a discursive and functional unit (rather than lexicogrammatical) that organizes the text in small sections to communicate the purposes of the activity in which the community members are enrolled. (Swales, 1990:110). To put it in another

way, a move is a unit that relates both writers' purposes and to the content they wish to communicate; a step is a lower-level text unit that provides a detailed perspective on the opinions open to the writers when establishing the moves (Swales, 1990:179-180).

Micro-structures, meanwhile, are linguistic rules that represent the semantic representation of the moves and steps (van Dijk, 1977: 6). In this way, micro-structures describe, represent, or illustrate the sentence simplicity or complexity of text. This argument is connected to Kaplan's (1966: 2) contrastive rhetoric hypothesis to ESP written texts; the author pointed out that "rhetoric is not universal but varies from culture to culture". Consequently, within the general structure, cultural can emerge, and writers can select particular syntactic and lexical features of the language.

Thus, in the current dissertation, both the syntactic complexity and the lexical richness allowed for analyzing the content and characteristics of abstracts from all the four disciplines and looked for possible variation. It also studied the move structures and the linkers that helped going from one move to the other. These two criteria, taken in the corpus analysis, contributed to determining the most common words (conjunctions) used as cohesive devices in the configuration of the rhetorical moves. This correlation is presented below in Figure 1, which illustrates the triangulation of the theory and shows rhetorical moves as the linking idea of the revised and cited theories.

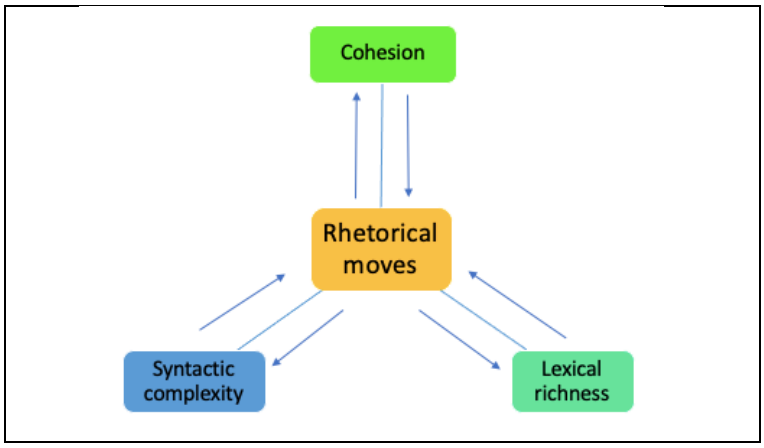


Figure 1. Triangulation of Theories Focal ideas

2.7.2 State-of-the-Art: Previous research related to the Ph.D. dissertation

2.7.2.1 Research on abstracts of scientific articles

The massive production of research articles across disciplines and languages has made RAAs gain prominent scientific value as documents to search information in academia. Such condition has led to RAAs being considered research corpora within the corpus linguistic analysis. This is because, as stated by Swales and Feak (2009: 1), "abstracts in the information explosion have

thus become an increasingly important part-genre" for discourse analysis. Abstracts, as the first point of contact with research information, after titles, have been investigated from different perspectives and approaches. This section highlights and summarizes studies related to the research interest.

Some researchers and scholars have kept their interest in the construction of rhetorical structures and lexico-grammatical features from different languages and publishing contexts in the last two decades (e.g., Halliday, 2000; Kafes, 2012; Dos Santos 1996; Swales and Feak, 1994; Martín-Martín, 2003; Suntara and Usaha ;2013; Lorés, 2004, 2014; Behnam and Golpour, 2014; Çakir and Fidan, 2015). These studies have documented rhetorical and linguistic variation. For example, Turkish abstracts in Kafes (2012), and English abstracts in Çakir and Fidan (2015), followed a three-move scheme: purpose, method, and result. Martín-Martín (2003) and Lorés (2004), meanwhile, discovered that Spanish abstracts reproduce the IMRD structure: introduction, method, result, and discussion. Behnam and Golpour (2014), on the other hand, found that Persian abstracts comply with the PMRC move pattern such as for purposes, methods, results, and conclusions. These research outcomes suggest that "abstracts written in different languages embrace a non-hierarchical move-structure with three or four stable moves" (Tovar Viera, 2019: 113). The analysis of these composing patterns allows us to understand how authors adhere to academic discursive practices to communicate their purposes (Bhatia, 1993; Swales, 1990) and how these standard conventions influence authors' preferred rhetoric in the actual use of language (Hyland, 2000).

Swales and Feak (1994) comparing abstracts of scientific papers, claimed that most abstracts meet English international standards. These academics highlight that abstracts as condensed texts displayed some variations in their rhetorical and linguistic realizations. Accordingly, Hyland (2000, 2004) reported that the rhetorical move structure is not uniform in abstracts of RA; it is because the move occurrence varies across disciplines and in many languages other than English. This trend reveals that moves are not hieratically constructed. For instance, while in Dos Santos (1996), the conclusion sections were non-obligatory, in Suntara and Usaha (2013), they frequently occurred to drive the communicative goal. According to Hyland (2000), this hierarchical and non-hierarchical divergence is the result of different social practices and institutionalized ideologies within the academia. Thus, the rhetorical move analysis helps to explore whether the patterns that compose them follow the English-speaking international academic community or respond to local discursive practices.

In this vein, Hyland (2009: 34) claims that "a text carries meaning and gains its communicative force only by displaying the patterns and conventions of the community for

which it is written". Since RAAs are texts that follow writing conventions, much research has gone beyond the structural analysis (e.g., Pho, 2008; Hyland and Tse, 2005; Mur-Dueñas, 2011; Poveda, 2007; Loutayf, 2017; Tseng, 2011; Kosasih, 2018; Lorés, 2014, just to reference a few). The foci of these studies have been to figure out the contextual y professional setting in which this part genre occurred (Pho, 2008), how intercultural rhetoric influences L1, L2 or FL in text production (Connor and Rozychi, 2013), and how academics "build solidarity with their readers" throughout the texts (Hyland and Tse, 2005: 124).

Investigating the lingua-cultural differences of abstracts, Mur-Dueñas (2011) and Poveda (2007) found that the surface structure of texts as a sociocultural construction of the language is different in English and Spanish. Within the same research interest, Loutayf (2017) noticed that most abstracts produced by Argentine writers employ the impersonal style to evade censorship in the international English-Speaking community. In this way, Liddicoat (2009: 121) stated that even though the communicative function of "genres themselves are shared between cultures, the ways in which each genre is constructed may vary" as measured by structure, style, content, and intended audience. Regarding the structure and style, Tseng (2011) and Pho (2008) report that 'present perfect and present tense' were most recurring grammatical tenses in English abstracts, while in Kosasih (2018), these tenses frequently appeared accompanying rhetorical moves. Lorés (2014: 105) notice that "English texts tend towards the use of active voice whose subjects function as textual nouns" to refer to the entire work. Spanish texts, in contrast, "share the characteristics of a passive form in the sense that no agent" is explicitly mentioned. The core of these results highlights that the target linguistic and rhetorical requirements represent discursive practices employed in academic communication (Lorés, 2014: 106) wherein the lingua-cultural conventions shape the linguistic content of the text (Connor, 2004).

This argument claims the need of analyzing whether Spanish writers when writing English abstracts published in a Spanish context tend to transfer Spanish language conventions into their texts. Characterizing the relationship between the text and the situation in which they are produced can drive to some possible linguistics implications and disciplinary reasons.

2.7.2.2 Previous research related to the Ph.D. dissertation

Finding an appropriate Ph.D. background for this section was difficult because there are not many Ph.D. theses related to the current theme of research. Most of the research published online was in North America or Europe —a few of them in South America. Ecuador has no research pertaining to the specific thesis. As a result, there is a remarkable opportunity to

contribute to both linguistics and applied linguistics research fields in this country. This section presents some of the research most closely related to the current thesis dissertation and the relation they hold to the theme and topic of the currently supported approach. The background selection included three aspects directly related to the current research aims: (a) research done in a university context; (b) research concerning to Ph.D. programs; and (c) research concerning rhetorical move analysis. So, an overview of this review is commented.

In many fields, corpus linguistics has been the basis for the analysis of academic discourses. Thus, Martinez (2012) analyzes the rhetorical and functional organization of moves in a 92 Ph.D. theses corpus. The corpus came from TeDiCE-2010, collected between 2000 – 2010 in the fields of history and physics from Chilean and Spaniard discursive communities. The sample was non-probabilistic and intentional, so it was chosen randomly at the researcher's discretion. The research followed a qualitative methodological approach grounded on corpus-based linguistics, supported by a non-experimental-transactional design, and with an exploratory-descriptive scope and a mixed analysis frame.

The main outcomes of the research reported the emergence of a new rhetorical unit called *displacement*. It was found that the genre doctoral thesis is organized under four identifiable displacements: namely, Preliminary framing, disposition to research, focal issues, and research support. Results also evidenced higher rhetorical-functional variation within the field and less variation concerning the discursive community. Such variation is due to the field and discourse community differences. Regarding the didactic and pedagogical implications, Martínez considered that, although manuals are currently on the market, they basically incorporate a general perspective on the thesis as a product but not on writing processes per se. Thus, designing virtual platforms, courses, or workshops based on a gender-based methodology and focused on the doctoral students' writing strategies, professors and the institution itself would have empirical information to carry out the validation of this genre. As stated before, this study confirms that there are few works related to this research topic and complementary top-down approach to do rhetorical move analysis.

The study constituted an input from the academic institutions. In short, it contributed to a better understanding of the genre, which needs further research, compared to the genre of scientific research articles explored internationally and in a Latin American regional context. The relationship between that research and the current thesis dissertation lies in the notion to support the necessity of written production of novice writers and graduate students. Although the researcher considered the idea, he does not develop it but leaves it as an open path for future research.

Blanco (2019) is another research study which examines 171 abstracts published in eighteen prestigious Venezuelan and Colombian journals in the education discipline. On the basis that abstracts are discursive genres representing longer articles (Swales, 2004, 1990), the study evaluates what was done regarding research in education and how RA abstracts are structured. Abstracts indexed in RedALyC database, one of the three most qualified indexers in the Latin American subregion, were chosen for this research. The study used the IMRC rhetorical move structure proposed by Hyland (2000); it analyzed a small corpus of 25,710 words.

The author argued that the four-move structure was probably the most widely used in Venezuelan and Colombian journals by that moment. He also affirmed the same structure could be present in research articles in most social sciences and humanities journals. Blanco observed a similar trend in the textual organization of abstract in the journals of both countries. Nonetheless, abstracts from Venezuela seemed to follow a more hierarchical structure compared to those published in Colombia. The most frequent abstracts were those that had an introductory section. Well-structured abstracts (with three or four rhetorical structures) expressing results were the minority. Abstracts with less than three-move structures predominated during the research. Considering the results, the author recommended working not only with abstracts but with complete papers from education, other disciplines, and other countries to have a clear picture on writers' preferred rhetoric.

The research discussed above is related to the present thesis dissertation because it allowed for observing the organization of abstracts in the field of education and the criteria for corpus selection commonly used by Latin American researchers. In this case, the fundamental criterion was the indexation of the articles in recognized Latin American international indexers. Like Blanco's study, the current dissertation also follows Hyland's ideas regarding the similarity or variability in the structure of texts to look for common grounds or possible differences among RAAs.

Following similar research lines, Shinta, Effendi, and Ekaning (2018) focus the analysis on the writers' linguistic realizations and the standardized process in writing abstracts. The corpus consisted of 24 undergraduate and graduate thesis abstracts in education; the research was descriptive and qualitative in design. The criteria for corpus selection were (1) abstracts had to be written in the academic year 2014-2015 by undergraduate and graduate students from the English Language Teaching program at the State University of Malang, and (2) abstracts had to be the final version reviewed by the advisors and the examining board.

The most relevant results of this research were (a) five, out of eight, abstracts written by students with low-level GPA —grade point average— contained five moves, and (b) only three, out of five, abstracts (written by high-level GPA students) presented the complete five moves. After the move analysis, the authors realized that a few overlapping steps occurred in the moves, notwithstanding their GPA level. SPMRC, namely 'Situating the research-Purpose-Method-Result-Conclusion', was the common move pattern. The study also reported that (a) students had problems with understanding and using academic writing conventions, (b) they had difficulties using the rhetorical and logical strategies to express ideas effectively, (c) they showed troubles developing their argumentative position in the written discourse, and (d) many undergraduate and graduate students had not succeeded in communicating their intended messages and ideas. As a result, the writing was illogical and not rhetorically well-structured.

From the results, the authors suggested researchers should concentrate on the use of rhetorical moves to effectively organize the content of written language. The core of their suggestion is that: (a) writing should be guided so the students can come up with English conventions, (b) teachers should use a list of reporting verbs to enrich students' lexical knowledge when writing abstracts, and (c) supervisors might guide students through the process of writing abstracts. This research is related to the current dissertation work because it foresees discussing linguistic implications related to the organizational process of writing RAAs.

Quintanilla (2016) is a research study which, using Swales and Feak's (2009) model, examined the rhetorical structure of RA abstracts written in education and published in Chile. The corpus consisted of 50 abstracts indexed in Scielo and SCOPUS international database with a scientific journal ranking of 0.22. The abstracts corresponded to the last three issues of the journal of Pedagogical Studies in Philosophy and Humanities, advertised in 2013, of the Austral University of Chile.

The main research outcomes of this study indicated that 46% of the abstracts followed a four-move structure: M2-M3-M4-(M5), and 20% adopted a three-move pattern such as M2-M3-M4. Findings also revealed that 4% of the abstracts used a three-move non-structural schema, either M3-M2-M4 or M2-M4-M3. In this study, introduction and conclusion sections had the least occurrence throughout the corpus. The results also reported the repetition of terms and structures in each move. However, in the case of the method section, a greater lexical and structural variety was identified. This could be due to the variety of elements that constitutes such moves: for example, methodology, sample, type of analysis, materials, and procedures, among others. Thus, the author argued the findings had pedagogical implications; she suggested producing new material to teach academic writing that could strengthen discursive competences

within the academic-scientific communities. Even though she suggested the idea, she did not propose anything to be eagerly considered.

Based on the background review, the current Ph.D. dissertation is relevant. It looks for closing one of many research gaps commented by previous researchers. These main issues are (a) the little research concerning RA abstracts in Latin America, (b) the lack of research concerning this topic in Ecuador, (c) the lack of attention from researchers to the educational field concerning the promotion of strategies to develop writing skills, and (d) the lack of didactic material to guide writing processes. All the aspects mentioned above are briefly described by the researchers, but none of them completely propose guidelines to either identify abstracts' rhetorical move tendencies in the fields they explored or offer didactic solutions to the process of writing academic texts. Although there is much to be done in the educational and linguistic arena, this study aims, first of all, to close the research gap on the contrastive analysis of NA&EJs across disciplines (humanities and sciences). Thus, it looks for defining the frequent move structure in NA&EJs, as well as describing their linguistic realization: namely, syntactic structure and lexical sophistication. The authors cited above suggest emphasizing for future research in the relationship between RA abstracts' didactics needs, difficulties in accurate writing, and their move organization.

CHAPTER III

METHODOLOGY

RESEARCH DESIGN AND METHODS

This chapter addresses the research design and methods employed in the current dissertation study. First, it introduces the design of the research study, including the corpus used for the contrastive analysis. Then, it describes the methods adopted here, from the quantitative approach, specifying the instruments and procedures.

3.1 Research design

This dissertation is a cross-sectional study in design. It explores the rhetorical organization and linguistic realizations of RAAs published in NA&EJ. As mentioned in the previous chapter, up to the present, comparing RAAs between disciplines and fields has been largely ignored by the linguistic and applied linguistic research in Ecuador. Informed by the literature, this study a) defines the rhetorical move structure and the cohesive means associated with the cohesion of rhetorical moves, and b) describes the syntactic complexity and lexical richness of abstracts in the four disciplines aforementioned. Thus, the core of the research projection is that abstracts themselves, as Hyland (2004: 83) pointed out, have been a "rather neglected social artifact of disciplinary life", and that is the case of Ecuador in particular.

Regarding the research design, this is a comparative-descriptive study in which the selection of techniques includes quantitative procedures. For the result-oriented quantitative procedures, the technique employed was a deductive and inductive content analysis of the output text of the automatic text analyzers using the SPSS software platform. Additionally, the top-down and bottom-up approaches were performed; the top-down focused on the content of abstracts, whilst the bottom-up concentrated on the linguistic signals. Then, the exegesis technique, "a running commentary on the product that reveals something of its dynamic unfolding as a process" (Halliday and Hasan, 1989: 11), was used to interpret the research findings and define common composing patterns and probable linguistic trends related to the configuration of RAAs.

The dissertation, therefore, presents statistically the main research outcomes about rhetorical organization, syntactic structure, and lexical sophistication, with emphasis on responding to the general and preceding research questions. So, the research dealt with quantitative data collection, involving a documentary research type in design (Hernández-

Sampieri and Mendoza, 2018), and the interpretation of the data, undertaking exegesis thematic and discourse analysis overviews (Martínez-Miguelez, 2004).

3.2 Corpus (sample)

The contrastive analysis constituted 240 English RAAs published in NA&EJ, in the periods 2010-2018, and written in the disciplines of education, sociology, electronics, and agronomy. These abstracts were considered representative and reliable corpora because they are indexed in ERIC, EBSCOhost, DOAJ, Elsevier, American statistical association, SciSearch, SCOPUS, AS&T, and Google Scholar, which have stable publication and indexation standards widely and respectfully accepted inside research and academic communities. The North American abstracts' sub-corpora come from the following journals: American Journal of Education, Journal of Teacher Education, American Journal of Sociology, Sociological Perspectives, Journal of Electronic Material, Journal of Electronic Packaging, Journal of Agricultural and Food Chemistry, and Journal of Agricultural Science. Similarly, Ecuadorian abstracts' sub-corpora come from the following journals: Alteridad, Sophia (philosophy & education), UTCiencia (science & humanities), Revista Tecnológica ESPOL, Iconos, Analitika, Universitas, Innova research journal, Siembra, la Granja, La Técnica, Amazónica, ACI Avance, Enfoque, Ingenius, and Maskay. Ecuadorian journals are indexed in the Latindex database (one of the most remarkable regional indexing in Latin America); they also hold international database indexes, such as Elsevier, DOAJ, Dialnet, REDIB, DRJI, SIS, MIAR, SciELO, OAJI.net, and EBSCOhost.

3.3 Procedures

The aim of the current dissertation is to provide an overall descriptive and comparative analysis of the representative population of abstracts in English. Thus, in the data analysis, abstracts in English from North American journals (NAJ) were treated as texts published in an English-speaking country. In contrast, those of the Ecuadorian journals (EJ) were considered as texts published in a non-Anglophone country and written by Spanish language users. Therefore, to find out common grounds and regularities across the four disciplines, in some cases, the association of abstracts in those journals were referred to as NAJ_1S, NAJ_2H, EJ_3S, and EJ_4H. These acronyms indicate the outcomes of North American journals in science, North American journals in humanities, Ecuadorian journals in science, and Ecuadorian journals in humanities fields. The figures and percentages of the rhetorical organization, syntactic

structure, and lexical sophistication of RAAs were mined independently to evaluate and determine whether differences between samples were or were not statistically significant.

3.3.1 Data collection

The data collection consisted of a corpus of 576 abstracts published in eight international journals (American Journal of Education, Journal of Teacher Education, American Journal of Sociology, Sociological Perspectives, Journal of Electronic Materials, Journal of Electronic Packaging, Journal of Agricultural and Food Chemistry, Journal of Agricultural Science), and in sixteen national journals (Alteridad, Sophia-Philosophy&Education, UTCiencia, Revista Tecnologica, Iconos, Analitika, Universitas, Innova Research, Siembra, La Granja, La Técnica, Amazónica, ACIavance, EnfoqueUTE, Ingenius, Maskay). (See Appendix 1)

The journals published in North America –U.S.A. were selected following international ranking in the fields of sociology, education, electronics, and agronomy. The national journals, published in Ecuador, were also ranked nationally as the top journals in the four disciplines and published in Spanish, with English abstracts accompanying their articles. Ecuadorian journals, like North American ones, were indexed in a regional and international database. (See Appendix 1)

The decision on selecting the highest-ranked national and international journals was based on the following assumption: abstracts written by experienced researchers and expert writers are the model of composing accurate writing, in terms of well-structured information. Features of proficient academic writing in English would, then, have worthwhile linguistic implications for novice and less experienced academic writers in an Ecuadorian educational context. English abstracts published between 2010 and 2018, in issues 1 and 2, were gathered from NA&EJ to guarantee controlled comparison analysis across disciplines and fields.

3.3.2 Corpus selection

The thesis dissertation used a random probability sample method to select the original corpora, which consisted of 576 English RA abstracts. It also employed a sample selection method via internal criteria related to the aim of the research (see Table 8, below). Accordingly, the author selected a corpus of 288 RAAs from North American journals as well as 288 from Ecuadorian journals. This selection included 72 texts from each stratified subgenre: namely, education, sociology, electronics, and agronomy from each country.

Table 8. Internal criteria for corpus selection (Tovar, 2019)

Characteristic	Claim
Abstracts of empirical research studies	Abstracts were selected from empirical disciplines because these fields "generally" have no obligatory abstract writing criteria.
Unstructured abstracts	Since the study looks for rhetorical patterns (obligatory, conventional, optional) to compare Ecuadorian and North American journals, the format of structured abstract may affect the research interest, so the author analyzed rhetorical patterns to determine moves in abstract which were "apparently" written with no schema (writing experience based) in the four selected discipline journals.
Single paragraph condensed summary	The abstracts cannot have more than one paragraph since most literature consider structured abstracts as those containing two or more paragraphs (more than 300 words). The intention is to analyze the structure of short, condensed abstracts.
Wider range of samples	To have a balanced sample size. In the corpus, all abstracts had to be written by different authors or co-authors. One abstract per writer must be selected since the research had no personal writing skills analyses purposes but rather a disciplinary RA abstracts analysis aim.

Each set of abstracts was double-checked to see if they met the internal selection criteria. Abstracts with no internal criteria conditions were excluded, so the corpus selection restarted until RAAs met the required characteristics to be considered as sampling populations for the rhetorical and linguistic analysis.

3.3.3 Corpus sampling procedures

Using the random sampling selection excel *fx=randbetween* program, out of 288 texts, we obtained the final 240 NA&EJs: 120 abstracts in North American journals and 120 in Ecuadorian journals. To give the *fx=randbetween* program functionality, abstracts, in a spreadsheet, were first numbered from 1 to 144 with their respective discipline and publication context. Then, the *fx=randbetween* function was activated, and the selection of 30 abstracts per discipline started. Once the choice of the RAAs ended, abstracts were rearranged through a normalization process using the function *fx=dataremoveduplicates* to eliminate double or repeated texts. After completing this process, the sampling corpus registered 30 RAAs in the required disciplines. Finally, the functions *vlookup* and *search* identified the discipline and its publication context (Text associated with Tovar, 2022: 4).

3.3.4 Move stability criteria

Within the identification of moves, multiple criteria have been applied. For example, a move is considered conventional if it shows 100% (Tseng, 2011), 90% (Dos Santos, 1996), 70% (Çakır & Fidan, 2015), 60% (Kanoksilapatham, 2005), and 50% (Swales, 1990) of occurrence throughout the texts. By contrast, a move is categorized as optional in less than 50%, 60%, and 70% percentages. This analysis indicates that researchers vary in the criteria for interpreting and identifying moves across discourse community practices. Thus, in the current dissertation,

a move was considered stable if it had 50% occurrence; less than 50% was recognized as infrequent but potential to characterize the realization of the genre. The move stability criteria were adopted because following a high value delimits the possibility of reporting variation. As a result, less frequent moves may not be reported as rhetorical tendencies of particular genres (Tankó, 2017).

3.4 Data analysis, reliability, and instruments

3.4.1 Data analysis

The main scope in the analysis was that single moves could be isolated and examined to discover the structure of abstracts concerning their move order, move occurrence, and linguistic features. The study consisted of two parts: first, it identified the set of communicative purposes, and second, it explored the former surface structure and linguistic features. The classification of the moves was done as follows:

1. Look for organization and patterns: Identification of moves (and the bounds between them) through a through a lexical and grammatical choice, which functioned as linguistic signals of text cohesion.
2. Work from a sentence-level analysis to grasp cohesive markers.
3. Assignment of numbers to a move.
4. Validation of the preliminary classification through an intra-rater-coder reliability; this consisted of a second move analysis done by the author.
5. Validation of the categorization by querying inter-rater agreements.

The stages listed above ensured the move coding reliability. To reach intra-rater reliability, the author re-analyzed a month later the initial classification of all the RAAs in both NA&EJ sub-corpora. Inter-rater agreement was tested by the co-coder, a MA in applied linguistics, who independently rated the RAAs submitted to analysis. Additionally, according to the steps described below in Table 9, the researcher did a sequential observation to identify the moves in the corpus. Once the move structure of RAAs in North American journals was identified (by following the intra and inter-rater analyses), the analysis of the move structure in abstracts of Ecuadorian journals started.

The identification of the rhetorical move structure in RAAs of Ecuadorian journals followed the same procedure used to analyze North American ones. After identifying and categorizing move structures of abstracts in Ecuadorian journals, these were compared with the rhetorical move structure of North American ones to see to what extent abstracts of Ecuadorian

journals followed a similar or a different schema. Finally, the analysis outlined the research outcomes.

Table 9. Data analysis and procedures

Order	Steps
1	Building a preliminary move categorization.
2	Training the co-coder and harmonization of categorizing moves.
3	Analysis of the 120 North American journal research article abstracts.
4	Checking intra-coder and inter-coder reliability.
5	Analyzing the 120 Ecuadorian journal research article abstracts.
6	Checking intra-coder and inter-coder reliability.
7	Comparing the results of the North American and the Ecuadorian Corpus.
8	Outlining final research outcomes.

3.4.2 **Building a preliminary move categorization sample**

Abstracts of research articles involve moves. According to Swales (1990), a move is a functional unit that illustrates the organized discourse and the linguistic features that constitute the content. That is, moves place the communicative purpose of the texts, by attesting disciplinary writing conventions, in terms of frequency, order, and stability. Thus, to make the rhetorical analysis more manageable, a preliminary categorization of moves using a top-down analysis of abstracts was created, as shown in Table 10 below.

The move model was based on a randomly selected analysis of 20 abstracts from each one of the disciplines selected published in North American Journals. It took the information content and communicative functions into account to divide abstracts into move sections. Consequently, the analysis took each turn on a topic or communicative function (even if this occurred in mid-sentence) as a borderline section. The preliminary analysis was based on the move model proposed by Hyland (2000), which, as stated above, has been extensively used in the rhetorical organization of abstracts in scientific papers. First, it was observed the occurrence of Hyland's move model: introduction, objective, methods, results, and conclusion, but later in a detailed analysis, new moves emerged, as can be seen in the table below.

Table 10. Analytical criteria for move agreement and discussions

#	Moves	Communicative purpose	Linguistic signals
1	Thematic focus	Announces the interest or importance of referring to the research study	*The research project is born from …, This type of study and the way it is presented to the audience…, This work arises from the need …*
2	Background	Introduces selected and relevant investigations in the disciplinary field	*in a recent work…, this is a follow up study of…, After a lengthy period of focusing on…*
3	Purpose	Defines the objective of the study	*The present study examines…, the aim of this investigation is…, the objective was to…*
4	Method	Describes the procedures, instruments, and materials used for the data analysis	*the data for this research…, the article analyses data from..., The study constitutes of x and y participants…*
5	Results	Outlines the important outcomes of the research study	*The findings reveal…, the results of a series of consecutive tests revealed…, Results of this study indicate…*
6	Conclusion	Summarizes the information content and the importance of the paper	*The article concludes…, it reached the following conclusions…, the main conclusion is that there is…*
7	Recommendations	Suggests possible applications for a particular purpose	*The results of the study suggest…, the findings suggest that…, this will be to have a high-quality game to be used as…*

As a result, in the categorization of moves, thematic focus (announcing the topic) and background (previous research) resulted from the division of the introduction section. The author took the latter 'recommendations' as an independent section in the corpus because the 'conclusions' often embedded 'recommendations' which were not conclusions but new ideas for further research. The seven-move schema was based on the idea that a move can embed another and, as a result, it hid the occurrence of potential moves, so punctuation and linguistic signals were used to found the boundaries between these moves. The table below shows the intra-rater reliability of the preliminary move pattern (described above) across the four disciplines published in North American journals. In the process of checking the intra-rater reliability of the coding procedure, it compared outcomes between the first move-coding and the second move-coding done by the researcher at different times in length. Thus, 97% reported similarity in the move coding, which showed significance as it was below the 0.05% error. The procedures applied here were statistically consistent since the intra-rater Spearman Correlation ($r_R = .95$) is significant at the 0.01 level ($p = .85$). For further analysis of the move frequency, and move occurrence when building the preliminary move model, see Appendix 2.

Table 11. Intra-rater reliability of the preliminary move-pattern

Reliability	Raters	Spearman Corr.	Sig.
Education	1(1) - 1(2)	.96	1.0
Sociology	1(1) - 1(2)	.90	.86
Electronics	1(1) - 1(2)	.96	.71
Agronomy	1(1) - 1(2)	.94	.83

Note: Correlation is significant at the 0.01 (2 tailed)

3.4.3 Training the co-coder and harmonization of categorizing moves

The second human coder, who has a MA in applied linguistics and taught courses on academic writing at the Department of National and Foreign Language Pedagogy in an Ecuadorian university, was familiarized with the preliminary rhetorical move structure and genre analysis theory of English in scientific and research contexts (Swales, 1990; Hyland, 2000). The co-coder paid special attention during the training to the discussion of each of the move's taxonomy and its communicative purposes.

To familiarize the co-coder with the theory underlying this work, a training course conference about the rhetorical organization of journal RAAs (in essence, move models) with an emphasis on Hyland's (2000) model was carried out. It also introduced and discussed the non-hierarchical preliminary move pattern found in this research. The training course lasted four weeks, three days per week, with two hours each day; it entailed two phases or stages. The first stage of the training course was entirely theoretical. It presented the models of Swales (pioneering work related to introduction sections of RAs), Dos Santos, and Hyland. The latter, Hyland's model, for RAAs is widely used in linguistics and applied linguistics research across disciplines and languages. In this stage, the preliminary move model was discussed so that the co-coder could see the possible similarities with the modes already presented. Then, some authentic material (print and online RAAs) that displayed the use of those move models were given to illustrate the construction of abstracts. Once the co-coder had a clear picture of the rhetorical organization of abstracts, examples of RAAs in the disciplines of linguistics, literature, education, sociology, electronics, and agronomy were offered to show variations in the construction of those abstracts. Likewise, to identify moves and set up the borders between them, a list of linguistic signals taken from the journal article abstracts under study was introduced. For example, *this is a follow-up study of...* —introduction/background, *the main goal of this research is…* —purpose, *the article analyses data from...* —methodology, *results of this study indicate…* —findings, *it reached the following conclusions…* —conclusions.

The second stage of the training course consisted of practical examples. This allowed the co-coder to put into practice the gained knowledge about the rhetorical construction of

abstracts. In this stage, clarifications on the linguistic signals to establish the boundaries between moves were made. At the end of this stage, the co-coder was able to examine the rhetorical structures of abstracts without any difficulty.

Genre analysis in this study, then, was devoted to classifying the communicative purpose of the texts in academic discourses. The analysis focused on the rhetorical structures and their linguistic realizations that tended to recur in genre-specific texts —*abstracts* (Swales, 1990). During the session of categorization and harmonization of moves, new problems emerged that required the formulation of clear analytical decisions, for instance, linguistic signals to establish the move boundaries, and move categorization. To handle the problems and prevent future mistakes, the author re-analyzed, and the co-coder independently read the 20 abstracts from each discipline of North American journals to deal with those issues and filter out such difficulties.

3.4.4 Reliability agreement of the categorization of move

The analytic unit was the clause because the sentence features did not allow a thoroughly satisfactory analysis. Within this pilot analysis earlier discussed, new phrases and formulaic expressions emerged; after further discussions, the agreement reached on the occurrence of another move (M8, implications) as highlighted and described below in Table 12. All possible problems and clarifications were addressed, and the researcher and the co-coder agreed on a final eight move schema out of the 20 RA abstracts from North American journals.

Table 12. Analytical criteria for the inter-rater agreement between author and co-coder

#	Moves	Communicative purpose	Linguistic signals
1	Thematic focus	Announces the interest of importance of referring to the research study	*The research project is born from …, This type of study and the way it is presented to the audience…, This work arises from the need …*
2	Background	Introduces selected and relevant investigations in the disciplinary field	*in a recent work…, this is a follow up study of…, After a lengthy period of focusing on…*
3	Purpose	Defines the objective of the study	*The present study examines…, the aim of this investigation is…, the objective was to…*
4	Method	Describes the procedures, instruments, and materials used for the data analysis	*the data for this research…, the article analyses data from..., The study constitutes of x and y participants…*
5	Results	Outlines the important outcomes of the research study	*The findings reveal…, the results of a series of consecutive tests revealed…, Results of this study indicate…*
6	Conclusion	Summarizes the information content and the importance of the paper	*The article concludes…, it recached the following conclusions…, the main conclusion is that there is…*
7	Recommendations	Suggests possible (pedagogical) applications for a particular purpose	*The results of the study suggest…, the findings suggest that…, this will be to have a high-quality game to be used as…*
8	**Implications**	**Points to premises and interpretation scope of the work for subsequent research.**	***The research led to the conformation of…, the transient model can simulate a variety of…, the significance of this research is…***

Once coding all the abstracts, a reliability agreement of the categorization of moves took place. It also compared whether there was a significant statistical agreement between the move analysis undertaken independently by the author and the one fulfilled by the co-coder. In the intra-coder reliability, the author re-analyzed 20 abstracts from North American English sub-corpora; the procedures were held separately and at different periods to guarantee objectivity. Thus, from the identified eight rhetorical move structures in RAAs, 96% were coded similarly by the researcher and the co-coder. There was a 0.4% difference when categorizing the moves, which represented high reliability as the error was below 0.5%; thus, the methodological procedure was statistically reliable. Table 13 shows that the intra-rater and inter-rater Spearman Correlations are significant at the 0.01 level (intra-rater: $r_R = .83$) and (inter-rater: $r_R = .83; r_R = 1.0$), respectively. This final schema (move pattern in table 12) was a guideline for the analysis of the rest of the North American journal RAAs as well as for the 120 Ecuadorian ones. Appendix 3 reports the intra-rater and inter-rater analysis in NAJ.

Table 13. Intra-rater and inter-rater reliability of move identification in NAJ

Reliability	Raters	Spearman Corr.	Sig.
			two
Intra-rater	1(1) -1(2)	.83	0.87
Inter-rater	1(1) - 2	.83	0.81
	1(2) - 2	1.0**	0.93

Note: **Correlation is significant at the 0.01 (2 tailed)

3.4.5 Instruments, steps, and techniques

The study employed a series of statistical instruments and programs such as SPSS statistical analysis (ANOVA, multiple t-test, Mann-Whitney U Test, Tukey's post hoc test) and the observation technique for describing "abstracts in actual use of English language" (Tovar, 2022: 5). In this dissertation study, sentences were the unit of analysis. The top-down and bottom-up approaches were adopted when identifying the rhetorical moves and establishing the bounds between them (Ackland, 2009). As "a move can be realized by several sentences (Pho, 2008: 235) "as well as by a single one" (Lau, 2004: 6), linguistic signals to differentiate one move from another were used. For example, *this type of study…, in a recent work…, the present study…, the data for this research…, the findings reveal…, the article conclude…, the results of the study…,* and so on (for further formulaic expressions see Tables 10 and 12 above). The top-down approach puts emphasis on the information content while the bottom-up approach focuses on linguistics evidences to identify the textual construction of moves in each disciplinary field.

Concerning the linguistic realizations, both English sub-corpora went through software-based text analyses that measured the syntactic complexity of abstracts, on the one hand, and their lexical richness, on the other. L2 Syntactic Complexity Analyzer -L2SCA (Lu, 2010) measures the syntactic complexity of journal RAAs. It assesses 14 syntactic indices grouped into (1) length of production units, (2) amounts of coordination, (3) amounts of subordination, and (4) degree of phrasal sophistication. LASCA is a parser analyzer for screening complex sentence structures in sample texts distributed in 14 syntactic indices, as shown in Table 7. It provides researchers with a comprehensive analysis to predict writing quality. Furthermore, the web-based text analyzer, VersaText (Thomas, 2015), searched for N nominal clauses, as of N that subject, N that complement, N to-infinitive, N of-preposition, and preposition-plus-wh structures to pinpoint what structures regularly appear in the two English sub-corpora.

The *Compleat Lexical Tutor*, Vocabulary profiler (Cobb, 2006) available online at https://www.lextutor.ca/vp/eng/ gauges the lexical richness, explicitly lexical density (LD), lexical variation (LV), and lexical sophistication (LS). The English corpora collected from North American and Ecuadorian journals were administered to the vocab profiler (Cobb), which performs a lexical choice analysis of the texts. The output text shows the lexical profile of the written compositions by extracting the percentage of high- and low-frequency words and academic words covering word diversity, sophistication, and word density. These three dimensions effectively measure writers' lexical competence and vocabulary richness of any text (Laufer & Nation, 1995).

The output texts of the automatic text analyzers were processed using SPSS Statistics to figure out text complexity and vocabulary sophistication. Accordingly, after obtaining the syntactic complexity indices and vocab-profile for each English sub-corpus, multiple independent sample t-tests were performed to set up differences in RAAs of NA&EJ across disciplines. Additionally, one-way ANOVAs were used to determine significance between NA&EJs. The online software programs were selected because of their free access and widespread use as consistent text analyzers in many corpus linguistic studies.

3.4.6 **Steps for the data analysis of research article abstracts**

3.4.6.1 Rhetorical organization

The steps described below led the data analysis of RAAs published in NA&EJ across disciplines:

1. Defining basic linguistic constituents of analysis (sentences and clause), classifying and labeling sentences.
2. Identification of the rhetorical organization present in English abstracts, by categorizing moves according to their communicative purposes and linguistic signals.
3. Grouping the moves as higher-level entities and the moves as lower-level entities based on the frequency of occurrence.
4. Comparing the occurrence of each move in the four English sub-corpora with multiple t-tests and ANOVA statistical procedure.
5. Producing descriptive statistics on surface textual structure, including abstract length, an average number of sentences per abstract, sentence length, and move length.
6. Quantitative comparison of surface textual structure with t-tests and ANOVA statistical procedure.
7. Checking intra-rater analysis and inter-coder agreement of reliability.
8. Summary and description of the main outcomes.

3.4.6.2 Statistical Analysis

In the case of surface textual structure, the main trend (average) of the data items were tested and reported in percentage, and then the four English sub-corpora were compared with t-tests and an ANOVA test to state whether there were compelling differences in the surface textual structure of abstracts among the groups. When comparing the rhetorical features of two English sub-corpora, one-way ANOVA statistical analysis was performed for measuring the frequent occurrence of moves.

The reliability process of coding RAAs were tested through the Excel program functions, which encoded the percentages of validity between the first analysis and the second analysis performed by the author. Thus, the reliability of rhetorical patterns found in this analysis was encoded by contrasting the author's second analysis and the encoding made by the co-coder. The nonparametric Spearman Correlation measured the strength and direction of the association between two classified variables. Data in Table 14 shows the statistical significance of the intra- and inter-rater reliability agreement in the association of abstracts from the two fields. Significant correlation was detected in the intra-rater reliability in humanities ($r_R = .95$) and sciences ($r_R = .99$) by grouping NA&EJs. Similar result was found in the inter-rater validity in humanities and sciences, respectively ($r_R = .99$) at the 0.01 level (2 tailed). (See Appendix 4 for further details on reliability process between humanities and sciences)

Table 14. Intra-rater and inter-rater reliability of move analysis in the two fields

Reliability	Field	Raters	Spearman Corr.	Sig.
				two
Intra-rater	Humanities	1(1) -1(2)	0.95**	0.05
	Sciences	1(1) - 1(2)	0.99**	0.04
Inter-rater	Humanities	1(2) - 2	0.99**	1.00**
	Sciences	1(2) - 2	0.99**	0.08

Note: **Correlation is significant at the 0.01 (2 tailed)

Also, significant intra-rater and inter-rater agreement reliability figures were reported in the proportion of matching judgments between abstracts in NAJ and EJ ($r_R = .98$) across disciplinary fields ($r_R = .97$). Data in Table 15 illustrates the correlation coefficient between the two ratings done by the researcher (intra-rater reliability) and among the ratings by the co-coder (inter-rater reliability). As can be observed from the data below, this analysis suggests high reliability in identifying the rhetorical move structure in NA&EJs.

Table 15. Intra-rater and inter-rater reliability of move identification in NA&EJs

Publishing Context	Reliability	Raters	Spearman Corr.	Sig.
				two
NAJ	Intra-rater	1(1) - 1(2)	0.997**	0.05
	Inter-rater	1(2) - 2	0.998**	0.32
EJ	Intra-rater	1(1) - 1(2)	0.930**	0.03
	Inter-rater	1(2) - 2	0.999**	0.66

Note: **Correlation is significant at the 0.01 (2 tailed)

3.4.7 Linguistic realizations

3.4.7.1 Sentence structures in NA&EJs

3.4.7.1.1 Statistical analysis

One-way analysis of variance (ANOVA) was run to search for statistical differences among the 74 overall mean values reported in the data analysis. To prove if there was a relevant difference for all pairs of groups, as followed (a) NAJ_1S and NAJ_2H; (b) NAJ_2H and EJ_3S; (c) EJ_3S and EJ_4H; and (d) NAJ and EJ, Tukey post hoc test was performed. Accordingly, no significant differences were found among groups ($p = 0.212 > .05$) since the q statistics ($q < q\%$ 2.89) was less than the critical value (see Appendix 5). Nonetheless, in the section 4.2.1.2, multiple t-tests reported significant statistical differences across disciplines.

3.4.7.2 Syntactic complexity

It allows for a comprehensive understanding of the syntactic structure of RAAs by calculating independently the frequent occurrence of the 14 indices within the four dimensions presented

in Chapter II, Table 7. It assesses the (1) length of production units, (2) amounts of coordination, (3) amounts of subordination, and (4) degree of phrasal sophistication, described by Lu (2010).

When looking for the occurrence of complex nominals per a clause, the data in the English sub-corpora was mined within four groups; then, the analysis focused on identifying the occurrence of (a) nominal that-clause as the subject, (b) nominal that-clause as a subject complement, (c) nominal to-infinitive clause (d) nominal of-prepositional as a subject complement, (e) nominal of-preposition-plus-*wh* clause; see the examples of abstracts published in North American journals below:

(a) The fact **that the government** incorporated forward-looking structural measures shows his interest in increasing the circular flow of incomes. (Sociology)

(b) Results based on the percentage change in sample resistance showed **that the sintered silver** lasted at least ten times longer than aluminum wire bonds. (Electronics)

(c) An array of thermoelectric coolers (TECs) integrated inside an electronic package has the **potential to provide** such efficient cooling of hot spots on chip. (Electronics)

(d) Transient operation of TECs is **capable of driving** cold-side temperatures below steady-state values. (Electronics)

(e) In this paper, we address the **question of how** to engineer the electronic structure to enhance the performance of a thermoelectric material. (Electronics)

3.4.7.2.1 Statistical analysis

Independent sample t-tests were performed to figure out if the mean variations between abstracts in NAJ and EJ are statistically significant. To monitor the family error ratio and adjust the alpha value for each assessment, Bonferroni correction was used, as of .05/14, where .05 is the level of significance. In the same way, a one-way t-test was run to see whether there were statistical differences between the two EJ and NAJ in the amounts of coordination and subordination dimensions as well as the degree of phrasal sophistication across disciplines. Table 16 below shows the descriptive statistics of RAAs in the four disciplines in NA&EJ across disciplines.

Table 16. Descriptive statistics of abstracts in NA&EJ

Context	Discipline	RAA	Words per RAA		# Sentences per abstract		Sentence length		Words per move		Total words
			Mean	SD	Mean	SD	Mean	SD	Mean	SD	
American	Education	30	164.11	23.97	6.80	2.04	23.33	12.28	32.81	4.63	4.162
	Sociology	30	141.77	19.19	7.40	2.11	28.35	11.04	28.35	11.80	4.253
	Agronomy	30	176.83	27.94	8.67	2.26	35.37	10.83	58.94	9.31	5.305
	Electronics	30	192.03	53.61	8.22	2.78	24.75	10.14	51.60	17.46	5.761
											19.481
Ecuadorian	Education	30	172.97	52.16	6.33	2.53	38.00	14.06	44.73	13.78	5.189
	Sociology	30	146.70	55.90	5.41	2.42	25.29	14.94	43.57	14.57	4.401
	Agronomy	30	189.10	45.96	8.20	3.63	23.38	14.76	52.05	34.72	5.938
	Electronics	30	163.56	44.16	5.88	2.18	35.20	12.10	45.51	18.78	4.097
											19.625
TOTAL		240									**39.106**

To answer the **SSQ 4.5**, the "corpus was part-of-speech tagged using Tree Tagger then searched for the N that subject, N that complement, N to-infinitive, N of-preposition, and preposition-plus-wh structures based on syntactic information" by querying fixed terminologies (Jian & Hyland, 2016: 10). In this part of the analysis, the online automated text analyzer VersaText of Thomas (2015) was applied. Additionally, to enhance the quality of the analysis and to assure that all nominal clauses were classified, the author carried out manual verification of the data obtained across the corpora. Finally, multiple T-tests were conducted to determine statistical significance. Within the analysis, Jian and Hyland's (2016) methodology was taken as a referent for this stage.

3.4.7.3 Lexical richness

3.4.7.3.1 Statistical analysis

The output texts (figures) of the English corpora reported by the *lextutor* web-based software analyzer were scooped using SPSS Statistics to interpret the sub-questions and get clear data that contributed to answer the main RQ. Thus, after obtaining the lexical dimensions for each English-sub corpus, multiple independent sample t-tests were performed to correlate the degree of lexical richness and lexical dimensions between abstracts published in NA&EJ across the four disciplines and two fields. Therefore, the paired sample t-test was employed to detect significant differences between lexical measures, namely group 1 LS and LV, group 2 LD and LV, and group 3 LD and LS.

Additionally, a one-way analysis of variance (ANOVA) was applied to compare abstracts in NA&EJ groups and observe whether there were any statistically significant differences between the linguistic means of the groups. Then, to determine which specific groups differed from each other, a post hoc test was carried out. To answer the subquestion 5.4, the data of the

four sub-corpora was run in the *VersaText* online text analyzer. Subsequently, data obtained for the output texts were compared to determine if there was any statistical difference in the use of lexical categories (content words) across the four disciplines.

During the lexical richness analysis, the abstracts were compiled in 4 sub-corpora in the two contexts of publications such as North American journals and Ecuadorian ones. Then, each sub-corpus was submitted to the *vocabprofile* lexical analyzer to get the output text (raw data). After getting the output text data, it was organized within the textual features that constituted the lexical richness of texts as of lexical density (content words vs. function words), lexical diversity or variation (Type Token ratio), and lexical sophistication (academic words and off list words [specialized terminology]). (For further analysis sees Appendix 6, registers 1 to 5)

CHAPTER IV

PRESENTATION OF RESEARCH

This chapter highlights the research outcomes of the corpus analysis of research article abstracts in the four disciplines described in previous paragraphs. The first part presents the quantitative results of the rhetorical organization of abstracts and, in the second part, their linguistic realizations. The linguistic realizations of abstracts address three primary analyses as the following: First, it describes the sentence structures. Then, it lays out the main results of the syntactic complexity and outlines the lexical richness of abstracts. Each section concludes by briefly summarizing the research outcomes.

4.1 Rhetorical organization in journal research article abstracts

This section sets forth the rhetorical move structure of English abstracts in NA&EJ as measured by intra-rater tests and inter-rater reliability agreement. In this phase, the research followed three steps. Those steps included (a) preliminary categorization of the rhetorical structure of abstracts, (b) intra-rater test between the initial move structure and the second move analysis done by the author and, finally, (c) inter-coder agreement between the author and the second human coder. Data gained in this study served as the basis for answering research question number 1:

1. Does the rhetorical structure of English RAAs published in North American journals vary from those of the Ecuadorian ones? If they have no variation, what is the most frequent move structure in NA&EJs across the four disciplines, considering humanities and science fields?

The following sub-questions were explored to answer the main research question:

1.1. What is the rhetorical move structure of English abstracts published in NA&EJ?
1.2. What is the rhetorical move structure of abstracts in North American journals compared to those of Ecuadorian ones?
1.3. What is the rhetorical move structure of English abstracts across disciplines, considering humanities and sciences fields?
1.4. What is the rhetorical move structure of English abstracts in NA&EJ across disciplines?
1.5. What is the degree of variability in the number of sentences per abstract, abstract length, sentence length, and move length in NA&EJ across disciplines?

4.1.1 Analysis of the research questions

In detail, data gathered in this analysis served to answer the main RQ1, as follows:

RQ 1. Does the rhetorical structure of English research article abstracts published in North American journals vary from those of the Ecuadorian ones? If they have no variation, what is the most frequent move structure in NA&EJs across the four disciplines, considering humanities and science fields?

Since abstracts function as independent discourses, Hyland (2000, 2004) points out that the rhetorical move structure is not uniform. It is because the move occurrence in abstracts of research articles varies across languages and disciplines Hyland (2000). For example, abstracts written in languages other than English, depending on the discipline, could adopt a hierarchical schema with four regular moves: purpose, method, result, and conclusion (Martín-Martín, 2003, Lorés, 2004). By contrast, English abstracts may follow a pattern of three-stable moves: purpose, method, and results (Kafes, 2012, Pho, 2008). Lau (2004), on the other hand, reported move heterogeneity as he found three rhetorical patterns: (1) introduction, purpose, method, conclusion, (2) introduction, results, conclusion and (3) results and conclusion. According to Hyland (2000), these rhetorical divergences could be the result of diverse sociocultural practices and institutionalized philosophies within the discourse communities. These social and cultural differences influence writing either in following international conventions or countrywide discursive practices. Therefore, to examine what rhetorical variation frequently occurred in abstracts of scientific papers published in NA&EJ, the following **SSQ** were raised. These questions guided in responding to RQ 1.

SSQ 1.1 What is the rhetorical move structure of English abstracts published in NA&EJ?

Data in Table 17 below reports that abstracts published in NA&EJ followed a non-hierarchical eight rhetorical move organization with four recurrent moves. These stable or constant moves are thematic focus (M=32.00; *Sd*=5.42), purpose (M=56.50; *Sd*=1.73), method (M=57.65; *Sd*=1.89), and results (M=56.50; *Sd*=2.38), namely M1-M3-M4-M5, respectively. Methods were the first most frequent moves (96 %), followed by purposes and products (94%) and thematic focus (54%). Implication and recommendation sections were the least frequent moves throughout the entire corpora. Conclusions were the fifth most frequent moves, preceded by background sections. Significance was found at the level $p < .05$ in method, product, and recommendation sections. For further analysis see appendix 7 that contains data on rhetorical moves per abstract in NA&EJs, considering the four disciplines.

Table 17. Hierarchical eight move structure in NA&EJs

	Rhetorical move structure					
Moves	*Total*	*f*	*mean*	Sd	*p.*	*Occ.*
M1. Thematic focus	128	12.64	32.0	5.42	.13	***54***
M2. Background	75	7.39	18.8	4.65	.25	*32*
M3. Purpose	226	22.27	56.50	1.73	.21	***94***
M4. Method	231	22.76	57.75	1.89	.03	***96***
M5. Product	226	22.27	56.50	2.38	.03	***94***
M6. Conclusion	93	9.16	23.25	3.30	.12	*39*
M7. Recommendations	18	1.77	4.25	3.78	.02	*8*
M8. Implications	18	1.77	4.50	2.08	.27	*8*

Note: *f= frequency; Occ.= % of occurrence*

Within this analysis, semi-linear rhetorical move-structure patterns were also found throughout the corpus in NA&EJs. Although the frequency of those move patterns is not hierarchically distributed, they provided a clear picture of the preferred rhetoric. Such semi-linear rhetorical patterns may be, perhaps, employed by authors' preference or perhaps influenced by the editorial context or different discourse conventions. The Table below illustrates the frequency and occurrence of such rhetorical-move patterns used in the construction of abstracts in scientific papers published in NA&EJ.

Table 18. Semi-linear rhetorical move patterns

	Rhetorical move patterns in NA&Ejs					
Semi-linear moves	**Total**	***f***	***Occ.***	**mean**	**Sd**	***p***
M3-M4-M5-M6	28	22.58	12	7.0	4.45	.164
M3-M4-M5	27	21.77	11	6.0	5.60	.004
M1-M2-M3-M4-M5	22	17.74	9	5.5	3.60	.08
M2-M3-M4-M5	13	10.49	5	3.2	2.54	.04
M1-M2-M3-M4-M5-M6	12	9.68	5	3.5	2.14	.17
M2-M3-M4-M5-M6	9	7.26	4	2.3	2.01	.04
M4-M5-M6	3	2.42	1	0.8	0.50	.25
M3-M4	3	2.42	1	0.8	0.50	.25
M1-M2	2	1.61	1	0.5	0.58	.25
M4-M5	2	1.61	1	0.5	0.58	.25
M3-M4-M5-M6-M7	1	0.81	-	-	-	-
M2-M3-M4	1	0.81	-	-	-	-
M1-M2-M3	1	0.81	-	-	-	-

Note: *f= frequency; Occ.= % of occurrence*

SSQ 1.2 What is the rhetorical move structure of abstracts in North American journals compared to those of Ecuadorian ones?

As seen in Table 19, abstracts in North American journals (NAJ) followed a four rhetorical move structure: thematic focus, purpose, method, and results. In this analysis, results are the first frequent move (100%), followed by method (95%) and purpose (93%). Thematic focus with 59% of occurrence is the fourth move that occurs across the texts. Conclusions function as moves that restate key supporting ideas discussed throughout the information content of the abstract and offer a sense of closure on the central idea of the paper. Nonetheless, for their

frequency of occurrence (47%), they were considered as unstable moves. On the contrary, abstracts in Ecuadorian journals (EJ) adopted a three rhetorical move pattern: purpose, method, and results. The method is the first move (98%), followed by purpose (96%) and results (88%). Though thematic focus reached 48% in providing readers with a clear picture of what the research topic is, its occurrence qualifies it as an unstable movement. Implications and recommendations were the least frequent moves. Implications point out linguistic or pedagogical trends as well as the interpretation scope of the work for subsequent research. Recommendations suggest or advise possible applications, perhaps pedagogical trends, and theoretical considerations for a particular purpose.

Table 19. Rhetorical structure in North American vs. Ecuadorian journals

	North American Journals					**Ecuadorian Journals**				
	Total	*f*	*mean*	*Sd*	*Occ.*	Total	*f*	*mean*	*Sd*	*Occ.*
M1. Thematic focus	71	13.25	17.8	4.1	***59***	58	12.06	14.5	3.0	*48*
M2. Background	39	7.28	9.8	2.2	*33*	37	7.69	9.3	3.0	*31*
M3. Purpose	111	20.70	27.8	0.5	***93***	115	23.91	28.8	1.9	***96***
M4. Method	114	21.27	28.5	1.0	***95***	117	24.32	29.3	1.0	***98***
M5. Results/Product	120	22.39	30.0	0.0	***100***	106	22.04	26.5	2.4	***88***
M6. Conclusion	56	10.45	14.0	3.4	*47*	37	7.69	9.3	4.0	*31*
M7. Recommendations	13	2.43	3.3	2.6	*11*	5	1.04	1.3	1.5	*4*
M8. Implications	12	2.25	3.0	3.2	*10*	6	1.25	1.5	1.3	*5*

Note: *f= frequency; Occ.= % of occurrence*

When testing whether there is a significant difference between the mean of the moves used in NA&EJs, the independent samples test showed that the *p value* is greater than the level of significance ($p = .553 > \alpha = .05$). Although, according to the figure below, the means are statistically different for both Ecuadorian (M=15.06) and North American (M=16.72) groups, there is no significant difference between the mean of the moves employed in abstracts of Ecuadorian and North American journals.

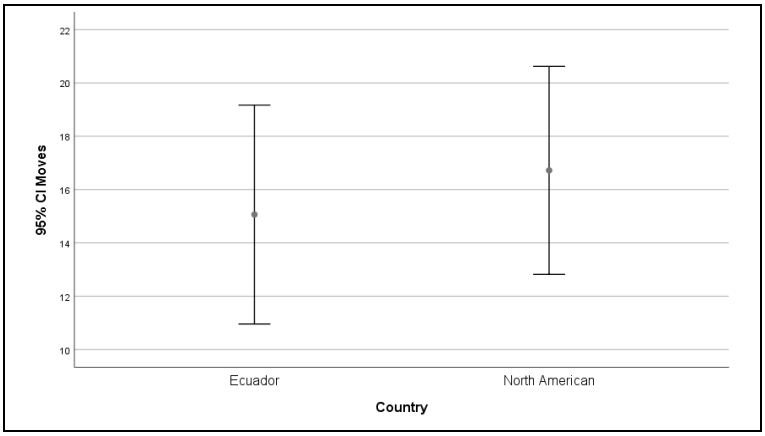


Figure 2. Mean values of moves in NA&EJs

According to the figure 3 (below), it can be determined that the move patterns between the North American and Ecuadorian journals are statistically very similar. The median value

for the case of Ecuador is 13 move patterns, while for North America it is 16 move pattern; their mean values are 16.72 and 15.06, respectively. The minimum and maximum values are equal. In addition, there is greater variability in the move pattern of Ecuadorian journals compared to the move pattern of North American ones. Regarding the values of the quartiles, in the case of Ecuador, at least 50% of the journal abstracts have between 4 and 28 move patterns. And, in the case of North American, at least 50% of those abstracts have between 7 and 28 move patterns.

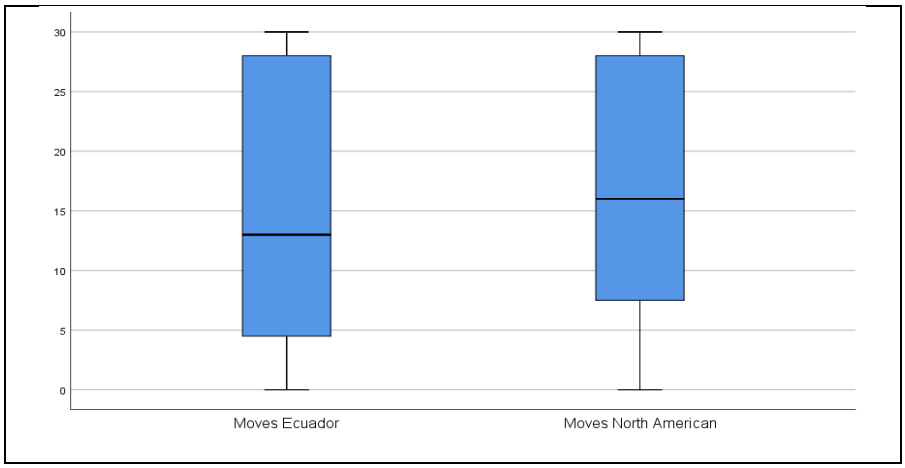


Figure 3. Distribution of move pattern in NA&EJ

SSQ 1.3 What is the rhetorical move structure of English abstracts across disciplines, considering humanities and sciences fields?

Abstracts in both humanities and sciences fields showed variability in the rhetorical organization throughout the corpora. Data in Table below reports that abstracts in humanities, published in North American journals followed a four-move structure (M1-M3-M4-M5), whereas those of sciences adopted a five-move pattern (M1-M3-M4-M5-M6). Similarly, abstracts in humanities and published in Ecuadorian journals hold a four-move schema (M1-M3-M4-M5) compared to those of sciences that integrate three moves when presenting the research study (M3-M4-M5). The move frequency significantly varies across the two fields. T-tests found no significant differences in mean scores of the humanities ($p = 0.658 > 0.05$) and sciences ($p = 0.692 > 0.05$) in the two English written sub-corpora.

Table 20. Rhetorical structure in humanities and sciences

	Humanities						Sciences					
	North America			Ecuador			North America			Ecuador		
Moves	Total	*f*	*Occ.*	Total	*f*	*Occ.*	Total	*f*	*Occ.*	Total	*f*	*Occ.*
1. Thematic focus	31	11.49	**52**	30	12.15	**50**	40	15.04	**67**	28	11.97	47
2. Background	22	8.15	37	23	9.31	38	17	6.40	28	14	5.99	23
3. Purpose	56	20.74	**93**	59	23.89	**98**	55	20.68	**92**	56	23.93	**93**
4. Method	58	21.48	**97**	60	24.30	**100**	56	21.05	**93**	57	24.36	**95**
5. Results	60	22.22	**100**	50	20.24	**83**	60	22.56	**100**	56	23.93	**93**
6. Conclusion	25	9.26	42	21	8.50	35	31	11.66	**52**	16	6.84	27
7. Recommendations	7	2.60	12	3	1.21	5	6	2.26	10	2	0.86	3
8. Implications	11	4.07	18	1	0.40	2	1	0.38	2	5	2.14	8

Note: *f= frequency; Occ.= % of occurrence*

When examining whether there is a significant difference between the mean of the moves used in humanities and sciences fields, the independent samples test showed that the p value is greater than the level of significance ($p = .849 > \alpha = .05$). That is, according to the figure 4 below, the means are not statistically different for both humanities (M=16.16) and sciences (M=15.63) fields. Therefore, there is no significant difference between the mean of the moves displayed in abstracts written in humanities and sciences, or so-called soft and hard sciences.

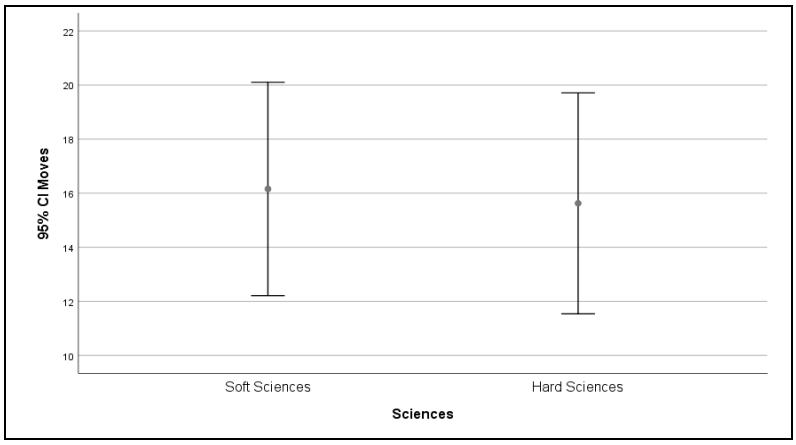


Figure 4. Mean values of moves in humanities and sciences

The average mean scores of moves in abstracts of humanities published in North American and Ecuadorian journals were compared in order to find out differences between the two publishing contexts. The independent samples test revealed that the means are not statistically too different for both Ecuador (M=15.50) and North American (M=16.81) countries. According to the figure 5 below, therefore, there is no significant difference. Thus, the p value is higher than the level of significance ($p = .740 > \alpha = .05$). In the same way, simple statistical analysis was employed to assess differences between the mean scores of moves in abstracts of sciences published in North American and Ecuadorian journals. Results in the figure below show no significance between the two academic discourses, namely NA&EJ. The mean scores are not statistically representative in North America (M=16.63) and Ecuador (M=14.63). Therefore, the p value ($p = .626$) is greater than the level of significance ($\alpha = .05$).

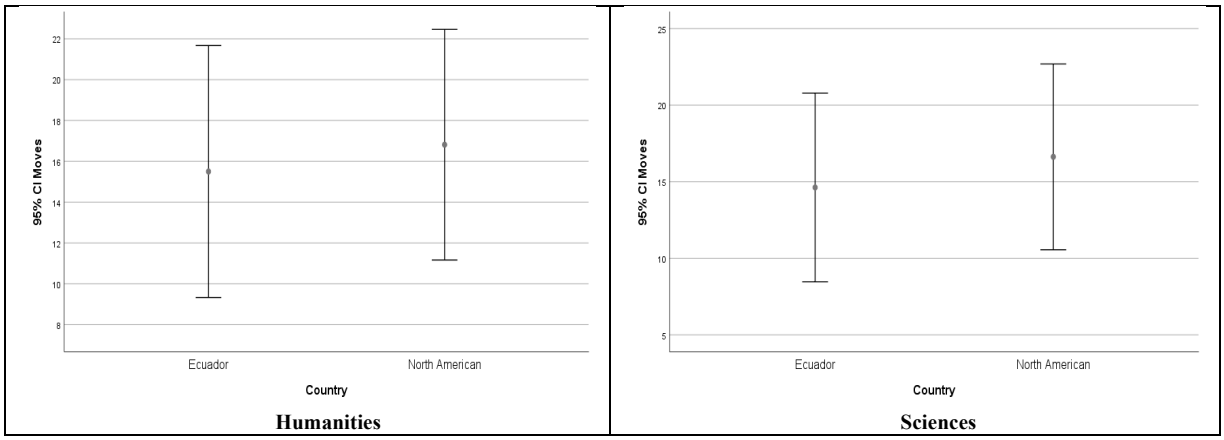


Figure 5. Mean values of moves in humanities and sciences fields

The figure 6 (below) sets out that the move structure between the humanities and sciences fields is similar. The median value for the case of humanities is 14 move patterns, while for North American it is 15; their mean values are 15.16 and 15.63, respectively. The minimum and maximum values are equal. In addition, there is greater variability in the move pattern of abstracts in sciences compared to those of humanities. Regarding the values of the quartiles, in the case of humanities, at least 50% of the journal abstracts have between 6 and 29 move patterns. And, in the case of sciences, at least 50% of those abstracts have between 5 and 28 move schemes.

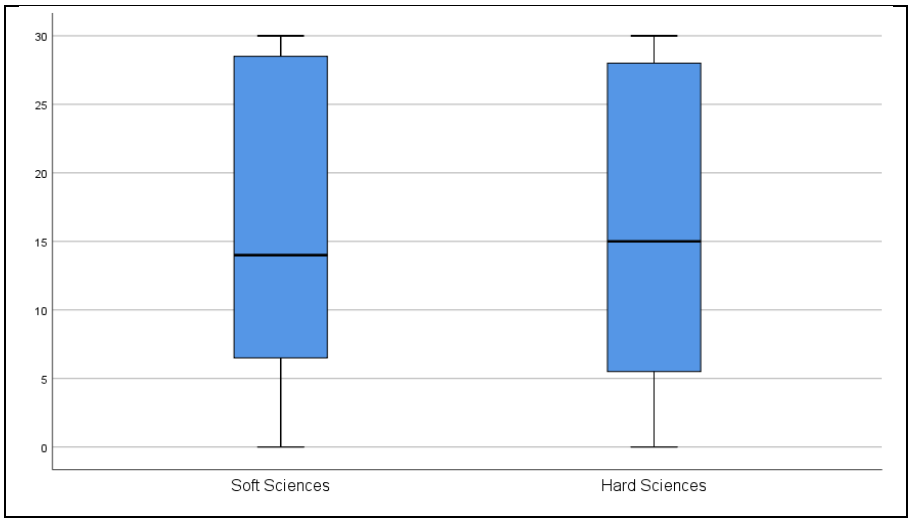


Figure 6. Distribution of move pattern in humanities and sciences

SSQ 1.4 What is the rhetorical move structure of English abstracts in NA&EJ across disciplines?

Table 21 below presents the rhetorical structure adopted in abstracts of RAs across the four disciplines. Abstracts from education in Ecuadorian journals and sociology and agronomy in North American journals followed a five-move schema, namely thematic focus, purpose, method, results, and conclusions (M1-M3-M4-M5-M6). Abstracts of electronics in NAJ and

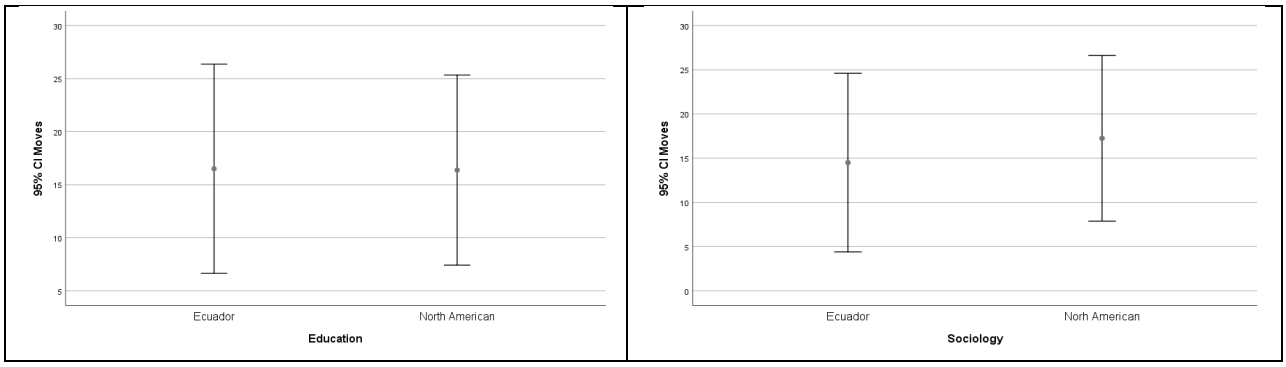
those of agronomy in EJ embraced a four-move pattern such as M1-M3-M4-M5. Sociology and electronic abstracts in EJ and those of education in NAJ included a three-move rhetorical structure, as M3-M4-M5. Background, recommendations, and implications were the least frequent moves used along with the texts. As we can see from the data in the table, the move occurrence varies from one discipline to another. For example, while in agronomy, results in EJ are the first frequent move; in electronics they are the third frequent one.

Table 21. Rhetorical structure across disciplines

	Sociology		**Education**		**Agronomy**		**Electronics**	
Moves	EJ	NAJ	EJ	NAJ	EJ	NAJ	EJ	NAJ
1. Thematic focus	43%	**60%**	**53%**	43%	**57%**	**77%**	37%	**57%**
2. Background	43%	43%	40%	30%	20%	27%	27%	33%
3. Purpose	**100%**	**93%**	**100%**	**93%**	**87%**	**93%**	**100%**	**90%**
4. Method	**100%**	**97%**	**100%**	**97%**	**93%**	**90%**	**97%**	**97%**
5. Results	**77%**	**100%**	**90%**	**100%**	**93%**	**100%**	**93%**	**97%**
6. Conclusion	20%	**50%**	**50%**	33%	33%	**60%**	27%	47%
7. Recommendations	0%	7%	10%	20%	7%	17%	0%	3%
8. Implications	3%	13%	0%	23%	7%	0%	10%	3%

Note: *EJ= Ecuadorian journals; NAJ= North American journals*

When comparing whether there is a significant difference between the mean of the moves used across the four disciplines in NA&EJs, the independent samples tests showed no significance. Even though the means are statistically different across disciplines, there is no significant difference between the mean of the moves in abstracts published in NA&EJ. Thus, the mean in education in Ecuadorian (M=16.50) and in North American journals (M=16.38) is higher than the level of significance ($p = .093 > .05$). Likewise, sociology abstracts in Ecuador (M=14.50) and North America (M=17.25) reported no differences ($p = .644 > .05$). In the same way, abstracts in electronics published in Ecuador (M=14.50) and in North America (M=15.88) have no significance ($p = .825 > .05$). Similarly, agronomy abstracts in Ecuador (M=14.75) and those of North America (M=17.38) indicate no statistical significance ($p = .656 > .05$). See figure 7 below.



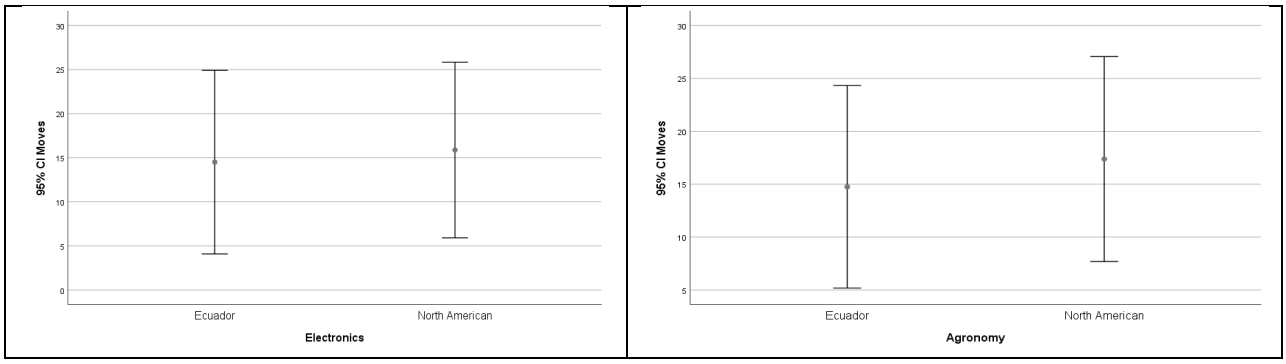


Figure 7. Mean values of moves across disciplines in NA&EJs

It can be determined, from the figure 8 (below), that the move occurrence of education and electronics abstracts between NA&EJ is similar while those of sociology and agronomy are different. The median value for the case of education in Ecuador is 16 (M=16.38) move patterns and in North America it is 11.50 (M=16.50). The median value for move patterns in electronics in Ecuador is 9.50 (M=14.50) and 15 (M=15.88) in North America. The minimum and maximum values are different in both disciplines. There is greater variability in the move pattern of abstracts in education and electronics in Ecuadorian in comparison with North American journals. At least 50% of education abstracts in North America have between 7–29 move patterns and 5–29 in Ecuador. Electronics abstracts report between 3–29 move patterns in North American and between 4–29 in Ecuadorian journals.

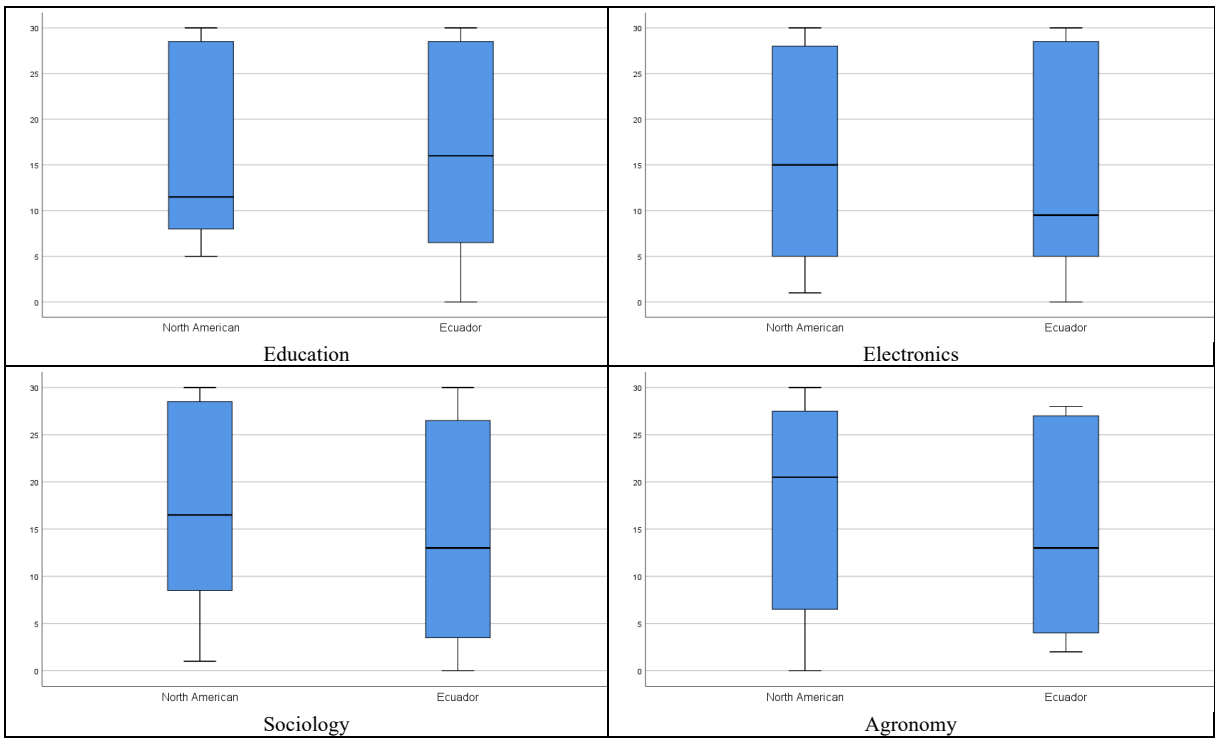


Figure 8. Distribution of move pattern across disciplines

Figure 8 (above) indicates that the median value for the case of sociology in Ecuador is 13 (M=14.50) move patterns, and in North America it is 16.50 (M=16.25). The median value

for move patterns in agronomy in Ecuador is 13 (M=14.75) and 20.50 (M=17.38) in North America. The minimum and maximum values are different in both disciplines. There is greater variability in the move pattern of abstracts in agronomy in North American compared to those of Ecuadorian journals. By contrast, sociology abstracts in Ecuador show greater variability in the move pattern than the North American ones. At least 50% of agronomy abstracts in North America have between 6–28 move patterns and 3–28 in Ecuador. Sociology abstracts report between 6–29 move pattern in North American and between 2–28 in Ecuadorian journals.

SSR 1.5. What is the degree of variability in the number of sentences per abstract, abstract length, sentence length, and move length in NA&EJ across disciplines?

Data in Table 22 presents the descriptive statistics of the surface structure of NA&EJs in the four disciplines. Figures of average values of abstracts in NA&EJ implied variability in the amount of surface structure across disciplines. According to the statistical analysis, no significance was found in words per abstract (p = .483 > .05), sentences per abstracts (p = .0622 > .05) and move length (p = .328 > .05) when grouping disciplines. However, the difference in sentence length was statistically significant (p = .005 < .05) between NA&EJs. Moreover, no significant differences were reported in the number of surface structures employed in texts published in NA&EJ (p = .475 > .05) and written in sciences and humanities (p = .330 > .05).

Running the t-Test: Two-Sample Assuming Equal Variances between NA&EJs informed of variation in the independent use of surface structures in each discipline. Education and electronics in words per abstract (p = .002 < .05; p = .026 < .05) and sentence per abstract (p = .004 < .05; p = .002 < .05) exhibited statistical significance. Yet, education texts were the only abstracts that had statistically significant differences in move length (p = .0001 < .05) between the two academic discourses, NA&EJ.

Table 22. Distribution of the surface structure in abstracts across disciplines

Context	**Discipline**	**RAA**	**Words per RAA**		**# Sentences per abstract**		**Sentence length**		**Move length**		**Total Words**
			Mean	SD	*Mean*	SD	*Mean*	SD	*Mean*	SD	
Ecuadorian	Education	30	*172.97*	52.16	*6.333*	2.533	*24.675*	14.062	*44.732*	13.776	5.189
	Sociology	30	*146.7*	55.90	*5.406*	2.42	*25.291*	14.94	*43.574*	14.567	4.401
	Agronomy	30	*189.1*	45.96	*8.194*	3.63	*23.378*	14.76	*52.045*	34.716	5.938
	Electronics	30	*163.56*	44.155	*5.876*	2.177	*27.784*	12.104	*45.511*	18.776	4.097
Total Sub-corpora		120									**19.625**
North-American	Education	30	*164.11*	23.97	*6.80*	2.041	*19.814*	12.279	*32.8*	4.63	4.162
	Sociology	30	141.76	19.19	*7.40*	2.11	*19.41*	11.04	*28.35*	11.802	4.253
	Agronomy	30	*176.83*	27.94	*8.67*	2.26	*21.496*	10.83	*58.94*	9.311	5.305
	Electronics	30	*192.03*	53.61	*8.223*	2.784	*22.733*	10.136	*51.6*	17.455	5.761
Total Sub-corpora		120									**19.481**
Total Corpora		*240*									***39.106***

4.1.2 **Cohesive devices in RA abstracts**

Cohesion, as Halliday and Hasan (1976: 8) stated, is a "semantic relation between an element in the text and other element that is crucial to the interpretations of it". Thus, cohesive relationships are found both "within a sentence and between sentences". This section reports the conjunctive elements, including additives, adversatives, causals, and temporals that function as cohesive devices and create semantic relations within the sentences themselves. That is, it describes the way they express particular meaning which presupposes the occurrence of other constituents in the discourse (Halliday and Hasan, 1976: 10). In a sense, they are signaling a textual relation with what follows or what has gone before for the meaning-making of the text. Data examined in this section allowed for responding the main RQ 2.

RQ 2. What are the cohesive means observed in English RAAs which introduce moves and help to hold moves cohesion in NA&EJ?

Table 23 below shows that the overall number of cohesive means used in RAAs in NA&EJ across disciplines is constituted of 486 linguistic elements. But the shared cohesive devices that frequently occur along with the corpora are 355, distributed in the following way: Additives with 32.7% (M=16.57; Sd=18.73), followed by adversatives with the 30.7% (M=13.63; Sd=11.61), causals with the 18.6% (M=26.6; Sd=2.37), and temporals with 18.0% (M=6.4; Sd=5.59) of occurrence. The most common cohesive devices are (a) *'also'* with 51.7% in additives; (b) *'but'* with 33.9% in adversatives; (c) '*thus'* with 18.2% in causals; and (d) *'finally'* with 34.4% in temporals. These conjunctive elements have the highest percentage of incidence in the abstracts published in the two academic discourses, NA&EJ. The least percentage of occurrence observed in additives, adversatives, causals, and temporals were '*likewise*', '*furthermore*' (3.4%), '*nevertheless*' (1.8%), '*as a result'* (4.5%), and '*subsequently*' (3.1%), respectively. (In this analysis sees Appendix 8)

Table 23. Cohesive devices in abstracts of NA&EJ

	Cohesive devices in NA&EJs				**Shared cohesive devices in NA&EJs**			
	f	***Occ.***	***mean***	***Sd***	***f***	***Occ.***	***mean***	***Sd***
Adversatives	150	32,2	5,36	8,45	116	32,7	16,57	18,73
Additives	133	28,5	8,31	14,43	109	30,7	13,63	11,61
Causals	111	23,8	2,92	2,85	66	18,6	6,6	2,37
Temporals	92	19,7	2,79	3,94	64	18,0	6,4	5,59
Total	**486**				**355**			

Note: *f= frequency; Occ.= % of occurrence*

Abstracts published in NA&EJ "characterize the state or variety of language naturally-occurring" in texts (Sinclair 1991: 171). This analysis shows a similar rhetorical move structure

(RMS) adopted in NA&EJ and language patterns used in the chosen disciplines. Nonetheless, the occurrence of those moves to achieve the purposes, and the linguistic expressions that accompany each move varies across disciplines and fields. The result-oriented analysis showed that there was a clear relation between rhetorical moves and the cohesive means (linkers or connectors) that build up RAAs. Such rhetorical move occurrence can be taken as new tendencies for writing abstracts of scientific papers, as stated by Hyland (2005, 2009, 2014).

4.2 Linguistic realizations of journal research article abstracts

Taking RAAs published in NA&EJ as the representative corpus sample, it was undertaken by the contrastive and disciplinary analysis. Thus, in the section 4.2.1, sentence structure of abstracts is presented, and the corresponding syntactic complexity in section 4.2.2. Finally, lexical richness obtained from the software-driven text analysis is described in section 4.2.3.

4.2.1 Types of sentence structures in NA&EJs

Lexico-grammatical features in several academic texts have been the foci of linguistic research (e.g., Hyland, 2000, 2004). Evidence from the empirical database research has documented the usage of a higher amount of formal linguistic features throughout the RAAs across disciplines and fields. The study, therefore, is mainly concerned with the possible interdisciplinary variation. Thus, here, the study explored the types of sentence structure (surface structure) that occurred in abstracts of NA&EJ. The syntactic structures included in the cross-disciplinary analyses are simple, compound, complex, and compound-complex sentences that together construct the information content of abstracts written in English. The research question number 3 had been analyzed in this section.

> 3. Are there any significant differences between English RAAs published in North American journals and those published in Ecuadorian ones, considering the types of sentences and average sentence length?

The main research question 3 was interpreted based on the subsequent questions:

> 3.1. What types of sentence structures frequently occur in English RA abstracts published in NA&EJ?
>
> 3.2 Do abstracts published in NA&EJ in the field of sciences vary from those of humanities, considering the number of sentence structures?
>
> 3.3 What is the degree of variability in the type of sentence structures in NA&EJ, considering the four disciplines?

4.2.1.1 Analysis of research questions

This sub-section described the surface structure: simple, compound, complex, and compound-complex in the abstracts published in NA&EJ. Data gained in this section served as the basis for answering the main RQ 3, as follows:

> **RQ 3.** Are there any significant differences between English RAAs published in North American journals and those published in Ecuadorian ones, considering the types of sentences and average sentence length?

From a linguistic theory, sentence structure is the way a sentence is arranged in the conventional system of the language; in general terms, it refers to the grammatical arrangement of words in sentences whose function is to communicate something (cf. Fabb, 2005). Although sentence structure depends on the language in which it is written and spoken, its communitive purpose is to convey accurate information, combining content within proper structures. The central core underlying this analysis is that "sentences are built up of a series of constituents (syntactic units), each of which belongs to a specific grammatical category and serves a specific grammatical function" (Radford, 2009: 1). It is common in English, for example, to look for a simple sentence, the structure of 'subject, verb, object'. However, there are many ways to convey information in much more complex and complicated sentence structures while still providing the scope of the massage and being grammatically correct as such.

All sentences consist of one or more clauses: clauses are categorized as grammatical units that incorporate a subject, verb, and/or predicate. A clause can be independent, on the one hand, and dependent, on the other. Additionally, a sentence must contain at least one independent clause to be complete. Therefore, to explore the types of sentence structures that frequently occurred in abstracts of scientific papers published in NA&EJ, the following SSQ are responded. In detail, research RQ 3 was interpreted based on the subsequent inquiries:

> **SSQ 3.1.** What types of sentence structures frequently occur in English RA abstracts published in NA&EJ?

Data in Figure 9 presents the sentence structures that frequently occur in NA&EJs. Abstracts in NA&EJ have the occurrence of four-sentence structures. Simple sentences (M=123.50) are the first frequent ones, followed by complex sentences (M=93.00) and compound sentences (M=65.00). Compound-complex or so-called combining sentences (M=10.50) are the least frequent sentence structure throughout the English corpora. The function of simple sentences was to communicate to readers the purpose of the research.

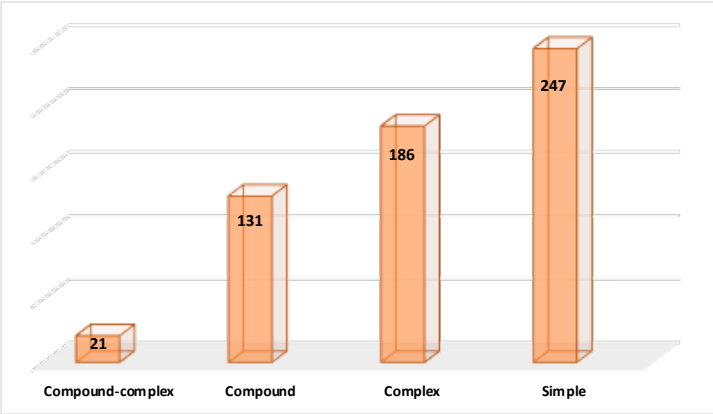


Figure 9. Raw numbers of type of sentences

To explore variability in the occurrence of sentence structures between abstracts published in North American and Ecuadorian journals, mean scores were compared. As can be seen from the data in the table 24, abstracts of North American journals use a great number of types of sentence structures in comparison with those of Ecuadorian ones. Although in both North America and Ecuador the incidences of sentences followed a similar pattern, the frequency of occurrence (according to the mean) varies. For example, abstracts in North American journals (M=34.59) had more cases of simple sentences than Ecuadorian (M=27.25) ones. Independent samples tests reported significant variability on the amount of compound-complex (p = .004 < .5) and simple sentences (p = .020 < .5). Additionally, significance was observed in complex sentences (p = .0005 < .05) but not in compound sentences (p = .092 > .5) in the two academic discourses.

Table 24. Type of sentence structures in NA&EJs

	North America				Ecuador			
Sentences	**Total**	***f***	***Mean***	***Sd***	**total**	***f***	***Mean***	***Sd***
Compound	17	5.0	18.25	6.70	4	1.63	14.50	6.46
Complex	73	21.47	28.00	2.31	58	23.67	18.50	3.51
Compound-complex	112	32.94	4.25	0.50	74	30.21	1.00	1.41
Simple	138	40.59	34.50	5.80	109	44.49	27.25	5.31

SSQ 3.2 Do abstracts published in NA&EJ in the field of sciences vary from those of humanities, considering the number of sentence structures?

Table 25 (below) illustrates the use of the four sentence structures (types). Abstracts in humanities and sciences published in North American journals employed more cases of sentence types. However, the highest proportion of sentence structures was reported in the field of humanities (M=46.6; Sd=29.74). Abstracts published in Ecuador in humanities had the fewest proportion of sentence structures (M=29.0; Sd=24.56). There was no occurrence of compound-complex sentences in humanities in Ecuadorian journals. A pair two sample t-test

reported differences in the occurrence of sentence structures in humanities and sciences fields. Abstracts written in humanities in two different academic communities had statistical significance ($p = .007 < .05$) comparing the no significance of abstracts in sciences ($p = .233 > .05$). In addition, significant variation was observed in the use of simple sentences ($p = .024 < .05$) across the two fields. Out of the four types of sentences examined in humanities and sciences, no significance was reported in compound-complex ($p = .239 > .05$), complex ($p = .500 > .05$), and compound sentences ($p = .054 > .05$).

Table 25. Distribution of sentence structures in humanities and sciences

	North American Journals							
	Humanities				**Sciences**			
Sentences	Total	*f*	Mean	Sd	Total	*f*	Mean	Sd
Compound	36	20.0	18	7.07	37	23.1	18.5	9.20
Complex	56	31.1	28	2.83	56	35.0	28.0	2.83
Compound-complex	9	5.0	4,5	0.71	8	5.0	4.0	-
Simple	79	43.9	39,5	0.72	59	36.9	29.0	0.71
	Ecuadorian Journals							
	Humanities				**Sciences**			
	Total	*f*	Mean	Sd	Total	*f*	Mean	Sd
Compound	21	18.1	10.5	7.78	37	28.7	18,5	0.71
Complex	37	31.9	18.5	4.95	37	28.7	18,5	3.54
Compound-complex	-	-	-	-	4	3.1	2	1.41
Simple	58	50.0	29.0	5.66	51	39.5	25,5	6.36

SSQ 3.3 What is the degree of variability in the type of sentence structures in NA&EJ, considering the four disciplines?

Data in table 26 reports that the frequency of sentence structures in each discipline was significantly diverse. Agronomy abstracts in sciences in both NA&EJ (M=21.3; M=18.3, respectively) employed more types of sentences than their counterpart disciplines. Simple sentences were the frequent structures used across the four disciplines in North American journals. Thus, education and sociology had a considerable number of these structures (*f*=45.5; *f*=42.2), followed by agronomy and electronics (*f*=35.3; *f*=38.7), respectively. Complex sentences were the second frequent structures, either in North American or Ecuadorian journals. There was no occurrence of compound-complex sentences in education and sociology fields in Ecuador. Abstracts in electronics reported in having fewer cases of sentence structures throughout the written corpora.

Table 26. Type of sentences across the four disciplines

	North American Journals							
	Education		Sociology		Agronomy		Elecronics	
Sentences	Total	*f*	Total	*f*	Total	*f*	Total	*f*
Compound	13	14.8	23	45.0	25	27.2	12	16.0
Complex	30	34.1	26	28.3	26	30.6	30	40.0
Compound-complex	5	5.7	4	4.4	4	4.7	4	5.30
Simple	40	45.5	39	42.4	30	35.3	29	38.7
Mean	*22.0*		*23.0*		*21.3*		*18.8*	
S.d	*15.89*		*14.45*		*11.70*		*12.84*	
	Ecuadorian Journals							
	Education		Sociology		Agronomy		Elecronics	
	Total	*f*	Total	*f*	Total	*f*	Total	*f*
Compound	16	25.4	5	9.4	19	26.0	18	32.1
Complex	22	34.9	15	28.3	21	28.8	16	28.6
Compound-complex	-	-	-	-	3	4.1	1	1.80
Simple	25	39.7	33	62.3	30	41.0	21	37.5
Mean	15.8		13.3		18.3		14.0	
S.d	11.15		14.57		11.24		8.91	

Statistical analysis applied separately on each discipline informed that electronic abstracts denoted significance on the use of complex sentences (p = .011 < .05) in the two academic discourses. Education texts had significance in simple sentences (p = .017 < .05). Likewise, the differences between complex (p = .010 < .05) and compound sentences (p = .0005 < .05) in sociology abstracts were significant in both NA&EJ.

4.2.2 Syntactic complexity in journal research article abstracts

As syntactic complexity has been recognized as a standard measure of text complexity in writing, it has been actively investigated as a construct in language development research. An infinite set of simple or complex sentences can be created using the constituents of the sentence (words, phrases, or clauses). Accordingly, this study explores a wide range of structures that characterize the syntactic complexity of abstracts in NA&EJ. Based on this purpose, the corresponding fourth main research question was upraised.

4. Are there any significant syntactic structure (type of sentences) differences between English RAAs published in North American journals and those published in Ecuadorian ones, considering the humanities and science fields? If so, what are those differences?

The following sub-questions helped to answer this head question:

4.1 To what extent does syntactic complexity in abstracts of North American vary compared to those of Ecuadorian journals?

4.2 To what extent does syntactic complexity vary in abstracts published in NA&EJ, considering humanities and sciences fields?

4.3 To what extent does syntactic complexity vary in abstracts published in NA&EJ, considering education, sociology, agronomy and electronics as the target disciplines?

4.4 What abstracts indicate to have more left embeddedness words before the verb of the main clause?

4.5 What is the frequency of complex nominals per a clause in abstracts of NAEJ across disciplines?

4.2.2.1 Analysis of research questions

The following sub-section presents the syntactic complexity of abstracts in scientific articles between the two academic discourses. Indeed, data gained in this sub-section served as the basis for answering the RQ 4, as follows:

RQ 4 Are there any significant syntactic complexity (type of sentences) differences in research article abstracts written in English, published in NAEJ, considering the fields understudy? If so, what are these differences?

Syntactic complexity as a standard index of linguistic achievement in L2 writing (Lu, 2011), as stated above in previous sections, has been investigated to find out, for instance, how proficiency correlates with sophistication and whether the register (e.g., academic discourse) influences the lexico-grammatical choices. Following Ortega (2015: 82), syntactic complexity is here explored as "the range and the sophistication of grammatical resources exhibited in language production". Thus, syntactic complexity embodies associated approaches, as of diversity, variation, and level of language elaboration when producing texts (Ortega, 2015). It is not surprising that academic texts such as RA abstracts characterize their abstracts by organization and diverse language. Therefore, in order to achieve the objective of the study, the overall measures of sentence complexity indices are used as venues for answering the RQ number 4. In this analysis, the main research question was interpreted based on the analysis of the subsequent questions:

SSQ 4.1 To what extent does syntactic complexity in abstracts of North American vary compared to those of Ecuadorian journals?

Table 18 below compares the results obtained from the analysis of syntactic complexity dimensions in NA&EJs. T-tests revealed no significance in the mean of syntactic complexity (t = -0.0729, p = 0.942) used in abstracts in NA&EJ. Nonetheless, what stands out in the data analysis is the significant statistical differences found in complex T-units per T-unit (p = 0.037),

coordinate phrases per clause (p = 0.023), coordinate phrases per T-unit (p = 0.029), T-units per sentences (p = 0.032), complex nominals per clause (p = 0.024), complex nominals per T-unit (p = 0.020), and clauses per sentences (p = 0.045) across the fourteen indices. Abstracts in North American journals made use of much more production unit length (M=54.400), amount of subordination (M=0.484) and coordination (M=0.404), and degree of sophistication (M=1.753). Abstracts in Ecuadorian journals employed more overall sentence complexity (M=1.005). There was significant variability in overall sentence complexity (t = -2.861, p = 0.045), amount of subordination (t = 4.530, p = 0.0003), and degree of phrasal sophistication (t = -4.865, p = 0.0004) in both academic written discourses.

Table 27. Dimensions of syntactic complexity in NA&EJs

		Ecuadorian Journals		**North American Groups**			
Measure	**Code**	mean	SD	mean	SD	***t***	***p***
Length of production unit							
Mean length of sentence	**MLS**	48.345	3.057	48.918	6.151	0.383	0.776
Mean length of T-unit	**MLT**	59.456	2.217	64.592	6.304	-0.990	0.377
Mean length of clause	**MLC**	48.106	1.823	49.691	5.756	-0.212	0.841
Amount of subordination							
Clauses per T-unit	**C/T**	1.238	0.040	1.302	0.032	-1.964	0.120
Complex T-units per T-unit	**CT/T**	0.112	0.023	0.153	0.026	-3.057	0.037*
Dependent clauses per clause	**DC/C**	0.185	0.012	0.209	0.024	-1.402	0.233
Dependent clauses per T-unit	**DC/T**	0.230	0.012	0.272	0.037	-1.712	0.162
Amount of coordination							
Coordinate phrases per clause	**CP/C**	0.118	0.017	0.197	0.026	-3.582	0.023*
Coordinate phrases per T-unit	**CP/T**	0.147	0.025	0.257	0.038	-3.329	0.029*
T-units per sentences	**T/S**	0.813	0.030	0.757	0.036	3.220	0.032*
Degree of phrasal sophistication							
Complex nominals per clause	**CN/C**	1.443	0.052	1.671	0.082	-3.515	0.024*
Complex nominals per T-unit	**CN/T**	1.783	0.036	2.178	0.157	-3.742	0.020*
Verb phrases per T-unit	**VP/T**	1.331	0.040	1.410	0.060	-1.784	0.148
Overall sentences complexity							
Clauses per sentences	**C/S**	1.005	0.035	0.985	0.026	2.861	0.045*

Note: **statistical significance at the level p < .05; CN/T, CN/C, T/S, CP/T, CP/C, CT/T*

When comparing the difference between the mean of syntactic indices used in NA&EJs, the independent samples tests showed no significance at the level of α = .05. Though the means are statistically different in North American (M=12.33) and Ecuadorian (M=11.74) journals, the figure 10 (below) shows no significant differences (p = .805 > .05).

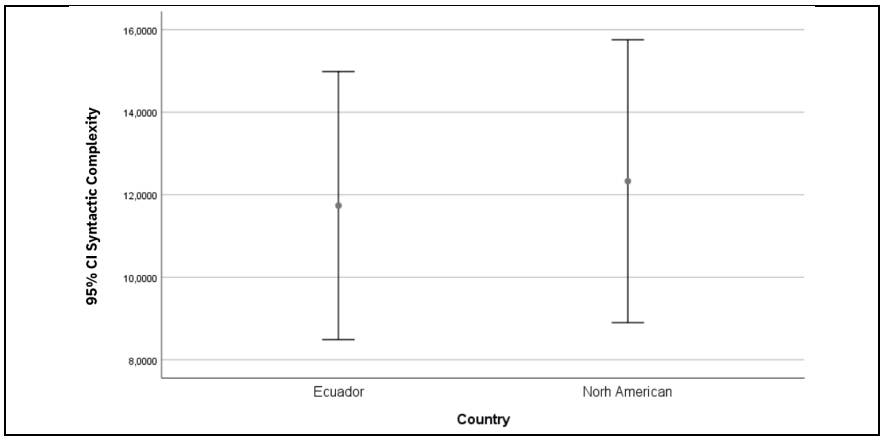


Figure 10. Syntactic complexity in NA&EJs

SSQ 4.2 To what extent does syntactic complexity vary in abstracts published in NA&EJ, considering humanities and sciences fields?

Table 28. Syntactic complexity dimensions

		Humanities						Sciences					
		Ecuador		North America				Ecuador		North America			
Measure	Code	Mean	SD	Mean	SD	*t*	*p*	Mean	SD	Mean	SD	*t*	*p*
Length of production unit													
Mean length of sentence	**MLS**	47.341	4.428	45.374	7.483	0.319	0.779	49.350	2.096	52.462	2.698	-1.288	0.326
Mean length of T-unit	**MLT**	58.022	2.540	59.855	5.238	-0.445	0.699	60.889	0.287	69.329	1.421	-8.235	0.014*
Mean length of clause	**MLC**	48.179	3.011	45.704	5.705	0.524	0.641	48.032	0.939	53.679	1.804	-3.927	0.059
Amount of subordination													
Clauses per T-unit	**C/T**	1.206	0.023	1.313	0.049	-2.802	0.107	1.270	0.014	1.291	0.017	-1.385	0.300
Complex T-units per T-unit	**CT/T**	0.122	0.034	0.176	0.002	-2.192	0.159	0.102	0.005	0.131	0.002	-7.831	0.015*
Dependent clauses per clause	**DC/C**	0.195	0.004	0.224	0.015	-2.680	0.115	0.176	0.010	0.193	0.023	-0.942	0.445
Dependent clauses per T-unit	**DC/T**	0.235	0.009	0.295	0.031	-2.655	0.117	0.225	0.016	0.250	0.033	-0.971	0.433
Amount of coordination													
Coordinate phrases per clause	**CP/C**	0.110	0.011	0.219	0.007	-11.291	0.007*	0.126	0.023	0.176	0.007	-2.909	0.100
Coordinate phrases per T-unit	**CP/T**	0.133	0.016	0.287	0.020	-8.570	0.013*	0.161	0.029	0.227	0.013	-2.865	0.103
T-units per sentences	**T/S**	0.816	0.041	0.756	0.059	1.183	0.358	0.810	0.030	0.759	0.021	1.966	0.188
Degree of phrasal sophistacation													
Complex nominals per clause	**CN/C**	1.482	0.028	1.725	0.090	-3.647	0.067	1.404	0.034	1.617	0.020	-7.696	0.016*
Complex nominals per T-unit	**CN/T**	1.783	0.004	2.268	0.203	-3.384	0.077	1.783	0.062	2.088	0.001	-6.989	0.019*
Verb phrases per T-unit	**VP/T**	1.317	0.035	1.426	0.075	-1.850	0.205	1.346	0.053	1.394	0.063	-0.839	0.489
Overal sentences complexity													
Clauses per sentences	**C/S**	0.982	0.029	0.991	0.040	-2.415	0.831	1.028	0.027	0.979	0.016	2.251	0.153

Data in Table 28 (above) illustrates the distribution of the syntactic complexity dimensions in humanities and sciences in NA&EJs. Out of the 14 syntactic complexity indices, abstracts in Ecuadorian journals reported 11 lower mean values in humanities and 12 lower ones in sciences fields compared to those of North American journals. Abstracts in humanities, compared to those of sciences, employed a greater amount of subordination (M=0.471), amount of coordination (M=0.387), and degree of phrasal sophistication (M=1.667). Multiple t-tests indicated statistical differences at the p level .05. Thus, humanities reported significance in coordinated phrases per clause (t= -11.291, p = .007), and coordinated phrases per T-unit (t= -8.570, p = 0.013). By contrast, sciences had significance in complex T-units per -unit (t= -7.831, p = .015), complex nominals per clause (t= -7.696, p = .016), and complex nominals per T-unit (t= 6.989, p = .019).

The independent samples tests showed no significance at the level of α = .05 between abstracts in humanities and sciences in length of production unit (*t* =-1.319, *p* = 0.20), amount of subordination (*t* =-0.249, *p* = 0.80) and coordination (*t* = -0.083, *p* = 0.93), degree of phrasal sophistication (*t* = -0.488, *p* = 0.63), and overall sentence complexity (*t* = -0.773, *p* = 0.46). Although the means of syntactic complexity are statistically different for both humanities (M=11.52) and sciences (M=12.55) fields, according to the figure 11, there is no significant difference. The *p value* is greater than the level of significance (p = .668 > α = .05) when comparing the mean syntactic complexity of both fields between North American and Ecuadorian journals.

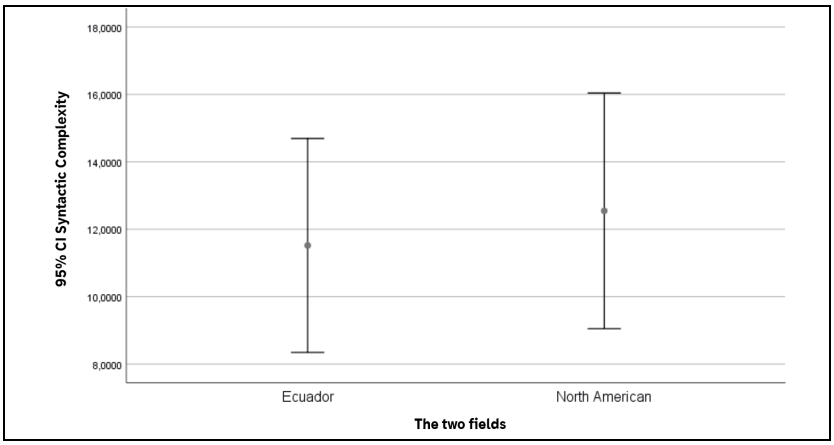


Figure 11. Syntactic complexity of both fields in NA&EJs

The average mean scores of syntactic complexity indices in abstracts of humanities in North American and Ecuadorian journals were compared to find differences between the two groups. The independent samples test reported that the means are not statistically very different for both Ecuador (M=11.56) and North American (M=11.47) countries. Then, according to the figure below, there is no significant difference. The p value is greater than the level of significance (p = .977 > α = .05). Similarly, the mean scores of syntactic complexity indices in abstracts of sciences were used to discover differences between North American and Ecuadorian journals. Data in the figure 12 shows that although the mean scores are different in North America (M=10.16) and Ecuador (M=14.61), they are not representative. The p value (p = .210) is greater than the level of significance (α = .05). Therefore, the differences between the means of abstracts written in sciences and published in NA&EJ are not statistically significant.

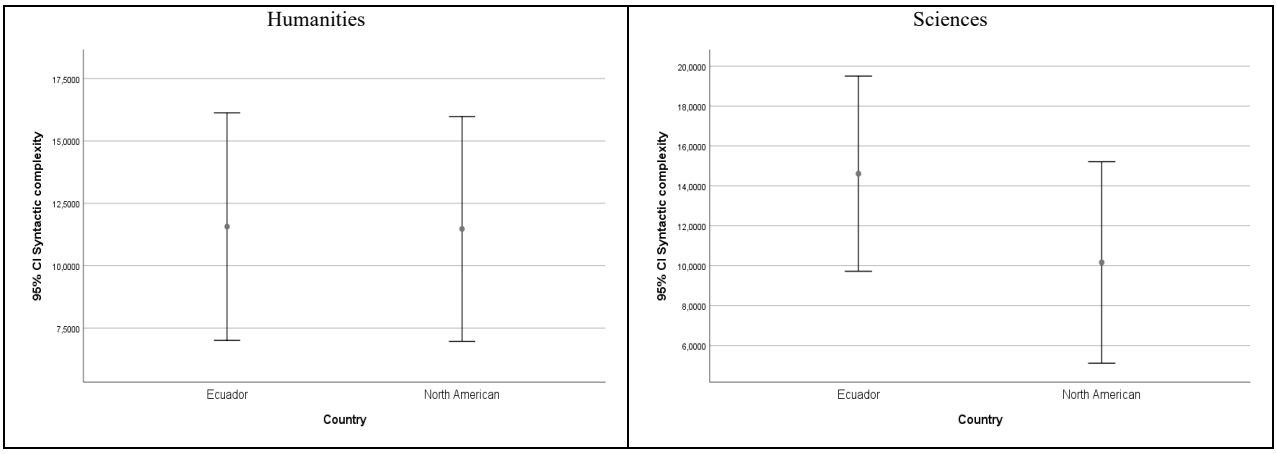


Figure 12. Syntactic complexity across disciplinary fields

SSQ 4.3 To what extent does syntactic complexity vary in abstracts published in NA&EJ, considering education, sociology, agronomy and electronics as the target disciplines?

The results obtained from the analysis of abstracts across disciplines and published in NA&EJ are summarized in Table 29 below. Out of 14 syntactic complexity indices in each discipline, abstracts of Ecuadorian journals showed 3 higher mean values in sociology (length of production unit) and 1 higher mean value in electronics (sentence complexity) than the abstracts published in North American journals. Multiple t-tests revealed no statistical differences in the syntactic complexity indices between disciplines and between the four syntactic dimensions across disciplines at the level of significance (α = .05). Just sociology abstracts published in Ecuadorian journals outpaced those of North American counterparts in the use of syntactic complexity indices (M=12,139, Sd=22.541) across the four syntactic dimensions. Abstracts written in education (M=12.382, Sd=23.116), electronics (M=12.884, Sd=24.272), agronomy (M=13.484, Sd=25.404) and published in North American journals used more occurrences of the syntactic indices along with the four syntactic dimensions compared to Ecuadorian ones.

Table 29. Mean scores of syntactic complexity indices across disciplines

	Length of production unit			Amount of subordination				Amount of coordination			Degree of phrasal sophistication			Sentence complexity		
	MLS	MLT	MLC	C/T	CT/T	DC/C	DC/T	CP/C	CP/T	T/S	CN/C	CN/T	VP/T	C/S		
Sub-Corpora	*mean (SD)*	*mean (SD)*	*mean (SD)*	*mean (SD)*	*mean (SD)*	*mean (SD)*	*mean (SD)*	*mean (SD)*	*mean (SD)*	*mean (SD)*	*mean (SD)*	*mean (SD)*	*mean (SD)*	*mean (SD)*	*t*	*p*
1.Slgy	50.472 (4.927)	59.818 (6.470)	50.308 (4.133)	1.222 (0.051)	1.190 (0.100)	0.192 (0.005)	0.228 (0.018)	0.102 (0.012)	0.122 (0.022)	0.787 (0.026)	1.462 (0.109)	1.786 (0.124)	1.293 (0.019)	0.962 (0.051)	0.1182	*0.906*
2.Slgy	40.082 (0.884)	56.152 (2.313)	41.670 (1.821)	1.348 (0.024)	0.174 (0.006)	0.235 (0.019)	0.317 (0.030)	0.224 (0.017)	0.302 (0.024)	0.714 (0.014)	1.789 (0.066)	2.412 (0.126)	1.479 (0.055)	0.963 (0.022)		
1.Edu	44.210 (1.083)	56.227 (1.744)	46.050 (2.703)	1.222 (0.051)	0.146 (0.019)	0.197 (0.036)	0.241 (0.007)	0.118 (0.008)	0.144 (0.0260	0.787 (0.024)	1.462 (0.039)	1.786 (0.034)	1.293 (0.124)	0.962 (0.109)	-0.1175	*0.907*
2.Edu	50.665 (1.739)	63.559 (1.795)	49.738 (2.291)	1.279 (0.028)	0.177 (0.037)	0.214 (0.026)	0.273 (0.022)	0.213 (0.032)	0.273 (0.024)	0.797 (0.018)	1.662 (0.039)	2.125 (0.028)	1.372 (0.095)	1.019 (0.045)		
1.Elec	47.868 (3.992)	60.686 (4.781)	47.368 (1.386)	1.280 (0.055)	0.106 (0.187)	0.183 (0.065)	0.236 (0.040)	0.143 (0.060)	0.182 (0.017)	0.789 (0.037)	1.428 (0.007)	1.826 (0.007)	1.383 (0.068)	1.009 (0.019)	-0.1207	*0.904*
2.Elec	50.555 (6.110)	68.325 (11.231)	52.403 (8.214)	1.303 (0.036)	0.132 (0.048)	0.209 (0.022)	0.273 (0.028)	0.181 (0.040)	0.236 (0.038)	0.743 (0.029)	1.603 (0.060)	2.089 (0.043)	1.350 (0.085)	0.968 (0.039)		
1.Agro	50.832 (5.882)	61.092 (5.701)	48.696 (7.023)	1.261 (0.065)	0.099 (0.014)	0.169 (0.010)	0.213 (0.019)	0.110 (0.035)	0.141 (0.049)	0.831 (0.021)	1.380 (0.073)	1.738 (0.102)	1.308 (0.113)	1.047 (0.037)	-0.1454	*0.885*
2.Agro	54.369 (2.150)	70.334 (3.597)	54.954 (2.308)	1.280 (0.022)	0.130 (0.030)	0.177 (0.033)	0.226 (0.044)	0.170 (0.049)	0.214 (0.059)	0.774 (0.035)	1.632 (0.085)	2.088 (0.095)	1.439 (0.064)	0.99 (0.051)		

Note: 1=Ecuadorian journals; 2=North American journals; SD=standard deviation

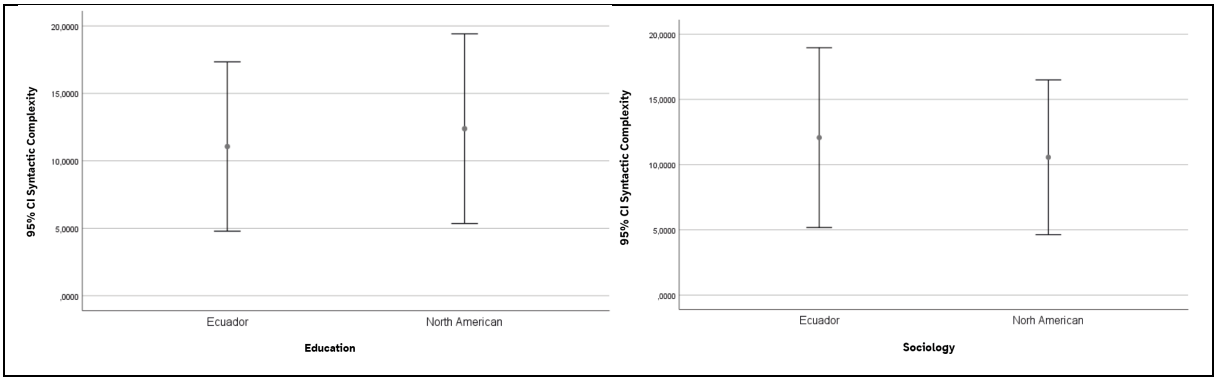
MLS= Mean length of sentence
MLT= Mean length of T-unit
MLC= Mean length of clause

C/T= Clauses per T-unit
CT/T= Complex T-units per T-unit
DC/C= Dependent clauses per clause
DC/T= Dependent clauses per T-unit

CP/C= Coordinate phrases per clause
CP/T= Coordinate phrases per T-unit
T/S= T-units per sentences
C/S= Verb phrases per T-unit

CN/C= Complex nominals per clause
CN/T= Complex nominals per T-unit
VP/T= Verb phrases per T-unit

The cross-disciplinary analysis used independent samples tests to compare the mean scores of the syntactic complexity dimensions across the four disciplines in NA&EJ. Table 13 indicates; although there was variability in the mean scores in education (M=11.06), sociology (M=12.07), electronics (M=11.74), and Agronomy (M=12.06) in Ecuador compared to North America (M=12.38; M=10.56; M=12.88; M=13.48), no statistical significance was found. Additionally, no significant difference was observed in the means of syntactic complexity indices in sociology (p = .738), education (*p = .777*), electronics (*p = .820*), and agronomy (*p = .783*) disciplines. However, ANOVA: single factor informed statistical and significant differences in the length of production units ($p = 0.0004$) across disciplines. Moreover, there was a positive coefficient of correlation (0.995) in the four disciplines. Additionally, ANOVA: single factor found statistical differences in the amount of coordination ($p = 0.0020 < 0.05$) and degree of phrasal sophistication ($p = 0.0028 < 0.05$) among sub-groups.



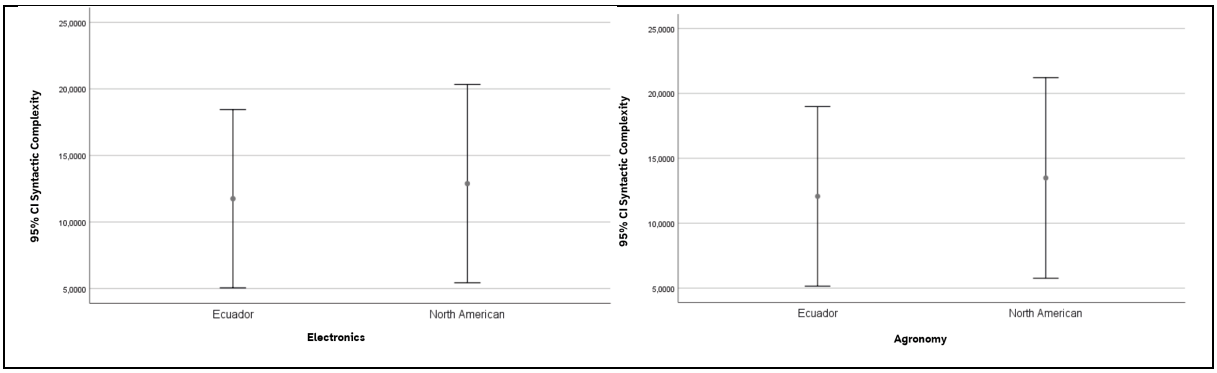


Figure 13. Syntactic complexity indices across disciplines

SSQ 4.4 What abstracts indicate to have more left embeddedness words before the verb of the main clause, considering disciplinary fields in NA&EJ?

Figure 14 below presents the summary statistics for left embeddedness words before the verb of the main clause in the four disciplinary areas. From this data, it can be seen that abstracts published in Ecuadorian journals showed a higher occurrence in the use of left embeddedness words (average mean=5.63) throughout the English sub-corpora. Abstracts in sciences used more left embeddedness words before the main verb than humanities counterparts. Electronics abstracts in both NA&EJ reported the highest incidence of left embeddedness (M=6.59, M=5.87), respectively. Although there were differences in the mean scores across disciplines, no statistical significance was found between NA&EJs (t = 0.5392, p = 0.618).

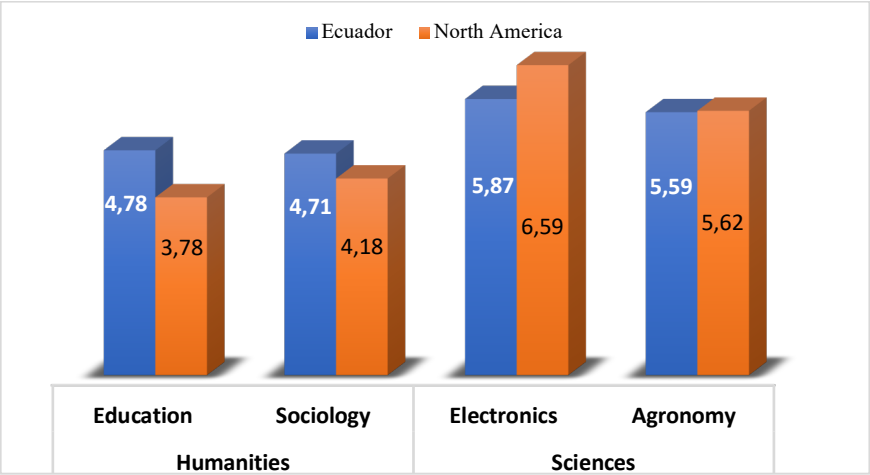


Figure 14. Left embeddedness words across disciplines.

SSQ 4.5 What is the frequency of complex nominals per a clause in abstracts of NA&EJ across disciplines?

Table 30. Complex nominal types across disciplines

Nominals per clause	North American Journals				Ecuadorian Journals					
	Education	Sociology	Electronics	Agronomy	Education	Sociology	Electronics	Agronomy		
	mean (SD)	*mean (SD)*	*mean (SD)*	*mean (SD)*	*mean (SD)*	*mean (SD)*	*mean (SD)*	*mean (SD)*	*t*	*p*
a	— (–)	— (–)	— (–)	— (–)	— (–)	— (–)	1 (–)	1 (–)	-2.00	0.09
b	10.5 (5.77)	14.5 (8.08)	11.5 (6.34)	8 (4.32)	12 (6.63)	6.5 (3.45)	4.5 (2.29)	7.5 (4.03)	2.19	0.07
c	10 (5.48)	6.5 (3.45)	7 (3.74)	5.5 (2.87)	4.5 (2.29)	6.5 (3.45)	11.5 (6.34)	3 (1.41)	-0.32	0.38
d	2.5 (1.12)	7.5 (4.03)	7.5 (4.03)	3 (1.41)	6 (3.16)	8 (4.32)	7.5 (4.03)	4.5 (2.29)	-1.51	0.13
e	2 (0.82)	— (–)	1.5 (0.50)	— (–)	— (–)	1 (–)	— (–)	— (–)	0.22	0.41

Note*: **(a)** nominal that-clause as the subject, **(b)** nominal that-clause as a subject complement, **(c)** nominal to-infinitive clause, **(d)** nominal of-prepositional as a subject complement, **(e)** nominal of-preposition-plus-wh clause*

Table 30 above shows the descriptive statistics of complex nominal types across disciplines in NA&EJs. These nominals are: (a) that-clause as the subject, (b) that-clause as a subject complement, (c) to-infinitive clause, (d) of-prepositional as a subject complement, and (e) of-preposition-plus-wh clause. ANOVA: Two-Factor without replication showed statistical significance (p = 0.000) in complex nominal types in all four disciplines in NA&EJ at the p = .05 level. Yet, no significance was found in the amount of complex nominal types employed in humanities and sciences (t = 0.875, p = 0.19 > .05). It also reports no statistical differences between NA&EJs in sciences (t = 0.477, p = 0.32 > .05) and NA&EJs in humanities (t = 0.828, p = 0.21 > .05).

Further analysis through the English sub-corpora revealed that nominal that-clause as a subject complement is the first frequent nominal type (f = 142; M = 42.6), followed by nominal to-infinitive clause (f = 101; M = 29.8) and nominal of-prepositional as a subject complement (f = 85; M = 25.4). Nominal of-preposition-plus-wh clause (f = 6; M = 1.6) and nominal that-clause as the subject (f = 2; M = 0.7) are the least frequent nominal types. Abstracts in North American journals reported greater usage of nominal types (M = 5.02; SD = 0.21) compared to those of Ecuadorian ones (M = 4.4; SD = 0.13). Mean scores in figure 15 below illustrate the complex nominals frequently used in NA&EJ in each of the four disciplines. Thus, the t-test demonstrates a statistical difference in the use of complex nominals in NA&EJs (t = -7.234, p = 0.001).

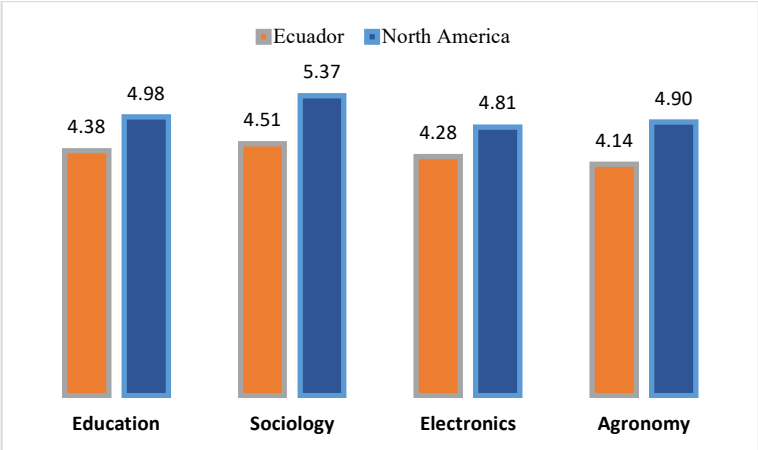


Figure 15. Use of complex nominals.

Data in Table 31 (below) reports that concerning the occurrence of nominals, education, electronics, and sociology abstracts in Ecuadorian journals used more nominal that-clauses than North American ones. The abstracts of Ecuadorian journals tended to have more nominals as subject complement (55%), to-infinitive clause (49%), and nominals of-prepositional as a subject complement (38%), respectively. Multiple t-tests showed no statistical differences when comparing education ($t = 0.31$, $p = 0.38$), sociology ($t = 0.76$, $p = 0.25$), electronics ($t = 0.42$, $p = 0.35$), and agronomy abstracts ($t = 0.45$, $p = 0.34$) between NA&EJ. Sentences in items a-b-c-d-e (see the discussion, section 5.2.2, RQ 4), show the way that nouns take a nominal complement in the form of *that clause* either as the subject or as a subject complement. They also function as to-infinitive clause, of-prepositional clause, and preposition-plus-wh clause.

Table 31. Per cent of complex nominal types in the four disciplines

	Education		**Sociology**		**Electronics**		**Agronomy**	
	NAJ	EJ	NAJ	EJ	NAJ	EJ	NAJ	EJ
Nominals as:	*Occ.*	*Occ.*	*Occ.*	*Occ.*	*Occ.*	*Occ.*	*Occ.*	*Occ.*
***(a) that*-clause** as the subject	0	0	0	0	0	2	0	4
***(b) that*-clause as** subject complement	43	55	52	30	43	18	50	50
***(c) to-infinitive* clause**	41	19	22	30	25	49	33	18
***(d) of-prepositional* as** subject complement	9	26	26	38	27	31	17	29
***(e) of-preposition-plus-wh* clause**	7	0	0	3	4	0	0	0

Note: *NAJ=North American Journals; E =Ecuadorian Journals; Occ.=% of frequency*

The cross-disciplinary and linguistic analysis looks for differences in the dimensions of syntactic complexity. The analysis indicates that NA&EJ vary in coordinating structure, phrasal sophistication, and sentence complexity. The genre-related differences in this dissertation are that coordination, subordination, and sophistication significantly occurred in abstracts published in NAJ. Abstracts in Ecuadorian journals suggested a higher occurrence of using left-embeddedness words and sentence length, making them less readable. This research finding is

consistent with the complexity of writing in native and non-native English texts observed in earlier studies by Ai and Lu (2013). The resemblant syntactic structures found here can be taken as tendencies for future studies to examine the relationship between syntactic complexity and writing quality with other components of writing such as organization, content, and vocabulary.

4.2.3 Lexical richness in journal research article abstracts

Laufer and Nation (1995: 308) claim that the writing quality of an entire text can be anticipated by gauging its lexical richness. As stated above, a growing number of empirical works had assessed the LD, LV, and LD employed in native and non-native English-written text (e.g., Schmitt, 2000; Šišková, 2012; Bestgen, 2017; Ha, 2019; Djiwandono, 2016; Lei and Yang, 2020). The dimensions of lexical richness account for the degree of various and extensive vocabulary to which a writer employs in a text (Laufer and Nation, 1995: 307). In academic writing, vocabulary is considered as a good indicator for determining the quality of composing patterns. In this way, the current dissertation looked for word diversification and sophistication in abstracts of scientific papers.

Taking abstracts as the framework of the analysis, the complete *lextutor vocab-profile* (Cobb, 2006) measures the LD, LV, and LS of RA abstracts in the two English sub-corpora. Accordingly, based on the purpose, the corresponding fifth research question was raised to describe statistical differences or regularities between abstracts.

5 Do English RAAs published in North American journals show higher or lower lexical richness than those published in Ecuadorian ones? If so, in what lexical indices do they differ from their Ecuadorian counterparts?

The subsequent questions are investigated in this section to respond to the head question are:

5.1 To what extent do abstracts published in North American vary in the lexical richness from those of Ecuadorian journals??

5.2 To what extent do abstracts published in North American vary in the lexical richness from those of Ecuadorian journals, considering humanities and sciences fields?

5.3 To what extent do abstracts published in North American vary in the lexical richness from those of Ecuadorian journals, considering the four disciplines?

5.4 What is the frequency of the content words (Ns, Vs, ADJs, ADVs) compared to function words in abstracts published in NA&EJ?

5.5 What is the degree of variability in the use of content words in NA&EJs, considering the first thousand (1000) and the second thousand (2000) words?

4.2.3.1 Analysis of research questions

This sub-section describes the lexical richness, accounting for lexical density, lexical variation, and lexical sophistication in abstracts of academic papers, published in Anglophone and non-Anglophone speaking contexts. Data gained in this section served to respond to the following RQ:

> **RQ 5** Do English RA abstracts published in North American journals show higher or lower lexical richness than those published in Ecuadorian ones? If so, in what lexical indices do they differ from their Ecuadorian counterparts?

Good writing is branded by several features, like coherence, meaningful connections between ideas, practical punctuation and mechanics, and accuracy to conform to academic writing standards. Nonetheless, to keep a positive effect on the reader, the writing must maintain a well-use of vocabulary throughout the text. Djiwandono (2016), for example, suggests using lexical diversity in writing —word diversification to avoid monotonous and tedious tone; this may demonstrate writers' vocabulary knowledge and familiarity with the genre. Therefore, Laufer and Nation (1995) argue, measuring the LD, LV and LS that writers employed in texts contributes to determining the degree of lexical richness and diverseness of words used in this genre. Thus, uncovering significant differences in the distribution of lexical richness across disciplines and between publishing contexts would imply that they represent variation in the use of language concerning their linguistic knowledge and community practices. Hence, it allows to delve into the lexical knowledge used in abstracts of RA published in English (North America) and non-English speaking contexts (Ecuador) to observe differences and similarities between them. Therefore, to achieve the objective of this section, the proportion of lexical words versus function words, the variety of words, and the ratio of low-frequency and off-list words were the basis for answering RQ number 5. In this analysis, the main research question was interpreted based on the subsequent questions:

SSQ 5.1 To what extent do abstracts published in North American vary in the lexical richness from those of Ecuadorian journals?

Table 32. Lexical richness in the two academic discourses

	Ecuadorian J.		**North American J.**			
	mean	SD	mean	SD	***t***	***p***
Lexical Density	0.59	0.024	0.65	0.013	-7.554	0.005*
Lexical Sophistication	86.43	4.605	83.03	6.861	0.633	0.044*
Lexical Variation	0.60	0.029	0.60	0.017	2.500	0.792
Words in text	5109	671.80	4920	842.97	-0.805	0.465
Total lexical richness	29.10	1.525	27.99	2.289	0.059	0.953

Note: Statistical significance at the level $p < .05$*

Table 32 above provides an overview of the lexical richness in abstracts published in NA&EJ. Data in this part showed no difference in the proportion of lexical diversity (p = .792 > .05) between the two NA&EJs. However, there was statistical difference in the lexical density (p = .005 < .05) and lexical sophistication (p = .044 < .05) in abstracts of the two academic discourses, see figure 16 below. Abstracts published in Ecuadorian journals indicated a considerable use of lexical sophistication (specialized terminology and off-list words) in the production of those texts. Though the mean lexical richness in abstracts from Ecuador was statistically different (M = 29.10) than North America (M=27.99), no significant differences were found ($t = 0.059$, $p = 0.953 > 0.05$). Abstracts in North America indicated to employ more content words compared to the mean scores in Ecuadorian texts.

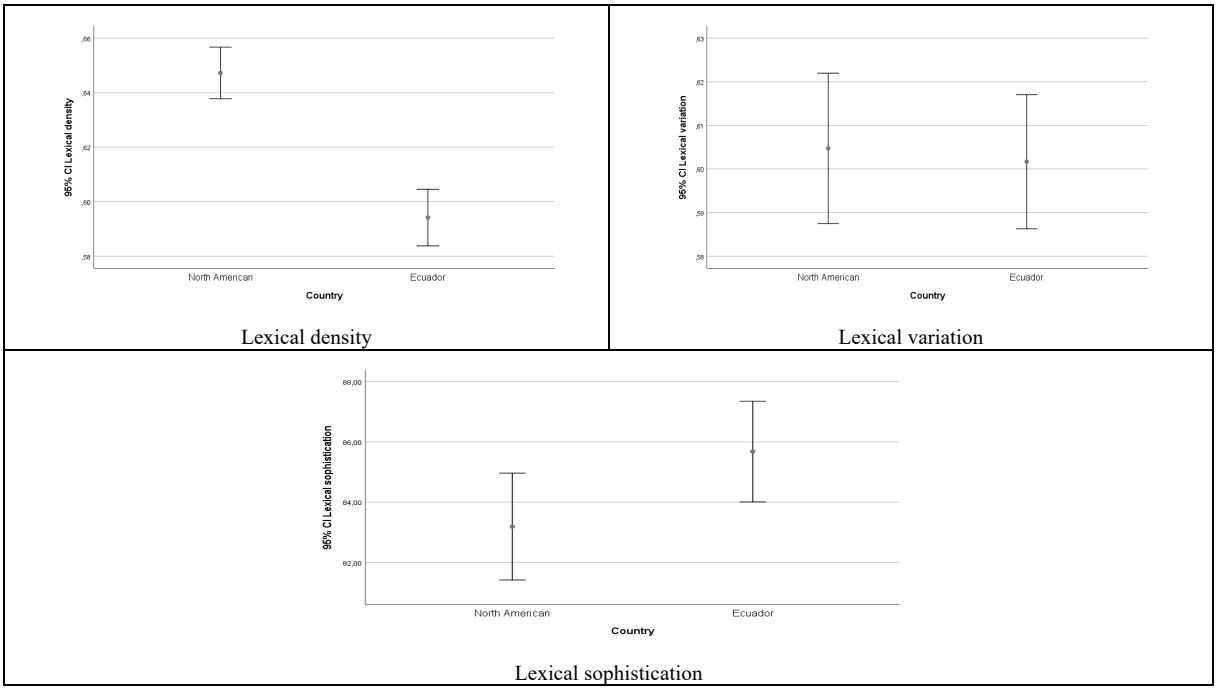


Figure 16. Lexical density, diversity and sophistication in NA&EJs

When looking for correlation of the lexical richness indices between NA&EJs, the Pearson coefficient of correlation was applied. Data in the figure 17 shows the positive and

negative Pearson correlation. Thus, according to the data, there is a moderate positive correlation between the lexical density (0.6508; 0.4392) in abstracts between NA&EJ, but it is not statistically significant. There is a high positive correlation between the lexical sophistication (0.9242; 0.0758) in NA&EJs; such a correlation is statistically significant (with a 10% of significance). This implies that at the time that the lexical sophistication in Ecuador increases, the lexical sophistication in North American increases, too. There is a moderate negative correlation between lexical variation (-0.6391; 0.3609) in NA&EJs. Yet, this correlation is not significant. The correlation between words (0.5051; 0.4949) in abstracts of NA&EJ is moderately positive; nonetheless, it is not statistically significant.

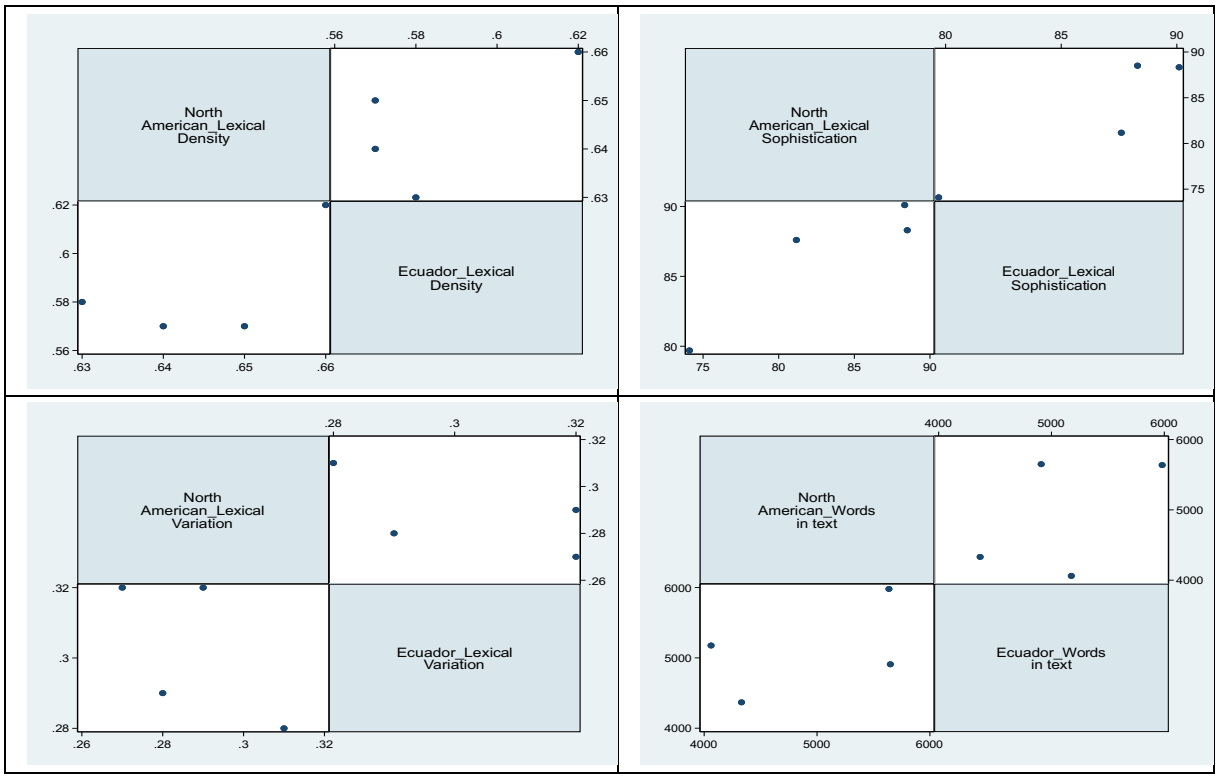


Figure 17. Pearson coefficient correlation in NA&EJs

According to the data in the figure 18, it can be seen that the lexical density indices between the four disciplines in NA&EJs are the greatest in agronomy and education in North America (0.66 and 0.65). By contrast, the lowest indices are in sociology and education in Ecuador (0.57). The highest lexical sophistication indices are reported in education in both NA&EJs (90.1 and 83.33). Contrary, the lowest ones are in agronomy and electronics in North American Journals (74.1and 79.7). Lexical variation indices in sociology abstracts of Ecuadorian (0.32) and North American (0.31) journals are greater compared to those of education in Ecuadorian (0.25) and electronics (0.27) in North American journals. In the same way, words in texts were the highest in agronomy abstracts in both contexts of publication

(5981 and 5637) and the lowest in education in Ecuador (4061) and sociology (4331) in North America.

Figure 18. Lexical richness with and between NA&EJs.

SSQ 5.2 To what extent do abstracts published in North American vary in the lexical richness from those of Ecuadorian journals, considering humanities and sciences fields?

The table 33 below presents the descriptive statistics of lexical richness of RAAs in humanities and sciences. A significant difference between NA&EJs in humanities was evident in the lexical density at the p = .05 level. Abstracts written in sciences in Ecuadorian (M=0.58) and North American (M=0.63) journals tend to employ more instances of content words than those of humanities. In the same way, abstracts published in humanities in both NA&EJ reported to have more lexical sophistication than those of sciences. Abstracts published in Ecuadorian journals in humanities and sciences fields in Ecuador (M=30.0; M=29.5) showed considerably greater mean scores on the lexical richness than those of North America.

Table 33. Lexical richness in humanities and sciences in NA&EJs

	Humanities					
	Ecuador		North America			
	mean	Sd	mean	Sd	*t*	*p*
Lexical Density	0.57	0.00	0.57	0.01	-15	0.004*
Lexical Sophistication	89.2	1.27	88.3	0.12	0.868	0.476
Lexical Variation	0.285	0.05	0.32	0.01	-0.412	0.720
Words in text	4772	571.34	4368	190.92	1352	0.308
Total lexical richness	**30.0**	0.41	29.7	0.04	0.799	0.508
	Sciences					
	Ecuador		**North America**			
	mean	Sd	mean	Sd	*t*	*p*
Lexical Density	0.58	0.03	0.63	0.02	-1.80	0.21
Lexical Sophistication	87.6	5.59	81.17	5.00	1134	0.37
Lexical Variation	0.29	0.00	0.27	0.01	3.00	0.09
Words in text	4909	758.02	5650	9.19	-0.37	0.74
Total lexical richness	**29.5**	1.85	27.4	1.66	1135	0.37

Data in the figure 19 shows statistical differences in LD and LS in humanities and sciences fields at the level of significance in NA&EJs. Thus, the mean of lexical density in abstracts written in humanities in Ecuadorian (M=0.653) and those of North American (M=0.578) journals were statistically different ($p = 0.000 < .05$). In the same way, abstracts in sciences in Ecuadorian (M=0.641) and those of North American (M=0.609) journals were significantly different ($p = 0.002 < .05$). Similarly, there was significance ($p =.001 < .05$) in the lexical sophistication used in abstracts of sciences published in Ecuador (M=78.42) and in North America (M=82.41) but not in abstracts of humanities ($p = .043 > .05$). Any significant differences appeared in the lexical variation of abstracts in humanities ($p = .288 > .05$) and sciences ($p = .538 > .05$) between NA&EJ.

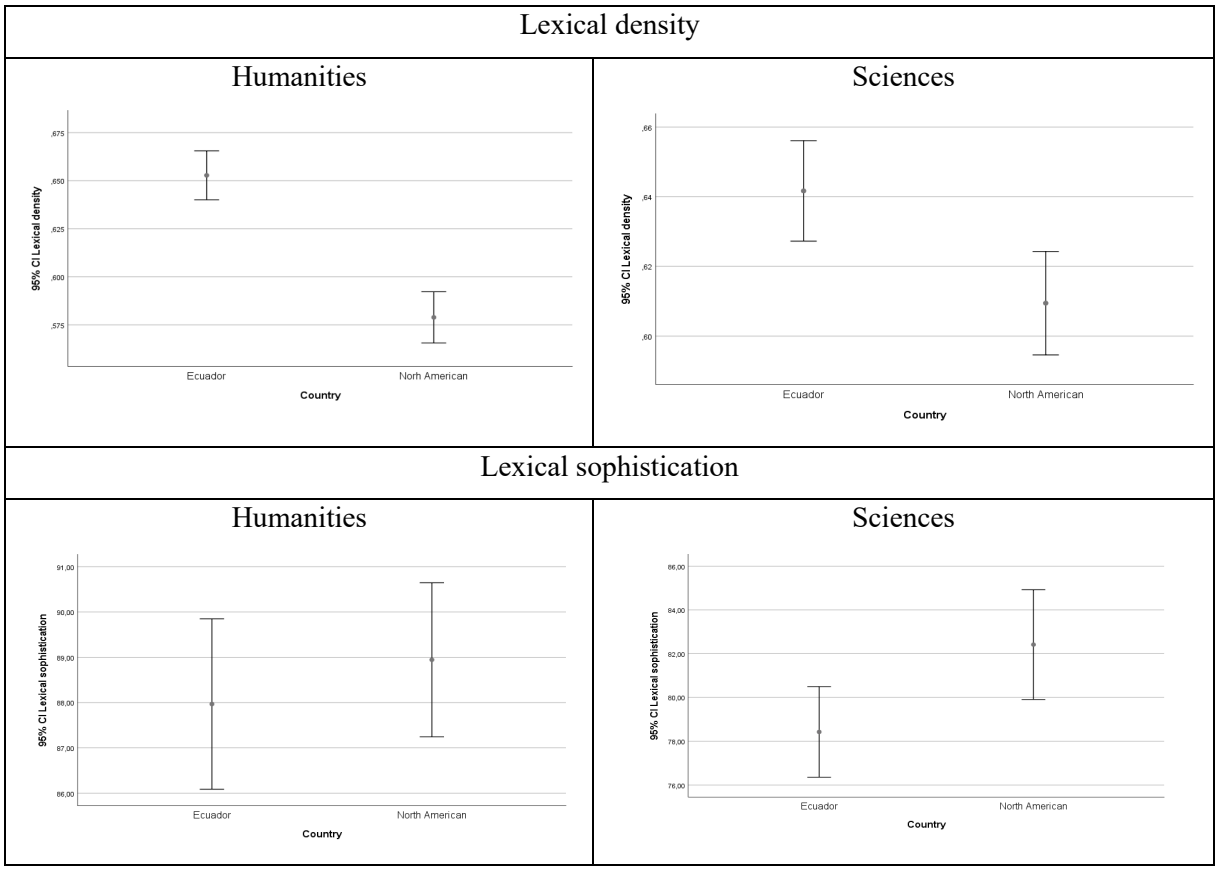
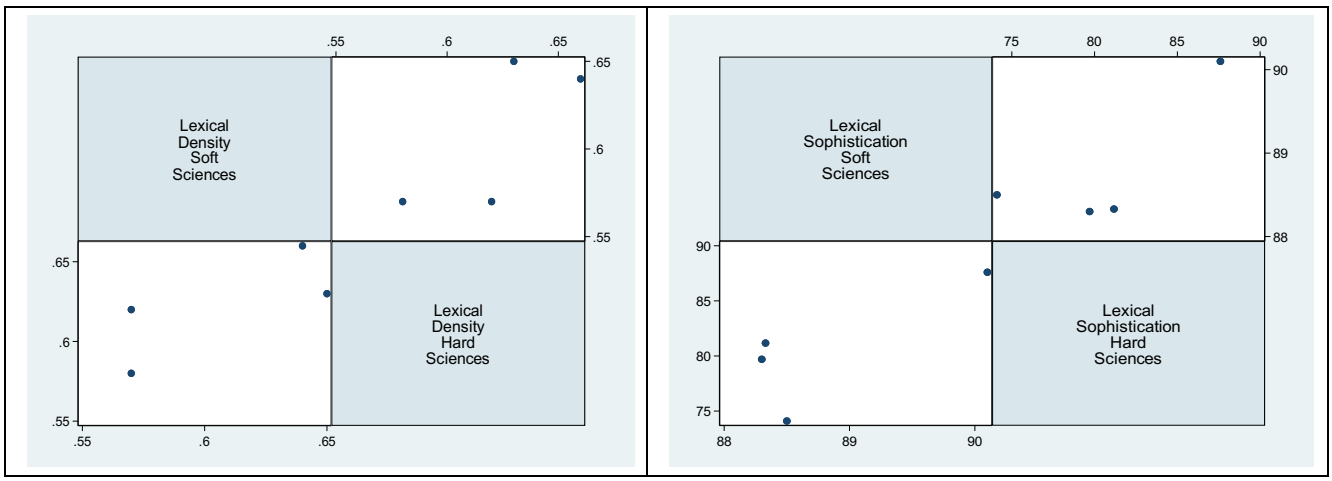


Figure 19. Lexical riches in humanities and sciences fields

To find out correlation of the lexical richness indices between humanities and sciences in NA&EJs, the Person coefficient of correlation was used. As it can be seen from the data in the figure 20, there is a high positive correlation between the lexical density (0.7481; 0.2519) in abstracts between humanities and sciences, but it is not statistically significant. There is also a high positive correlation between the lexical sophistication (0.7789; 0.2211) in humanities and sciences fields; such a correlation is not significant. There is a moderate negative correlation between lexical variation (-0.1406; 0.8554) in humanities and sciences; nonetheless, this correlation is not significant. The correlation between words (-0.8408; 0.1592) in abstracts of NA&EJ is higher negative and not statistically significant.



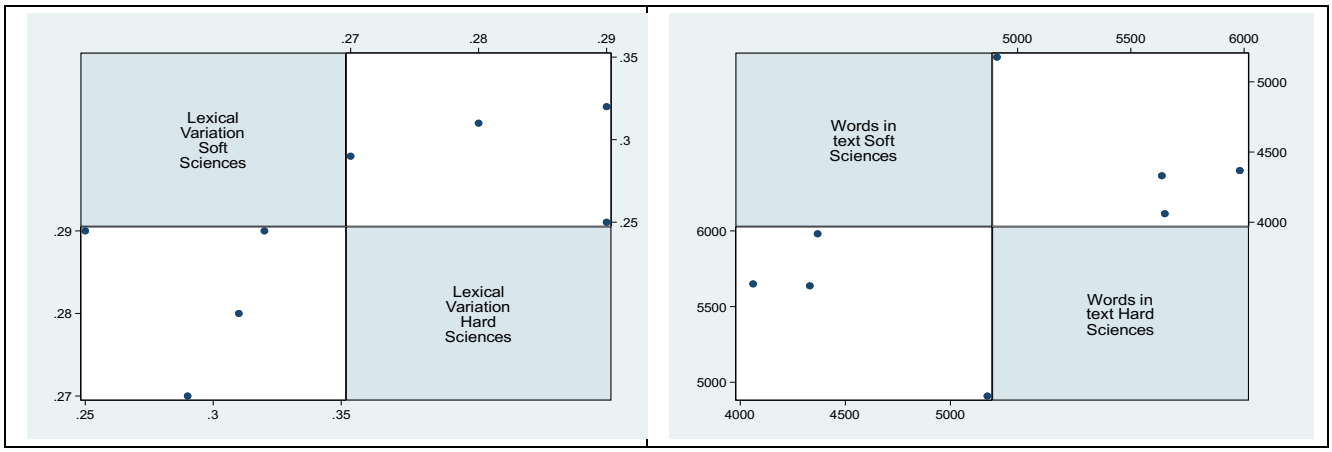


Figure 20. Pearson coefficient correlation in humanities and sciences

SSQ 5.3 To what extent do abstracts published in North American vary in the lexical richness from those of Ecuadorian journals, considering the four disciplines?

Table 34 (above) shows the descriptive statistics of lexical richness across disciplines. Lexical sophistication reported to be the dimension with more occurrence throughout the two English sub-corpora followed by lexical density and lexical variation. Education abstracts in Ecuadorian journals tend to have the highest instances of lexical richness indices. Agronomy abstracts in North American ones, report to have the lowest amount of lexical richness indices. From the data in Table above, it can be seen that there is no statistical difference across disciplines between NA&EJs at the p = .05 level. Yet, multiple independent t-tests report significance between lexical indices of each discipline comparing the two academic journals.

Table 34. Lexical richness across disciplines

Discipline	LD mean	LS mean	LV mean	TLR mean	Words in text mean	*t*	*p*
1 Education	0.57	90.1	0.25	30.31	5176		
2 Education	0.65	88.33	0.29	29.76	4061	*0.901*	*0.46*
1 Sociology	0.57	88.3	0.32	29.73	4368		
2 Sociology	0.64	88.5	0.31	29.82	4331	*-1.416*	*0.29*
1 Electronics	0.58	87.6	0.29	29.49	4909		
2 Electronics	0.63	81.17	0.27	27.36	5650	*0.992*	*0.42*
1 Agronomy	0.62	79.7	0.29	26.87	5981		
2 Agronomy	0.66	74.1	0.28	25.01	5637	*0.991*	*0.42*

Note: *1 = Ecuadorian Journals; 2 = North American Journals*
LD=lexical density; LS=lexical sophistication; LV=lexical variation; TLR=total lexical richness

Accordingly, the figure 21 illustrates that the average lexical density of education abstracts between Ecuador (M=0.591) and North America (M=0.656) is statistically very different (p = .00 < .05). Similarly, the average lexical density of sociology abstracts between Ecuador (M=567) and North America (M=0.649) is significant (p = .00 < .05). Likewise, the mean lexical density of electronic abstracts between Ecuador (M=588) and North America

(M=0.622) is statistically different (p = .011 < .05). In the same way, the mean lexical density of agronomy abstracts between Ecuador (M=630) and North America (M=0.661) is significantly different (p = .027 < .05).

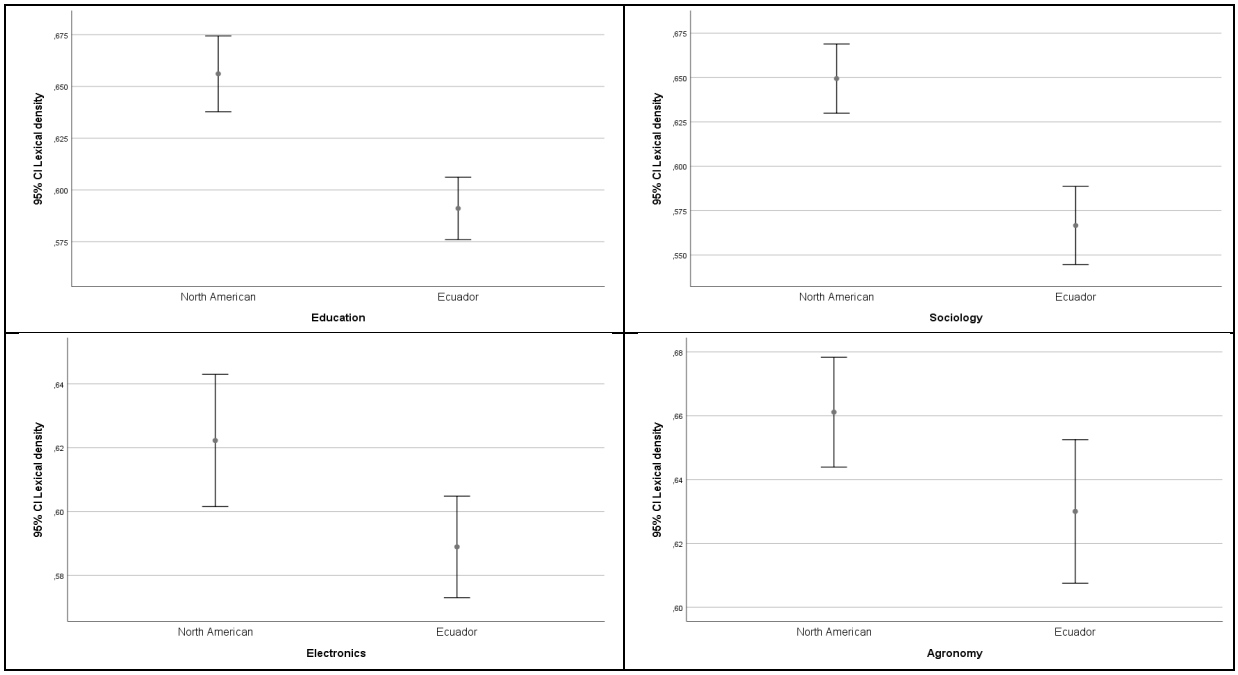


Figure 21. Lexical density across disciplines in NA&EJs

Regarding the lexical sophistication, data in the figure 22 indicates that there is statistical difference (p = .00 < .05) between the mean scores of electronic abstracts in North American (M=80.64) and Ecuadorian (87.52) journals. Data in this part reveals no statistical significance between the mean score of education (p = .081 > .05), sociology (p = .658 > .05), and agronomy (p = .584 > .05) abstracts when comparing NA&EJ.

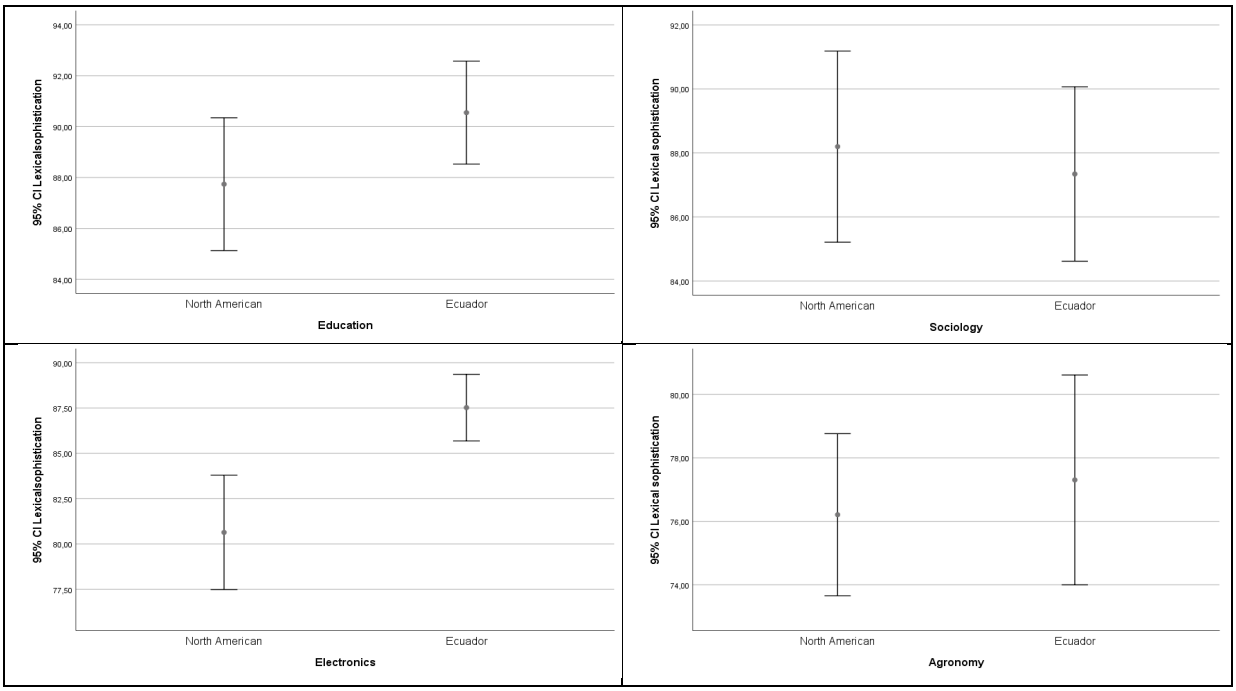


Figure 22. Lexical sophistication across disciplines in NA&EJs

When examining the lexical variation in each discipline between NA&EJs, no statistical difference in the mean scores of sociology, electronics, and agronomy texts was found. Thus, the means of abstracts in sociology (p = .585), electronics (p = .647), and agronomy (p = .154) were greater than the level of significance (α = .05). Nonetheless, education abstracts in Ecuadorian (M=0.609) and North American (M=0.651) academic journals reveal differences and statistical significance (p = .048 < .05), see figure 23 below.

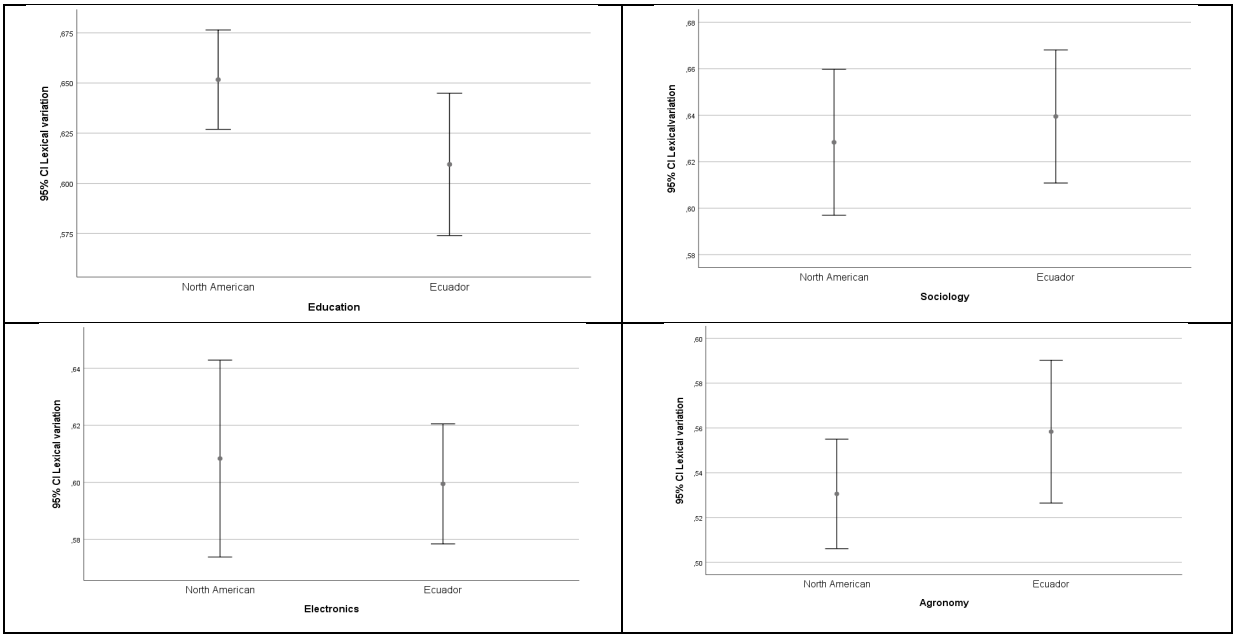


Figure 23. Lexical variation across disciplines in NA&EJs

The figures below illustrate the median, maximum and minimum values of the lexical variation, lexical density and lexical sophistication for each of the disciplines of the NA&EJ. The values of lexical variation in Ecuador for each discipline are more heterogeneous than North American lexical density, with greater variability in education and less in sociology. The median values are different between the four disciplines, and in turn, different from the North American journals, being higher for sociology and education. Lexical density in Ecuadorian texts is more heterogeneous than North American ones; it shows greater variability in agronomy and less in education. The median values are very different between each discipline, but also different from the North American journals, being higher for agronomy and education. Lexical sophistication in Ecuador is very similar to the North American journals, with higher variability in agronomy and less in electronics. The median values are very different between each discipline, but they do not differ much (they are very similar) from the North American journals, being higher for education and electronics.

The values of lexical variation in North America for each discipline are heterogeneous, with greater variability in sociology and less in education. Lexical density is more homogeneous

than lexical variation; it shows greater variability in agronomy and less in education. Lexical sophistication is very heterogeneous (more scattered than lexical density); there is greater variability in electronics and less in sociology. The median values are very different for each subject, being higher for sociology and education.

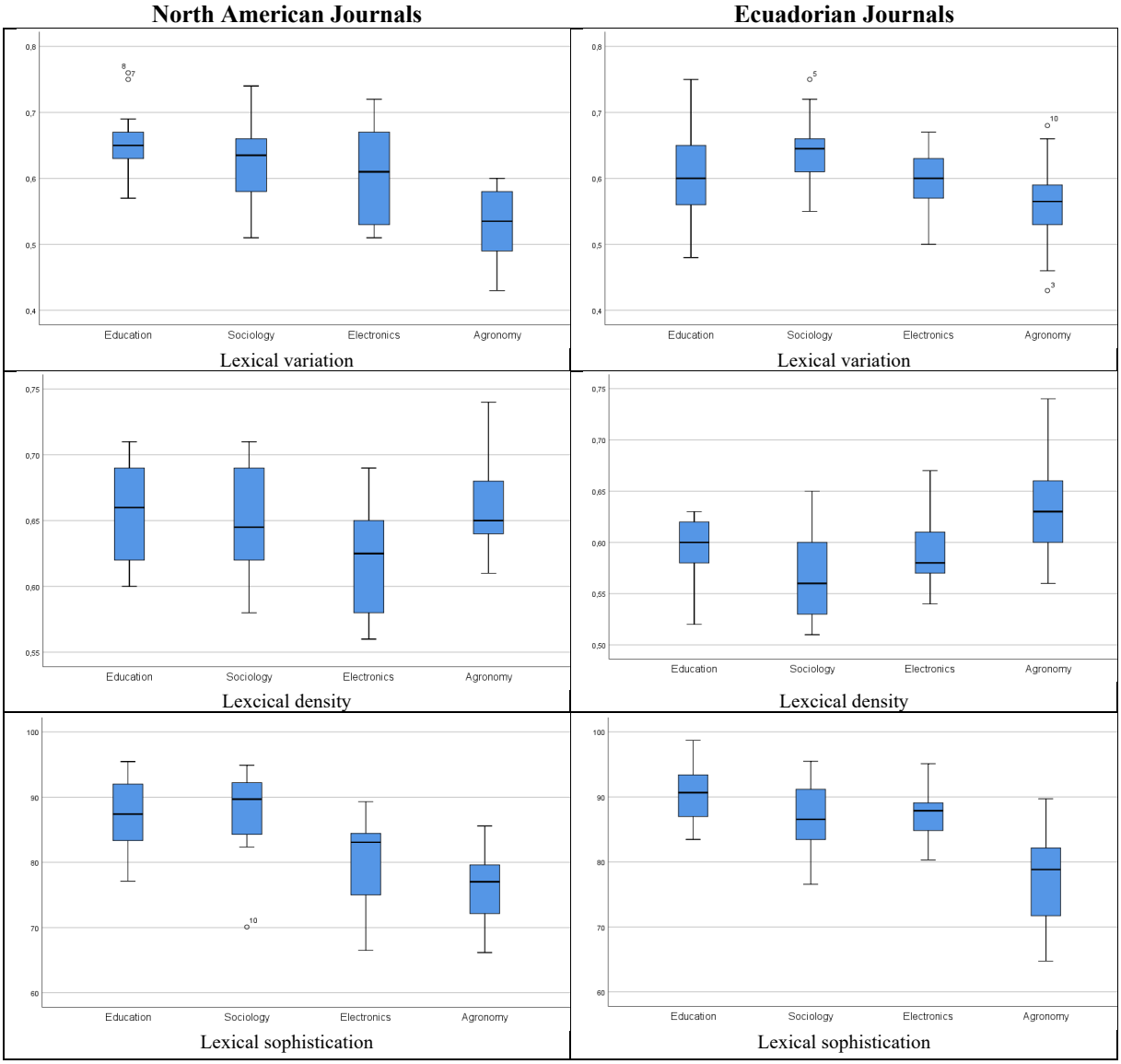


Figure 24. Distribution of lexical richness indices within and across disciplines in NA&EJs

SSQ 5.4 What is the frequency of the content words (Ns, Vs, ADJs, ADVs) compared to function words in abstracts published in NA&EJ?

Table 35 shows no significant difference in the use of content and function words in NA&EJs. However, the mean score of adverbs in North America (M=66.5) and Ecuador (M=48.5) is statistically significant (p =.003 < .05). Nouns with 37% were the first most frequent lexical item, followed by prepositions (17%), verbs (14%), determiners (12%), and adjectives (9%). Pronouns (1%), conjunctions (3%), and adverbs (4%) were the least frequent linguistic features

in this study. Abstracts in Ecuadorian journals tend to use more content words (M=334) than those of North American ones. By contrast, abstracts in North America produced less frequent occurrences of function words (*f* = 30%) compared to the Ecuadorian journals.

Table 35. Content and function words in NA&EJs

		North American Journals				**Ecuadorian Journals**					
		Token	*f.*	mean	SD	Token	*f.*	mean	SD	***t***	***p***
Content Words	Nouns	2912	*39*	728	125.7	3218	*36*	804.5	135.8	-0.65	0.548
	Verbs	1101	*14*	275.3	24.58	1154	*14*	288.5	24.88	-564	0.602
	Adjectives	769	*10*	192.3	21.47	782	*8*	195.5	29.05	-198	0.852
	Adverbs	266	*3*	66.5	1.291	194	*4*	48.5	4.509	6.21	0.003*
Function Words	Prepositions	151	*16*	37.75	4.646	137	*17*	34.25	2.872	1.60	0.18
	Determiners	76	*10*	19	11.52	53	*14*	13.25	1.258	0.00	1.00
	Conjunctions	15	*4*	3.75	0.957	19	*3*	4.75	0.5	-1.00	0.37
	Pronouns	33	*1*	8.25	2.217	36	*1*	9	0.816	-0.43	0.69

Note: *statistical significance * p < .05.*

SSQ 5.5 What is the degree of variability in the use of content words in NA&EJs, considering the first thousand (1000) and the second thousand (2000) words?

Data in Table 36 compare the use of 1000 and 2000 words in NA&EJs. The analysis found no difference at the *p* = .05 level in the occurrence of the Top 1000 words in the two academic written discourses. As the table below shows, there is statistical significance in the use of adverbs (*p* = 0.02 < 0.05) within the 2000 words between NA&EJs but not in nouns, verbs, and adjectives. Nouns and verbs frequently occurred in both Top 1000- and 2000-word usage in NA&EJs. Abstracts in both NA&EJ showed greater usage (M=115) and frequent occurrence (*f* = 47%) of the Top 1000 words than the 2000 words (M=54, *f* =11%). However, abstracts in Ecuadorian journals use more instances of the first and second thousand words compared to those of North American (*f* =27%).

Table 36. Content words in the 1000 to 2000 words NA&EJs

		Native Groups			**Non-native Groups**				
	Category	Token	mean	SD	Token	mean	SD	***t***	***p***
1000 words	Nouns	784	187.6	39.4	969	238.6	23.5	-1.71	0.162
	Verbs	598	143	18.5	671	160.6	20.0	-1.3	0.264
	Adjectives	254	63.3	0.58	267	70	10.1	-1.21	0.293
	Adverbs	119	28.6	3.30	107	27.6	2.6	0.452	0.674
2000 words	Nouns	438	107.3	15.7	509	129.3	14.5	-1.52	0.203
	Verbs	220	53	9.0	225	54.3	7.6	-0.18	0.86
	Adjectives	144	36.3	1.83	137	37	6.4	-0.26	0.81
	Adverbs	46	12	1.91	24	5.6	2.2	3.412	0.02*

Note: *statistical significance * p < .05*

Throughout the analysis, there were differences in the LD and LS but none in the proportion of LV used in NA&EJ. The statistical significance found in the means of lexical richness between the humanities and sciences texts support the claim that lexical knowledge varies and is unstable, too, as it depends on the discipline, subject area, and publication context. The higher proportion of content words in a text (as reported in NAJ) may acknowledge it to be considered more informative. By contrast, fewer function words in a text may advise the presence of more subordinate clauses (Laufer & Nation, 1995) and, as a result, more complex to process.

As stated in previous chapters, rhetoric and writing style —*in this study, moves and their linguistic realizations*, are structurally related. Thus, according to van Dijk (1972) they are interwoven in the instantiation of the micro-structures (compositional elements or linguistic features), which are conveyed to describe the semantic characterization of the macro-structures (moves, functions, steps). Consequently, the frequency and occurrence of the individual moves, to some extent, can be characterized by representative linguistic features that help to classify specific moves and their functions when communicating the essence of the text. Such a correlation is because rhetoric includes pragmatic tendency of the macro textual level and linguistic elections of the micro-level (Dale et al. 1998: 347). Data gained in this section of the dissertation allowed for discussing the main research questions in the following Chapter V.

CHAPTER V

SUMMARY, IMPLICATIONS, CONCLUSIONS (DISCUSSION)

5.1 SUMMARY: Following the objectives

This chapter presents a synthesis of the research findings concerning its primary goals. The general one was to compare 240 English RAAs from education, sociology, electronics, and agronomy published in NA&EJ, considering humanities and sciences fields. Here, it compares RAAs by defining the rhetorical move structure, the linguistic realization, and the cohesive means associated with rhetorical moves. About the primary analysis, the study found no significance in the mean of moves used between NA&EJs ($p = .553 > 0.05$). Therefore, the rhetorical move structure between North American and Ecuadorian RAAs in all disciplines is very similar, and the variation of the moves is not unique to any discipline. The major finding was the occurrence of a non-hierarchical eight-move schema with four recurrent moves in NA&EJs. This non-hierarchical move pattern was considered as an emergent rhetorical structure to produce RAAs, as it summarizes the scope of the entire article. Such an eight-move structure consisted of the following moves: Thematic focus, Background, Purpose, Method, Results/Product, Conclusion, Recommendations, and Implications. Abstracts published in North American journals followed a four-move pattern (M1-M3-M4-M5), whereas those of Ecuadorian ones adopted a three-move schema (M3-M4-M5).

The contrastive analysis, in addition to moves, involved the review of their linguistic realizations, including syntactic complexity and lexical richness. Thus, regarding the surface structures in NA&EJs, the current research study showed the main informational results. First, no significance was found in words per abstract, sentences per abstracts, and move length at the level of significance ($\alpha = .05$). However, the mean of sentence length between NA&EJs was statistically significant ($p = 0.005 < 0.05$). The analysis also informed no significant differences in the number of the surface structures employed in abstracts published in NA&EJ ($p = 0.475 > 0.05$) and written in sciences and humanities fields ($p = 0.330 > 0.05$). Second, the *t-Test* reported variation in the independent usage of surface structures in each discipline. For example, in education and electronics, words per abstract ($p = 0.002 < 0.05$; $p = 0.026 < 0.05$, respectively) and sentences per abstract ($p = 0.0004 < 0.05$; $p = 0.002 < 0.05$, respectively) showed statistical significance. Within this comparison, abstracts in education were the only texts that had statistically significant differences in move length ($p = 0.0001 < 0.05$) in NA&EJ.

Third, concerning the sentence structure types, a four-sentence structure was reported in NA&EJs. The four syntactic structures are simple, complex, compound, and compound-

complex. Simple sentences (M=123.50) are the first most frequent, while compound-complex or so-called combining sentences (M=10.50) are the least frequent ones throughout the corpora. Moreover, the frequent occurrence of certain sentence structures varies in abstracts of NA&EJ. Thus, abstracts in North American journals (M=34.59) showed more cases of simple sentences than those of Ecuadorian (M=27.25) ones. Significant variability was reported in the amount of compound-complex ($p = 0.004 < 0.5$), simple ($p = 0.020 < 0.5$), and complex sentences ($p = 0.0005 < 0.5$) but not in compound sentences ($p = 0.092 > 0.5$) between NA&EJs. This research finding is closely connected with those of Cooley and Lewkowicz (2003), who found a similar occurrence in academic texts.

Fourth, abstracts in humanities published in North America tended to have the highest proportion of sentence structures (M=46.6; Sd=29.74) compared to those of Ecuador that had the fewest proportion (M=29.0; Sd=24.56). Abstracts written in humanities and published in NA&EJ reported statistical significance ($p = 0.007 < 0.05$) comparing the no statistical difference in sciences ($p = 0.233 > 0.05$). Significant variation was observed in the use of simple sentences ($p = 0.024 < 0.05$) between humanities and sciences fields. The regularity of sentence structures in each discipline was significantly diverse. Thus, agronomy abstracts in sciences in both NA&EJ (M=21.3; M=18.3) employed more types of sentences than their counterpart disciplines. Simple sentences were the frequent structures used across the four disciplines in North American journals. There was no occurrence of compound-complex sentences in education and sociology fields in Ecuadorian journals.

Regarding syntax complexity in abstracts of NA&EJ, statistical difference was found in complex T-units per T-unit ($p = 0.037$), coordinate phrases per clause ($p = 0.023$), coordinate phrases per T-unit ($p = 0.029$), T-units per sentence ($p = 0.032$), complex nominals per clause ($p = 0.024$), complex nominals per T-unit ($p = 0.020$), and clauses per sentence ($p = 0.045$). North American texts made use of a length of production unit (M=54.400), amount of subordination (M=0.484) and coordination (M=0.404), and degree of sophistication (M=1.753) indices. By contrast, abstracts in Ecuadorian journals employed more overall sentence complexity (M=1.005). There was significant variability in overall sentence complexity ($t = -2.861$, $p = 0.045$), amount of subordination ($t = 4.530$, $p = 0.0003$), and degree of phrasal sophistication ($t = -4.865$, $p = 0.0004$) in NA&EJs. Furthermore, multiple t-Tests reported no significant differences in the dimensions of (a) length of production unit ($t = -1.319$, $p = 0.20$), (b) amount of subordination ($t = -0.249$, $p = 0.80$) and coordination ($t = -0.083$, $p = 0.93$), (c) degree of phrasal sophistication ($t = -0.488$, $p = 0.63$), and (d) overall sentence complexity ($t = -0.773$, $p = 0.46$) in humanities and sciences. Although there was variability in the mean of

syntactic complexity indices between NA&EJs, no statistical significance was reported (p = .805 > .05). The significance and occurrence of these features are indicative of the properties of expository texts, which reflect a variation in the linguistic features and communicative purposes (Martin, 1992).

Finally, considering lexical richness, no significant and statistical differences were shown in the average number of lexical richness indices ($t = 0.059, p = 0.953 > 0.05$) between NA&EJs. However, there were statistical differences in the lexical density (p = .005 < .05) and lexical sophistication (p = .044 < .05), but not in the proportion of lexical diversity (p = .792 > .05) used in the two NA&EJs. Abstracts in North American journals reported to have high mean values of lexical density (M=0.65), which according to Ure (1971) and Halliday (1985), texts with higher density are more easily understood. However, this claim could be quite problematic if we consider that comprehension, among other things, "depends on the syntactic and cohesive properties of the composition" (Laufer and Nation, 1995: 309). It is because the text may "contain many more pronouns and auxiliaries than nouns and lexical verbs" (Johansson, 2008: 61) that could affect the quality and readability of the text. Consequently, lexical items and frequent words make texts more accessible to follow; on the contrary, infrequent words and non-standard forms used in some RAAs make them lexically dense. The figures for lexical sophistication showed that abstracts in Ecuadorian journals used a high number of academic words and specialized terminology to produce those texts.

5.2 Discussion of the results

This phase addresses the subject-matter of how abstracts across the four disciplines varied in rhetorical organization and linguistic realization, considering humanities and sciences fields. It discusses the main research questions related to the rhetorical move structure, on the one hand, and the linguistic realizations of RAAs in NA&EJ, on the other.

5.2.1 Abstracts and their rhetorical move organization

Abstracts as "a stand-alone genre" are the major channel to communicate the essence of the RA to a large audience. In fact, for the communicative purpose and well-elaborated sections, they are a central "part of many scientific articles and guarantee that the results of the scientific work done will get worldwide circulation" (Ventola, 1994: 298). As a result, abstracts become the tool to master and manage the ever-growing information spreading globally in academic settings (Ventola, 1994: 333). Moreover, due to their brevity, abstracts are essential in providing the necessary information for journal editors and potential readers to determine whether the

paper deserves to be read in its entirety (Gillaerts & Van de Velde 2010: 136). Since abstracts are the first section of the article that is completely read, the answers to the research questions about rhetorical organization and surface structure in RAAs of NA&EJ are discussed below.

RQ 1. Does the rhetorical structure of English RAAs published in North American journals vary from those of the Ecuadorian ones? If they have no variation, what is the most frequent structure of the move in NA&EJs across the four disciplines, considering humanities and sciences fields?

Regarding the rhetorical organization, abstracts published in two different contexts of publication, as of North American and Ecuadorian journals, reported the occurrence of a non-hierarchical eight rhetorical move organization with four recurrent moves, such as thematic focus (M=32.00; Sd=5.42), purpose (M=56.50; Sd=1.73), method (M=57.65; Sd=1.89), and results (M=56.50; Sd=2.38). This research finding is in line with those of Tanko (2017), who found similar rhetorical pattern in abstracts written in the literature discipline. These research outcomes suggested that the context of publication and the discipline to which the text is writing determine the preferred rhetoric. Therefore, based on the scarce literature related to this type of research, this non-hierarchical schema, in this study, is considered as a new emergent move structure. Thus, the rhetorical move structure discovered along with the corpora was thematic focus, background, purpose, method, results, conclusions, recommendations, and implication (henceforth, M1-M2-M3-M4-M5-M6-M7-M8, respectively).

Although the occurrence of M2-M7-M8 moves were not highly frequent, here, they were taken as emerging moves. These moves, together with the others, contributed to gaining knowledge on the relevance of the research and allowed for deciding whether or not to read the entire paper. The newly added moves to this non-hierarchical structure are M1-M2, whose function is to outline the context of the article, and M7-M8, which endorse the research with suggested propositions for further analysis. This result is connected with those of Tanko (2017), where these moves were few frequent but occurred in the corpora. When comparing NA&EJs, a four-move pattern (M1-M3-M4-M5) was observed in North American, and a three-move schema (M3-M4-M5) in Ecuadorian journals.

A further analysis reported that the move schema M1-M3-M4-M5 was frequent in humanities in both NA&EJs, while the M1-M3-M4-M5-M6 structure occurred just in sciences in North America. On the contrary, abstracts in sciences and published in Ecuadorian journals hold the structure M3-M4-M5. These research outcomes are in connection with the literature review reporting that the frequent move structure and its occurrence varied depending on social

aspects, for example, disciplinary practices and discourse conventions (e.g., Lorés, 2004; Samraj, 2002; Pho, 2008; Çakir and Fidan, 2015; Hyland, 2000; Suntara and Usaha, 2013; Lau, 2004). The variability in the move frequency across abstracts reports no significant differences in mean of the moves used in humanities ($p = 0.692 > 0.05$) and sciences ($p = .849 > \alpha = .05$) fields. Similarly, when comparing the fields between NA&EJs, the mean of the moves in abstracts of humanities and science are not statistically significant. It is because the *p* value in both cases ($p = .740$; $p = .626$) is greater than the level of significance ($\alpha = .05$). Although the move structures in humanities and sciences seems quite similar, there is greater variability in the move pattern of abstracts in sciences compared to those of humanities.

The differences found in NA&EJs could be the fact that according to Hyland (2009), discursive practices orient and influence the way texts display the structures and conventions of the scientific community for which they are written. Therefore, it is there where meanings are conveyed and gain their communicative force (Hyland, 2009). From this point of view, the current dissertation highlights that variations in NA&EJs are the result of "what writers do in different situations, the influence of proficiency, and cultural background on writing processes" (Hyland, 2009: 155). Connor (2004: 293) supports such a view when stating that in particular types of texts, "the expectations and norms of discourse communities (cultural and disciplinary) shape the situational interpretations and practices". This claims the idea that texts are linked to diverse communities of practice with different lingua-cultural repertoires as well as "rhetorical conventions, discourse expectations of disciplinary communities" and publication settings that determine the distribution of moves (Hyland, 2009: 229).

Considering the rhetorical organization and move frequency per discipline, abstracts of sociology and agronomy in North American journals followed a five-move structure such as M1-M3-M4-M5-M6. Similar tendency was observed in education abstracts in Ecuadorian journals. Agronomy abstracts published in Ecuador and those of electronics in North America hold a four-move structure (M1-M3-M4-M5). Meanwhile, abstracts in sociology and electronics published in Ecuadorian journals and those of education in North American ones employed a three-move structure (M3-M4-M5). Here, background, recommendations, and implications were the least frequent moves throughout the texts. These research findings are in connection with those of Dos Santos (1996), Pho (2008), Behnam and Golpour (2014), and Çakır and Fidan (2015) who documented similar trends across disciplines and languages. Comparing the move patterns found in the present dissertation with previous research cited above, it can be stated that the moves M3-M4-M5 are obligatory in the majority of RAAs across disciplines. The current PhD dissertation, therefore, corroborates with those findings since the

pattern M3-M4-M5 was the most frequent that accompanied the occurrence of the emerging moves discovered in NA&EJs. Within this analysis, it was observed that the move frequency varies from one discipline to another. For instance, results in agronomy in Ecuadorian journals are the first frequent moves, while these moves in electronics are the third frequent.

Table 37 below summarizes the patterns of rhetorical move organization adopted in the four disciplines, considering humanities and sciences in both NA&EJs.

Table 37. Moves patterns across disciplines

HUMANITIES			
Sociology	Sociology	Education	Education
3 Moves	5 Moves	5 Moves	3 Moves
Purpose, Method, Product	Thematic Focus, ***Purpose, Method, Product,*** Conclusions	Thematic Focus, ***Purpose, Method, Product,*** Conclusions	***Purpose, Method, Product***
Ecuador	North America	Ecuador	North America
SCIENCES			
Agronomy	Agronomy	Electronics	Electronics
4 Moves	5 Moves	3 Moves	4 Moves
Thematic Focus, ***Purpose, Method, Product***	Thematic Focus, ***Purpose, Method, Product,*** Conclusion	***Purpose, Method, Product***	Thematic Focus, ***Purpose, Method, Product***
Ecuador	North America	Ecuador	North America

Though there was variability in the rhetorical structure and move occurrence across disciplines, surprisingly, no statistical significance was found. As reported in Chapter IV, the mean of the moves used in each discipline between NA&EJs was higher than the level of significance ($\alpha = .05$). However, further analysis indicated that the move occurrence in education and electronics abstracts are similar while those of sociology and agronomy are different. Greater variability in the move pattern was observed in abstracts of education, sociology, and electronics in Ecuador, and in those of agronomy published in North America. Contrary to expectations, this research did not uncover novel interdisciplinary differences between NA&EJs, but a great variability in the move frequency and the moves employed throughout the abstracts.

Aside from the non-hierarchical emergent move structure discovered in this study, NA&EJs reported semi-linear rhetorical structures employed to present readers the gist of the paper. The first five semi-linear rhetorical structures across disciplines are sequentially

described. The move structure M3-M4-M5-M6 with 28 occurrences, is followed by M3-M4-M5 with 27 incidences, M1-M2-M3-M4-M5 with 22 occurrences, M2-M3-M4-M5 with 13 incidences, and M1-M2-M3-M4-M5-M6 with 12 occurrences. The least frequent semi-linear move patterns are M3-M4-M5-M6-M7, M2-M3-M4, and M1-M2-M3. These research findings are connected with those of Quintanilla (2016), Çakir and Fidan (2015), Martín-Martín (2003), Hyland (2000, 2004), Behnam and Golpour (2014), and Kafes (2012), which reported variation in the construction of academic texts across disciplines, languages, and publishing contexts. The examples from 1 to 4 illustrate the occurrence of semi-linear patterns across disciplines in abstracts of NA&EJ.

Example 1. Education abstract (17) in North American journals:

(**M3**) This article shares findings from a qualitative study of an undergraduate urban education fellowship designed to connect teacher-candidates with activist teacher communities and explore questions of social justice, equity, and multicultural teaching. (**M4**) Fellows attended conferences, professional meetings, and on-campus dialogues over one semester. Interview transcripts and meeting notes were analyzed through the lenses of teacher inquiry and transformative learning theory. (**M5**) Findings reveal how teacher-candidates experienced shifts in their viewpoints through encountering new perspectives, discomfort with returning to their lives with new understandings, and a strong drive to further their learning about urban education. (**M6**) Within the context of a persistent gap between a mostly white, middle-class teaching force and a racially and socioeconomically diverse student population, […].

Example 2. Sociology abstract (10) in Ecuadorian journals:

(**M3**) This research identifies the factors which explain the professor's satisfaction with the labor practices of an Ecuadorian university. (**M4**) The study had used an instrument which was applied to 902 persons. The information was studied using factorial analysis through the method of Multiple Correspondence Analysis. (**M5**) The results generated six factors that explain several concepts of interest for this research; such as: recognition and job autonomy, satisfaction with the facilities to work development, monitoring (control or supervision) of the leader, salary and professional development satisfaction, and the leader's treatment and reaction (management) of problems.

Example 3. Agronomy abstract (12) in North American journals:

(**M1**) Texas ranks first in cotton production in the United States and accounts for approximately 40% of the total production. […]. (**M2**) With peanut being a legume crop, farmers routinely leave residue on the soil surface to improve soil fertility; however, V. dahliae can survive in the crop residue contributing inoculum to the soil. (**M3**) A microplot study was conducted to investigate the impact of peanut residue infested with V. dahliaeon subsequent microsclerotia density in soil and Verticillium wilt development in cotton. (**M4**) The effects of infested peanut residue rate on percent germination of cotton seeds and on wilt incidence were monitored in 2008 and 2009. […]. (**M5**) Results indicate infested peanut residue serve as a source of V. dahliae inoculum and removing infested residue can reduce disease development in subsequent cotton crops.

Example 4. Education abstract (16) in Ecuadorian journals:

(**M2**) In a recent work by Chalak and Kassaian (2010) the motivation and attitudes of university undergraduate students towards learning English as a second language is studied. […]. (**M3**) The present study is based on the one conducted by Chalak and Kassaian (2010) and aims to investigate the motivation of the 45 students in the career of applied linguistics in teaching English […]. (**M4**) For the purpose of this investigation a questionnaire containing items related to five different domains is used: 1) Interest in Foreign Languages, 2) Motivational Intensity, 3) Integrative Orientation, 4) Desire to Learn English, 5) Instrumental Orientation. (**M5**) The results show that all the applied linguistics students are highly motivated, both integrative and instrumentally, since they affirm to want to learn English in order to get a better job and be able to communicate with English language speakers.

Regarding the surface structure of abstracts written in English, difference in sentence length was statistically significant ($p = 0.005 < 0.05$) between NA&EJ. It means that abstracts in NA&EJ implied variability in the length of sentences across disciplines. Yet, education texts

had the abstracts that reported significant differences in move length ($p = 0.0001 < 0.05$) between the two academic discourses. These abstracts also exhibited statistical difference in the words per abstract ($p = 0.002 < 0.05$) and sentences per abstract ($p = 0.0004 < 0.05$). Similar tendency is shown in electronics abstracts at the level of significance ($\alpha = .05$). These results informed variability in the surface structure throughout RAAs across disciplines in NA&EJ.

RQ 2. What are the cohesive means observed in English RAAs which introduce moves and helps to hold moves cohesion in NA&EJs throughout the four disciplines, considering humanities and science fields?

Cohesive devices, so called links, are words or phrases used to connect ideas to each other with different parts of a text. Within the wider list of cohesive devices, the conjunctions or conjuncts were the most common in this research. They were used to join phrases, clauses, or sentences together and made sense of the content displayed in NA&EJs. In this way, conjunctions function as "linguistic devices that create cohesion" (Halliday &Hasan, 1976: 13) by providing a "semantic relation that is explicitly marked" in the text (Sanders & Maat, 2006: 591-592). From this point of view, conjunctions understood as discourse markers allowed for encoding meaning to express relationships between sentences, embodying different functions and semantic relations. Conjunctions, therefore, according to Crystal (2008:73), are a grammatical classification of words whose main function here was to connect the information of content in abstracts of NA&EJ.

Concerning the conjunctions appearing in NA&EJs, the present dissertation identifies the additives, adversatives, causals, and temporals. As stated above, their function was to create semantic relations to connect sentences throughout the RAAs. It was observed that statistically, additives were the most frequent conjunctive devices (32.7%) throughout the English corpora, followed by adversatives (30.7%), causals (18.6%) and temporals (18.0%). Following Halliday and Hasan (1976), the analysis highlighted the role that these conjunctive elements have "to express certain meaning which presuppose the presence of other components in the discourse" (p.226). Thus, in the current dissertation, additives, adversatives, causals, and temporals were used to introduce moves. These conjunctives created semantic relations within the sentences themselves and helped to hold move cohesion. Additives worked as elements that add information to the texts and helps to construct the content. Examples 1 and 2 describe the function of the most common additive (with 51.7%) across disciplines.

Example 1. Education in North America (M5)

> Collective efficacy reveals how well group members relate to one another while working toward common goals. It ***also*** reveals group resilience and the willingness of group members to continue working through difficult situations

Example 2. Sociology in North America (M5)

These tests reveal that changes in social organization are strongly associated with changes in land use independent of measures of population size, affluence, and technology. ***Also***, local birth events shape local land use changes and key proximate determinants of land use change

Adversatives serve to express opposition or contrast between two statements that share semantic relations of succession in time. Examples 3 and 4 define the function of the most common adversative (with 33.9%) throughout abstracts.

Example 3. Agronomy in North America (M5)

When defoliated at the vegetative stage, above-ground biomass was similar among the three species in the field, ***but*** meadow bromegrass produced greater above-ground biomass than smooth bromegrass in the greenhouse.

Example 4. Electronics in North America (M6)

The analysis shows that the transient cooling using high amplitude current pulses is beneficial for short term infrequent hot spots, ***but*** high amplitude current pulse cannot be used for very frequent or long-lasting hot spots.

Causals, meanwhile, allowed for announcing a statement that occurs because of something that has been previously done. That is, they are used to express or indicate a situation or causative event that is responsible for a final result. Examples 5 and 6 outline the function of the most common causal (with 18.2%) throughout abstracts.

Example 5. Education in Ecuador (M3)

On the basis the dissemination of the use of learning styles, several recommendations have been published on the use of certain strategies, which could be used in teaching-learning process without a way of measuring instrument that allows their study. ***Thus***, the objective of the research was to validate an instrument of learning strategies based on theoretical, reflexive, pragmatic and active styles, through criterion and construct validations, as well as its psychometric correction.

Example 6. Electronics in Ecuador (M4)

The fact that the system includes wireless communication allows distancing the operator from the robot arm and ***thus*** can reduce risk when working in addition a large number of wires that may hinder or impede the development of any activity is eliminated.

Temporal cohesive devices characterize the performative sequence of events, that is, signal and draw the relationship between the propositions of the two subsequent sentences. Examples 7 and 8 summarize the function of the most frequent temporal (with 18.2%) in the texts.

Example 7. Sociology in Ecuador (M6)

Finally, we show that the increase in the number of inactive young people is due to a change in the trade-of between studying and being in labor force rather than an increment in need (not in education or employment).

Example 8. Agronomy in Ecuador (M5)

About the richness of uses, six uses were identified in the parish of Limoncocha of the province of Sucumbíos. ***Finally***, the most commonly used species were mint (Mentha sativa), (Ageratum conyzoides), chugri yuyu (Bryophillum pinnatum) and yuyu kiwi (Saccharum officinalis).

The analysis of abstracts in NA&EJ allowed for describing specific instances of cohesive means in the realization of moves. For example, '*also*' worked as an additive cohesive device to present additional information concerning the research findings. In other words, it announces extra information showing afterthoughts. '*Finally*', as a temporal cohesive device,

presents suggestions, based on series of successive events, which may be considered for further analysis and consideration. '*Thus*', meanwhile, as a causal cohesive device, introduces a performative statement, which is the result of previous events, where one is responsible for the connection or relationship between episodes. On the other hand, '*but*' as an adversative cohesive device, contrasts the events that happen successively in time by sharing semantic relations in propositions.

Accordingly, abstracts in this analysis are seen as the product of the linguistic system of the language, which constitute the systematic representation of the composing patterns encapsulated in the content of the text as such. That is, the linguistic realization of NA&EJs, according to Halliday (1985), unfolds a systematic connection between the sociocultural setting and the practical organization of the language. It is because the use of cohesive devises, to some extent, may depend on the authors' preferences or the context in which the text is placed (Hyland, 2000, 2004, 2009), which account for different frequencies of occurrence. This could be the possible reason why some cohesive means commonly occur among abstracts, while others barely appear in both NA&EJ.

The results are not meant to indicate a correlation between the text connectivity and writing quality, in the sense that the corpora analyzed results from abstracts published in different academic settings, different disciplines and scientific discourse communities. Accordingly, the analysis here described the conjunctive categories used in abstracts of NA&EJ, considering their frequent occurrence to communicate the scope of the paper throughout the moves. However, an underlying factor that perhaps explains the variation in the frequent use of conjunctive elements in RAAs could be the nature of those abstracts. Such a nature to be considered is the context of publication, such as North America and Ecuador, as well as different linguistic backgrounds (Connor, 2004). This claim is supported by Kang (2005) and Rahman (2013) who stated that linguistic background may affect the writing style as such. Kang, for instance, highlights that second or foreign language learners could adopt local linguistic strategies to produce texts written in English. Rahman, meanwhile, argues that L2 speakers' knowledge about the genre, discourse practices, and readers' interest in comprehension, all have an effect on the use of cohesive devices.

5.2.2 Abstracts and their linguistic realizations

This sub-section discusses the linguistic realization of abstracts, targeting their syntactic complexity and their lexical richness. In linguistics, realization is a process where some kind of surface representation is derived from the actual use of language in underlying contexts.

5.2.2.1 Syntactic complexity

Concerning the syntactic complexity, the main research questions guiding this analysis are the following:

RQ 3. Are there any significant differences between English RAAs published in North American journals and those published in Ecuadorian ones, considering the types of sentences and average sentence length?

Traditionally, "sentences are built up of a series of constituents (syntactic units), each of which belongs to a specific grammatical category and serves a specific grammatical function" (Radford, 2009: 1). Sentence structure then refers to how all the constituents of a sentence interlock to produce meaning. Thus, sentence structure, in this analysis, was considered as one of the features that determines the complexity of sentences written in English abstracts in NA&EJ. The sentences identified in this research are (a) simple, (b) compound, (c) complex, and (d) compound-complex. Though these types of sentence structure appeared in both NA&EJs, these occurred much more frequently in abstracts published in North American journals. Thus, simple sentences are the first most frequent structure (M=123.50), while compound-complex were the least frequent sentence structure type (M=10.50) in all English abstracts published in NA&EJs. According to the latter results, no compound-complex sentences were found in abstracts of humanities and published in Ecuadorian journals.

Subordinating (complex) sentences, after simple sentences, were found to be the second most frequent constructions in both NA&EJs, these sentence structures reported statistical significance ($p = 0.0005 < 0.5$). Surprisingly, in North American journals, complex sentences frequently occurred across the four disciplines. Education and electronics followed by sociology and agronomy had a considerable number of these types of structures. The variability in the occurrence of sentence structures in NA&EJs is the result of the different discursive practices and writers' English background (Kang, 2005; Rahman, 2013). Moreover, abstracts in sciences are more experimental; they perform many actions and experiments to report the findings. By contrast, humanities texts tend to show the findings through speculative, subjective thinking from a more critical and analytical approach.

As stated above, simple sentences were recurrent in abstracts published in NA&EJ. This type of sentence frequently occurred along with the moves, whose function was to communicate to readers the purpose of the research (see excerpts 1 and 2). Therefore, the occurrence of simple sentences showed statistical differences across the fields of humanities and sciences ($p = .024 < .05$). Additionally, within the analysis, past tense was presented when summarizing the

method and results sections of the RAAs, such as in excerpts 3 and 4. The excerpts below illustrate the function of the simple and past tenses in organizing the communicative purposes of the moves in NA&EJs.

Excerpt 1. Education discipline in North American journals

> (**M3**) We *examine* edTPA (a teacher performance assessment) implementation at one private university during the first year that our state required this exam for initial teaching certification.

Excerpt 2. Electronics discipline in North American journals

> **(M3**) This work *studies* the spontaneous self-assembly of Ge QDs on AlAs, GaAs and AlGaAs by high-temperature in situ annealing using molecular beam epitaxy (MBE).

Excerpt 3. Sociology discipline in Ecuadorian journals

> (**M4**) The model *used* for obtaining the results is the logistic regression, where it is considered that a woman participates in the labor market if it is classified within the economically active population (PEA).

Excerpt 4. Agronomy discipline in Ecuadorian journals

> (**M5**) Results *showed* there were statistical differences between biocontrol treatments and the control. Tomato seedlings with leaves treated *had* bigger averages than those with soil inoculation.

What is surprising and an unanticipated finding in this dissertation is that passive voice was used across NA&EJs (M=99.50). Abstracts in Ecuadorian journals written in the field of humanities and sciences (f = 8.863) made use of this structure more than those of North American journals (f =7.043). Though this structure was not the focus of this dissertation, such construction, according to Biber (1988:104), contributes to characterizing texts as highly informative discourses. In effect, the occurrence of this structure and other linguistic features such as nouns and nominalizations are strong indicators of the presence of expository texts (Biber, 1988). A possible explanation of this unexpected finding could be that passive voice is categorized as one of the common features used in scientific discourse (Halliday & Martin, 1993). The presence of this structure was clearly observed when describing the methodology section of the abstract. Thus, in many cases, it was observed that the agent was denoted or removed thoroughly, "resulting it in a more abstract presentation of information" (Biber, 1988: 228). Such a tendency made the discourse topic of some abstracts in Ecuadorian journals a bit unclear, less direct with wordy sentences, as in the excerpts of the methodology section below.

Education discipline

> Indicators and indices *are established* in order to measure certain psychodynamics presence of oral culture in students. The research *was conducted* with a quantitative-qualitative approach by applying surveys, observation files and depth unstructured interview.

Sociology discipline

> The study had used an instrument which *was applied* to 902 persons. The information *was studied* using factorial analysis through the method of multiple correspondence analysis (MCA).

Agronomy discipline

> Weekly, we determined the growth stage of the plants, at 120 days of planting a cut off of homogeneity, at 20 cm above the ground and determined the biomass yield of the grass structure and chemical composition *was determined*.

Electronics discipline

> Data *were complemented* whit a Geographical Information System (GIS) and an objective function *was defined* in order to determine the Jatropha oil production- associated profit.

RQ 4. Are there any significant syntactic complexity differences between English RAAs published in North American journals and those published in Ecuadorian ones, considering the humanities and science fields? If so, what are those differences?

Syntactic complexity, "the range of forms that surface in language production and the degree of sophistication of such forms" (Ortega, 2003: 492), is a novel dimension to gauge L2 writing quality. Syntactic structure anchored as the degree of elaboration at the sentence, clause and phrase level, turns out to be, in many ways, an indicator of students' language proficiency and L2 writing ability. Linguistic features, such as grammatical structure (or complexity) that characterize these differences have been identified and discussed along with this section.

The cross-disciplinary analysis (see Table 27) showed that out of the 14 syntactic complexity indices measured in NA&EJs, abstracts in Ecuador had 12 lower mean values than those of North America. That is, just the T-units per sentence (T/S) and clauses per sentence (C/S) had higher mean values (M= 813, SD= 0.030; M= 1.005, SD= 0.035). Independent sample t-tests suggested that 7 out of 14 syntactic complexity indices reported significant statistical differences in both NA&EJs. Results also indicated significant variability in coordinating structure, phrasal sophistication, and sentence complexity between NA&EJs.

Although differences between NA&EJs are not found to be significant, results from the growing body of literature confirm the syntactic shift-pattern of Wolfe-Quintero et al. (1998). These authors stated that there is a decrease in coordinating sentences at higher levels of competence in favor of subordinating structures, and, similarly, a decrease in subordination in favor of phrase complexity at higher levels. This recognized that the syntactic structure varies in the production of L2 writing (Ortega, 2003), both academic and argumentative, and "by structural differences between target languages" (Kuiken & Vedder, 2019: 196). Thus, the genre-related differences in this dissertation are that coordination and subordination, and the degree of sophistication vary significantly and occurred in abstracts published in North American journals. Moreover, abstracts in North America made use of much more production unit length (M= 54.400), while those of Ecuador employed more overall sentence complexity (M= 1.005).

These research findings are connected with those of earlier studies in Ai and Lu (2013) who documented variation in the writing complexity between English texts published in different editorial contexts. That final claim is quite valid and influential if we consider that Ecuadorians' L1 background and writing conventions differ from those of North Americans. Although the current dissertation does not investigate the writing quality of the RAAs, this study, like the previous ones done by Perez (2020), Villavicencio et al. (2018), Tamayo and Cajas (2020), and León and Rosero (2018), observed sentence structure difficulties in texts of Ecuadorian journals. This unexpected finding supports the claim that writing compositions in English vary "among writers from different social and L1 backgrounds", and with a culture-specific educational training (Grabe & Kaplan, 1996: 239). Furthermore, contrastive studies (e.g., Lu & Ai, 2015; Ai & Lu, 2013; Ortega, 2003; Norris & Ortega, 2009; Kuiken &Vedder ,2019) have documented that, in many ways, L1 linguistic background and L2 knowledge determine how writers organize information in the target language.

Although the texts under study are the kind of written discourse to be read and interpreted, there is still a potential contrast between them (Neumann 2013). Thus, abstracts in humanities denoted significance in coordinated phrases per clause (t= -11.291, p = .007) and coordinate phrases per T-unit (t= -8.570, p = 0.013). By contrast, sciences had significance in complex T-units per unit (t= -7.831, p = .015), complex nominals per clause (t= -7.696, p = .016), and complex nominals per T-unit (t= 6.989, p = .019). There was no statistical difference at the level of significance between humanities and sciences ($p = .668 > \alpha = .05$) in NA&EJs. It is because the mean of syntactic complexity indices in abstracts of humanities between NA&EJ was not different ($p = .977 > \alpha = .05$). Similarly, it was found no significance in the mean of syntactic complexity in abstracts of sciences published in NA&EJ ($p = .210 > \alpha = .05$).

Regarding the syntactic complexity across disciplines, no statistical differences were displayed between disciplines and between the four syntactic complexity dimensions. Yet, out of 14 syntactic complexity indices in each discipline, sociology and electronics abstracts in Ecuadorian journals showed higher mean values, sociology in the length of production unit and electronics in sentence complexity. Although there was statistical difference between the mean in education, sociology, electronics, and agronomy abstracts between NA&EJs, no statistical significance was found. Therefore, the syntactic complexity indices in sociology (p = .738), education ($p = .777$), electronics ($p = .820$), and agronomy ($p = .783$) were higher than the level of significance ($\alpha = .05$). Nonetheless, ANOVA: single factor informed statistical and significant differences in the length of production units ($p = 0.0004$) across disciplines.

On the other hand, abstracts published in Ecuadorian journals suggested a greater occurrence of left embeddedness words (M= 5.63) throughout the English sub-corpora (see examples below [Tovar, 2022: 8]). It could be, perhaps, that non-proficient Ecuadorian L2 authors tend to use complex constructions compared to advanced L2 writers, similar to native ones, who communicate ideas explicitly with ease (Lambert and Kormos, 2014). In addition, abstracts in sciences used more left embeddedness words than humanities. Electronics abstracts in both North American (M=6.59) and Ecuadorian (M=5.87) journals had the highest incidence of left embeddedness words. Although there were statistical differences in the mean of left embeddedness words across disciplines, no significance was found between NA&EJs ($t = 0.5392$, $p = 0.618$). Left embeddedness words as the component of text difficulty varies across disciplines. Thereby, it was observed that such structural tendency "contributes to the meaning of the text and indirectly impacts reading comprehension" (Frantz et al. 2015: 388). Therefore, it is advised to write complex ideas in a tangible and simple way by cutting off redundant and superfluous information so that the text flows from one idea to another. The examples below (1-4) are associated with those of Tovar (2022: 8):

1. The decrease of interfacial electrical conductance ***triggers*** steady-state temperatures over copper and silicate melting points and, in consequence leads to temperature high enough to explain the physical degradation. (Electronics, *6 words before the main verb*)

2. One of the main objectives of traffic studies ***is to determine*** the existing vehicular traffic on a particular stretch of highway under study. (Electronics, *8 words before the main verb*)

3. The design procedure of the fuzzy controller as declaring variables, the fuzzification, the inference mechanism, the knowledge base and defuzzification of the system ***are discussed*** in this work. (Electronics, *22 words before the main verb*)

4. The temperature response of the model to independent variation of electrical resistivity of studied materials, and interfacial electrical and thermal conductance between the copper contact and its diffusion barrier ***were obtained***. (Electronics, 29 *words before the main verb*)

Most of the RAAs are made up of 5 to 9 sentences in a paragraph, and sentence length ranged from 23 to 38 tokens (words). Hence, paragraph length in humanities contained between 93–375 tokens, whilst in sciences, it was between 92 and 340 (Text-related words to Tovar, 2022). Half of the RAAs published in NA&EJ comprise an average length of 168 and 169 tokens —*words per abstract used to construct English texts*. Abstracts published in Ecuador compared to those of North America exceed the mean sentence length. Thus, sociology in Ecuadorian journals had the highest frequent length of sentences (M= 25.291) than North American ones (M= 19.410). Then, in accordance with Bulté and Housen (2012), we can state that the surface structure together with linguistic features are one of the constituents that help the (re)production and comprehension of texts. It is because surpassing the limited number of words made texts more complex and cognitively difficult to process (Biber and Conrad, 2009).

In this way, Wallwork (2013: vii) highlights that "sentences longer than 30 words are generally hard to assimilate without having to be read twice".

Concerning the use of complex nominals in NA&EJs, it reported to be statistically different (t = -7.234, p = 0.001). Nonetheless, no significance was found in sciences (t = 0.477, p = 0.32 > .05) and humanities (t = 0.828, p = 0.21 > .05) between NA&EJs. In addition, no statistical difference was detected in the amount of complex nominal types employed in humanities and sciences fields (t = 0.875, p = 0.19 > .05). Within this analysis, *nominal that-clause as a subject complement* tended to be the first frequent nominal type (f = 142; M = 42.6), while *nominal that-clause as the subject* (f = 2; M = 0.7) is the least frequent nominal in NA&EJs. North American journals seemed to have greater usage of nominal types (M = 5.02; SD = 0.21) compared to those of Ecuadorian ones (M = 4.4; SD = 0.13). Nonetheless, when comparing education (p = 0.38), sociology (p = 0.25), electronics (p = 0.35), and agronomy abstracts (p = 0.34) between NA&EJ, no statistical differences were reported. Examples below illustrate the presence of nominal types in NA&EJs across disciplines, as the following:

(a) Nominal that-clause as the subject

1. The **fact** *that the system includes* wireless communication allows distancing the operator from the robot arm and thus can reduce risk when working in addition a large number of wires… [Electronics: Ecuadorian journals]

2. The **fact** *that the government incorporated forward-looking structural measures* shows his interest in increasing the circular flow of incomes. [Sociology: North American journals]

(b) Nominal that-clause as a subject complement

1. Analyses of variance results provide **evidence** *that preservice teachers were* significantly less biased and prejudiced and more likely to endorse adaptive instructional practices… [Education: North American journals]

2. This research makes a comparative analysis between the University of Guayaquil and the ESPOL about the **impact** *that teaching the entrepreneurship subject has* over the students' purpose of generating projects. [Education: Ecuadorian journals]

(c) Nominal to-infinitive clause

1. Multiracials have the **flexibility** *to opt out of multiracial identity, to shift identities depending on context*, and are characterized by in-group diversity. [Sociology: North American journals]

2. (…), it has provided them the **possibility** *to acquire better food quality, to generate self-employmen*t and also job creation for third parties. [Sociology: Ecuadorian journals]

(d) Nominal of-prepositional as a subject complement

1. This paper analyzes the **potential** *of using multiple TECs for hot spot cooling* to obtain favorable thermal profile on chip in an energy efficient way. [Electronics: North American journals]

2. This article refers to the different **ways** *of generating electricity in distributed generation systems*. [Electronics: Ecuadorian journals]

(e) Nominal of-preposition-plus-wh clause

1. (…) rather than a result of a good **understanding** *of how the impact of varying temperatures and flow* rates at rack level influences each component in the chain from the chip level to the cooling tower. [Electronics: North American journals]

2. We discuss our findings in the **context** *of how colleges might better use* their existing initiatives to improve student outcomes, and in light of recent findings from a randomized controlled trial study. [Education: North American journals]

Following Jiang and Hyland (2016: 518), meta-discursive nouns were analyzed based on their lexical-grammatical context, rather than categorizing them only by semantic means. Thus, the realization of nouns allows to have clear interpretations of the different stances and decision-making that authors adopt in their texts to present the information. For example, in the present dissertation, the noun 'fact' in sentences (1-2) is a nominal complement in the form of a that-clause functioning as the subject. It presents a description of what happened and its contingencies. In sentence (3), the noun 'evidence' indicates when a belief or proposition is valid based on the available information. The noun 'impact' in (4) describes the possible effect of actions or processes that encounters different objects in different scenarios. The nouns 'way' (8) and 'context' (10) are related to the manner or to the circumstances of actions that generate results. 'Flexibility' and 'possibility' in examples (5-6) use the proposition as an alternative to point out uncertain outcomes, whereas 'potential' in (7) denotes the process of validating knowledge. Finally, 'understanding' in (9) concerns the mental reasoning based on the prior information and the subsequent complement or additional information reinforcing the argument.

Taken together, these results suggest linguistic and pedagogical implications for further analysis. For example, Ecuadorian writers in particular should reflect on stylistic features such as word choice, sentence complexity, text cohesion, sentence length, and left embeddedness when writing English abstracts.

5.2.2.2 Lexical richness

The following main research questions address data analysis about the lexical richness of research article abstracts in NA&EJ journals across the four disciplines:

RQ 5. Do English RAAs, published in North American journals, show higher or lower lexical richness than those published in Ecuadorian ones? If so, in what lexical indices do they differ from their Ecuadorian counterparts?

Research article abstracts in NA&EJ indicated variation in the lexical knowledge used throughout the texts. Infrequent words (unusual words, off-word lists) and specialized

terminology frequently occurred in abstracts of Ecuadorian journals. There was variability in the mean of LD (p = .005) and LS (p = .044) of abstracts, but no statistical difference between NA&EJ (t = 0.059, p = 0.953 > 0.05). The Pearson coefficient of correlation indicated a moderate positive correlation between the lexical density (0.6508; 0.4392) in abstracts of NA&EJ, but it is not statistically significant. It also informed a high positive correlation between the lexical sophistication (0.9242; 0.0758) in NA&EJs; such a correlation is statistically significant (with a 10% of significance). This implies that at the time that the lexical sophistication in Ecuadorian texts increases, the lexical sophistication in North America ones increases, too. Lexical variation showed a moderate negative correlation in NA&EJs (-0.6391; 0.3609), which is not significant (p = .792).

These research outcomes are in connection with those of Lee (2018), Douglas (2019), Ha (2019), and Tank (2017). These authors suggested that texts, depending on the disciplinary field, differ somehow in lexical sophistication, lexical density and word frequency. Read (2000) supports such claims by stating that differences in lexical richness are the result of learners' writing skills and language proficiency. Although writing skills and language proficiency are not the matter of this dissertation, according to Douglas (2012: 20), they highly correlate with "vocabulary use that supports academic achievement". Then, it makes sense to find diversification in the lexical richness of abstracts in NA&EJ across disciplines.

Another significant finding is that statistical differences related to the lexical density were found in humanities and sciences fields at the $p = .05$ level. However, abstracts of sciences in NA&EJ (M=0.63; M=0.58) seemed to employ more content words than those of humanities. Abstracts in sciences reported to have a greater use of lexical sophistication than those of humanities. Person coefficient of correlation suggested that there is a high positive correlation in the lexical density (0.7481; 0.2519) and lexical sophistication (0.7789; 0.2211) between abstracts of humanities and sciences, but it is not statistically significant. On the other hand, LV reported a moderate negative correlation, which is not significant in humanities and sciences. This is because variation always depends on the length in words of the text so that "a longer text usually gives a lower LV value than a shorter text" (Johansson, 2008: 63). These results, like those of Djiwandono (2016), suggested that depending on the field, LV and LS vary in the sense that lexical diversity and sophistication are unstable in experienced and novice writers.

Laufer and Nation (1995: 310) support such a claim by stating that LV is "unstable for short texts and can be affected by differences in text length". Therefore, a high measure in LS and LV simply describe how authors can express themselves with their own vocabulary by introducing non-standard and different words. This is because LV measures the "percentage

between the different words in the text and the total number of running words", and not the types of words learners know (Laufer and Nation, 1995: 310). From the stated above, variation of lexical richness followed Laufer and Nation's (1995) and Vermeer's (2000) ideas and preconceptions. Thus, results in this dissertation accounted for describing "different words, not the quality of the different words used" in abstracts of NA&EJ across disciplines (Laufer and Nation, 1995: 310). Further analysis revealed that although the mean of LV in North America for each discipline is heterogeneous, and likely similar to Ecuador, it showed higher variability in sociology and fewer in education. LD is more homogeneous; nonetheless, it had similar tendency of variability as reported in Ecuadorian texts. LS, meanwhile, is very heterogeneous with greater variability in electronics and less in sociology.

Factors influencing such variation in the lexical richness of NA&EJs could be the authors' linguistic background (Djiwandono, 2016), socio-cultural scenarios (Connor, 2004), and language competence (Ha, 2009; Read, 2000). For example, Read (2000: 5) pointed out that lexical richness somewhat responds to "authors' language ability such as *language knowledge* (grammar, vocabulary) and *strategic competence* (organizational knowledge to communicate effectively)". Though this dissertation did not examine the authors' writing knowledge, variability in lexical richness in Douglas (2012) could be the result of writing ability highly correlating with lexical knowledge in predicting sophistication. The research outcomes lead to the idea that vocabulary richness in academic discourses correlates with vocabulary size and word frequency level, which varies across disciplines, L2 proficiency, social context, as well as authors' writing experiences (Laufer and Nation, 2001).

Relying on the use of content and function words in NA&EJs, no significant difference was reported. However, abstracts in Ecuadorian journals tend to use more content words (M=334), whereas those of North American ones produced less frequent occurrences of function words (f = 30%). Nouns and prepositions are the first most frequent content and function words, respectively. Though adverbs are the least frequent content word, the mean value in North America (M=66.5) and Ecuador (M=48.5) is statistically different ($p = .003 < .05$). Comparing the use of 1000 and 2000 words in NA&EJs, no difference was found at the $p = .05$ level in the occurrence of the Top 1000 words in the two academic discourses. Nonetheless, statistical significance was reported in the use of adverbs ($p = 0.02 < 0.05$) within the 2000 words between NA&EJs. Laufer and Nation (1995) showed that high- and low-frequency words and sophisticated words vary from text to text. This differs from the findings presented here in the sense that there were no differences in the 1000-word usage between NA&EJs.

In this dissertation, LD acknowledges that "a text using a higher proportion of content words than function words" is more informative (Johansson, 2008: 65). However, LD differed on the "syntactic structure and cohesive properties of the written compositions" (Laufer and Nation, 1995: 309). Thus, fewer function words in a text may advise the presence of more subordinate clauses (Laufer and Nation, 1995). Such claim supports the occurrence of complex sentences reported and discussed in chapter 4 about syntactic complexity of abstracts in NA&EJ. In this analysis, function words were used to put those content words together and connect the information. In contrast, content words provided readers with essential information to interpret the meaning of the sentence. Thus, according to Halliday and Hasan (1976: 10), lexical knowledge functions as the core of meaning construction in discourse comprehension. Therefore, the sets of words used in RAAs were essential for meaning-making.

In the current dissertation, LV and LS were found to be the most influential factor in describing differences in the vocabulary richness in abstracts of NA&EJ across disciplinary fields. This result mirrors that of Hyland (2004: 63), who claims that such variability is the result of "field's organizational structures, beliefs and authorized institutional practices" that academic discourses attempt to follow. Based on the results explained in this section, it could be implied that abstracts in NA&EJ employed a rich lexical background and familiarity with the genre RAAs. It is possible, therefore, that the slight variation of lexical richness in NA&EJs may be conditioned by familiarity with the topic, text length, writing conventions, discursive practices, communicative purposes, and sentence-construction skills: The latter, sentence-construction skills, especially for those authors from non-English backgrounds. As a sort of remark of the lexical richness in NA&EJs, it can be argued that English abstracts are far from being homogeneous. This is also because abstracts must meet the journals' guideline standards for publication.

5.2.3 Functional analysis of the genre RA abstract for pedagogical applications

This section discusses possible avenues of developing pedagogical application and suggestions when writing abstracts of scientific papers. Based on research into the rhetorical and linguistic structures of abstracts in NA&EJ and the publication contexts in which they occur, research questions number 6 is responded to.

RQ 6. How could the linguistic and rhetorical move analysis be considered in the process of teaching English for Specific Purposes? If so, what possible linguistic and didactic suggestions could be proposed for writing abstracts of scientific papers?

The emphasis on analyzing the functions and structural organizations of the genre RAAs, in particular, has reported preferred ways of communicating the gist of the complete paper, on the basis of rhetorical functions and communicative purposes. Hyland (2002: 189), among others, highlights the relevance of genre analysis insofar as it raises insights into "tendencies in scientific publication, revealing how writers use textual and rhetorical features" to conform to disciplinary conventions. Over the last few decades, research on this and other types of genres have significant impact on the contemporary teaching practices and in the learning of languages for specific purposes in specialized disciplinary fields (Bhatia, 1997).

Considering the communicative intentions as the representative function of this type of genre, Bhatia (1997: 313) points out that the genre analysis "offers a dynamic explanation of the way expert users of language manipulate generic conventions to achieve a variety of complex goals associated with their specialty by focusing attention on the variation in language use by members of different disciplinary cultures". This quotation concentrates on the idea that, to some extent, institutionalized and professional contexts as discourse communities determine or influence writers' linguistic behavior in terms of rhetorical preferences. Following this argument, the SFL theory acknowledges the relevance of teaching the functional and contextual roles of composition patterns in discourses. This, in Halliday's (2004) words, provides learners with pedagogical applications by teaching not only discourse conventions but discussing the structures and features of texts such as those of RAAs.

In the current dissertation, it was found that most RAAs followed journals' structural procedures to build up the information content. As claimed throughout this dissertation, abstracts are independent and self-contained texts typical of a scientific domain and respond to conventions and rhetorical traditions specific to each area of knowledge. The main characteristic of structured abstracts is that they present a list of statements corresponding to the main RA sections, such as objectives, design, techniques, methods, major results and conclusions. The length of these abstracts usually lies within 150 and 200 words, and they act as "summaries and substitutes" for complete documents. A note of caution is due here since both the rhetorical organization of abstracts and their discursive characteristics cannot be understood without describing the functions that are associated with this genre.

Generally, the academic importance of abstracts can be listed as follows: First, RAAs allow text indexing in different databases, both locally (university electronic repositories, for instance) and internationally (for example, Linguistics and Language Behavior Abstracts or Web of Science). Second, they accompany the reader with the basic content of the full text such as objectives, methodology, results, and so on. Finally, they have a clear persuasive function,

on the basis that their rhetorical and linguistic structures persuade the reader to undertake the full reading of the text. Jiang and Hyland (2016: 1) highlight that these promotional aspects have made "RAAs become an important genre in all knowledge fields, playing a crucial role in persuading readers, and reviewers, to take the time to go further into the paper itself". Therefore, abstracts of scientific papers are renowned and compulsorily written in academic and professional contexts.

The structure of RAAs has been extensively addressed in the literature. In this research, following the studies of Hyland (2000), Swales (1990) and Bhatia (1993), rhetorical move is seen as a functional academic writing with explicit communicative goals. Thus, as it was said in previous chapters, an abstract must follow the macrostructure of the RA so that the structure and content of both texts must be very similar. Therefore, proposing writing suggestions to produce academic texts such as abstracts is suitable since these academic texts, like the complete RA, include functions and structures: for example, introduction, objectives, methodology, results-discussions, and conclusion. Hence, in this type of written genre, the term rhetorical move refers to grouping communicative events that perform the same rhetorical function in the original text. Abstracts therefore must follow the rhetorical structure suggested by Hyland (2000). Such a structure includes an introduction (I), methodology (M), purpose (P), results (R), and conclusions (C).

In the English for Specific Purposes (ESP) research tradition, understanding the social contexts surrounding texts helps writers recognize appropriate rhetorical choices to use for specific academic purposes. In this way, Swales (1990) and Bhatia (1993) argue that pedagogical applications help learners with no English-speaking background to master the functions and linguistic conventions of texts. Therefore, introducing the rhetorical structures and grammatical features of those texts, writers with no English background find useful formats and templates to write RAAs. Martín-Martín (2003) supports the claim that writing suggestions allow authors to control and organize the preferred rhetoric and stylistic structures of the scholarly texts employed in English-speaking discourse communities.

The current dissertation in NA&EJs from specialized disciplines, as mentioned in the previous chapter, evidenced the presence of an emerging structure with eight moves occurring throughout the corpora. The results of the rhetorical move analysis and linguistic realizations of NA&EJs raised the possibility to be considered in the process of teaching ESP. In fact, as stated above, results provided insightful paths to suggest writing procedures when producing academic texts in English. The steps in section 5.2.4 describe the processes carried out on the

NA&EJs corpus that help to answer RQ 6 discussed previously and subsequently to document the linguistic and pedagogical implications in section 5.2.5.

5.2.4 Overview of the analysis

Halliday's (1985:11) exegesis technique, "a kind of running commentary on the product that reveals something of its dynamic unfolding as a process" was used for the analysis. Therefore, specific linguistic and rhetorical structures presented in the sections below were considered for writing abstracts in academic contexts. Following Hyland (2000), Swales (1990, 2004), and Halliday (1976), it describes the cohesive means used to sustain cohesion and coherence in abstracts of NA&EJ as well as their relation to moves organization. The analysis focused on the communicative function of emerging eight-move structure and linking words used to go from one move to the other.

This stage projected the criteria of adequacy and sufficiency of the data. Sufficiency here referred to the amount of data collected. Thus, sufficiency was achieved when the data reached a state of 'information saturation' and the new information brought nothing new. Adequacy, by contrast, denoted the selection of information concerning the theoretical needs of the research and the emerging moves. At this point of the analysis, based on the adequacy and sufficiency, data indicated the same repeated move structure in NA&EJs. Consequently, the corpus was plenty reliable and enough to test and contrast the theory under study. In this stage, the 'theoretical sampling' allowed generating conclusive reasonings and assumptions (Glaser and Strauss, 1967).

When selecting data, the following questions arose: (a) What kind of information do we need, and (b) How do we intend to gather it? To answer question (a), move organization, connectors, and verbs were chosen. Connectors because they helped to keep sections coordinated and that, together with verbs, allowed going from one step to another when identifying moves. For question (b), according to Halliday and Hasan (1976), a set of connectors (linking words) and verbs which directly had incidence on moves passage or transition was listed. Tables 38 (below) containing the classification of cohesive means and recurrent verbs systematize the data collected during the analysis of education abstracts. For further analysis sees Appendix 9, which contains discourse markers and verbs in the four disciplines under study.

Table 38. Recurrent cohesive means and verbs in education discipline

COHESIVE MEANS			
Additives	**Adversatives**	**Causal**	**Temporal**
Also	But	So	Then
In addition	Yet	Thus	First...Next
Furthermore Besides	However	Hence	Afterwards
Similarly	Instead	Therefore	After that
Likewise	On the other hand	Consequently	Subsequently
By contrast	Nevertheless	Accordingly	Previously
For instance	At any rate	Because of this	Before that
In contrast	As a matter of fact	For this reason	Later
Moreover	Rather	It follows	Presently
Additionally	On the contrary	On this basis	Meanwhile
In order to	At least	As a result	Finally
	I mean	In consequence	Eventually
	To tell you the truth	For	First…Then
	Actually	Then	First... Second
	In fact	Under those circumstances	In conclusion
	Although	Otherwise	To conclude with
	Though	With regard to this	In short
	Overall	In effect	More recently
	Then	Generally	At the end
	Even though	For this	As a final result
	Contrary to	Unfortunately	Another
	Whereby	On the basis	To this end
	Indeed	In this context	

MOVES	**RECURRENT VERBS**
Thematic focus	Is - Present - Increase - Was - Show
Background	Is - Count - Consist of - Has
Purpose	Present - Was - Generate - Identify - Make – Examine - Is aimed - Seek - Purpose
Method	Was - Use – Is - Analyzed - Were - Correspond - Carry out - Participate - Has Proceeded - Selected - Obtained
Result	Show - Establish - Highlight - Carry out - Find - Resulted
Conclusion	Suggest - Are - Determine - Highlighted – Is- Be -Allow -Was – Set out
Recommendation	Be - Suggest - May bring
Implication	Are - Discussed – Considered

5.2.4.1 Analytical design stage

The analytical stage allowed for having a more global and holistic view of the research findings. As stated above, the eight-move structure found in the current dissertation represents new textual possibilities of organizing scientific information in abstracts of NA&EJ. Thus, the presence of eight moves suggested a new rhetorical structure or rhetorical variety (even if it is not recurrent) possible in all areas analyzed and potentially emerging in RAAs. Because the new structure found here offers an alternative structure for organizing abstracts of scientific papers, a recurrent question arises. What is the functionality of these findings? Thus, the analysis concentrated on organizing the cohesive means to, along with the eight-move structure, build up writing suggestions for RAAs.

Among the data reduction tasks, the most representative here was the categorization of

consistent and recurrent vocabulary in NA&EJs. Thus, the purpose, method, and product moves were the central and fundamental structures that concentrate the communicative intention. Recommendation and implication move emerged as an intent to suggest applications and the impact for further research. Such a communicative purpose resulted in a new way of perceiving research in comparison to most studies (Can et al., 2016; Dos Santos, 1996; Huang, 2018; Hyland, 2000; Kafes, 2015; Lee, 2017; Lorés, 2004, 2014, 2016; Loutayf, 2017; Martín-Martín, 2005; Pho, 2008; Quintanilla, 2018; Ren & Li, 2011; Shinta et al., 2018; Suntara & Usaha, 2013; Swales, 1990; Tseng, 2011) that generally attempt to introduce finite and completed research products with no further suggestions.

5.2.4.2 Moves and cohesive means relevant evidence

A low percentage of occurrence in the rest of the rhetorical moves did not make the abstracts lose their purpose and informative scientific value. By contrast, a synergy among cohesive means used to go through one move to another and the semantic relation between the moves and the verbs employed in each move section was evident. Such a synergy provided lexical and grammatical information of NA&EJs. Therefore, the selection of the most relevant cohesive means follows two essential steps. First, all the linking words and verbs used in RAAs were counted and the repeated ones removed. Later, using Halliday's (1976) classification, cohesive means were ordered and selected to build up a database for further suggestions. Data in appendix 10 contain the common linguistic features found in the categorization of moves, which together with those of Morley (2014) allow for generating phraseological patterns to write RA abstracts.

5.2.4.3 Cohesion in abstracts of NA&EJ.

Cohesion creates a linguistic wrap regardless of the length of text and does not lose its essence as an understandable whole (Halliday & Hasan, 1976). Thus, NA&EJs as a communication system of the language fulfilled three linguistic functions to communicate meanings; these are ideational, interpersonal and textual. Out of the three functions, this dissertation emphasized the analysis of the textual category by reviewing its communicative function. It documented the frequent cohesive elements that occur in each move section of the RAAs, considering the situational context. Abstracts here represented the scaffolding or semantic fabric associated with the textual structuring of the scientific texts.

Cohesion in NA&EJs works as intra-textual linkers to establish semantic relationships. It established connections of the linguistic elements for texts construction. Thus, based on

Halliday and Hasan (1976), grammatical cohesion —*textual construction of correlations of meaning*— in NA&EJs was investigated. Out of the five types of grammatical cohesion, conjunctives were analyzed. It emphasized the "function they have of relating to each other linguistic elements that occur in succession but are not related by other, structural means" (Halliday & Hasan, 1976: 227). The excerpts below (**a – h**) illustrate the functions of the standard conjunctive devices appearing in particular moves of NA&EJs, as of additives, adversatives, causals and temporals.

a. The frequency-dependent real (ε′ε′) and imaginary (ε″ε″) parts of the complex permittivity (ε∗ε∗) and the alternating current (AC) conductivity are presented. ***Also***, the effect of temperature and mass concentrations on the dielectric properties of BN-EG nanofluids are demonstrated. (**M5**: Additives in electronics -North American journals)

b. Greater absorption was noted 6 h after treatment (HAT) in GS compared with GR plants, ***but*** no differences were observed at 12 to 72 HAT. Oversprayed plants absorbed 33 and 61% more 14C by 48 and 72 HAT, respectively, than plants not oversprayed. (**M5**: Adversatives in agronomy - North American journals)

c. These spending patterns split producers into up-market and down-market segments and stoke winner-take-all dynamics among up-market producers. Economic dependence on high-income consumers could ***thus*** lead to a new form of industrial segmentation, based on vertical differentiation by product quality or status. (**M2**: Causals in sociology -North American journals)

d. ***Finally***, this study suggests important implications for program administration and policy and for methodologies used in teacher education research. (**M7**: Temporals in education -North American journals)

e. […]; and the third is an endophyte fungus taxonomically considered as a sterile mycelium. ***Also***, a referential witness was used (inoculum of Colletotrichum) and an absolute witness. (**M4**: Additives in agronomy -Ecuadorian journals)

f. Indeed in [1], this physical degradation was interpreted as a main consequence of Joule effect, ***however*** their employed model reached too low temperatures to explain the observed physical degradation. (**M2**: adversatives in electronics -Ecuadorian journals)

g. The 18-week study involved twenty-eight participants in two classes. Each class received a specific CF, ***thus***, the group 1 metalinguistic and the group 2 reformulation. (**M5**: Causals in education -Ecuadorian journals)

h. For this purpose, optimal scaling is performed qualitative variables considered, ***then*** the factors are discovered home and migrant housing and ultimately explores the groups found. (M5: Temporals in sociology -Ecuadorian journals)

The four conjunctive categories of cohesion described above function as the lexico-grammatical choices to connect ideas. Accordingly, the text-forming function creates a semantic unity between the sentences to express text cohesion. Although there were common cohesive means shared among abstracts, other cohesive means barely appeared in NA&EJs. So, some cohesive means appear in North American but not in Ecuadorian journals and vice versa (c.f. appendix 11). Here, following Halliday (1985), the linguistic realization of RAAs unfolds a systematic relationship between the social setting and the functional organization of the language. Accordingly, abstracts by their nature were considered instances of product

construction and processes of continuous semantic relations between sentences along the move. Abstracts, then, as the product of the linguistic system of the language, constitute the systematic representation of the composing patterns encapsulated in the content of the text. This analysis allowed to elaborate and describe the following linguistic and pedagogical implications, which can be taken as clues for writing abstracts of scientific papers.

IMPLICATIONS AND LIMITATIONS OF THE DISSERTATION

5.2.5 Linguistic and pedagogical implications to write RAAs

A clear connection between moves and cohesive devices served for suggesting paths for language teaching, especially for developing skills in the written production of scientific texts, here abstracts (cf. Swales & Feack, 2012). Currently, the quality of writing plays a fundamental role in scientific communities, particularly in the dissemination of knowledge generated by researchers worldwide. Consequently, Hyland (2000) states that in academic situations such as lectures and publishing in specialized journals, the information submitted in the abstract showed how accurate the entire article is. From this point of view, abstracts as an independent genre fulfill the function of persuasion and set out the central aspects of the research presented as a whole. According to Hyland (2007: 157), the genre approach is advantageous for *teaching-learning cycles* in writing; it allows teachers to focus on what to teach and how to develop an understanding of the contextual situated purposes of texts.

In this way, the teaching of academic writing to L2 learners (and those who study English as a foreign language –*EFL*) should be done through "the explicit teaching of language functions and structures of typical academic texts" (Martín-Martín, 2013: 348), with major emphasis on the analysis of the structural organization of RAAs. This is because "by developing a theory of language and a pedagogy based on research into the linguistic structures of texts and the social contexts in which they occur" (Martín-Martín, 2013: 330), learners become aware of the rhetoric employed in RAAs. With the knowledge and awareness of language structures and rhetorical variation, student writers feel more confident of making the appropriate rhetorical and lexico-grammatical decisions to write RAAs for an international audience. Therefore, language instructors and material developers should take a leading role in finding strategies to help L2 and EF learners to foster learning processes and writing skills.

From the stated above, insightful recommendations (see sections below) and phraseological patterns (Appendix 10) are suggested for novice writers to organize the writing of RAAs. Such suggestions resulted in the main composing and rhetorical patterns found in abstracts of NA&EJ, and those advised by Dr. John Morley in 2014, extracted from scientific

articles of high-quality journals at The University of Manchester. The suggestions proposed here are staged as a complementary contribution to the processes of written mini texts in academic contexts. This dissertation ponders that (as Hyland, 2000, had already declared) producing abstracts in academic contexts could have an impact on the development of writing of short texts and, later, longer texts.

General recommendations for writing abstracts

A student should consider several aspects when writing and further synthesizing an abstract; thus, it is necessary to follow the recommendations below:

1. Avoid including quotations or bibliography: As a general rule, an abstract does not include a bibliography unless it is especially important.
2. Evade using technical language: unlike the areas, the abstract should reach the highest possible audience, including the non-expert audience. A medium-technical, clear, and concise language is more suitable to reach attention and help in abstract content comprehension.
3. Concepts must not be defined.
4. Include only the information the study contains: The abstract should be as representative as possible of what someone may find in the extensive document.
5. Present only the relevant information: This helps readers in finding the foci of the study.
6. The title must not be repeated in the text: The abstract must be independent and "exclusive", so the title should not be included.
7. Avoid the first person of the singular and use the plural just when necessary: the exclusive use of the third person is recommended.
8. Eliminate acronyms or abbreviations: It is not recommended to endorse or stylize abbreviations. However, it may sometimes be necessary since the abbreviated concept is a keyword (e.g., AIDS) or by-word limit subject requested for abstracts.
9. Evade including generic names or trademark names.
10. Present exact results: give precise and concise objective results.
11. Write a complete, concise, clear, and cohesive abstract.
12. Use the active voice.
13. Exclude figures, graphs, tables, diagrams, or equations.
14. The abstract must work independently; that is, it must be able to sustain itself without the support of the full text.

15. Maintain the structure of the complete study: it is advisable to follow the same sequence of sections used in the original research article.

16. Length of 250 words: The following suggestions are the appropriate extension if there are no additional recommendations from the journal:

For a short document or article: between 150 and 200 words

For a long document or article: approximately 250 words.

For thesis or books: 300 words preferably.

5.3 Practical recommendations to write an abstract

Based on the analysis of this research corpus, the following recommendations may also be important to write a scientific abstract. First, write the abstract in a single paragraph, impersonal mode, and in past tense, except for the conclusions that carry the verbs in present. Second, avoid sentences that are too long to present the main topics. Third, check that the language translated version contains the same information presented in the original language of the abstract. Finally, remember that the abstract is not the background nor a historical review of the topic nor a comment on the article. Rather, it is a mini-text that provides readers with brief, precise and well-structured information about the research study.

5.3.1 Linguistic didactic suggestions

A didactic design can potentially help a specialist on a topic to think about and develop a training activity based on any specific demand. In the case of this research, the author as an instructor of subjects related to the production of scientific texts has perceived a functional purpose of this research work. It can respond to the need of providing students with textual production tools that help to improve scientific writing processes. Although these suggestions are made for a particular group of students (Ecuadorians), they can be adapted to all programs that require it to support the writing of abstracts of research articles.

Consequently, these suggestions can be useful to develop syllabuses that contemplate the development of writing as a process and not as a product (c.f. section I in Hyland, 2009: 8-42). This is because rhetorical move analysis (based on Swales' and Hyland's theories) is precisely dealing with the process of textual production. From this perspective, considering the linguistic function of Hyland's studies, this research goes beyond the simple description of the texts to propose practical suggestions. In this way, controlled abstracts writing, as stated above, can lead to supporting teachers and students, and thus opens a path from linguistic descriptions to applied linguistics, in such a way that it develops writing processes.

5.3.2 **The abstract as an academic text**

The phrase academic text suggests considering that the writing must subscribe to a particular genre. In the case of this research, we refer to those texts whose function is to synthesize an investigation through the drafting of the abstract. To write this type of genre, it is suggested to order the most significant information in the text and leave out irrelevant details. During this discursive activity, the writer must retrieve the main ideas of the study and present the synthesized and hierarchically organized contents, following the structure of the RAAs offered by the journals.

The task of appropriately building up an abstract is an operation that is practiced through the selection and organization of information. Therefore, it is advisable to resort to the proposed and preconfigured macrostructures to produce such texts. Summarizing promotes the understanding of the basic text. It helps to fix the primordial content of the writing. It also clarifies in an integrated form the most relevant ideas and expressions. Additionally, it encourages the development of the reader's processing operations (analysis, synthesis, inferences, and paraphrase) and positively favors to the personal reconstruction of knowledge.

The importance of writing abstracts as condensed models of research articles is unquestionable because they are usually included within the article itself, after the title. Therefore, they are an essential part of research article publishing protocols. The functional role of abstracts is to tell readers about the article content. Thus, potential readers can get a general idea of its content and decide if they are interested in reading the entire document. Formally, they are the type of informative summaries that incorporate the most outstanding contributions of the article because they include the research topic, the methodology, and, above all, the results obtained from the data.

5.3.2.1 Conceptual framework: suggestions

Writing is defined as a self-controlled, attentive, and aware use of language to generate "texts-as-autonomous objects" (Hyland, 2002: 6), concentrating on the final product, with emphasis placed on sentence level and language form, for instance, grammar, syntax and mechanism. From this view, most experts see writing as a discourse-based approach (Nunan, 1999: 288), controlled-composition approach (Silvia, 1990: 12), controlled-to-free approach (Raimes, 1983: 95), or/and traditional-text-based approach (Tribble, 1996: 37). The primary emphasis is on the "quality of language production" rather than on the length of the text (Ortega,2015: 5); it involves a process, a semiotic function, and the mastery of the written code. That conscious use of the written code implies the following: (1) The awareness of the grammar of the

language, (2) the knowledge of the mechanisms of text cohesion and coherence according to the type of text, and (3) the stylistic and pragmatic knowledge of the language. Even the rhetorical factors such as the conventions on the spatial arrangement of the text (margins, white space, letter sizes, etc.) are necessary along with writing procedures.

Writing is understood as a dynamic and contemporary skill that performs multiple intrapersonal and interpersonal functions and that is related to all areas of knowledge and all disciplines of study. It contains social, cognitive, and discursive dimensions; it is also a powerful instrument of learning which equips us with communication and thinking skills. Writing, therefore, makes our learning and thinking visible and permanent. Considering the significance of writing in daily life, it is impossible to avoid its academic domain. Writing is a social and communicative skill that should be instructed to and well-developed by students in educational contexts (Ortega, 2015: 83). Therefore, guiding writing processes can fulfill the lack of spaces and strategies or recommendations to perform texts writing processes within educational institutions.

Through academic activities, the student writer is positioned into a discursive community where s/he will be able to practice and reproduce the preferred rhetoric and style as such. Thus, the student writer must learn how to organize written codes to develop scientific discourses locally or internationally. Writing and the rhetorical writing procedures are conceived as exercise-medium practices. It is because during the writing procedures, students become familiar with the standard requirements of discursive communities. These requirements involve researching, reading, preparing, and reconstructing the text. Such writing procedures consist mainly to promote students' access to the academic writing standards and rhetorical organization of abstracts. Therefore, based on the current research findings, the textual organization of abstracts is presented below, which adheres to the standards of journals and publishing organizations.

5.3.3 **Planning an abstract: General aspects**

Normally, scientific abstracts are written for the following reasons: (a) Submitting an article to a scientific journal, (b) Writing a proposal to make a book or chapter, (c) Completing a thesis, and (d) Requesting to present research at a conference. An abstract must follow a rigorous order of the work structure. Thus, if the paper is structured with an *introduction, materials, methodology, discussion, and conclusions*, the abstract must also conform to the parallel order of the article. By following the text closely in each part, potential readers should be able to understand the text by interpreting the questions that follow. Why was the study done? What

and how was it done? What was found? What do these findings mean, and What impact do they have? (Swales & Feak, 2009; Swales, 2004).

In this dissertation, the author proposes to write abstracts by following the eight-move structure found during the corpus analysis because they give an account of the complete content of the articles they represent. So, after the analysis between these pages, to teach how to produce such academic texts, it is recommended to consider the suggestions that are offered to achieve a standard abstract. Such suggestions are the guidelines to produce acceptable abstracts for any type of congresses, journals, or a thesis or book presentation. These structuring suggestions adhere to the eight-move rhetorical schema discovered in the corpus of NA&EJs, as the following:

Moves 1, 2 and 3: Thematic focus, background, purpose (30% of the abstract)

This section should include the central topic of the research and the reason for such investigation. In this section the following questions need to be responded to: What is the importance of research? Why would a reader be interested in reading the full work? The background of the work should be elaborated on to answer the questions, What has been done so far? What has not been done? The objectives or purpose that is the problem that the work aims to solve this work should address the questions, what is intended to be achieved with this research? What is the main argument/hypothesis? Moreover, a general reference to the conceptual framework where the work and theories in use are circumscribed. See example below:

> **(M1)** Mathematics educators <u>agree that</u> elementary teachers <u>should</u> possess confidence and competence in teaching mathematics. Many prospective elementary teachers (particularly women) pursue careers in elementary teaching despite personal repeated experiences of mathematics anxiety. **(M2)** <u>Previous studies of</u> mathematics anxiety have tended to focus on physical sensations that occur during test-taking situations. **(M3)** <u>This study analyzes</u> how three women prospective elementary teachers described, explained, and related their experiences of mathematics anxiety while learning mathematics as K-12 students and while learning to teach mathematics. (Education abstract in NAJ)

Move 4: Methodology (40% of the abstract)

The methodological section should be the central and most important part of the abstract because it determines the value of the research while contrasting it against other research studies. So, the methodology section must include the following aspects:

Design: What kind of study is it: qualitative, analytical, descriptive, exploratory, correlational? And, why it is relevant: What variables will be studied? How were the subjects distributed? What groups were selected?

Sample or corpus: What was the size of the sample or population? And when informants are incorporated, the following questions must be answered: How many participants were considered? Where did they come from? How were they accessed? How were they divided? What treatment did each group receive?

Materials: What material was used to achieve the objectives of the research? What instruments were used? Which methods were used? What software was used?

Procedure: What was done to obtain these results? How were the instruments used in this process? What were the steps that were sequentially followed? See examples below:

> **(M4)** In this study, hall bars were fabricated on epitaxial graphene formed on 4H-SiC 0001 under various growth environments. Subsequently, they were analyzed via electrical characterization, atomic force microscopy (AFM), Raman mapping, and transmission electron microscopy (TEM) with emphasis on the C-face. (Electronics abstract in NAJ)

> **(M4)** To test this prediction data from, two groups of elementary preservice teachers (PSTs) were compared: one group that attended a typical mathematics-methods course and one that attended a course integrating analysis skills for learning from teaching. Data consist of PSTs' comments on video clips of mathematics instruction administered before and after course completion. (Education abstract in NAJ)

Moves 5 and 6: Results and conclusions (20% of the abstract)

The sections of the results and conclusions should be concrete and precise, and should include answers to the following questions: What results were obtained through the procedure and methodology applied? What trends were found? Are they significant? Were there any changes? To what extent? What were the objectives of the research? What can be said about the hypotheses? What is the significance of the research? What was the main result? What were the unexpected results? Why are these results useful? Can these results be generalized? What do these findings bring to the understanding of the phenomenon under study? Why would it be important to continue moving forward in this field? See example below:

> **(M5)** Results of this study indicate that the application of a fungicide had no effect on any of the variables tested with grain sorghum hybrid responses noted. DKS 53-67 produced higher yield, greater test weight, higher percent protein, and N than DKS 54-00. **(M6)** The article concludes that the application of a fungicide when little or no disease is present does not promote overall plant health or increase yield. (Agronomy abstract in NAJ)

Moves 7 and 8: Recommendation and implication (10%)

Finally, the recommendations and implications sections are essentially valuable because they show a synopsis of the study and open the way to new and forthcoming research. Therefore, this section should include the following:

Limitations: What have been the weaknesses of this research?

Recommendations: What changes should be implemented concerning the results of the research findings? What should be studied in the future?

Practical implications: What functional impact will this research have? How will it improve the process or phenomenon studied?

Social implications (where it is relevant): What is the impact of this research on society? What factors will improve? To what extent will the quality of life improve?

Originality: What new features have been incorporated into this research? How is it different from the rest of the research designed to date? What is its differential value?

Writing as a process is a conceptual perspective used in teaching writing; it was introduced by Flower and Hayes in 1996. Although it is a successful writing procedure, it has not been applied to the production of abstracts. Thus, it is interesting to propose guideline suggestions to practice the written production process in stages such as planning, writing, evaluating, and, finally, re-elaborating the written product. This perspective leads to thinking about the writing process with an awareness of the type of texts and their characteristics, by considering the purposes and functions of the written text. An example of such procedures can be also observed in Rios (2004) for other kinds of academic texts. Accordingly, this research proposes to undertake the drafting steps as writing moments. See example below:

> **(M7)** <u>The results of the study suggest</u> that devices optimized for particular steady-state operating conditions can then be dynamically simulated in a transient operating model. **(M8)** <u>The significance of this research is that</u> the transient model can simulate a variety of operating conditions including automotive and truck drive cycles so further research is needed to verify such operating condition. (Electronics abstract in NAJ)

5.3.4 Writing moments

First moment: Production

At this first moment, students must read the rhetorical moves schema provided by the teacher. Later, they must read several scientific articles and internalize if the abstracts express the central idea that they want to communicate to the reader. During this reading process, students must be aware of the rhetorical moves of the texts. Therefore, in each article, they should review whether the introduction presents the problem's interest and a description of the scientific environment. They must search for what is done and what is not about the research topic; they also must review whether the objectives are raised. Students should also check whether the articles have drafted the method section accurately; this can give an idea about the viability of the research.

Finally, they must identify the most significant results and verify if the main conclusions follow and fulfill the objectives. In other words, students must be sure whether the results and conclusion sections link the objectives and results. Students must, subsequently, compare the data obtained by the abstracts and that provided in the different sections of the scientific research articles. Once the students have developed abstract writing awareness, it is time to

write the first draft of their own abstract. The students should write without worrying too much about the formal details or the text extension.

Second moment: Review

After the first version, students must proceed to the second moment: review the written abstract. The second moment allows for checking that the abstract accomplishes the recommendations given and follows the proposed structure. The instructor must analyze them one by one, rectify what is wrong, and count the number of words to avoid going beyond the allowed extension limits.

Abstracts must be concise and clear, and each part must contain the necessary information. This can be achieved by suppressing the redundant, wordy and complex phrases and expressions that can be conveyed concisely while using fewer words. This will help students in proposing and forming accurate texts considering text typologies, norms and writing conventions. They can take advantage of this phase to detect some abstract failures. It is reached by comparing the written abstract with the content of the article the abstract represents. This comparison leads to seeing the relevant elements of each part so that reading the abstract shows the entire content of the research article in a synthetic way.

Third moment: Evaluation

At the third moment, each complete abstract is read in class, preferably in an audible voice, making only the necessary pauses indicated by the punctuation marks. And, if the student manages to reach the end without problems, and everything "sounds" well for sure, the abstract is well written. On the contrary, if the student fails, it is necessary to find out what is missing, either in the wording or in its contents, and, therefore, it will be necessary to repair it.

The less experienced writers might feel that these moments are time-consuming, but after the written work is done, once following these steps, the activity is understandable, easy, and the student can do everything automatically, almost as a routine. Finally, it can be concluded that an abstract drafted with clarity, order, method, and scientific rigor practically confirms the quality of the article which will be, in most cases, approved by journals' editors, publishers, and readers. By contrast, deficiencies in written production will surely lead to an unfavorable opinion. We can then say that the wider readership of a scientific paper is subject to the abstract's accuracy.

5.3.4.1 A constructivist approach to teaching

Seeing abstracts as a process of textual production, the didactic method adjustable to this type

of text is constructivism. This didactic method allows the student writers to take advantages of their own abilities to build up new knowledge. So, using guideline suggestions that integrate common rhetorical and linguistic structures, learners will be able to guide the writing processes of abstracts. In other words, the model is proposed to develop autonomous learning. The interest of the guideline suggestions is more centered in the process than in the product; the product must be a successful consequence of the correct writing process. With this in mind, moves, functions, and linguistic features discussed in Table 12 chapter III are considered when producing the sections of RAAs.

It is important to emphasize that an abstract's structure requires organization; it arises from the planning and writing process. The basic rhetorical moves correspond to purpose, methodology, and results. These sections contain the center of research development and define the theoretical and investigative scopes that lead to the questions, research objectives, and, consequently, underpin the discussion. Previous moves deliver support elements for text, such as references to other studies and authority texts (background). Regarding the remaining moves, we can say that conclusions tend to exemplify and highlight the progress made. The recommendation and implication sections complement the results, linking them to other research and the proposed hypothesis by measuring their practical applications and often social avenues and impact.

One of the fundamental tools in the field of genre analysis is the notion of rhetorical moves proposed by Swales (1990, 2004). This type of study has had a decisive effect on the study of ESP closely linked to the teaching of academic writing in English (Hyland, 2014a; Swales &Feak, 2009). In this sense, the value of the theoretical and methodological framework proposed by Swales (1990, 2004) is that it has from its origin a didactic inspiration in the applied linguistics arena. A primary general aspect of rhetorical moves studies is that they mostly focus on a specific section, such as introduction, or an embedded genre, such as abstract. It is imperative to consider that the original model by Swales (1990) was created to explain only the introduction structure. Despite this, his methodological and theoretical framework has already been extended to describe other specific sections and the overall research article structure. In the present thesis dissertation, the author chose to analyze the abstract as an embedded genre and because it is predominantly analyzed in linguistic research around the world. It is an important contribution to research in Ecuador because no study has been found concerning this subject in this country.

In the field of linguistics, there is an extreme terminological variety of the categorization of rhetorical moves. This is due to the expansion and advancement of the original model by

Swales (1990). The model has descriptive value, but it is known that it is a prototypical rhetoric organization that does not give precise guidelines regarding disciplinary variation. The results of the current research reached the same point because, even if the author found new moves, disciplinary fields seem not to interfere in the occurrence of moves.

Swales' model (1990) implies that rhetorical structures are reached following a set of stages (steps). Researchers do not raise doubts about this aspect and approve that the moves are built out of them. However, how the steps go into moves is not evident because the incidence of a series of steps (and the achievement of a move) is not systematic in any discipline, nor are the traits that identify the boundary markers systematic. Swales (2004) discusses this theme in a brief section called "The status of move reconsidered". Following the author's criterion, a semantic comprehension of the former functional ideas of moves to define moves' boundaries seems to be more necessary than establishing grammatical means. In this way, Swales states that:

> […] although the constitution of moves has sometimes been aligned with a grammatical unit such as a sentence, utterance, or paragraph [...], it is better seen as flexible in terms of its linguistic realization. At one extreme, it can be realized by a clause: at the other by several sentences. It is a functional, not a formal, unit. (Swales, 2004: 228-229)

Moves are prototypical schemas fused to organize texts and fulfill a particular communicative purpose. In this regard, we can say, theoretically at least, that moves perform a communicative function. Such a communicative function together with linguistic signals help to define the move and establish the move boundaries. In the production stage, linguistics signals or phraseological expressions help to organize the sections of the abstract objectively and moves give clear information of the abstract's content. Moves, in general terms, standardize and synthesize the information that must be included in the abstract.

5.3.4.2 Teaching techniques to develop abstracts' writing skills

The technique proposed here is called *guided writing*. It allows for writing ideas and thoughts without worrying too much about grammar, spelling, and other properties of language at the beginning. The key feature of this technique is that the instructor must correct few errors. The students guide themselves by following a rhetorical structure or template so that they can produce their abstracts autonomously. At this stage, the purpose of this type of writing is centered on the process, not on the product. The best manner to learn is through practice, not under the use of any theory, so-called the network of concepts. Here, the students self-evaluate their text and rewrite what is necessary until the abstracts complete the characteristics of the

followed structure. That is why writing must be seen first as a process-oriented approach and then as a final product-oriented approach of such process.

Writing as a process consists of a series of steps that is characterized by pre-writing, writing the first draft, reviewing, writing a second draft and correcting errors to achieve the final product. An instructor must use multiple classes to adequately perform this activity. At this writing stage, it is recommended that students analyze several abstracts; this is because while reading the abstracts, they can observe the functions and structures to compare with the template. This step allows the learners to be aware of the rhetorical organization of abstracts. Writing begins with the error-free draft performance. Once the draft is complete, students can make written comments, discuss them with the teacher, or share them with a classmate for constructive feedback.

Finally, students will rewrite their drafts considering the ideas and suggestions received in the previous step. Therefore, teachers should encourage activities in which students can analyze and produce abstracts at the same time. Within this process, students should identify their errors so that they can correct theirs and those of their peers. This chore makes them more responsible for their own learning. That is, through guiding themselves and guiding others, they can identify the difficulties, solve their doubts, and receive adequate instruction and support. If the students, along with the other fundamental skills master the writing conventions of English, they will be more effective during the textual production of academic texts.

5.3.4.3 Writing stages to produce RAAs

This guideline suggests instructors prepare 'workshops' to develop the skills needed for writing abstracts. They must allow the student writers to exercise the writing skill individually. This practice leads to strengthening communication skills, following a structural model in writing abstracts of scientific texts. This process should be mediated and teacher-oriented, bearing in mind the following steps:

Pre-Writing Stage: At this stage, the student must collect the set of data necessary to produce the abstract, such as selecting one or more research articles from different areas of knowledge.

Planning Stage: First, the student writer follows a rhetorical move structure to review several abstracts from different disciplines. Here, the sections of the abstracts should be identified. Second, the students must write an abstract, following the rhetorical model. Within the planning stage, brainstorming can be used to organize the information content of the abstract; thus, the ideas relevant to the text should be included. Subsequently, they organize the

ideas in a hierarchical form to select the information that builds up each move or section of the abstract.

Writing Stage: At this stage, using the rhetorical move model, the learner can develop the written code considering the five aspects: Adequacy, the informational elements that must compose each move; Coherence, the relevant and essential information for each move; Cohesion, connection of the phrases that make up the text; Grammar, spelling rules, morphosyntactic and lexical choices; and, arrangement in space, how the abstract should be presented. In this phase, the students require constant mediation of the teacher and collaboration of peers through the reviews and suggestions for improvement. Students must be guided to draft at least one first written product to be evaluated and then clean-up to make it the final product. Drafts are necessary so that the final product is a well-crafted text.

Rewriting Stage: Once the drafts have been reviewed and the writings corrected, the students must proceed to rewrite what has already been built by debugging the text. The written code of adequacy, consistency, cohesion, grammar, and layout should be carefully reviewed both in the content and structure of the abstract. At this stage, instructor and peers assume the role of editors of style and structure with critical thinking to suggest remedies to the text. A properly written text must meet characteristics such as precision, clarity, naturalness, ownership, and objectivity; the latter is fundamental for academic texts. Once the main problems in the composition of a text are identified, students must review words that are useful in scientific and technical language. Finally, the student writer must avoid using either neologisms or foreign words or traces from the original text.

Post-writing Stage: In this last stage, the text can be appreciated as a final product. The student writers are encouraged towards reading the texts and commenting on them. Here, the student reader evaluates the text constructively by providing ideas and comments while the instructor revises it academically in terms of content and structure. This collaborative work pays special attention to the process of generating ideas, impressions and controversies on the composition of the text as a final product. This process gives language social status and helps students acquire and develop constant interaction with others, as well as encourages self-regulation and decision-making. Thus, the final product is meaningful because students value the process.

Based on Flower and Hayes (1996), analyzing the communicative situation through the generation and organization of ideas, student writers strategically build their linguistic knowledge to review and evaluate the text. Within this phase, the students simultaneously practice reading and acquire academic vocabulary according to their interest and study pace to

comment on the texts. To put it in another way, in the post-writing stage, the students can judge the text as a product by reading, processing, and interpreting. During this phase, it is also important to check cohesive information that could help readers to move from one sentence to another. Appendices 7-8 present a simplified list of connectors and verbs that could be used to write abstracts of scientific papers.

5.3.4.4 Linguistic-didactic considerations

5.3.5 Didactic value of the research

The construction of knowledge is not a mechanical factor. It is achieved by accumulating information, and it is possible by activating organized mental structures that allow for understanding facts, actions, and events. Learning to write is a complex task and, to internalize that type of learning, it is required to perform meaningful activities. Through these activities, students see the real usefulness of what they write and the purposes they pursue when writing. Consequently, academic writing instructions are suggested as didactic sequences related to the writing tasks. The writing suggestions lead to empowering students to develop strategic and autonomous learning.

A writing model focused on rhetorical moves does not conceive writing only as an instrument of communication but as the means of interpreting ideas by organizing and reorganizing knowledge. In addition, strategic peer-correction work involves influencing or controlling each other's behavior, building socio-cultural identities, and perceiving phenomena in different ways. The writing suggestions are based on the transformation of knowledge from a personal experience that comes to regulate and self-regulate knowledge. These aspects are essential at the higher education level where critical dialogue should be promoted. Consequently, the student that is taught in cognitive writing spaces is an analytical person capable of problematizing knowledge and not an automaton who repeats information. The writing instructions guarantee the processing of information as the product of a complex process. It implies developing in students the ability to recognize the communicative situation, thinking, documentation, critical analysis, and contrast, among other procedures.

When students manage to undermine grammar conventions, they do not necessarily know how to write. The writing act involves understanding, regulating, and exercising control over the mental processes; that is, skills that are activated during the writing process. Through a textual production model, students learn how to build knowledge discursively. Therefore, writing should be considered as a mechanism of building new knowledge based on the construction of meaning. Writing helps to solve complex problems and, thus, it is necessary to

make scholars aware of the mental operations that the writer performs to achieve a text that corresponds to a particular communicative situation. Writing as a regulatory means of learning and promoting interaction between participants should be considered when planning programs and teaching activities for the development of writing skills. These activities must be done in a collaborative environment, as students require peer interaction to achieve meaningful learning.

Writing activities must be attached to the discipline to which the students belong. This allows students to handle topics of interest and makes the writing practice real and not prefabricated. Such activities should promote the production of abstracts by following the stages of pre-writing, planning, writing, rewriting, and post-writing.

5.3.6 **Linguistic value of the research**

The linguistic source of this eight-move structure is based on systemic functional linguistics (SFL). These current leading suggestions to write abstracts in English are didactic tips, which by their definition and functionality are coalesced into knowledge practices of writing production. It means that the specific use of the language depends on the discursive roles of the participants, the conventions that delimit discursive action, and the communicative purposes to perform a communicative act (Halliday & Martin, 1993). From this point of view, teaching scientific writing must have communicative purposes. It must be related to the standards of the scientific community surrounding the disciplinary context. Accordingly, students will write consistent texts that fulfill the needs of their communicative purposes and the scientific community standards.

This idea puts emphasis on the functional role of language in the organization of an academic text, such as the abstract, to express meanings using the appropriate rhetorical structures. Thus, the writing of the genre abstract makes use of the lexical-grammatical, textual, and contextual dimensions to achieve a text that fulfills its corresponding communicative functions. This allows the characterization of texts and detects their schematic structures, functionalities, and linguistic realizations (Halliday and Martin, 1993). Yet, students are not expected to become experts in scientific writing, but rather users that can understand the writing standards and conditions to write academically.

As stated above, the linguistic basis of these ideas is functional systemic linguistics. This view is a way to expand the functionality of the move model proposed by Hyland (2000, 2004). Currently, Hyland's move model has been expanded and applied to different disciplines following patterns and textual conventions stipulated by a discursive community. Here, it is not a question of memorizing fixed structures or schemes, but about understanding the purpose of

the text to achieve coherent texts based on patterns of rhetorical moves. That is, students write texts not mechanically but following textual structures. Although texts share common rhetorical structures, abstracts have contextual aspects delimited by the discursive norms of a scientific community. So, this genre is not fixed but compelling and variable; they transform over time according to the needs of the context and the means of interaction.

From the stated above, advances in scientific research studies in the field of academic writing address the importance of this genre (e.g., Hyland, 2000; Swales & Feak, 2009; Lorés, 2004). Those studies made it possible to affirm that the conventional aspects of textual structures can be taught by designing strategies to model the processes involved in written production. The approaches that are based on the development of skills seem necessary, but in no way are they enough to work out on this competence. Therefore, it is relevant to guide and control the students' progress and performance. So, instructors should emphasize feedback to strengthen writing procedures. Such writing procedures should emphasize in the textual qualities such as of coherence, cohesion, language conventions, and the domain structure of the corresponding academic genre.

5.3.6.1 Final remarks when teaching writing

The first activity that can be done in academic writing classes is to get the student to examine the general organization of the genre RAAs. Therefore, it is necessary to show the student several texts of the research field (abstracts, complete RA, or sections of the RA, for example). This sample of the academic genre in English will help the learners become familiar with that field, and they will be able to recognize the rhetorical structure that characterizes RAAs. Such activities can even lead to proven analytical activities of this genre. In other words, the students could compare scholarly texts in their L1 and the English language and, thus, could contrast the concurrent and different points. In this way, the students will be able to distinguish the rhetorical and linguistic patterns adopted in both academic discourses. Another important activity (when working with rhetorical moves) is the analysis of the L2 language. That is to say, the appropriate lexicon and syntax, for instance, the use of connectors for each move or the use of more recurrent verbs in each move to express the corresponding content.

Research article abstracts perform a function that should be identified by both the writer and the reader. Therefore, students must be helped to discover that this text meets social goals: its main objective is to inform about the process and result from theoretical or empirical research. Although the informative function is present, the RAAs play a management role; it acts as a report in miniature to sell the paper. Thus, academic literacy and systematic teaching

of explicit functions and language structures of this type of genre are the most promising way to achieve competence in academic writing skills. That is why it is essential to promote linguistic research oriented to the description of common grounds and differences among this type of academic texts. This helps students to understand and be aware of the rhetorical practices and language structures that experienced writers use to respond to international English-speaking disciplinary conventions. Therefore, the central idea is to develop rhetorical awareness of the general structure of exemplary RAAs so that learners experience the presence of multicultural difference in the organization of this genre. Such rhetorical awareness provides learners with the needed linguistic and discursive knowledge to organize the information. In general, L2 or EFL learners will be able to account for what is written, the intention they pursue, and the effect the texts can have on the reader-evaluator according to the communicative standards.

A rhetorical and language structure analysis, according to Martín-Martín (2013: 335), allows for addressing:

> […] the identification of the purpose of each of the macrostructural units of a RA (- and RA abstracts) should lead to the teaching of the functional categories (moves) which relate both to the writer's purpose and to the content that the writer wishes to communicate.

This stage, thus, can be achieved from two perspectives: First, by focusing on describing the organization of the genre RAAs, putting emphasis on their textual characteristics. That is, identifying and describing the lexical and grammatical qualities, discursive and pragmatic elements that the texts have and, subsequently, teaching them intentionally. Second, by placing users in the social context from which the texts arise so that each participant learns the use through direct contact with the rhetorical situations it responds to. The writing suggestions are based on the idea that genres can be learned through social processes and the collaboration of academic community members. This latter position came from the idea that the text has a meaning potential (Halliday & Martin, 1993). The purpose of the texts is understood as mastering and understanding the multiple intentions of its users.

In this way, the communicative purpose of the text as a meaning potential, according to Bhatia (1993: 21), is "inevitably reflected in the interpretative cognitive structuring of the genre". From this idea, writing is closely associated with the communicative intent and exemplary patterns of a discursive community organization. Therefore, the properties of the structural organization of texts should be considered cognitive because they reflect the strategies employed by members of a discursive community to achieve a specific communicative purpose. Thus, the cognitive structure in a genre is the "interactive activity

which employs accepted resources for the purpose of sharing meanings", used by professional discourse communities (Hyland, 2002: 30). That is why it makes sense to propose cognitive learning strategies for writing.

From the perspective of ESP, interest in a genre arises from its applicability as a means for teaching and analyzing the writing of the language for non-native English speakers in mainly educational and specialized fields. (Swales, 1981, 1990, 2004; Bhatia, 1993, 2002 2004). In fact, Bathia (1993) suggests that the cognitive level of genre construction involves the significant strategic qualities of the social practices, contrary to the Swales' model (1990), which focuses on linguistic and sociological factors. Despite this criticism, Bathia (1993) developed the analysis proposed by Swales (1990) but broadened its gaze towards the cognitive aspects of rhetorical moves. In the linguistic dimension, genre is conceived as varieties of a language that materialize in a set of linguistic-textual traits that coexist systematically through the textual surface.

The identification and analysis of textual elements and rhetorical moves, as Hyland (2005, 2009) had previously stated, contribute to the teaching of academic writing. In our case, rhetorical moves provide writers with language, content, and contextual elements to learn writing. According to Hyland (2009: 7), this genre analysis offers multiple advantages when researching and teaching writing in academic contexts. Both writers and readers gain knowledge of the type of text and its structure. Consequently, teachers can better advise their students in the writing process while students become aware of the conventions and composing patterns used in academic texts. To put it in another way, writing should implement different classroom activities focused on the genre studies and the corresponding rhetorical moves. These types of procedures in Martín-Martín's (2013: 346) words, "contribute to acknowledge a functional understanding of writing contexts, and the notion that language is socially situated and employed to achieve personal and institutional purposes". The students, then, do something specific and practice conventions to write in English, which in turn makes the process more rewarding and ultimately produces coherent written compositions.

5.3.7 **Limitations of the corpus design in NA&EJs.**

Regarding journal selection, this thesis dissertation took abstracts from online national and international journals that published research articles in the disciplines mentioned during the research. Possible constraints to building up the corpus applied for the current study were to determine a necessary restrictive criterion. These constrains are connected to the difficulties of corpus design in the sense that every corpus has limitations due to the accessibility, time, and

finance (Biber et al. 1998). Therefore, despite those limitations, the corpus selection presented in the analysis of RAAs was appropriate and useful to examine the rhetorical organization and a variety of linguistic elements. However, the corpus here does not aim to be a representative of the entire four disciplines, yet it was adequate to representing language features and composing structures of abstracts published in NA&EJ and in the chosen disciplines to analyze differences or regularities.

In this way, following Biber and Gray (2016), the current study explored if "the language of science research writing is quite different from the language of humanities prose" (p.7) and whether these compositions can "employ complex and elaborated grammar; exhibit an explicit maximum meaning and be conservative and resistant to linguistic change" (p.7). Therefore, the corpus-based approach allowed the researcher to examine the sampling corpus of NA&EJs and describe the typical grammatical structures and the rhetorical organization used in these academic texts. Although abstracts did not show any significant incidence of the rhetorical move organization, they were representative samples to describe how these texts in the humanities and sciences fields present the gist of the paper.

The emerging moves found here give a complete idea of the content and organization of the RAAs. But we must be aware that while it could help the successful textual production of abstracts, it is incomplete. Thus, the generalizability of the research findings might be undergone to certain conditions: for example, limited sample size, the chosen disciplines, discourse community practices and publishing contexts. However, the results provide useful insights to describe the recurrent rhetoric, lexical and syntactic structure used in abstracts of NA&EJ, which reflects the actual use of language. Further research should investigate whether the prior L2 knowledge and L2 proficiency influence the type of rhetorical, lexical and syntactic structures employed in journal RAAs across disciplines.

CONCLUSIONS

A corpus, well-defined as "a collection of naturally-occurring language texts, chosen to characterize a state or variety of a language" (Sinclair 1991: 171), was the base to compare abstracts in NA&EJ. The English corpus of RAAs does not intend to represent the entirety of each of the four disciplinary fields. By contrast, the corpus available is suitable for this dissertation to represent trends in rhetorical move structure and language patterns. Considering "methodological basis for pursuing linguistic research" (Leech 1992: 105), it describes the conversational functions that conform to the rhetorical patterns, and the language expressions that accompany moves in NA&EJs. The outcomes of this dissertation, like those of Lorés

(2004), acknowledge that RAAs differ in their rhetorical move organization, communicative functions, and linguistic realizations. In theory, the research findings showed that the rhetorical and language patterns are frequent or nearly constant in RAAs, revealing possible textual similarity between and within texts. In this Ph.D. dissertation, the aim was to compare English abstracts published in NA&EJ, considering humanities and science. The analysis defined the move structure and cohesive means employed in NA&EJs among the four disciplines. It also described the linguistic realization of abstracts, including their syntactic complexity and lexical richness. Although the syntactic complexity and lexical richness were slightly different between NA&EJs, no evidence of possible incidence of these variables was reported in the construction of rhetorical moves. That is to say, lexical richness and syntactic complexity did not influence the types or numbers rhetorical moves and move structure that frequently occurred in RAAs. However, further analysis provides evidence that there was a well-defined relation between rhetorical moves and cohesive means to build up RAAs. Such lexical and grammatical relationships draw the systemic connections between sentences that construct those moves. Thus, following Halliday and Hasan (1976), moves as the semantic-discursive units that exercise a particular communicative function generate cohesive lexical correlations of meaning that represent the semantic fabric of the abstracts.

This study has found that generally abstracts in NA&EJ exhibited a similar eight non-hierarchical move pattern (M1-M2-M3-M4-M5-M6-M7-M8) with four stable moves (M1-M3-M4-M5). As stated above, the moves: *thematic focus, background, recommendation, and implication*, not described in the classical studies of Hyland (2000) were treated as emerging moves. This emerging move structure represents a new textual possibility or rhetorical variety (even if it is not recurrent) to construct abstracts. In essence, this structure revealed a new tendency of organizing abstracts in NA&EJ with different move frequency across disciplines. For example, recommendation move barely occurred in sociology and electronics abstracts of North American journals; similarly, implications did not appear in agronomy texts. Thus, 3% to 17% of the RAAs contained the implication move, and 3% up to 23% contained the recommendation move. Since the emerging move structure found here gives a complete organization of the RAAs, it leads to thinking about an alternative model, which could be offered as a template for writing academic texts. Thus, the move structure, in particular, the relation between rhetorical moves and cohesive means used in NA&EJs inferred possible linguistic implications to suggest writing procedures for abstracts. This is quite valid because writing suggestions offer an explanation of the rhetorical bias and tendencies employed in particular text (Hyland, 2014b). Hyland (2014a) stated that any rhetoric may "act as a vehicle

for teaching particular discourses" (p.394) and communicative skills. It is because "language is effective only when individuals use conventions that other members of the community find familiar and convincing" (p.395). Such a rhetorical tendency showed the sentence construction skills in NA&EJs. This led to discussing in section 5.2.5 some of the linguistic and rhetorical practices found in this dissertation and those suggested by academics to write academic texts.

This dissertation lays the groundwork for future research into abstracts of NA&EJ, providing quantitative comprehensive framework for detecting differences or common grounds in their syntactic structure and lexical richness. The corpus-based approach allowed to describe the typical grammatical structures used in these academic texts, even if they did not show any incidence on rhetorical move organization. The analysis revealed similar linguistic outcomes regardless of the publishing context and the four disciplines. Yet, abstracts published in Ecuadorian journals suggested a greater occurrence of left embeddedness words (M= 5.63) and subordinated sentences throughout the English sub-corpora. It could be, perhaps, why non-proficient Ecuadorian L2 authors tend to use complex constructions compared to advanced L2 writers, who express ideas more simply (Lambert and Kormos, 2014). This made those texts, in many cases, more difficult to process. Although the current study does not investigate the writing quality of the RAAs, the slight variations found here may be the result of different English backgrounds. That is, to some extent, L1 and prior L2 knowledge influenced how writers organize and structure the information content of texts, such as those in RAAs. As a sort of remark of the lexical richness in NA&EJ, it can be argued that English abstracts are far from being homogeneous. Thus, abstracts in North American journals tended to use more content words than those of Ecuadorian journals, which made these texts became more informative and comprehensible. Since lexical diversity is quiet "unstable for short texts and can be affected by differences in text length" (Laufer and Nation, 1995: 310), no significant differences were observed in abstracts of NA&EJ. This implied that both NA&EJs used varied and extensive vocabulary; nonetheless, infrequent words (unusual words, off-word lists) and specialized terminology frequently occurred in abstracts of Ecuadorian journals. LV and LS were found to be the most influential factor in describing differences in the vocabulary richness in abstracts of NA&EJ across disciplines. From the results above, it is inferred that the factors influencing variation in the lexical richness of NA&EJs could be associated with authors' L1 and L2 educational context (Djiwandono, 2016), socio-cultural scenarios (Connor, 2004), and language competence (Ha, 2009; Read, 2000). Although these factors were not examined here, such differences highly correlate with lexical knowledge in predicting sophistication in the construction of academic texts.

Taken together, these findings strengthen the idea that that an abstract represents a unity of meaning between the parts that make them up, wherein a cohesive relationship is established. Then, writing abstracts is not adding words, forming sentences, or structuring interconnected paragraphs. On the contrary, abstracts, like any cohesive texts, must be eminently textual, linguistically coherent, and cohesive to be accepted by the recipient. Thus, the identification and analysis of textual elements, to some extent, contributed to suggest academic writing practices (Hyland, 2007). Here, the use of language (lexico-grammatical choices: for instance, use of connectors), content (what each move should contain), and context (writing with a purpose and having an audience) are considered for the interpretation of texts. The macrostructures (rhetorical patterns) and the microstructures (linguistics features) found in this analysis were the pilars to construct preconceptions about the relationships between them. Therefore, non-hierarchical macrostructures provided the roadmap of the abstract to read while specific linguistic features allowed to recognize how academic language works when producing coherent and cohesive abstracts in NA&EJ.

In general, although there were no significant differences between NA&EJs, this study suggests that the disciplinary field is not the only aspect to be considered when examining RAAs. It is because in the dissemination of research currently conducted in English, linguistic and cultural variations may condition the content and structure of abstracts. That is why RAAs in each discipline, followed the language standards and writing instructions of scientific communities, as well as the journal's requirements for producing abstracts. From this point of view, research related to the rhetorical organization of NA&EJs is a developing area that still requires reviewing aspects that separate organizational structures from different discourse community research requirements. This claim is quite valid and influential if we consider that Ecuadorians' L1 background and writing conventions differ from those of North Americans. This study also strengthens the idea that the slightly differences in the sentence structure and lexical richness in NA&EJs could be treated as new tendencies in the actual use of language. Nonetheless, further work needs to be done to establish whether this tendency is replicated or vary with other disciplinary fields. In essence, this dissertation opens novel and pioneering paths towards corpus linguistics and applied linguistics studies in Ecuador. The present study adds to the growing body of research that indicates that texts vary across disciplines. However, research on linguistic competence, context of the publication, as well as authors' writing experiences is a must to see if these factors correlate with journals' guidelines for publication.

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APPENDICES

Appendix 1. Characteristics of journals used in the NA&EJ corpora

ECUADORIAN JOURNALS				
DISCIPLINE	***JOURNAL***	***HOST***	***INDEXATION***	***WEBSITE***
EDUCATION	Alteridad	Pontificia Salesiana del Ecuador	DOAJ, Latindex 2.0, Scielo-Ecuador, redalyc	https://alteridad.ups.edu.ec/index.php/alteridad/
	Sophia (Philosophy-Education)	Pontificia Salesiana del Ecuador	DOAJ, Latindex 2.0, Scielo-Ecuador, redalyc	https://sophia.ups.edu.ec/index.php/sophia/
	UTCiencia (Miselanea)	Universidad Tecnica de Cotopaxi	Latindex 2.0, Directorio de Investigación de Indexación de Revistas (DRJI), REDIB, Scientific Indexing Services (SIS)	http://investigacion.utc.edu.ec/revistasutc/index.php/utciencia/issue/archive
	Revista Tecnologia (Miselanea)	Escuela Superior Politécnica del Litoral	Latindex 2.0, REDIB, e-revistas	http://www.rte.espol.edu.ec/index.php/tecnologica
SOCIOLOGY	ICONOS	Flacso	DOAJ, Latindex 2.0, Scielo-Ecuador, redalyc	https://revistas.flacsoandes.edu.ec/iconos
	ANALITIKA	Instituto Nacional de Estadistica y Censos	DOAJ, Latindex 2.0, EBSCO host	https://www.ecuadorencifras.gob.ec/Analitika/
	Universitas (C.S. y H.)	Pontificia Salesiana del Ecuador	DOAJ, Latindex 2.0, Scielo-Ecuador, redalyc	https://universitas.ups.edu.ec/index.php/universitas/
	INNOVA Research Journal	Universidad Internacional del Ecucador	Latindex 2.0, Dialnet	http://revistas.uide.edu.ec/index.php/innova
AGRONOMY	Siembra	Universidad Central del Ecuador	DOAJ, Latindex 2.0, Dialnet	http://revistadigital.uce.edu.ec/index.php/SIEMBRA/issue/view/170
	La Granja	Pontificia Salesiana del Ecuador	SCOPUS, DOAJ, Latindex 2.0, Scielo-Ecuador, redalyc, EBSCOhost	https://lagranja.ups.edu.ec/index.php/granja/
	La Tecnica	Universidad Tecnica de Manabi	DOAJ, Latindex 2.0, Dialnet, Open Journals Academic Index (OAJI.net)	https://revistas.utm.edu.ec/index.php/latecnica
	Amazonica Ciencia y Tecnologia	Universidad Estatal Amazónica	Latindex 2.0, Dialnet, Open Journals Academic Index (OAJI.net), REDIB	https://revistas.proeditio.com/REVISTAMAZONICA
ELECTRONICS	ACI AVANCE Ciencia e Ingennierias	USFQ	DOAJ, Latindex 2.0, REDIB	https://revistas.usfq.edu.ec/index.php/avances
	Enfoque UTE. Scientific Engineering Journal	Universidad Tecnica Equinoccial	DOAJ, Latindex 2.0, Scielo-Ecuador, REDIB, Open Journals Academic Index (OAJI.net)	https://ingenieria.ute.edu.ec/enfoqueute/index.php/revista
	Ingenius Science and Technology	Pontificia Salesiana del Ecuador	DOAJ, Latindex 2.0, Scielo-Ecuador, redalyc, EBSCOhost, ESCI	https://ingenius.ups.edu.ec/index.php/ingenius/
	Maskay (Electrica & Electronica)	Universidad de las Fuerzas Armadas ESPE	DOAJ, Latindex 2.0, Scielo-Ecuador, REDIB, Dialnet	https://journal.espe.edu.ec/ojs/index.php/maskay/index
NORTH AMERICAN JOURNALS				
DISCIPLINE	***JOURNAL***	***HOST***	***INDEXATION***	***WEBSITE***
EDUCATION	American Journal of Education (AJE	University of Chicago	Elsevier, Scopus, EBSCOhost, Web of Science, ERIC	https://www.journals.uchicago.edu/journals/aje/about
	Journal of Teacher Education (JTE)	Michigan State University	Scopus, SCImago, PorQuest, ERIC SAGE Publishing	https://journals.sagepub.com/home/jte
SOCIOLOGY	American Journal of Sociology (AJS)	University of Chicago	Elsevier, Scopus, EBSCOhost, FRANCIS, ProQuest	https://www.journals.uchicago.edu/journals/ajs/about
	Sociological Perspectives	Portland State University	Scopus, SCImago, PorQuest, EBSCO SAGE Publishing	https://journals.sagepub.com/home/spx
ELECTRONICS	Journal of Electronic Materials (JEM)	SUNY Polytechnic Institute** NEW YORK	Scopus, SCImago, PorQuest, EBSCO Springer, Science citation Index	https://www.springer.com/journal/11664
	Journal of Electronic Packaging (JEP)	ASME-AMER SOCIETY OF MECHANICAL ENGINEERS University of Colorado**	Scopus, Science Citation Index, Web of Science, METADEX, Technology research database	https://asmedigitalcollection.asme.org/electronicpackaging/pages/about
AGRONOMY	Journal of Agricultural and Food Chemistry (JAFC)	American Chemical Society	CAS, SCOPUS, Proquest, PubMed, CABI, Web of Science	https://pubs.acs.org/journal/jafcau
	Journal of Agricultural Science (JAS)	Center of Science and Education	EBSCOhost, MIAR, OAJI, CiteFactor, Open J-Gate, CrossRef	http://www.ccsenet.org/journal/index.php/jas

Appendix 2. *Intra-rater reliability move coding in North American RAAs.*

	EDUCATION						SOCIOLOGY						ELECTRONICS						AGRONOMY							
	First Coding			Second Coding			First Coding			Second Coding			First Coding			Second Coding			First Coding			Second Coding			MOVES	
	Move stabiltiy			Move stabiltiy			Move stabiltiy			Move stabiltiy			Move stabiltiy			Move stabiltiy			Move stabiltiy			Move stabiltiy			*F1(1)*	*F1(2)*
Moves	#	*f*	%	#	*f*	%	#	*f*	%	#	*f*	%	#	*f*	%	#	*f*	%	#	*f*	%	#	*f*	%	*Tf*	*Tf*
1. Thematic focus	2	10	40	2	10	40	2	11.1	40	2	11.8	40	5	20	100	5	21.7	100	2	8.3	40	3	12.5	60	*11*	*12*
2. Background	3	15	60	2	10	40	2	11.1	40	2	11.8	40	3	12	60	3	13.04	60	3	12.5	60	2	8.3	40	*11*	*9*
3. Purpose	5	25	100	5	25	100	5	27.8	100	4	23.5	80	5	20	100	4	17.4	80	5	20.8	100	5	20.8	100	*20*	*18*
4. Method	5	25	100	5	25	100	4	22.2	80	4	23.5	80	5	20	100	4	17.4	80	5	20.8	100	5	20.8	100	*19*	*18*
5. Results	4	20	80	4	20	80	3	16.7	60	3	17.6	60	4	16	80	4	17.4	80	4	16.7	80	4	26.7	80	*15*	*15*
6. Conclusion	0	0	0	0	0	0	2	11.1	40	2	11.8	40	2	8	40	2	8.7	40	3	12.5	60	3	12.5	60	*7*	*7*
7. Recommendations	1	5	20	2	10	40	0.00	0.00	0.00	0	0.00	0	1	4	20	1	4.3	20	2	8.3	40	2	8.3	40	*4*	*5*
Total	20	100	400	20	100	400	18	0	360	17	0	340	25	100	500	23	100	460	24	100	480	24	100	480	*87*	*84*
%				100						94						92						100				
Average Match		**97%**																								
F1(1) = author first move coding																										
F1(2) = author second move coding																										

Appendix 3. Intra-rater and inter-rater reliability move coding in North American RAAs.

	EDUCATION							SOCIOLOGY						ELECTRONICS						AGRONOMY							
	Intra-Coding			Inter-Coding			Intra-Coding			Inter-Coding			Intra-Coding			Inter-Coding			Intra-Coding			Inter-Coding			MOVES	
	Move stabiltiy			Move stabiltiy			Move stabiltiy			Move stabiltiy			Move stabiltiy			Move stabiltiy			Move stabiltiy			Move stabiltiy			F1(3)	C1(1)
Moves	#	f	%	#	f	%	#	f	%	#	f	%	#	f	%	#	f	%	#	f	%	#	f	%	Tf	Tf
1. Thematic focus	2	9.5	40	3	13.04	60	3	15	60	3	15	60	5	21.7	100	4	18.2	80	3	12.5	60	4	16	80	13	14
2. Background	2	9.5	40	2	8.7	40	2	10	40	2	10	40	3	13.04	60	3	13.6	60	2	8.3	40	2	8	40	9	9
3. Purpose	5	23.8	100	5	21.7	100	4	20	80	4	20	80	4	17.4	80	4	18.2	80	5	20.8	100	5	20	100	18	18
4. Method	5	23.8	100	5	21.7	100	4	20	80	4	20	80	4	17.4	80	4	18.2	80	5	20.8	100	5	20	100	18	18
5. Results	4	19.04	80	5	21.7	100	3	15	60	3	15	60	4	17.4	80	4	18.8	80	5	20.8	100	5	20	100	16	17
6. Conclusion	1	4.7	20	1	4.3	20	2	10	40	2	10	40	2	8.7	40	2	9.09	40	3	12.5	60	3	13	60	8	8
7. Recommendations	1	4.7	20	1	4.3	20	1	5	20	1	5	20	1	4.3	20	1	4.5	20	1	4.2	20	1	4	20	4	4
8. Implications	1	4.7	20	1	4.3	20	1	5	20	1	5	20	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Total	21	100	420	23	100	460	20	100	400	20	100	400	23	100	460	22	100	440	24	100	480	25	100	500	88	90
%				91.0						100						95.6						96				
Average Match	98%																									
F1(3)= author move-coding																										
C1(1) = co-coder move analysis																										

Appendix 4. Reliability coding in humanities and sciences

a) Reliability coding in humanities

Codes	Moves	First analysis by the author	Intra-coder reliability (2 analysis by the author)	Inter-coder reliability (author's and readers' analysis)
SLG-EJ01	Thematic focus	12	13	13
SLG-EJ02	Background	12	13	13
SLG-EJ03	Purpose	28	29	30
SLG-EJ04	Method	30	30	30
SLG-EJ05	Results	24	23	23
SLG-EJ06	Conclusion	6	6	6
SLG-EJ07	Recommendations	0	0	0
SLG-EJ08	Implications	1	1	1
ED-EJ01	Thematic focus	15	16	17
ED-EJ02	Background	11	11	12
ED-EJ03	Purpose	29	30	29
ED-EJ04	Method	29	30	29
ED-EJ05	Results	28	27	27
ED-EJ06	Conclusion	14	15	14
ED-EJ07	Recommendations	3	3	3
ED-EJ08	Implications	1	0	0
SLG-NAJ01	Thematic focus	17	18	18
SLG-NAJ02	Background	12	13	13
SLG-NAJ03	Purpose	28	28	28
SLG-NAJ04	Method	29	29	29
SLG-NAJ05	Results	30	30	30
SLG-NAJ06	Conclusion	15	15	15
SLG-NAJ07	Recommendations	2	2	2
SLG-NAJ08	Implications	3	3	4
ED-NAJ01	Thematic focus	13	13	13
ED-NAJ02	Background	9	9	9
ED-NAJ03	Purpose	28	28	28
ED-NAJ04	Method	29	29	29
ED-NAJ05	Results	30	30	30
ED-NAJ06	Conclusion	10	10	10
ED-NAJ07	Recommendations	6	6	6
ED-NAJ08	Implications	6	7	7
	TOTAL SLG-EJ	113	115	116
			98,3%	99,1%
	TOTAL ED-EJ	130	132	130
			98,5%	98,5%
	TOTAL SLG-NAJ	136	138	139
			98,6%	99,3%
	TOTAL ED-NAJ	131	132	132
			99,2%	100%
	AVERAGE MATCH		**99%**	

Note: SLG-EJ= Sociology Ecuador, ED-EJ= Education Ecuador,
SLG-NAJ=Sociology North America, ED-NAJ= Education North America

b) Reliability coding in sciences

Codes	Moves	First analysis by the author	Intra-coder reliability (2 analysis by the author)	Inter-coder reliability (author's and readers' analysis)
AG-EJ01	Thematic focus	18	17	17
AG-EJ02	Background	5	6	6
AG-EJ03	Purpose	24	26	26
AG-EJ04	Method	28	28	28
AG-EJ05	Results	28	28	28
AG-EJ06	Conclusion	9	10	10
AG-EJ07	Recommendations	2	2	2
AG-EJ08	Implications	2	2	2
EL-EJ01	Thematic focus	10	11	11
EL-EJ02	Background	7	8	8
EL-EJ03	Purpose	30	30	30
EL-EJ04	Method	29	29	29
EL-EJ05	Results	28	28	28
EL-EJ06	Conclusion	8	8	8
EL-EJ07	Recommendations	0	0	0
EL-EJ08	Implications	3	3	3
AG-NAJ01	Thematic focus	23	23	23
AG-NAJ02	Background	8	8	8
AG-NAJ03	Purpose	27	28	27
AG-NAJ04	Method	27	27	27
AG-NAJ05	Results	30	30	30
AG-NAJ06	Conclusion	17	18	17
AG-NAJ07	Recommendations	5	5	5
AG-NAJ08	Implications	0	0	0
EL-NAJ01	Thematic focus	18	17	17
EL-NAJ02	Background	9	10	10
EL-NAJ03	Purpose	26	27	26
EL-NAJ04	Method	29	29	29
EL-NAJ05	Results	30	29	29
EL-NAJ06	Conclusion	13	14	14
EL-NAJ07	Recommendations	1	1	1
EL-NAJ08	Implications	1	1	1
	TOTAL AG-EJ	116	119	119
			97,5%	100%
	TOTAL EL-EJ	112	117	117
			95,7%	100%
	TOTAL AG-NAJ	137	139	137
			98,6%	99%
	TOTAL EL-NAJ	127	127	127
			100%	100%
	AVERAGE MATCH		**99%**	

Note: EL-EJ= Electronics Ecuador, AG-EJ= Agronomy Ecuador,
EL-NAJ= Electronics North America, AG-NAJ= Agronomy North America

Appendix 5. ANOVA Single factor among groups and Tukey Post Hoc Test

Register 1. Types of sentence structures

Sentence Types	EDUCATION		SOCIOLOGY		AGRONOMY		ELECTRONICS	
	America	*Ecuador*	*America*	*Ecuador*	*America*	*Ecuador*	*America*	*Ecuador*
	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
1.Compound	1,182	1,600	1,643	1,000	**2,500**	1,462	1,200	1,286
2.Complex	**1,875**	1,467	1,625	1,154	1,733	1,500	1,765	1,455
3.Compound-complex	1,000	0,000	**1,333**	0,000	1,000	1,000	1,000	1,000
4.Simple	**2,353**	1,667	2,438	2,063	1,765	**2,500**	1,813	1,615

Register 2. SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
NAJ-1S	10	17,8181022	1,78181022	0,35602128
NAJ-2H	10	15,4484498	1,54484498	0,29355331
EJ-3S	10	17,3989136	1,73989136	0,48010019
EJ-4H	10	12,2402778	1,22402778	0,50960221

Note: NAJ-1S= North America Sciences; NAJ-2H= North America Humanities; EJ-3S= Ecuador Sciences; EJ-4H= Ecuador Humanities.

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	1,94028244	3	0,64676081	1,57816115	0,211537347	2,86626555
Within Groups	14,7534929	36	0,40981925			
Total	16,6937753	39				

Register 3. Tukey Post Hoc Test

	Differences	*n (grop 1)*	*n (group 2)*	*SE*	*q*
NAJ1S -NAJ2H	0,23696524	10	10	0,202	1,171
NAJ2H-EJ3S	0,19504638	10	10	0,202	0,963
EJ3S-EJ4H	0,51586358	10	10	0,202	2,548
EJ4H-NAJ1S	0,55778245	10	10	0,202	2,755

Note: Since q statistics is less than the critical value ($q < q_a$ 2.89), there is no significant difference among groups

Register 4. The studentized range statistic (q)*

*The critical values for q corresponding to alpha = .05 (top) and alpha = .01 (bottom)

df for Error Term	**k= Number of Treatments**								
	2	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
5	3.64 5.70	4.60 6.98	5.22 7.80	5.67 8.42	6.03 8.91	6.33 9.32	6.58 9.67	6.80 9.97	6.99 10.24
6	3.46 5.24	4.34 6.33	4.90 7.03	5.30 7.56	5.63 7.97	5.90 8.32	6.12 8.61	6.32 8.87	6.49 9.10
7	3.34 4.95	4.16 5.92	4.68 6.54	5.06 7.01	5.36 7.37	5.61 7.68	5.82 7.94	6.00 8.17	6.16 8.37
8	3.26 4.75	4.04 5.64	4.53 6.20	4.89 6.62	5.17 6.96	5.40 7.24	5.60 7.47	5.77 7.68	5.92 7.86
9	3.20 4.60	3.95 5.43	4.41 5.96	4.76 6.35	5.02 6.66	5.24 6.91	5.43 7.13	5.59 7.33	5.74 7.49
10	3.15 4.48	3.88 5.27	4.33 5.77	4.65 6.14	4.91 6.43	5.12 6.67	5.30 6.87	5.46 7.05	5.60 7.21
11	3.11 4.39	3.82 5.15	4.26 5.62	4.57 5.97	4.82 6.25	5.03 6.48	5.20 6.67	5.35 6.84	5.49 6.99
12	3.08 4.32	3.77 5.05	4.20 5.50	4.51 5.84	4.75 6.10	4.95 6.32	5.12 6.51	5.27 6.67	5.39 6.81
13	3.06 4.26	3.73 4.96	4.15 5.40	4.45 5.73	4.69 5.98	4.88 6.19	5.05 6.37	5.19 6.53	5.32 6.67
14	3.03 4.21	3.70 4.89	4.11 5.32	4.41 5.63	4.64 5.88	4.83 6.08	4.99 6.26	5.13 6.41	5.25 6.54
15	3.01 4.17	3.67 4.84	4.08 5.25	4.37 5.56	4.59 5.80	4.78 5.99	4.94 6.16	5.08 6.31	5.20 6.44
16	3.00 4.13	3.65 4.79	4.05 5.19	4.33 5.49	4.56 5.72	4.74 5.92	4.90 6.08	5.03 6.22	5.15 6.35
17	2.98 4.10	3.63 4.74	4.02 5.14	4.30 5.43	4.52 5.66	4.70 5.85	4.86 6.01	4.99 6.15	5.11 6.27
18	2.97 4.07	3.61 4.70	4.00 5.09	4.28 5.38	4.49 5.60	4.67 5.79	4.82 5.94	4.96 6.08	5.07 6.20
19	2.96 4.05	3.59 4.67	3.98 5.05	4.25 5.33	4.47 5.55	4.65 5.73	4.79 5.89	4.92 6.02	5.04 6.14
20	2.95 4.02	3.58 4.64	3.96 5.02	4.23 5.29	4.45 5.51	4.62 5.69	4.77 5.84	4.90 5.97	5.01 6.09
24	2.92 3.96	3.53 4.55	3.90 4.91	4.17 5.17	4.37 5.37	4.54 5.54	4.68 5.69	4.81 5.81	4.92 5.92
30	2.89 3.89	3.49 4.45	3.85 4.80	4.10 5.05	4.30 5.24	4.46 5.40	4.60 5.54	4.72 5.65	4.82 5.76
40	2.86 3.82	3.44 4.37	3.79 4.70	4.04 4.93	4.23 5.11	4.39 5.26	4.52 5.39	4.63 5.50	4.73 5.60
60	2.83 3.76	3.40 4.28	3.74 4.59	3.98 4.82	4.16 4.99	4.31 5.13	4.44 5.25	4.55 5.36	4.65 5.45
120	2.80 3.70	3.36 4.20	3.68 4.50	3.92 4.71	4.10 4.87	4.24 5.01	4.36 5.12	4.47 5.21	4.56 5.30
infinity	2.77 3.64	3.31 4.12	3.63 4.40	3.86 4.60	4.03 4.76	4.17 4.88	4.29 4.99	4.39 5.08	4.47 5.16

Source: https://bit.ly/3iYlTy2 (last access on March 20th, 2020)

Appendix 6. Lexical richness: Statistical analysis

Register 1. Lexical richness in education and electronics RAAs

	America		**Ecuador**		***Correlation***		
	Educ	Elect	Educ	Elect	LD-LS	LS-LV	LV-LD
Lexical Density	0.65	0.63	0.57	0.58	-.459 (.541)		
Lexical Sophistication	88.33	81.17	90.1	87.6		-.087 (.913)	
Lexical Variation	0.29	0.27	0.25	0.29			.473 (.527)
Words in text	4061	5650	5176	4909			
# of texts	30	30	30	30			

Register 2. Lexical richness in sociology and agronomy RAAs

	America		**Ecuador**		***Correlation***		
	Slgy	Agro	Slgy	Agro	LD-LS	LS-LV	LV-LD
Lexical Density	0.64	0.66	0.57	0.62	.967* (.033)		
Lexical Sophistication	88.5	74.1	88.3	79.7		-.756 (.244)	
Lexical Variation	0.31	0.28	0.32	0.29			-.624 (.376)
Words in text	4331	5637	4368	5981			
# of texts	30	30	30	30			

Note: *significant correlation at the p= <.05 level* *

Register 3. Lexical profile in North American journals

Variable	1000 words (K1)	2000-words (K2)	Lexical Variation (TTR)	Academic Words (LS)	Off-list word	Content word (LD)
Education	67.2	73.8	0.29	88.3	11.67	0.65
Sociology	66.80	71.90	0.31	88.50	11.54	0.64
Electronics	61.4	69.10	0.27	81.70	18.28	0.63
Agronomy	59.5	65.7	0.28	74.1	25.9	0.66
Mean	*63.73*	*70.13*	*0.29*	*83.15*	*16.85*	*0.65*

Register 4. Lexical profile in Ecuadorian journals

Variable	1000 words (K1)	2000-words (K2)	Lexical Variation (TTR)	Academic Words (LS)	Off-list word	Content word (LD)
Education	70.7	75.6	0.25	90.1	9.87	0.57
Sociology	68.50	72.80	0.32	88.30	11.68	0.57
Electronics	67.1	73.20	0.29	87.60	12.43	0.58
Agronomy	64.2	70.1	0.29	79.7	20.33	0.62
Mean	*67.63*	*72.93*	*0.29*	*86.43*	*13.58*	*0.59*

Register 5. Mean values of indices of the lexical richness NA&EJs

Variable	1000 words (K1)	2000-words (K2)	Lexical Variation (TTR)	Academic Words (LS)	Off-list word	Content word (LD)
	Mean	Mean	Mean	Mean	Mean	Mean
Ecuador	67.63	72.93	0.29	86.43	13.58	0.59
America	63.73	70.13	0.29	83.15	16.85	0.65

Appendix 7. Rhetorical moves per abstract in NA&EJs per discipline

RHETORICAL MOVES PER ABSTRACT IN ECUADORIAN JOURNALS

EDUCATION

# Abstracts	M1	M2	M3	M4	M5	M6	M7	M8	Move Pattern per abstract
1	1	0	1	1	1	0	0	0	**4**
2	0	0	1	1	1	0	0	0	**3**
3	0	0	1	1	0	0	0	0	**2**
4	1	1	1	1	1	1	0	0	**6**
5	1	0	1	1	1	0	0	0	**4**
6	1	0	1	1	1	0	0	0	**4**
7	1	0	1	1	1	0	0	0	**4**
8	0	0	1	1	1	0	1	0	**4**
9	0	0	1	1	1	1	0	0	**4**
10	0	0	1	1	1	0	1	0	**4**
11	0	0	1	1	1	1	0	0	**4**
12	1	0	1	1	0	0	0	0	**3**
13	1	1	1	1	1	0	0	0	**5**
14	1	0	1	1	1	1	0	0	**5**
15	1	1	1	1	0	1	0	0	**5**
16	0	1	1	1	1	1	0	0	**5**
17	1	0	1	1	1	1	0	0	**5**
18	1	1	1	1	1	0	0	0	**5**
19	0	0	1	1	1	1	0	0	**4**
20	1	0	1	1	1	0	1	0	**5**
21	0	1	1	1	1	0	0	0	**4**
22	0	1	1	1	1	1	0	0	**5**
23	0	0	1	1	1	1	0	0	**4**
24	0	0	1	1	1	0	0	0	**3**
25	1	1	1	1	1	1	0	0	**6**
26	0	0	1	1	1	1	0	0	**4**
27	1	0	1	1	1	1	0	0	**5**
28	1	0	1	1	1	1	0	0	**5**
29	1	1	1	1	1	1	0	0	**6**
30	1	1	1	1	1	0	0	0	**5**
Move Pattern per discipline	**17**	**10**	**30**	**30**	**27**	**15**	**3**	**0**	

SOCIOLOGY

# Abstracts	M1	M2	M3	M4	M5	M6	M7	M8	Move Pattern per abstract
1	1	0	1	1	1	1	0	0	**5**
2	1	1	1	1	0	0	0	0	**4**
3	0	1	1	1	1	0	0	0	**4**
4	1	0	1	1	1	0	0	0	**4**
5	1	1	1	1	1	1	0	0	**6**
6	0	0	1	1	1	0	0	0	**3**
7	1	1	1	1	1	0	0	0	**5**
8	0	0	1	1	1	0	0	0	**3**
9	0	0	1	1	1	0	0	1	**4**
10	0	0	1	1	1	0	0	0	**3**
11	1	0	1	1	0	0	0	0	**3**
12	0	0	1	1	0	0	0	0	**2**
13	0	1	1	1	0	0	0	0	**3**
14	1	1	1	1	1	0	0	0	**5**
15	0	0	1	1	1	0	0	0	**3**
16	0	0	1	1	1	1	0	0	**4**
17	0	0	1	1	0	0	0	0	**2**
18	0	1	1	1	1	0	0	0	**4**
19	1	1	1	1	0	0	0	0	**4**
20	1	1	1	1	1	0	0	0	**5**
21	0	0	1	1	1	1	0	0	**4**
22	1	1	1	1	1	0	0	0	**5**
23	0	0	1	1	0	0	0	0	**2**
24	1	1	1	1	1	0	0	0	**5**
25	1	0	1	1	1	0	0	0	**4**
26	1	1	1	1	1	1	0	0	**6**
27	0	1	1	1	1	1	0	0	**5**
28	0	0	1	1	1	0	0	0	**3**
29	0	0	1	1	1	0	0	0	**3**
30	0	0	1	1	1	0	0	0	**3**
Move Pattern per discipline	**13**	**13**	**30**	**30**	**23**	**6**	**0**	**1**	

RHETORICAL MOVES PER ABSTRACT IN NOTRH AMERICAN JOURNALS

EDUCATION

# Abstracts	M1	M2	M3	M4	M5	M6	M7	M8	Move Pattern per abstract
1	1	0	1	1	1	1	0	0	**5**
2	1	0	1	1	1	0	0	0	**4**
3	0	0	1	1	1	1	0	0	**4**
4	1	0	1	1	1	1	0	0	**5**
5	0	1	1	1	1	0	0	0	**4**
6	0	1	1	1	1	0	0	1	**5**
7	1	0	1	1	1	1	0	0	**5**
8	1	0	1	1	1	0	0	1	**5**
9	0	0	1	1	1	0	0	1	**4**
10	0	1	1	1	1	1	0	0	**5**
11	0	0	1	1	1	1	0	0	**4**
12	0	1	1	1	1	0	0	0	**4**
13	0	1	1	1	1	1	1	1	**7**
14	0	0	1	1	1	0	0	0	**3**
15	1	0	0	1	1	1	0	0	**4**
16	1	1	1	0	1	0	0	0	**4**
17	0	0	1	1	1	1	0	0	**4**
18	0	0	1	1	1	0	0	0	**3**
19	0	1	1	1	1	0	0	0	**4**
20	0	0	1	1	1	0	0	1	**4**
21	0	0	1	1	1	0	1	0	**4**
22	1	1	1	1	1	1	0	0	**6**
23	1	0	1	1	1	0	0	0	**4**
24	1	0	1	1	1	0	0	1	**5**
25	1	0	1	1	1	0	1	0	**5**
26	1	0	1	1	1	0	1	1	**6**
27	1	0	0	1	1	0	0	0	**3**
28	0	1	1	1	1	0	0	0	**4**
29	0	0	1	1	1	0	1	0	**4**
30	0	0	1	1	1	0	0	0	**3**
Move Pattern per discipline	**13**	**9**	**28**	**29**	**30**	**10**	**5**	**7**	

SOCIOLOGY

# Abstracts	M1	M2	M3	M4	M5	M6	M7	M8	Move Pattern per abstract
1	1	1	1	1	1	0	0	0	**5**
2	1	0	1	1	1	0	0	1	**5**
3	1	0	1	1	1	0	0	1	**5**
4	0	0	1	1	1	1	0	0	**4**
5	1	0	1	1	1	1	0	0	**5**
6	0	0	1	1	1	0	0	0	**3**
7	1	0	1	1	1	0	0	0	**4**
8	0	0	1	1	1	1	0	0	**4**
9	0	1	0	1	1	0	0	1	**4**
10	1	0	1	0	1	1	0	0	**4**
11	0	0	1	1	1	1	0	0	**4**
12	0	1	0	1	1	0	1	0	**4**
13	0	1	1	1	1	0	0	0	**4**
14	1	0	1	1	1	0	0	0	**4**
15	0	1	1	1	1	1	0	0	**5**
16	1	1	1	1	1	0	0	0	**5**
17	1	0	1	1	1	1	0	0	**5**
18	0	0	1	1	1	0	0	0	**3**
19	0	1	1	1	1	1	0	0	**5**
20	1	1	1	1	1	0	0	0	**5**
21	0	1	1	1	1	1	0	0	**5**
22	1	0	1	1	1	1	0	0	**5**
23	1	0	1	1	1	1	0	0	**5**
24	1	0	1	1	1	1	0	0	**5**
25	1	1	1	1	1	0	0	1	**6**
26	1	1	1	1	1	1	0	0	**6**
27	1	0	1	1	1	1	0	0	**5**
28	1	1	1	1	1	0	0	0	**5**
29	1	0	1	1	1	1	0	0	**5**
30	0	1	1	1	1	0	0	0	**4**
Move Pattern per discipline	**18**	**13**	**28**	**29**	**30**	**15**	**1**	**4**	

	ELECTRONICS								
# Abstracts	M1	M2	M3	M4	M5	M6	M7	M8	Move Pattern per abstract
1	0	1	1	1	0	0	0	0	**3**
2	0	0	1	1	1	1	0	0	**4**
3	0	0	1	1	1	1	0	0	**4**
4	1	0	1	1	1	1	0	0	**5**
5	0	0	1	1	1	0	0	0	**3**
6	0	0	1	1	1	0	0	0	**3**
7	1	1	1	1	1	0	0	0	**5**
8	0	1	1	1	1	0	0	0	**4**
9	0	0	1	1	1	0	0	0	**3**
10	1	1	1	1	1	0	0	0	**5**
11	1	0	1	1	1	0	0	0	**4**
12	0	0	1	1	1	0	0	0	**3**
13	1	1	1	1	1	0	0	0	**5**
14	1	1	1	0	0	0	0	1	**3**
15	1	0	1	1	1	0	0	0	**4**
16	1	0	1	1	1	0	0	0	**4**
17	0	0	1	1	1	1	0	0	**4**
18	0	0	1	1	1	0	0	0	**3**
19	1	0	1	1	1	0	0	0	**4**
20	0	1	1	1	1	0	0	0	**4**
21	1	0	1	1	1	0	0	0	**4**
22	0	0	1	1	1	1	0	0	**4**
23	0	0	1	1	1	0	0	0	**3**
24	0	0	1	1	1	0	0	1	**3**
25	0	0	1	1	1	0	0	0	**3**
26	1	0	1	1	1	0	0	0	**4**
27	0	0	1	1	1	0	0	0	**3**
28	0	0	1	1	1	0	0	0	**3**
29	0	1	1	1	1	1	0	0	**5**
30	0	0	1	1	1	1	0	1	**4**
Move Pattern per discipline	**11**	**8**	**30**	**29**	**28**	**7**	**0**	**3**	

	ELECTRONICS								
# Abstracts	M1	M2	M3	M4	M5	M6	M7	M8	Move Pattern per abstract
1	0	0	1	1	1	1	0	0	**4**
2	0	0	1	1	1	0	0	0	**3**
3	0	1	1	1	1	0	0	0	**4**
4	1	1	1	1	1	0	0	0	**5**
5	0	0	1	1	1	1	0	0	**4**
6	0	0	1	1	1	0	0	0	**3**
7	1	0	1	1	1	0	0	0	**4**
8	0	0	1	1	1	1	0	0	**4**
9	0	0	1	1	1	0	0	0	**3**
10	1	0	1	0	1	1	0	0	**4**
11	1	0	1	1	1	0	0	0	**4**
12	1	0	1	1	1	0	0	0	**4**
13	0	0	0	1	1	1	0	0	**3**
14	0	0	1	1	1	0	0	0	**3**
15	0	0	0	1	1	1	0	0	**3**
16	1	0	1	1	1	0	0	0	**4**
17	1	1	1	1	1	0	0	0	**5**
18	1	0	1	1	1	1	0	1	**6**
19	1	1	1	1	1	1	0	0	**6**
20	1	1	1	1	1	0	0	0	**5**
21	1	0	1	1	1	0	0	0	**4**
22	0	0	1	1	1	1	0	0	**4**
23	1	0	1	1	1	0	0	0	**4**
24	0	1	1	1	1	0	1	0	**5**
25	0	0	0	1	1	0	0	0	**2**
26	1	0	1	1	1	0	0	0	**4**
27	1	1	1	1	1	1	0	0	**6**
28	1	1	1	1	1	1	0	0	**6**
29	1	0	1	1	1	1	0	0	**5**
30	1	1	1	1	1	1	0	0	**6**
Move Pattern per discipline	**17**	**9**	**27**	**29**	**30**	**13**	**1**	**1**	

	AGRONOMY								
# Abstracts	M1	M2	M3	M4	M5	M6	M7	M8	Move Pattern per abstract
1	1	1	1	1	1	0	0	0	**5**
2	1	0	1	1	1	0	0	0	**4**
3	0	0	1	1	1	1	0	0	**4**
4	0	0	1	1	1	0	0	0	**3**
5	0	0	1	1	1	0	0	0	**3**
6	1	1	1	1	1	1	0	0	**6**
7	1	1	0	1	1	1	1	0	**6**
8	0	0	1	1	1	1	0	0	**4**
9	0	0	1	1	1	0	0	0	**3**
10	1	1	0	0	0	0	0	0	**2**
11	0	0	1	1	1	1	0	0	**4**
12	1	0	1	1	1	0	0	0	**4**
13	1	0	1	1	1	0	0	0	**4**
14	1	0	1	1	1	0	0	0	**4**
15	1	0	1	1	1	0	0	0	**4**
16	1	0	1	1	1	0	0	0	**4**
17	1	0	1	1	1	0	0	0	**4**
18	0	0	1	1	1	0	0	0	**3**
19	0	0	1	1	1	0	0	0	**3**
20	0	0	1	1	1	0	0	0	**3**
21	0	0	0	1	1	1	0	0	**3**
22	1	0	1	1	1	0	0	0	**4**
23	1	0	1	1	1	1	0	1	**6**
24	0	0	1	1	1	1	0	0	**4**
25	1	0	1	1	1	0	0	0	**4**
26	1	1	1	1	1	1	0	0	**6**
27	1	0	1	1	1	0	0	0	**4**
28	0	0	1	1	1	0	1	1	**5**
29	0	0	1	1	1	0	0	0	**3**
30	1	1	0	0	0	0	0	0	**2**
Move Pattern per discipline	**17**	**6**	**26**	**28**	**28**	**9**	**2**	**2**	

	AGRONOMY								
# Abstracts	M1	M2	M3	M4	M5	M6	M7	M8	Move Pattern per abstract
1	0	0	1	1	1	1	0	0	**4**
2	1	0	1	1	1	1	0	0	**5**
3	1	0	1	1	1	0	0	0	**4**
4	1	0	1	1	1	0	1	0	**5**
5	1	0	1	0	1	1	0	0	**4**
6	1	0	1	1	1	1	0	0	**5**
7	1	0	1	1	1	0	0	0	**4**
8	0	1	1	1	1	1	0	0	**5**
9	1	1	0	1	1	0	0	0	**4**
10	1	0	1	1	1	1	1	0	**6**
11	1	0	1	1	1	1	0	0	**5**
12	1	1	1	1	1	0	0	0	**5**
13	1	0	1	1	1	1	1	0	**6**
14	1	0	1	1	1	0	0	0	**4**
15	1	0	1	1	1	1	0	0	**5**
16	0	0	1	1	1	1	0	0	**4**
17	1	1	0	1	1	1	0	0	**5**
18	1	0	1	1	1	1	0	0	**5**
19	1	1	1	1	1	0	0	0	**5**
20	1	0	1	1	1	1	0	0	**5**
21	1	1	1	0	1	1	0	0	**5**
22	1	0	1	1	1	0	1	0	**5**
23	1	0	1	1	1	0	0	0	**4**
24	0	0	1	1	1	1	0	0	**4**
25	1	0	1	1	1	1	0	0	**5**
26	0	1	1	1	1	0	0	0	**4**
27	0	0	1	1	1	0	0	0	**3**
28	0	0	1	0	1	0	1	0	**3**
29	1	1	1	1	1	1	0	0	**6**
30	1	0	1	1	1	1	0	0	**5**
Move Pattern per discipline	**23**	**8**	**28**	**27**	**30**	**18**	**5**	**0**	

Appendix 8. Cohesive devices in NA&EJs

	RECURRENTE DISCOURSE MARKERS IN NA&EJs										
***ADDITIVES**	***Occur***	**%**	**ADVERSATIVES**	***Occur***	**%**	**CAUSAL**	***Occur***	**%**	**TEMPORALS**	***Occur***	**%**
Also	60	45,1	but	37	24,7	thus	12	10,8	finally	22	23,9
in order to	19	14,3	however	27	18,0	for this	8	7,2	after that	9	9,8
In addition	18	13,5	Although	16	10,7	therefore	8	7,2	first...next	7	7,6
Additionally	6	4,5	while	13	8,7	because	8	7,2	then	6	6,5
as well as	6	4,5	then	10	6,7	then	8	7,2	in conclusion	5	5,4
Besides	5	3,8	yet	8	5,3	for this reasc	6	5,4	first....second	4	4,3
Likewise	4	3,0	rather	5	3,3	so	6	5,4	another	3	3,3
Furthermore	4	3,0	even	4	2,7	currently	5	4,5	It was conclude	3	3,3
in contrast	3	2,3	Overall	4	2,7	because of tl	5	4,5	before that	3	3,3
whereas	3	2,3	rather than	4	2,7	On the basis	5	4,5	previously	3	3,3
Moreover	2	1,5	instead	3	2,0	whereas	4	3,6	later	3	3,3
Similarly	1	0,8	at least	3	2,0	based on	4	3,6	before these/th	2	2,2
If not all	1	0,8	Though	2	1,3	as a result	3	2,7	presently	2	2,2
By contrast	1	0,8	Whereby	2	1,3	For	3	2,7	subsequently	2	2,2
For instance	0	0,0	on the other hand	2	1,3	unfortunatel	2	1,8	A the end	2	2,2
for instance	0	0,0	nevertheless	2	1,3	From this ...	2	1,8	currently	2	2,2
	133	100,0	at any rate	1	0,7	so that	2	1,8	previously	1	1,1
			in fact	1	0,7	under simila	2	1,8	More recently	1	1,1
M=	8,31		indeed	1	0,7	generally	2	1,8	It is concluded t	1	1,1
SD=	14,43		The fact that	1	0,7	under those	1	0,9	now	1	1,1
			in spite of	1	0,7	in consequer	1	0,9	However, subse	1	1,1
			Even though	1	0,7	with regard t	1	0,9	meanwhile	1	1,1
			Contrary to	1	0,7	on this basis	1	0,9	in the first..	1	1,1
			on the contrary	1	0,7	the reason w	1	0,9	As a final result	1	1,1
			I mean	0	0,0	as a final res	1	0,9	first...then	1	1,1
			To tell you the truth	0	0,0	as a main co	1	0,9	this is the first r	1	1,1
			actually	0	0,0	the consequr	1	0,9	apart from the	1	1,1
			as a matter of fact	0	0,0	because with	1	0,9	as a result	1	1,1
				150	100,0	in this contex	1	0,9	To this end	1	1,1
						this at a reas	1	0,9	afterwards	1	1,1
			M=	5,36		hence	1	0,9	eventually	0	0,0
			SD=	8,45		consequently	1	0,9	to conclude witl	0	0,0
						under condit	1	0,9	in short	0	0,0
						somewhat	1	0,9		92	100,0
						otherwise	1	0,9			
						accordingly	0	0,0	M=	2,79	
						in effect	0	0,0	SD=	3,94	
						it follows	0	0,0			
							111	100,0			
						M=	2,92				
						SD=	2,85				
	SHARE RECURRENT DISCOURSE MARKERS IN NA&EJs										
***ADDITIVES**	***Occur***	**%**	**ADVERSATIVES**	***Occur***	**%**	**CAUSAL**	***Occur***	**%**	**TEMPORALS**	***Occur***	**%**
Also	60	51,7	but	37	33,9	thus	12	18,2	finally	22	34,4
in order to	19	16,4	however	27	24,8	therefore	8	12,1	after that	9	14,1
In addition	18	15,5	Although	16	14,7	because	8	12,1	first...next	7	10,9
Additionally	6	5,2	then	10	9,2	then	8	12,1	then	6	9,4
Besides	5	4,3	yet	8	7,3	for this reasc	6	9,1	in conclusion	5	7,8
Likewise	4	3,4	rather	5	4,6	so	6	9,1	first....second	4	6,3
Furthermore	4	3,4	even	4	3,7	currently	5	7,6	It was conclude	3	4,7
	116		nevertheless	2	1,8	because of tl	5	7,6	before that	3	4,7
				109		On the basis	5	7,6	later	3	4,7
M=	16,57					as a result	3	4,5	subsequently	2	3,1
SD=	18,73		M=	13,63			66			64	
			SD=	11,61							
						M=	6,6		M=	6,4	
						SD=	2,37		SD=	5,59	

Appendix 9. Discourse markers and verbs

A. Recurrent Cohesive means from the corpus of all disciplines

COHESIVE MEANS			
ADDITIVES	ADVERSATIVES	CAUSAL	TEMPORAL
Also	But	So	Then
In addition	Yet	Thus	First..., next
Furthermore	However	Hence	Afterwards
Besides	Instead	Therefore	After that
Similarly	On the other hand	Consequently	Subsequently
Likewise	Nevertheless	Accordingly	Previously
By contrast	At any rate	Because of this	Before that
For instance	As a matter of fact	For this reason	Later
In contrast	Rather	On this basis	Presently
Moreover	On the contrary	As a result	Meanwhile
Additionally	At least	In consequence	Finally
In order to	I mean	For	Eventually
Moreover	To tell you the truth	Then	First…, then
Additionally	Actually	Under those circumstances	First..., second
	In fact	Otherwise	In conclusion
	Although	Regarding this	To conclude with
	Though	In effect	In short
	Overall	Generally	More recently
	Then	For this	At the end
	Even though	Unfortunately	As a result
	Contrary to	In this context	Another
	Whereby	Because	To this end
	Indeed	Based on	Eventually
	The fact that	From this point	Apart from the conclusion
	Even	So that	In conclusion
		Currently	It was concluded that
		In consequence	
		Because	
		The reason why	
		As a final result,	
		As a main consequence	
		The consequences of	
		From this model	

B. Recurrent verbs per move taken from the corpus of all disciplines

MOVES	RECURRENT VERBS BY MOVE
Thematic focus	Be – Present – Increase – Show – Determine - Differ – Share – Ignore – Occupy -Argue – Opt – Have – Rank – Grow - Source – Find – Transfer – Constitute – Treat - Push – Achieve – Constrain – Reduce - Present – Need – Continue - Consist of - Attract
Background	Be – Count – Consist of – Have – Document – Argue -Rely on – Introduce – Increase – Know – Debate - Suggest – Require – Leave - Base – Construct – Transport – Use
Purpose	Present – Be – Generate – Identify – Make – Examine - Aimed – Seek – Purpose – Investigate – Consider – Vary – Expect – Describe – Contribute – Ask – Address – Evaluate – Gain – Compare - Understand – Determine – Explore – Focus – Perform – Characterize – Report – Develop – Quantify - Focus - Concentrate – Identify – Motivate – Present - Demonstrate – Calculate – Include - Extend – Address – Cause – Demonstrate
Method	Be – Use - Analyze – Correspond - Carry out – Participate – Have – Proceed – Select - Obtain – Use – Embed – Test – Set – Draw – Observe – Base – Utilize – Synthesize – Observe – Model – Conduct - Carry Out – Apply – Follow – Confirm – Survey –Study – Plant – Measure – Lead – Monitor – Develop - Fabricate – Form – Focus – Compare - Encapsulate – Include – Prepare – Test – Present – Study – Segment – Examine – Design – Create - Determine
Result	Show – Establish – Highlight - Carry out – Find – Resulted – Show – Demonstrate – Reveal – Identify – Estimate – Provide – Illustrate – Suggest - Consider – Indicate – Argue – Report – Support – Probe – Show – Increase – Detect – Determine – Reflect –Reduce – Define – Reflect – Have – Represent – Observe – Observe – Present – Drive – Base – Contain – Generate – Form – Illustrate – Suggest – Predict – Result – Allow – Detail – Introduce – Perform – Obtain
Conclusion	Suggest – Be – Determine – Highlight - Allow – Set out – Conclude – Provide – Suggest – Assume – Allow – Inform – Operate – Undermine – Provide – Indicate – Discuss – Achieve – Confirm – Demonstrate – Conclude – Test – Observe – Use –Present – Offer – Seem – Find – Look - Extend
Recommendation	Be – Suggest - May bring – Recommend – Consider – Limit

Appendix 10. Phraseological pattens to produce abstracts of research articles.

It presents scientific terms and phrases widely used in academic papers; these terms and phrases are aligned with those academically accepted by the research community. The following phraseological elements listed below have been included as an illustrative practice, which can be considered for writing either RAAs or extensive papers. In the phrases below, the content words (Xs and Ys, too) in red should be substituted when used.

Thematic Focus: This section announces the interest or importance of referring to the research study. It provides a brief synopsis of the relevance of the topic, indicating the appropriateness of the investigation.	
Phraseological patterns	
X agree that Y should __ X have shown that Y X draws on insights from achievement ___ X is used as a fundamental part of __ X is normally accomplished by X has become difficult __ X and Y are known to produce ___ X is important for the high used of X due to its characteristic is __ X constitute a critical component for __ X are increasingly common in Y. X play an underexamined role as __ A lack of X and Y persists in __ In spite of X and Y offer __ Today, X are simultaneously skeptical of __ In this study, X focus on the __ One of the most significant current discussions in legal and moral philosophy is __ X is an increasingly important area in applied linguistics. X has been studied by many researchers using __ Researchers have not treated X in much detail. Recently, researchers have shown an increased interest in __ Over the past decade, there has been an increasing interest in investigating __	An understanding of one's intention is __ This article contributes __ The gap in academic skills __ Recent work suggests the importance of ___ Little research currently examines ___ Recently, this contentious issue had __ but ___ However, this research largely ignores __ To date, however, scholars have __ Most studies examine X relationships Scholars have debated whether X The incorporation of X into Y has __ A fully dynamic model of X is presented The surface temperature of X with a Y increase. The data consists of many X that are usually __ Theorized links between X and Y confirm __ The authors argue that X is __ Investigating X is a continuing concern within __ Central to the entire discipline of X is the concept of __ X and Y have been an object of research since the 1960s. X is a major area of interest within the field of __ Recent developments in X have heightened the need for __ The past decade has seen the rapid development of X in many __ To date there has been liitle research on __
Background: This section introduces and tells readers selected and relevant research studies in the disciplinary field. It informs readers what has been already done or developed on the research topic as a whole.	
Phraseological patterns	
Numerous studies have examined how X can __ Previous studies of X have __ A new approach to X research on is __ Research shows that X, but we know little about __ There is little such research focusing on X __ Recent investigations with X have been carried out; __ Extensive analysis of X has been widely applied in __ X has been used in data centers for more than fifty years. Much of this research, however, has relied on __ Even though these X have been extensively studied, little __ However, research seldom examines whether results from X Although research on X has been developed, __ Much of the current literature on X pays particular attention to __ A considerable amount of literature has been published on X. These studies __ Most studies in X have only been carried out in a small number of areas.	There have been increasing demands and interests in X with Recent work on the X has __ Over the past few decades, X X is important for __ More recently, scholars have __ A significant body of research has addressed One uncharted line of research is ___ Much of what we know about __ Research over the last year __ Recent research suggests increasing __ however, __ Prior research has documented the influence of __ A large and growing body of literature has investigated __ There is a large volume of published studies describing the role of __ Previous studies have reported __ (e.g., Smith, 1985; Jones, 1987; Johnson, 1992). Recently investigators have examined the effects of X on Y. Numerous studies have attempted to explain __ (for example, Smith , 1996; Kelly, 1998; ….) Preliminary work on X was undertaken by Abdul Karim (1992). Several studies investigating X have been carried out on __

Over the past decade most research in X has emphasized the use of __ Factors thought to be influencing X have been explored in several studies.	
Objective: This section defines the main objective of the current study.	
Phraseological patterns	
For this study, the author examines __ The authors investigate __ To meet this need, the authors examined __ This has motivated us to systematically explore ___ The aim of the model is to study __ In this work, we quantify the __ In this paper, we demonstrate In this paper, we concentrate on __ In this paper, we address __ In this study, we performed the analysis of __ In this study, we analyze __ In this work, the main goal was to investigate __ Our work has focused on Our objective is to develop __ Our objectives were to ___ A study was conducted to evaluate the effect of __ It compared the effectiveness of ____ It seeks to understand how __ It explores whether the X served __ The purpose of this study is __ The purpose of this study is to explore __ The overall objective of this study was __ The objective of this research was __ The present work describes __ The present work identifies and evaluates __ The aim of this study was to clarify several aspects of __ The aim of this study is to investigate the differences between X and Y. The objectives of this research are to determine whether __ This study seeks to obtain data which will help to address these research gaps.	The objectives are to investigate __ The aim of this paper is __ The scope of the present study was __ The overall objective of this study was __ This paper presents the __ This investigation evaluates __ This study aims at addressing __ This paper analyzes __ This study reports quali-quantitative analyses on __ This paper presents the ___ This work studies the __ This article presents an analysis of __ This study explores how structural __ This study analyzes how __ This study identifies __ This study investigates how __ This article examines __ This paper describes the __ This article addresses __ This study considers how __ This study examines how This study compared __ This research explores the __ This study focused on the __ This article describes the study of __ The major objective of this study was to investigate __ The aim of this research project has therefore been to try and establish what __ This research examines the emerging role of X in the context of __ This thesis will examine the way in which the __
Methodology: This section describes the procedures, instruments, and materials used for the data analysis. Here, authors give an account of how they carried out their research to reproduce the results.	
Phraseological patterns	
We collected survey data from __ We draw on a subset of __ We examine several different materials: __ The analysis relies on social network data. To test these predictions, data from __ A multivariate ANOVA test (N = 502) was conducted. During the fall of 2010, X in Y were surveyed. Drawing on data from observations, __ Using survey data from X across Y schools, __ Using the X Longitudinal Study, __ Two groups of X were compared. Two different measures of X were __ In this investigation, the X was compared; __ X and Y were analyzed. X and Y were tested. X and Y analyses were carried out on __ X and Y were applied; __ Data were analyzed using __ Data consist of __ Data were collected from __ Data were gathered from multiple sources at various time points during __ The study uses qualitative analysis to gain insights into __	Data for the present investigation came from __ The authors use longitudinal studies; __ The method is based on __ This study uses data from __ This study uses data from __ This study draws on interviews; __ This study analyzes data from __ Using data from __ Using numerical simulations, __ Using a laboratory experiment, __ Using a data set of __ It analyzed data from a small __ It utilized a quasi-experimental design; __ Through a qualitative content analysis of __ A randomized complete block design was used; __ A microplot study was conducted; __ A laboratory test was carried out by __ Numerical simulations were carried out on __ Cluster analysis of cross-sectional data was __ Experiments were conducted in __ The design of the questionnaires was based on __ For this study, the X was used to explore the subsurface __ A random sample of patients with X was recruited from Y Two groups of subjects were interviewed, namely X and Y; the first group were __

The synthesis of X was done according to the procedure of Smith (1973). Forty-seven students studying X were recruited for this study. Criteria for selecting the subjects were as follows: __	Data for this study were retrospectively collected from __ The data were normalized using __
Results: This section outlines the important outcomes of the research study. Here, writers report the relevant or significant data that emerge from the analysis.	
Phraseological patterns	
The results suggest that __ The results indicate that __ The research reveals that __ The results of these studies have __ The results highlight several important variables; __ The analyses demonstrate that __ Results also showed that __ Results demonstrate the __ Results indicate that Results reported that Findings reveal how __ Findings indicate that __ Findings reveal that __ Overall, results reported the __ These analyses reveal that __ This case study indicates that __ A second experiment shows __ Differences were not detected among __ All results indicate that the effects of __ Regression analyses showed that __ Analyses of variance results provide evidence that __ Likewise, strong performance on was __ Additionally, several indirect effects were found; __ Results indicate X serve as __ No increase in X was detected. Overall, these results indicate that __ The current study found that __	Results based on the X showed __ Results from X showed that __ Greater X was noted on__ Total X was greater than __ Similarly, X significantly increased. Alternatively, X are found __ In particular, the small X results in __ The results of the X were then corroborated to find __ In the final part of the paper, validation results of the X are presented. Furthermore, the effects of X varied across __ This analysis identifies a structural source of X not considered in previous research. Two of these X were isolated and identified in __ Most of the X detected on Y were __ The quality of X and Y are shown. Similar and acceptable control of the X was obtained. Changes in the X and quality of Y indicate that __ When X and Y control were combined, 98% and 97% of __ Neither X date nor Y rate affected the __ In the X, however, the Y did not differ __ Stand count reduction of up to 71% was observed in __ It was found that __ We found a wide range of __ On average, X were shown to have __ A comparison of the two results reveals __ The most interesting finding was that __
Conclusions: This section summarizes the information content and the importance of the paper. Here, writers summarize the significance of the findings in the disciplinary field or for future research.	
Phraseological patterns	
The authors conclude that __ Generally, the highest levels were __ Data-driven policy implications are discussed. It was concluded that __ This study confirms that __ This contribution, I suggest __ This, in turn, allows __ This article argues that __ These data demonstrate that although each type of __ These results also are consistent with __ These findings are discussed with __ These results provide insights on __ These results demonstrate the promise of __ These findings can inform __ The study illustrates the potential for using data on ___ The results indicate a possible small competitive disadvantage associated with __ This paper has argued that __ This study has found that generally __ This work contributes to existing knowledge X by providing_ This study has discussed the reasons for __	The study further looks at implementing __ The findings in this case provide evidence that __ Contrary to the authors' expectations, __ Based on the results, it is expected that the suggested __ Multivariate analysis of the volatile data demonstrated that __ Results have important consequences for __ Thus, testing the effect of X did not __ Overall, the X approach developed extends the use of __ Finally, the impact of X resistance is considered. Focusing only on the subset of X, however, suggests that __ Although no strong correlation X and Y was observed, __ Based on the X and Y work, it is concluded that __ We discuss our findings in the context of __ We conclude by __ Based on our analysis, we conclude that __ These findings further support the idea of __ These results match those observed in earlier studies. This research extends our knowledge of __ The current findings add to a growing body of literature on__ The present study confirms previous findings and contributes additional evidence that __
Recommendations: This section suggests possible (pedagogical) applications for a particular purpose and for further studies.	
Phraseological patterns	

Our findings suggest that __ Findings suggest that __ Finally, this study suggests __ These practices may bring new __ Paired t-test results based on longitudinal data (n = 79) suggest that __ This information can be used to develop targetted interventions aimed at __ Moreover, more X should be made available to …. More information on X would help us to establish a greater degree of accuracy on this matter. It is recommended that further research be undertaken in the following areas: __ There is, therefore, a definite need for __ This research has thrown up many questions in need of further investigation.	This finding suggests that __ The results suggest __ Together, these results suggest that __ These results suggest that __ These results should provide important __ Early X are recommended for __ These findings suggest that in general …. Taken together, these findings support strong recommendations to __ These findings suggest several courses of action for __ There is, therefore, a definite need for __ A future study investigating X would be very interesting. Further investigation and experimentation into X is strongly recommended. It is suggested that the association of these factors is investigated in future studies.
Implications: This section points to linguistic implications and interpretation scope of the work for subsequent research.	
Phraseological patterns	
Findings imply that __ These results have implications for __ The authors discuss the implications; __ Implications for high-growth states are discussed: __ The findings from this study have implications for __ Implications of these findings are discussed; __ Findings highlight implications; __ Another important practical implication is that __ An implication of these findings is that both X and Y should be taken into account when __ The evidence from this study suggests that __ An implication of this is the possibility that __	Finally, representative dynamic results are also given to demonstrate __ This allowed to infer that the __ The transient model can simulate a variety of __ Many times, different X do not give the expected results. *For this reason,* it is___ Implications for X and Y are considered Implications for X and Y are discussed: __ There are a number of important changes which need to be made. The findings of this study have a number of important implications for future practice.

Source: Tovar (2020), taken and adapted from the original RAAs in NA&EJ and those of Morley (2014)

Appendix 11. Recurrent cohesive means in EJ vs NAJ

			RECURRENT DISCOURSE MARKERS IN ECUADORIAN JOURNALS								
***ADDITIVES**	***Occur***	**%**	**ADVERSATIVES**	***Occur***	**%**	**CAUSALS**	***Occur***	**%**	**TEMPORALS**	***Occur***	**%**
Also	28	41,8	but	13	24,5	for this	8	11,0	finally	12	22,2
in order to	18	26,9	however	8	15,1	thus	8	11,0	first...next	6	11,1
In addition	8	11,9	Although	6	11,3	therefore	6	8,2	after that	6	11,1
Additionally	5	7,5	then	5	9,4	for this reason	5	6,8	another	3	5,6
Besides	4	6,0	even	4	7,5	because	5	6,8	It was concluded that	3	5,6
Likewise	2	3,0	rather	3	5,7	then	5	6,8	before that	2	3,7
Furthermore	2	3,0	yet	3	5,7	currently	4	5,5	presently	2	3,7
By contrast	0	0,0	Though	2	3,8	based on	4	5,5	first....second	2	3,7
For instance	0	0,0	Whereby	2	3,8	so	4	5,5	in conclusion	2	3,7
for instance	0	0,0	on the other hand	2	3,8	because of this	3	4,1	A the end	2	3,7
in contrast	0	0,0	nevertheless	1	1,9	unfortunately	2	2,7	currently	2	3,7
Moreover	0	0,0	at any rate	1	1,9	From this ...	2	2,7	then	1	1,9
Similarly	0	0,0	in fact	1	1,9	so that	2	2,7	subsequently	1	1,9
	67	100,0	indeed	1	1,9	as a result	2	2,7	previously	1	1,9
			The fact that	1	1,9	under those circunstances	1	1,4	later	1	1,9
			Overall	0	0,0	in consequence	1	1,4	meanwhile	1	1,9
			Even though	0	0,0	with regard to this; here	1	1,4	in the first..	1	1,9
			Contrary to	0	0,0	on this basis	1	1,4	As a final result	1	1,9
			instead	0	0,0	the reason why	1	1,4	first...then	1	1,9
			as a matter of fact	0	0,0	as a final result	1	1,4	this is the first report	1	1,9
			on the contrary	0	0,0	as a main consequence	1	1,4	apart from the conclusion	1	1,9
			at least	0	0,0	the consequnces of	1	1,4	as a result	1	1,9
			I mean	0	0,0	because without this	1	1,4	To this end	1	1,9
			To tell you the truth	0	0,0	On the basis	1	1,4	afterwards	0	0,0
			actually	0	0,0	in this context	1	1,4	eventually	0	0,0
				53	100,0	this at a reason	1	1,4	to conclude with	0	0,0
						hence	1	1,4	in short	0	0,0
						consequently	0	0,0	More recently	0	0,0
						accordingly	0	0,0		54	100,0
						in effect	0	0,0			
						generally	0	0,0			
						otherwise	0	0,0			
						it follows	0	0,0			
							73	100,0			
			RECURRENT DISCOURSE MARKERS IN NORTH AMERICAN JOURNALS								
***ADDITIVES**	***Occur***	**%**	**ADVERSATIVES**	***Occur***	**%**	**CAUSALS**	***Occur***	**%**	**TEMPORALS**	***Occur***	**%**
Also	32	48,5	but	24	24,7	whereas	4	10,5	finally	10	26,3
In addition	10	15,2	however	19	19,6	thus	4	10,5	then	5	13,2
as well as	6	9,1	while	13	13,4	on the basis of	4	10,5	previously	3	7,9
whereas	3	4,5	Although	10	10,3	because	3	7,9	after that	3	7,9
in contrast	3	4,5	yet	5	5,2	then	3	7,9	In conclusion	3	7,9
Likewise	2	3,0	then	5	5,2	For	3	7,9	before these/the	2	5,3
Furthermore	2	3,0	Overall	4	4,1	because of	2	5,3	later	2	5,3
Moreover	2	3,0	rather than	4	4,1	so	2	5,3	first....second	2	5,3
Besides	1	1,5	instead	3	3,1	generally	2	5,3	first...next	1	2,6
Similarly	1	2	at least	3	3,1	therefore	2	5,3	afterwards	1	2,6
By contrast	1	1,5	rather	2	2,1	under similar conditions	2	5,3	subsequently	1	2,6
Additionally	1	1,5	nevertheless	1	1,0	otherwise	1	2,6	It is concluded that	1	2,6
In order to	1	1,5	Even though	1	1,0	under conditions of	1	2,6	before	1	2,6
If not all	1	1,5	on the contrary	1	1,0	for this reason	1	2,6	now	1	2,6
For instance	0	0,0	Contrary to	1	1,0	as a result	1	2,6	More recently	1	2,6
for instance	0	0,0	in spite of	1	1,0	currently	1	2,6	However, subsequent analysis	1	2,6
	66	100,0	at any rate	0	0,0	somewhat	1	2,6	presently	0	0,0
			as a matter of fact	0	0,0	consequently	1	2,6	meanwhile	0	0,0
			on the other hand	0	0,0	accordingly	0	0,0	eventually	0	0,0
			I mean	0	0,0	hence	0	0,0	first...then	0	0,0
			To tell you the truth	0	0,0	it follows	0	0,0		38	100,0
			actually	0	0,0	in consequence	0	0,0			
			in fact	0	0,0		38	100,0			
				97	100,0						

Raw data 2. Syntactic complexity indices in NA&EJ s (L2SCA Automatic Text Analyzer)

FILENAME	W	S	VP	C	T	DC	CT	CP	CN	MLS	MLT	MLC	C/S	VP/T	C/T	DC/C	DC/T	T/S	CT/T	CP/T	CP/C	CN/T	CN/C
EcuaNNES 1	6136	140	139	127	106	26	17	20	201	43,8286	57,8868	48,315	0,9071	1,3113	1,1981	0,2047	0,2453	0,7571	0,1604	0,1887	0,1575	1,8962	1,5827
EcuaNNES 2	6315	139	145	135	112	26	18	13	185	45,4317	56,3839	46,7778	0,9712	1,2946	1,2054	0,1926	0,2321	0,8058	0,1607	0,1161	0,0963	1,6518	1,3704
EcuaNNES 3	5985	138	140	139	110	27	13	14	199	43,3696	54,4091	43,0576	1,0072	1,2727	1,2636	0,1942	0,2455	0,7971	0,1182	0,1273	0,1007	1,8091	1,4317
TOTAL	18436	417	424	401	328	79	48	47	585	132,6299	168,6798	138,1504	2,8855	3,8786	3,6671	0,5915	0,7229	2,36	0,4393	0,4321	0,3545	5,3571	4,3848
AVERAGE (mean)	6145	139,000	141,333	133,667	109,333	26,333	16,000	15,667	195,000	44,210	56,227	46,050	0,962	1,293	1,222	0,197	0,241	0,787	0,146	0,144	0,118	1,786	1,462
SD	165,198	1,000	3,215	6,110	3,055	0,577	2,646	3,786	8,718	1,083	1,744	2,703	0,051	0,019	0,036	0,007	0,008	0,026	0,024	0,039	0,034	0,124	0,109

FILENAME	W	S	VP	C	T	DC	CT	CP	CN	MLS	MLT	MLC	C/S	VP/T	C/T	DC/C	DC/T	T/S	CT/T	CP/T	CP/C	CN/T	CN/C
SIgyNNES 1	6647	134	144	129	120	25	11	12	210	49,6045	55,3917	51,5271	0,9627	1,2	1,075	0,1938	0,2083	0,8955	0,0917	0,1	0,093	1,75	1,6279
SIgyNNES 2	6307	137	158	138	111	27	11	16	187	46,0365	56,8198	45,7029	1,0073	1,4234	1,2432	0,1957	0,2432	0,8102	0,0991	0,1441	0,1159	1,6847	1,3551
SIgyNNES 3	7195	129	150	134	107	25	11	13	204	55,7752	67,243	53,694	1,0388	1,4019	1,2523	0,1866	0,2336	0,8295	0,1028	0,1215	0,097	1,9065	1,5224
TOTAL	20149	400	452	401	338	77	33	41	601	151,4162	179,4545	150,924	3,0088	4,0253	3,5705	0,5761	0,6851	2,5352	0,2936	0,3656	0,3059	5,3412	4,5054
AVERAGE (mean)	6716	133,333	150,667	133,667	112,667	25,667	11,000	13,667	200,333	50,472	59,818	50,308	1,003	1,342	1,190	0,192	0,228	0,845	0,098	0,122	0,102	1,780	1,502
SD	448,042	4,041	7,024	4,509	6,658	1,155	0,000	2,082	11,930	4,927	6,470	4,133	0,038	0,123	0,100	0,005	0,018	0,045	0,006	0,022	0,012	0,114	0,138

FILENAME	W	S	VP	C	T	DC	CT	CP	CN	MLS	MLT	MLC	C/S	VP/T	C/T	DC/C	DC/T	T/S	CT/T	CP/T	CP/C	CN/T	CN/C
ElecNNES 3	6501	135	151	137	109	19	7	19	197	48,1556	59,6422	47,4526	1,0148	1,3853	1,2569	0,1387	0,1743	0,8074	0,0642	0,1743	0,1387	1,8073	1,438
ElecNNES 2	6386	146	135	139	113	27	13	21	200	43,7397	56,5133	45,9424	0,9521	1,1947	1,2301	0,1942	0,2389	0,774	0,115	0,1858	0,1511	1,7699	1,4388
ElecNNES 1	6722	130	160	138	102	30	14	19	194	51,7077	65,902	48,7101	1,0615	1,5686	1,3529	0,2174	0,2941	0,7846	0,1373	0,1863	0,1377	1,902	1,4058
TOTAL	19609	411	446	414	324	76	34	59	591	143,603	182,0575	142,1051	3,0284	4,1486	3,8399	0,5503	0,7073	2,366	0,3165	0,5464	0,4275	5,4792	4,2826
AVERAGE (mean)	6536	137,000	148,667	138,000	108,000	25,333	11,333	19,667	197,000	47,868	60,686	47,368	1,009	1,383	1,280	0,183	0,236	0,789	0,106	0,182	0,143	1,826	1,428
SD	170,764	8,185	12,662	1,000	5,568	5,686	3,786	1,155	3,000	3,992	4,781	1,386	0,055	0,187	0,065	0,040	0,060	0,017	0,037	0,007	0,007	0,068	0,019

FILENAME	W	S	VP	C	T	DC	CT	CP	CN	MLS	MLT	MLC	C/S	VP/T	C/T	DC/C	DC/T	T/S	CT/T	CP/T	CP/C	CN/T	CN/C
AgroNNES 1	7383	148	164	152	121	24	10	19	222	49,8851	61,0165	48,5724	1,027	1,3554	1,2562	0,1579	0,1983	0,8176	0,0826	0,157	0,125	1,8347	1,4605
AgroNNES 2	7084	124	125	127	106	22	11	9	173	57,129	66,8302	55,7795	1,0242	1,1792	1,1981	0,1732	0,2075	0,8548	0,1038	0,0849	0,0709	1,6321	1,3622
AgroNNES 3	7095	156	178	170	128	30	14	23	224	45,4808	55,4297	41,7353	1,0897	1,3906	1,3281	0,1765	0,2344	0,8205	0,1094	0,1797	0,1353	1,75	1,3176
TOTAL	21562	428	467	449	355	76	35	51	619	152,4949	183,2764	146,0872	3,1409	3,9252	3,7824	0,5076	0,6402	2,4929	0,2958	0,4216	0,3312	5,2168	4,1403
AVERAGE (mean)	7187	142,667	155,667	149,667	118,333	25,333	11,667	17,000	206,333	50,832	61,092	48,696	1,047	1,308	1,261	0,169	0,213	0,831	0,099	0,141	0,110	1,739	1,380
SD	169,542	16,653	27,465	21,595	11,240	4,163	2,082	7,211	28,885	5,882	5,701	7,023	0,037	0,113	0,065	0,010	0,019	0,021	0,014	0,049	0,035	0,102	0,073

FILENAME	W	S	VP	C	T	DC	CT	CP	CN	MLS	MLT	MLC	C/S	VP/T	C/T	DC/C	DC/T	T/S	CT/T	CP/T	CP/C	CN/T	CN/C
EduNES 1	7862	155	179	163	127	32	25	31	277	50,7226	61,9055	48,2331	1,0516	1,4094	1,2835	0,1963	0,252	0,8194	0,1969	0,2441	0,1902	2,1811	1,6994
EducNES 3	8380	160	171	160	128	33	22	33	258	52,375	65,4688	52,375	1	1,3359	1,25	0,2062	0,2578	0,8	0,1719	0,2578	0,2062	2,0156	1,6125
EducNES 2	8166	167	177	168	129	40	21	41	281	48,8982	63,3023	48,6071	1,006	1,3721	1,3023	0,2381	0,3101	0,7725	0,1628	0,3178	0,244	2,1783	1,6726
TOTAL	24408	482	527	491	384	105	68	105	816	151,9958	190,6766	149,2152	3,0576	4,1174	3,8358	0,6406	0,8199	2,3919	0,5316	0,8197	0,6404	6,375	4,9845
AVERAGE (mean)	8136	160,667	175,667	163,667	128,000	35,000	22,667	35,000	272,000	50,665	63,559	49,738	1,019	1,372	1,279	0,214	0,273	0,797	0,177	0,273	0,213	2,125	1,662
SD	260,300	6,028	4,163	4,041	1,000	4,359	2,082	5,292	12,288	1,739	1,795	2,291	0,028	0,037	0,026	0,022	0,032	0,024	0,018	0,039	0,028	0,095	0,045

FILENAME	W	S	VP	C	T	DC	CT	CP	CN	MLS	MLT	MLC	C/S	VP/T	C/T	DC/C	DC/T	T/S	CT/T	CP/T	CP/C	CN/T	CN/C
SIgyNES 2	8530	214	220	205	155	45	28	47	359	39,8598	55,0323	41,6098	0,9579	1,4194	1,3226	0,2195	0,2903	0,7243	0,1806	0,3032	0,2293	2,3161	1,7512
SIgyNES 3	8574	218	234	215	157	55	27	51	401	39,3303	54,6115	39,8791	0,9862	1,4904	1,3694	0,2558	0,3503	0,7202	0,172	0,3248	0,2372	2,5541	1,8651
SIgyNES 1	8704	212	226	200	148	46	25	41	350	41,0566	58,8108	43,52	0,9434	1,527	1,3514	0,23	0,3108	0,6981	0,1689	0,277	0,205	2,3649	1,75
TOTAL	25808	644	680	620	460	146	80	139	1110	120,2467	168,4546	125,0089	2,8875	4,4368	4,0434	0,7053	0,9514	2,1426	0,5215	0,905	0,6715	7,2351	5,3663
AVERAGE (mean)	8603	214,667	226,667	206,667	153,333	48,667	26,667	46,333	370,000	40,082	56,152	41,670	0,963	1,479	1,348	0,235	0,317	0,714	0,174	0,302	0,224	2,412	1,789
SD	90,473	3,055	7,024	7,638	4,726	5,508	1,528	5,033	27,221	0,884	2,313	1,821	0,022	0,055	0,024	0,019	0,030	0,014	0,006	0,024	0,017	0,126	0,066

FILENAME	W	S	VP	C	T	DC	CT	CP	CN	MLS	MLT	MLC	C/S	VP/T	C/T	DC/C	DC/T	T/S	CT/T	CP/T	CP/C	CN/T	CN/C
ElecNES 1	7235	126	120	117	89	28	14	25	191	57,4206	81,2921	61,8376	0,9286	1,3483	1,3146	0,2393	0,3146	0,7063	0,1573	0,2809	0,2137	2,1461	1,6325
ElecNES 2	7376	152	155	152	119	28	12	20	237	48,5263	61,9832	48,5263	1	1,3025	1,2773	0,1842	0,2353	0,7829	0,1008	0,1681	0,1316	1,9916	1,5592
ElecNES 3	7589	166	172	162	123	33	17	32	262	45,7169	61,6992	46,8457	0,9759	1,3984	1,3171	0,2037	0,2683	0,741	0,1382	0,2602	0,1975	2,1301	1,6173
TOTAL	22200	444	447	431	331	89	43	77	690	151,6638	204,9745	157,2096	2,9045	4,0492	3,909	0,6272	0,8182	2,2302	0,3963	0,7092	0,5428	6,2678	4,809
AVERAGE (mean)	7400	148	149	143,667	110,333	29,667	14,333	25,667	230,000	50,555	68,325	52,403	0,968	1,350	1,303	0,209	0,273	0,743	0,132	0,236	0,181	2,089	1,603
SD	178,216	20,298	26,514	23,629	18,583	2,887	2,517	6,028	36,014	6,110	11,231	8,214	0,036	0,048	0,022	0,028	0,040	0,038	0,029	0,060	0,043	0,085	0,039

FILENAME	W	S	VP	C	T	DC	CT	CP	CN	MLS	MLT	MLC	C/S	VP/T	C/T	DC/C	DC/T	T/S	CT/T	CP/T	CP/C	CN/T	CN/C
AgroNES 1	7428	143	152	138	110	23	15	30	233	51,9441	67,5273	53,8261	0,965	1,3818	1,2545	0,1667	0,2091	0,7692	0,1364	0,2727	0,2174	2,1182	1,6884
AgroNES 3	8014	143	175	150	116	32	18	26	251	56,042	69,0862	53,4267	1,049	1,5086	1,2931	0,2133	0,2759	0,8112	0,1552	0,2241	0,1733	2,1638	1,6733
AgroNES 2	7662	139	147	133	103	20	10	16	204	55,1223	74,3883	57,609	0,9568	1,4272	1,2913	0,1504	0,1942	0,741	0,0971	0,1553	0,1203	1,9806	1,5338
TOTAL	23104	425	474	421	329	75	43	72	688	163,1084	211,0018	164,8618	2,9708	4,3176	3,8389	0,5304	0,6792	2,3214	0,3887	0,6521	0,511	6,2626	4,8955
AVERAGE (mean)	7701	141,667	158,000	140,333	109,667	25,000	14,333	24,000	229,333	54,369	70,334	54,954	0,990	1,439	1,280	0,177	0,226	0,774	0,130	0,217	0,170	2,088	1,632
SD	294,973	2,309	14,933	8,737	6,506	6,245	4,041	7,211	23,714	2,150	3,597	2,308	0,051	0,064	0,022	0,033	0,044	0,035	0,030	0,059	0,049	0,095	0,085

Mined data 2. Syntactic complexity components in abstracts of NA&EJ

SYNTACTIC COMLEXITY INDICES								
TEXTS	EducNNG	SlgyNNG	ElecNNG	AgroNNG	EducNG	SlgyNG	ElecNG	AgroNG
INDICES	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*
MLS	44.210	50.472	47.868	50.832	50.665	40.082	50.555	54.369
MLT	56.227	59.818	60.686	61.092	63.559	56.152	68.325	70.334
MLC	46.0501	50.308	47.368	48.696	49.738	41.670	52.403	54.954
C/S	0.962	1.003	1.009	1.047	1.019	0.963	0.968	0.990
VP/T	1.293	1.342	1.383	1.308	1.372	1.479	1.350	1.439
C/T	1.222	1.1902	1.280	1.261	1.279	1.348	1.303	1.280
DC/C	0.197	0.192	0.183	0.169	0.214	0.235	0.209	0.177
DC/T	0.241	0.228	0.236	0.213	0.273	0.317	0.273	0.226
T/S	0.787	0.845	0.789	0.831	0.797	0.714	0.743	0.774
CT/T	0.146	0.098	0.106	0.099	0.177	0.174	0.132	0.130
CP/T	0.144	0.122	0.182	0.141	0.273	0.302	0.236	0.217
CP/C	0.118	0.102	0.143	0.110	0.213	0.224	0.181	0.170
CN/T	1.786	1.780	1.826	1.739	2.125	2.412	2.089	2.088
CN/C	1.462	1.502	1.428	1.380	1.662	1.789	1.603	1.632
W	6145	6716	6536	7187	8136	8603	7400	7701
S	139	133	137	143	161	215	148	142
VP	141.333	150.667	148.667	155.667	175.667	226.667	149.000	158.000
C	133.667	133.667	138.000	149.667	163.667	206.667	143.667	140.333
T	109.333	112.667	108.000	118.333	128.00	153.333	110.333	109.667
DC	26.333	25.667	25.333	25.333	35.000	48.667	29.667	25.000
CT	16.000	11.000	11.333	11.667	22.667	26.667	14.333	14.333
CP	15.667	13.667	19.667	17.000	35.000	46.333	25.667	24.000
CN	195	200	197	206	272	370	230	229

Note: ***NNG***= *It represents abstracts in Ecuadorian journals*
NG= *Iit represents abstracts in North American journals)*
Edu= *abstracts in the education discipline;* ***Slgy***= *abstracts in the sociology discipline*
Elec= *abstracts in the electronics discipline;* ***Agro***= *abstracts in the agronomy discipline*

Syntactic Complexity indices				Syntactic structures	
MLS	Mean length of sentence	**DC/T**	Dependent clause per T-unit	**W**	Word count
MLT	Mean length of T-unit	**T/S**	T-unit per sentence	**S**	Sentence
MLC	Mean length of clause	**CT/T**	Complex T-unit ratio	**VP**	Verb phrase
C/S	Clause per sentence	**CP/T**	Coordinate phrase per T-unit	**T**	T-unit
VP/T	Verb phrase per T-unit	**CP/C**	Coordinate phrase per clause	**DC**	Dependent clause
C/T	Clause per T-unit	**CN/T**	Complex nominal per T-unit	**CT**	Complex T-unit
DC/C	Dependent clauses per clause	**CN/C**	Complex nominal per clause	**CP**	Coordinate phrase
				CN	Complex nominal