

Reflexive metadiscourse in research articles in Spanish: Variation across three disciplines (Linguistics, Economics and Medicine)



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Received 7 November 2013; received in revised form 11 December 2014; accepted 15 December 2014

Abstract

This corpus-driven study focuses on reflexive metadiscourse, taking the non-integrative approach to the study of this phenomenon (Mauranen, 1993a; Ädel, 2006; Toumi, 2009). The aim of this research project was to compare the deployment of reflexive metadiscourse in research articles from three disciplines (Medicine, Economics and Linguistics) written in Spanish, by looking at the occurrence of certain lexico-grammatical features that signal it. In this mixed-methods study, which combines quantitative and qualitative results, the findings were derived from a close manual analysis of 238 recent empirical RAs from Spanish-medium journals indexed in Web of Science (the MEL-2011 corpus). The results indicate that scientific writers from Economics and Medicine employ significantly fewer metadiscourse markers than their counterparts in Linguistics. There are also statistically significant differences between the three corpora in terms of several functional categories: self-mentions, relational markers, directives, discourse verbs, and code glosses. This suggests that this scientific genre varies greatly in terms of the manner and the extent to which scholarly writers from different disciplines are expected to signal their authorial presence, interact with their audience and guide the reader.

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Keywords: Reflexive metadiscourse; Research articles; Spanish; Scholarly writing; Reflexive model

1. Introduction

Writing research papers is not reduced to a mere objective presentation of empirical findings. As Becher (1989) notes, the subject who writes in a discipline possesses a metaknowledge that enables him/her to handle, among other things: (1) implicit conventions regarding the conception of science or the application of the scientific method in their respective discipline, (2) specific discursive codes concerning how disciplinary knowledge is presented and the establishment of authority and (3) textual formulas designed to establish distance from or support other research within the discipline. Thus, writing in a particular discipline implies that the writer is aware of a number of aspects that make up the specific culture of their “academic tribe” and that go beyond the actual investigative skills such a scientist may possess. All aspects mentioned by Becher (1989) are related to the rhetoric that is characteristic of particular discourses of various scientific disciplines.

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Reflexive metadiscourse, or discourse reflexivity (Mauranen, 2010), is a feature of scientific prose. This discourse about the ongoing discourse (thus, its reflective nature) includes at least three aspects (Ädel, 2006): (1) how scholarly writers refer to themselves, (2) how they relate and speak to their audience, and (3) how they refer to their own texts. The first one involves the phenomenon of self-reference or explicit self-mentions by the author. In this respect, some studies of research articles (RAs henceforth) written in English have shown that in some disciplines it is customary for authors to use first-person pronouns (singular and plural) to refer to themselves, while in others a more impersonal style is favored (Hyland, 2005; Fløttum et al., 2006b), while some studies which have focused on English–Spanish intercultural or interlinguistic variation (Carciu, 2009; Sheldon, 2009; Williams, 2010; Lorés-Sanz, 2011a) have found differences between English L1 and Spanish L1 scientific writers in terms of the deployment of self-reference markers. The second aspect is related to the existence of relational markers, for example, directives and inclusive “we” of engagement through which the authors explicitly establish a relationship with the reader. Regarding this point, it has been pointed out that scientific writers across cultures and disciplines use directives at a different extent and with different purposes (Swales et al., 1998; Taki and Jafarpour, 2012) and the use of inclusive “we” varies greatly across disciplines (Harwood, 2005) and languages (Lafuente-Millán, 2013; Diani, 2014; Vassileva, 2014). The third aspect is realized through the use of metatext or textual clues left by the author in order to guide the reader through RAs. In relation to the latter, studies have shown that in terms of the use of metatext, English scientific prose is usually more friendly to the reader than its counterpart written in other languages, such as German (Siepmann, 2006), Finnish (Mauranen, 1993b), Norwegian (Fløttum et al., 2006b) or Spanish (Valero-Garcés, 1996). That is, scientists writing in English tend to pave over the route through the text to their readers. This is achieved through the inclusion of lexical–grammatical resources, for example, code glosses, endophoric markers (also known as previews and reviews), text connectives or connectors, action markers. Cross-disciplinary (Hyland, 2007; Pooresfahani et al., 2012) and cross-linguistic (Mauranen, 1993b; Valero-Garcés, 1996; Moreno, 1997; Blagojevic, 2004) studies, as well as some which take a doubly contrastive approach (Dahl, 2004; Fløttum et al., 2006b; Zarei and Mansoori, 2007), have found evidence of variation regarding the deployment of these metatextual features.

Evidence is mounting that the research article as a scientific genre varies greatly across disciplines in terms of metadiscourse markers (Myers, 1989; Hyland, 1998, 1999a,b, 2000, 2001, 2002, 2004, 2005; Hyland and Tse, 2004, 2005; Lindeberg, 2004; Fløttum et al., 2006a,b; Mur Dueñas, 2003; Dahl, 2008; Afros and Schryer, 2009; Bruce, 2009; Afros and Schryer, 2009; Abdi, 2011; Keshavarz and Kheirich, 2011; Khedri et al., 2013). There is also some evidence of interdisciplinary variation in scientific prose in Spanish (Beke, 2005; Cubo de Severino, 2005; Müller, 2007; Bolívar et al., 2010). Müller (2007) and García Negroni (2008), in particular, focus their study on cross-disciplinary variation of metadiscourse in research articles. However, both studies are limited by the use of qualitative methods and small corpora, which does not allow for the findings to be generalizable.

The aim of this study is to compare how the RAs of Linguistics, Economics and Medicine written in Spanish signal the presence of their authors and their interaction with the readers. These three disciplines have been chosen on account of the observation made by some authors (Fløttum et al., 2006a,b; Silver, 2006) that they are representative of the three main branches of science: humanities, social sciences and natural sciences, respectively. Assuming that each of these branches exhibits different epistemological traditions and research methodologies, that is different understandings of what qualifies as scientific knowledge and of how science is done (Tosi, 2010; Abdi, 2011), it seems reasonable to expect that the writers of RAs from these three disciplines would realize differently their identity as authors in their scientific texts (Flowerdew, 2013).

I believe that the relevance and novelty of this research project lies in the fact that it is, to the best of my knowledge, the first mixed-methods study of variation of metadiscourse (MD) across disciplines which uses a relatively large corpus of scientific texts written in Spanish (238 RAs). Likewise, there are a number of implications and applications of this study. First, the findings may contribute to a better understanding of how the different linguistic systems, cultures and disciplinary communities interact and influence the rhetorical choices made by scientific writers. Second, the proposed taxonomy of metadiscourse markers for scholarly writing in Spanish can make a contribution towards the semi-automatic interrogation of large corpora of Spanish texts. Third, and in terms of pedagogical implications, an inventory of metadiscursive markers may facilitate the modeling of this genre in pre-graduate and graduate composition programs in Spanish-medium universities, as well as the teaching of academic writing in SAP (Spanish for academic purposes) courses. Finally, it may be useful to authors of academic writing manuals.

The aim of this paper is to establish what kind of relationship is established between the writer, the text and the readership in Spanish RAs across three distinct disciplines, and how this is shown in lexico-grammatical choices, which is accomplished using the reflexive metadiscourse model.

The research questions of the study are as follows:

1. What are the lexico-grammatical features which signal metadiscourse in research articles written in Spanish from three disciplines (Medicine, Economics and Linguistics)? How can they be grouped?

2. Are there statistically significant differences between the three corpora of RAs in terms of the rate of occurrence of metadiscursive features?

In the following, a description of the framework used in this study will be presented in Section 2. Section 3 provides a description of the MEL (Medicine, Economics and Linguistics) 2011 corpus. The general findings are presented in Section 4, where Sections 4.1 and 4.2 present the metadiscursive categories which emerged from the data analysis, whereas Section 4.3 deals with a discussion of the quantitative results. Section 5 presents the discussion of the results. The findings will be summarized and conclusions drawn in Section 6.

2. Metadiscourse

At the risk of vastly oversimplifying the complexity of this area of research, it is possible to identify two main traditions in the study of metadiscourse. On the one hand, there is one that uses a broad definition, in which textual interaction is seen as the defining feature of metadiscourse. On the other hand, there is the one which uses a narrow definition and puts reflexivity in the central place. The first tradition has been labeled as “integrative” (Mauranen, 1993a) or “interactive model” (Ädel, 2005), while the second has been called “non-inclusive” (Mauranen, 1993a) or “non-integrative” (Ädel and Mauranen, 2010).

One difference between the two approaches has to do with the linguistic phenomena which are considered properly metadiscursive. The broad definition of metadiscourse (e.g. Vande Kopple, 1985; Crismore, 1989; Markkannen et al., 1993; Luuka, 1994; Bunton, 1999; Dafouz-Milne, 2003; Mauranen, 2004; Hyland, 2005; Infantidou, 2005) embraces a broad range of linguistic categories, such as connectors, hedges and boosters, and evaluation or stance. None of these phenomena is considered metadiscursive in the narrow approach (Mauranen, 1993a; Ädel, 2006; Toumi, 2009).

Most of the metadiscourse models that have been proposed (Vande Kopple, 1985; Crismore, 1989; Markkannen et al., 1993; Luuka, 1994; Bunton, 1999; Dafouz-Milne, 2003; Mauranen, 2004; Hyland, 2005; Infantidou, 2005; Ädel, 2006; Toumi, 2009, *inter alia*) subscribe to a functionalist paradigm of language. On this point, it is worth noting that the term functionalist is used *sensu lato*, that is, the aforementioned models generally refer to how language works so its users can achieve certain communicative purposes (Hyland, 2005; Ädel, 2006). However, the term functionalistic does not always mean the same thing. Most integrative and non-integrative models are functionalist in the sense that they draw on Halliday’s (1970) metafunctional hypothesis. But while some researchers propose that metadiscourse serves both interpersonal and textual functions (e.g. Vande Kopple, 1985; Crismore, 1989; Markkannen et al., 1993; Luuka, 1994; Dafouz-Milne, 2003; Hyland, 2005; Infantidou, 2005), others argue that it only covers the textual function (e.g. Bunton, 1999; Dahl, 2004; Valero-Garcés, 1996; Moreno, 1997, 2004; Peterlin, 2005). And the proponents of reflexive models of metadiscourse (i.e. Mauranen, 1993a; Ädel, 2006; Toumi, 2009), which fit into the non-integrative or narrow approach, consider all metadiscourse as interpersonal but are functionalist in a different sense.

The present study is in line with the reflexive model of metadiscourse (Mauranen, 1993a; Ädel, 2006; Toumi, 2009), which is based on Jakobson’s (1985) functional model of language. The Jakobsonian model identifies six functions of language: metalinguistic (code/text), expressive (addresser), conative or directive (addressee), referential (context), poetic (message), and phatic (contact). However, only three of these functions are in focus in metadiscourse expressions, namely the metalinguistic, the expressive, and the directive (Ädel, 2006; Toumi, 2009). Their corresponding components of the speech event are the text/code, the writer, and the reader. With regard to reflexive metadiscourse, every metadiscursive instance focuses on one or more of these speech events. In this paper, reflexive metadiscourse is understood as

[...] the cover term for the self-reflexive expressions used by the writer to negotiate meaning in a text. It is the writer’s explicit commentary on his/her own ongoing text. It marks the writer’s awareness of the current text as text or as language, of him/herself as writer, and of the potential reader as reader of this text. Metadiscourse supports propositional content, but remains separate from it. It is the means by which propositional content is made coherent, legible and persuasive to the reader in accordance with the writer’s intentions (Toumi, 2009:66).

2.1. The reflexive model of metadiscourse (Ädel, 2006)

Ädel (2006:16) defines metadiscourse as “text about the evolving text, or the writer’s explicit commentary on her own ongoing discourse.” This concept covers two dimensions: “metatext” and “writer-reader interaction.” The former alludes to “reflexive linguistic expressions referring to the evolving text *per se* or its linguistic form” and the latter to “references to the writer persona and the imagined reader *qua* writer and reader of the current text” (Ädel, 2005:154).

According to [Ädel \(2006\)](#), metadiscourse exhibits four characteristic properties. First, it is a fuzzy category whose delimitation has proved to be elusive. Second, it is a functional category in the sense that its realization at the lexicogrammatical level can be instantiated by a wide range of forms and structures. Third, metadiscursive expressions may be multifunctional, that is, they can serve several linguistic functions simultaneously. And fourth, it is context-dependent, that is to say, in order to decide if a lexicogrammatical device is carrying out a metadiscursive function or not, the co-text must be closely inspected.

The reflexive model introduces four features for identifying metadiscourse:

1. Explicitness (based on [Mauranen, 1993a](#)) the requirement that the reference to the world of discourse be overtly stated.
2. World of discourse: the focus must be on the ongoing discourse rather than on other, 'worldly', activities or phenomena that are external to the text.
3. The current text (based on [Mauranen, 1993a](#)): metadiscourse material must refer to the current text rather than other texts, which corresponds to intertextuality.
4. Speaker-writer *qua* speaker-writer and audience *qua* audience (in the case of personal metadiscourse): A linguistic unit counts as metadiscourse only if it refers to the producer and receiver of the text in their roles as discourse participants, that is, in the world of discourse (as opposed to real people in the real world).

Considering the four criteria above, stance (or evaluation) is excluded from metadiscourse and is considered a neighboring but distinct category: "Unlike metadiscourse, stance is not self-reflexive language; it does not involve the metalinguistic function" ([Ädel, 2006:40](#)). And although there is some overlap between the two concepts (in both, speech participants are central components), metadiscourse connects the writer and the reader with the current text or with the world of discourse, while stance also connects them with the real world.

[Ädel \(2006\)](#) contends that using Roman [Jakobson's \(1985\)](#) theory to delineate the boundaries of this concept has several advantages over the interactive metadiscourse model ([Crismore, 1989; Hyland, 2005](#)), among which are: (1) it circumvents the problem of addressing the propositional element in metadiscourse, (2) the concept becomes less decontextualized with the inclusion of both the writer and the reader, and (3) reflexivity takes a leading role.

As regards the decision to draw on [Ädel's \(2006\)](#) reflexive model of metadiscourse, there are two important considerations. First of all, this model achieves a high degree of theoretical rigor by proposing clear criteria to circumscribe a fuzzy concept as metadiscourse, delimiting its scope and separating it from other phenomena, such as evaluation/stance, mitigation and attribution. And, secondly, by highlighting the reflexive nature of metadiscourse, as opposed to its alleged non-propositional content, the main objections to the concept of metadiscourse ([Mauranen, 1993a; Sinclair, 2005](#)) are avoided. Several scholars have noted the fact that a single metadiscursive marker may carry out two or more functions simultaneously: referential and expressive, metalinguistic and directive, and so on (e.g. [Crismore, 1989; Mauranen, 2003; Ädel, 2005; Hyland, 2005](#), *inter alia*).

Previous studies have reported contradictory results regarding the frequency of metadiscursive markers in scholarly articles. Both [Ädel \(2006\)](#) and [Pérez-Llantada \(2010\)](#) report that their quantitative data shows that "the amount of metadiscourse material is very limited compared to the amount of propositional, expository material" ([Pérez-Llantada, 2010:60](#)). In contrast, other authors have reported a higher occurrence of metadiscourse features. For example, in the quantitative analysis of his study, [Hyland \(1998\)](#) found an average of 373 metadiscourse occurrence per paper, roughly one every 15 words. [Cubo de Severino \(2005\)](#) claims metadiscourse material has an occurrence of 5% or 6%, and [Hernández Guerra \(2008\)](#) reports that between 3.36% and 4.77% of the words in Economics research articles are metatextual.

This discrepancy can be explained in part by the choice of framework. While [Ädel \(2006\)](#) and [Pérez-Llantada \(2010\)](#) take the non-integrative approach to metadiscourse ([Ädel, 2006](#)), the rest of the authors draw on the integrative approach to metadiscourse ([Hyland, 2005](#)). This model includes categories such as connectors, evidentials, hedges, boosters and attitude markers. In contrast, and as mentioned above, [Ädel's \(2006\)](#) reflexive model delimits the scope of metadiscourse leaving out other phenomena such as attribution (citations to other sources), evidentiality (use of hedges and boosters) and evaluation (expression of stance or attitude). Given the differences in delimitation of metadiscourse categories, it is not surprising that these studies report such differences in the frequency of metadiscourse material.

The reflexive model identifies two types of metadiscourse: personal and impersonal. It is worth noting that this division is not theoretical, but merely tries to account for two types of realizations at the surface level of the text. Personal metadiscourse makes direct reference to the writer and/or reader of the current text, either by pronouns (i.e. I, we, you) or nouns (e.g. the writer, dear reader). This explicit reference is to the current discourse participants as discourse participants, that is, the reader and the writer in their discursive roles of writer or imagined reader respectively. This implies that, in terms of deployment of the first person singular pronouns, the only tokens which are considered metadiscursive are those which refer to the writer presenting himself as a writer, rather than as a human being in the real world. A similar

approach is applied to the occurrences of first person plural pronouns. In contrast, impersonal metadiscourse does not make explicit reference to the discourse participants. This can be achieved by using passives and various impersonal constructions. Non-explicit metadiscourse expressions are still interpreted as being expressed and intended by the writer of the current text.

2.2. Metadiscourse in research articles written in Spanish

As previously stated, there is ample evidence that the research article written in English varies greatly across disciplines in terms of metadiscourse markers (Myers, 1989; Hyland, 1998, 1999a,b, 2000, 2001, 2002, 2004, 2005; Hyland and Tse, 2004, 2005; Lindeberg, 2004; Fløttum et al., 2006a,b; Mur Dueñas, 2003; Dahl, 2008; Afros and Schryer, 2009; Bruce, 2009; Afros and Schryer, 2009; Abdi, 2011; Keshavarz and Kheirich, 2011; Khedri et al., 2013). In contrast, there is not enough evidence at present to support the same claim regarding scientific prose in Spanish (Beke, 2005; Cubo de Severino, 2005; Müller, 2007; García Negroni, 2008; Bolívar et al., 2010). One reason for this is that a large part of the studies of metadiscourse in scholarly writing in Spanish have taken a cross-cultural (Spanish–English), rather than an interdisciplinary perspective (Valero-Garcés, 1996; Moreno, 1997, 1998, 2004; Mur Dueñas, 2003, 2007, 2011; Martínez, 2005; Carciu, 2009; Sheldon, 2009; Pérez-Llantada, 2010; Williams, 2010; Lorés-Sanz, 2011a,b; Murillo, 2012, inter alia). Only a handful of studies which have included RAs written in Spanish have combined a double perspective, cross-disciplinary and cross-cultural (Vázquez et al., 2006; Lafuente-Millán et al., 2010; Lorés-Sanz, 2011a).

While there have been several studies conducted to investigate metadiscourse in research articles written in Spanish (Valero-Garcés, 1996; Moreno, 1997, 1998, 2004; Beke, 2005; Cubo de Severino, 2005; Müller, 2007; Mur Dueñas, 2003, 2007, 2011; García Negroni, 2008; Carciu, 2009; Sheldon, 2009; Aguirre, 2010; Bolívar et al., 2010; Pérez-Llantada, 2010; Williams, 2010; Lorés-Sanz, 2011a, 2011b; Murillo, 2012), they are not exhaustive in that they do not usually apply a whole model but focus on some particular features.

Within the context of contrastive rhetoric, Moreno (1997, 2004) has studied various metadiscursive mechanisms employed by writers from two areas of the social sciences (Business and Economics) in a corpus of 36 articles written in Spanish and 36 in English. Beke (2005) analyzes interpersonal metadiscourse (Hyland, 2005) in a corpus of 15 articles in a Spanish-medium journal (*Revista de Pedagogía*). Cubo de Severino (2005) carries out a comparative analysis of the use of metadiscourse, similar to Hyland (1999b), applied to a corpus of 10 chapters from university textbooks and 10 research articles from Applied Linguistics. Meanwhile, Bolívar et al. (2010) compare and contrast the lexico-grammatical realizations of stance in two disciplines from the humanities through a comprehensive analysis of one research article from Psychology and one from Philosophy. In another study which draws on contrastive rhetoric, Pérez-Llantada (2010) compares two sections of a corpus of RAs (144 Introductions and 144 Discussion sections) in the discipline of Biomedicine written in English and Spanish.

In this growing body of literature, only the studies conducted by Müller (2007) and García Negroni (2008) have focused on interdisciplinary variation in relation to the use of metadiscourse mechanisms. Müller (2007) examines metadiscursive functions of modality modifiers introduced by ‘*como*’ in scientific discourse from four different disciplines (Archeology, Science, Geography and Linguistics), but because of its qualitative methodology and small corpus (20 exemplars), its results cannot be generalized. García Negroni (2008) explores subjectivity markers in research articles from four different disciplines, which include Medicine and Linguistics. This study has two limitations with respect to corpus design criteria. First, the author fails to specify how many exemplars make up the four subcorpora, only the number of words in each (e.g. Medicine, 32.337 and Linguistics, 36.425). Furthermore, the articles from Linguistics have a single author while the ones from Medicine have several authors. While articles in other disciplines, especially Medicine, tend to be multiple-authored, the lack of uniformity regarding the number of authors per article hinders the comparability of her findings.

3. Corpus description and procedure

In this exploratory-descriptive study of metadiscourse in scientific prose written in Spanish, I adopted a Type B design (Biber and Jones, 2009:1298) in which the unit of analysis is each individual text and the goal is to “examine differences between texts and text categories”. In the present study, rates of occurrence for metadiscursive markers were established across texts. The study comprised two phases: an exploratory stage in which 33% of the texts were analyzed in order to identify metadiscursive categories, and a corroborating stage in which the remainder of the texts (67%) were analyzed in order to test the hypothesis that there are statistically significant differences in the use of metadiscursive markers across the three subcorpora of RAs.

For the analysis, I compiled a corpus of RAs written in Spanish in three disciplines, namely, Linguistics, Economics and Medicine. As it was not feasible to have access to all the RAs published in these disciplines both in print and digital

versions, the MEL-2011 corpus can be characterized as incidental (Polgar and Thomas, 2000) or “opportunistic” (Teubert and Čermáková, 2004:120; Leech, 2007). In other words, we only included RAs in online format (HTML or PDF), as they are more easily accessible. Additionally, all the articles which were included complied with the following external criteria (Biber, 2004) in order to guarantee *tertium comparationis* (Connor, 2004:292), that is, “a common platform of comparison or shared similarity between texts”:

- They were published in Spanish-medium journals indexed in Thomson ISI.
- They had to be written directly in Spanish. Translations were excluded (as judged from the authors’ names and/or institution affiliation; when in doubt, authors were contacted).
- They had a single author.
- They were empirical. Theoretical discussions, literature reviews and methodological proposals were excluded.
- They had been published between January 2005 and January 2010.

Regarding the choice of single-authored articles, while it is not customary in certain disciplines (especially Medicine), this was essential to ensure that all plural form realizations of self-mentions were, in fact, metadiscursive. Previous studies (Moreno, 1997, 1998, 2004; Pérez-Llantada, 2010) have found that the use of the metadiscursive “we” or “our” (known in Spanish as “nosotros del autor” or “nosotros de modestia”) is more prevalent in Spanish prose than in English.

With reference to the Spanish-medium journals (see Appendix 1 for the full list) and the authors who publish in them, it must be acknowledged that they come from different cultural backgrounds (Spain, Chile, Mexico, Venezuela, etc.). However, this study sets out to examine inter-disciplinary variation, not inter-cultural or dialectal variation in RAs written in Spanish. Consequently, the nationality of the scholars was not tracked nor considered in the analysis.

As for the internal characteristics of our corpus, the articles were analyzed in their entirety, that is, the full text, with all sections (including appendixes, footnotes and endnotes), except references, tables and figures. Raw frequencies of tokens of the different metadiscourse markers in the whole RAs were counted. Since the number of words was not evenly distributed in the three sub-corpora, the data were normalized. So, in the remainder of the paper, unless stated otherwise, all the rates correspond to relative frequencies of the metadiscursive features which were studied. Table 1 shows the details of the corpus used for this study (see Appendix 1 for the list of Spanish-medium journals). The choice of convenience sampling, mentioned above, explains the uneven distribution of texts in each of three subdisciplines.

Despite the fact that in this study I draw on Ádel’s (2006) framework, I used a top-down and bottom-up approach in the exploratory phase of the investigation in that I did not start my analysis with an openly stated taxonomy of watertight categories. Rather, I arrived at the taxonomy of metadiscursive markers that I propose from observations of the actual authentic linguistic data, by carefully and manually annotating the 238 RAs that make up the MEL-2011 corpus. It is noteworthy that, with few exceptions (e.g. Fuertes-Olivera et al., 2001; Dafouz-Milne, 2003; Mur Dueñas, 2011), most of the studies of metadiscourse in Spanish have adopted Hyland’s (2005) taxonomy in its entirety and without modification. This can be brought up as a disadvantage due to the fact that it was proposed for English and it should not be assumed that the same metadiscursive features exist in Spanish.

In the exploratory phase, 33% of the RAs ($N=85$) were manually annotated in order to identify tokens of metadiscourse markers. Manual annotation, as opposed to an automatic search, was chosen because of the nature of the phenomenon. Metadiscourse has been characterized as both a fuzzy and functional category (Hyland, 2005; Ádel, 2006). This meant that in order to decide if a lexico-grammatical device was carrying out a metadiscursive function, Ádel’s (2006) criteria (see Section 2.1) were used and the co-text was closely examined.

As a result of the exploratory phase, eight broad categories of metadiscourse emerged from the data (for the complete list, see Sections 4.1 and 4.2, or Appendix 2): three of personal metadiscourse (PMD henceforth) and five of impersonal metadiscourse (IMD henceforth). These eight broad categories can be further disaggregated into twenty, as some of them have several realizations at the lexico-grammatical level. These 20 disaggregated categories were used as search items in the corroborating stage, where the rest of the articles (67%) were also manually annotated. An intra-rater reliability test, which reached 92.7%, was conducted by repeating the identification and categorisation of these units a month after the

Table 1
Description of the MEL-2011 corpus.

Sub-corpus	Number of texts per discipline	Number of words	Mean number of words per article
Linguistics	93	706.529	7.469
Economics	79	694.199	8.984
Medicine	66	223.972	3.338
	Total: 238	Total: 1.624.700	

initial categorisation. Contextual clues were used and my two dissertation supervisors were consulted in an attempt to resolve cases of overlap between some micro-level discourse functions. In order to further enhance reliability, two computational tools were used in the corroborating stage, namely, El Grial (www.elgrial.cl), a tagger and parser especially designed for the interrogation of corpora in Spanish (Parodi, 2010), and AntConc (www.antlab.sci.waseda.ac.jp/software.html), which allowed for the identification of metadiscursive clusters (Anthony, 2004).

As regards counting metadiscourse units, I followed Ädel's (2006) method, which consists of counting each linguistic unit (e.g. pronoun, verb, endophoric phrase, etc.) within a clause or sentence as a separate occurrence of metadiscourse. As an example, in the sentence: “*A continuación describimos los datos utilizados en este trabajo*” (Here we describe the data used in this work), I count 3 metadiscursive units, namely “*a continuación*” (endophoric marker), “*describimos*” (self-mention realized through the verbal system using a first-person plural ending) and “*este trabajo*” (reference to the text/code).

4. Findings

4.1. Personal metadiscourse markers

From the analysis of the micro corpus (i.e. 33% of the RAs), three major functional categories of Personal Metadiscourse emerged, namely (1) self-mentions (SM), (2) relational markers (RM) and (3) references to the participants (REFP). The first group, self-mentions (SM), is subdivided into two main groups: self-mentions realized by means of the pronominal system (i.e. first person singular/plural pronouns) (SMPS) and self-mentions realized by means of the verbal system (SMVS). As Spanish is a pro-drop language, this means that the personal pronoun is elided and the self-mention is realized in the verbal ending.

In order to be consistent with the criteria of explicitness and world of discourse stated above (see Section 2.1), only discourse verbs (Hyland, 2000) were considered in the analysis. I use this label as an umbrella term that encompasses all the following verb classifications which have been proposed in the literature and which may serve a metadiscursive function:

- Verba dicendi (e.g. denominar, afirmar, decir, señalar, enunciar, etc.).
- Verbs of visual perception (Müller, 2007) (e.g. ver, notar, observar, advertir, etc.).
- Research verbs (Fløttum et al., 2006a,b), which refer to the action or activities directly related to the research process (e.g. analizar, asumir, considerar, examinar, encontrar, estudiar, etc.).
- Verbs referring to processes involving verbal or graphical representation (Hyland, 2000) (e.g. describir, ilustrar, ejemplificar, presentar, exponer, resumir, etc.).
- Verbs related to text structuring and the guiding of the reader (Hyland, 2000) (e.g. comenzar con, enfocarse en, centrarse en, explorar o abordar (un problema o temática), regresar (sobre este punto), etc.).
- Position verbs (Fløttum et al., 2006a,b) or persuasive verbs (Biber, 1988) (e.g. postular, aseverar, sostener, argumentar, plantear, argüir, rechazar, objetar, hacer hincapié, recalcar, etc.).
- Cognition verbs (Hyland, 2002) or private verbs (Biber, 1988) (e.g. creer, pensar, asumir, interpretar, analizar, concluir, hipotetizar, etc.).

The complete list of discourse verbs which emerged from the manual annotation of the texts can be found in Appendix 3.

As regards the second sub-category of Personal Metadiscourse, namely, relational markers (RM), we found two lexico-grammatical realizations which are subsumed under this label. The first mechanism corresponds to personal directives (PDIR), which refers to first-person plural imperative forms (e.g. *analicemos, consideremos, supongamos, observemos, recordemos, tomemos como ejemplo, pongamos como ejemplo, veamos un ejemplo, no olvidemos, pensemos*, etc.). The second lexico-grammatical realization of RMs is the use of verbs with first person plural ending with an inclusive purpose (INCN), which are used by the writer to engage the reader (e.g. *en el ejemplo que acabamos de ver, tenemos, observamos, comparamos, logramos*, etc.). In many cases, these verbs are part of a conditional clause and are preceded by the word “if” (e.g. *si agregamos... podemos...; si las comparamos, hacemos...; si relacionamos... observamos... etc.*). In these cases, the producer of the text asks the reader to imagine hypothetical scenarios in their “shared world of discourse” (Ädel and Mauranen, 2010:46). In Spanish, this form has been claimed to serve an associative function (Montero-Fleta et al., 2004).

Finally, the third subgroup of Personal Metadiscourse markers that emerged from the data consists of all references to the participants (REFP) of the communicative act. The category references to the author (REFA) includes all references to the producer of the text (e.g. *el autor agradece... traducción del autor, las traducciones son de la autora, el autor es investigador responsable, ... son responsabilidad exclusiva del autor, se pueden solicitar al autor, la versión en inglés*

puede ser obtenida del autor, el autor de este ensayo/artículo, etc.). On the other hand, the references to the reader (REFR) category includes all references to the receiver of the discourse (e.g. *recomendamos al lector interesado visitar . . . , los lectores interesados en pormenores de la metodología . . . , a los que quieren hacerse una idea aproximada de . . . les refiero a la bibliografía de . . . , etc.*).

4.2. Impersonal metadiscourse markers

From the micro corpus analysis, five major functional categories of Impersonal Metadiscourse emerged, namely: (1) references to the text/code (REFC), (2) impersonal self mentions through discourse verbs (ISM), (3) impersonal directives (IDIR), (4) endophoric markers (END), and (5) code glosses (CG). Regarding the first category, it can be further subdivided into three types of references to the code: references to the full text (REFT), references to parts of the text (REFPT) and references to other semiotic modes (REFOSM), specifically images. Examples of references to the text markers (REFT) are *trabajo*, *artículo*, *ensayo* and *comunicación*. References to parts of the text (REFPT) encompass any mention of a section of text (*acápite*, *apartado*, *epígrafe*, *apéndice*, *resultados*, *pies de página*) made by the author. Finally, reference to other semiotic modes (REFOSM) corresponds to the allusions made by the author to the images which appear in the text including tables, graphs and figures (e.g. *el Cuadro 1 ofrece información del porcentaje de empresas, la estadía hospitalaria de los pacientes que se presenta en la Figura 3, en el segundo panel de la gráfica 1 se muestra el comportamiento del diferencial salarial 50-10, el siguiente gráfico muestra por porcentajes los distintos modos de representación del tabú de la muerte en el corpus, etc.*).

As for the use of impersonal self mentions (ISM), it was found that the authors of the three disciplines use discourse verbs in four impersonal forms, namely: (1) Passive forms with “se impersonal” (PSI) (e.g. *se describe*, *se debe recalcar*, *se señaló*, etc.), (2) Passive forms with “be” and no agent (PSNA) (e.g. *atendiendo a lo expuesto en párrafos anteriores, si bien lo establecido anteriormente, todos estos trabajos mencionados intentan de un modo u otro describir un uso que a primera vista aparece como caótico o caprichoso*, etc.), (3) verbal periphrasis (IDVVP) in which the main verb is a verbum dicendi or another discourse verb (e.g. *conviene precisar*, *puede argumentarse*, *es importante recalcar*, *vale la pena precisar*, etc.) and (4) nominalization (IDVN) (e.g. *En los casos en que el análisis no presenta ninguna complicación me limito a la exposición del mismo, mención especial se debe hacer sobre la cohorte hipotética de la figura, en el apartado 2 de este trabajo sobre [. . .] se presenta una explicación más detallada sobre esta cuestión, la propuesta concreta es que los tiempos verbales en castellano son en realidad formas lingüísticas de significado modal y/o evidencial, los comentarios se centran en el período más reciente, la anterior aseveración muestra no solo la importancia de las decisiones de política, una prueba sencilla a favor de este planteamiento*, etc.).

The third category of Impersonal Metadiscourse, impersonal directives (IDIR), is considered a subtype of relational marker (RM) (Hyland, 2005), but unlike the two categories of relational markers mentioned before (PDIR, personal directives, and INCN, inclusive “nosotros”), in the case of impersonal directives, the writer is suggesting a course of action to the reader, who is addressed obliquely. In the MEL (Medicine, Economics and Linguistics) 2011 corpus, this metadiscursive function may take one of the following realizations at the lexico-grammatical level: (1) verbs in the imperative mood which deploy “se impersonal”, (e.g. *véase*, *obsérvese*, *considérese*, *nótese*, *recuérdese*, *téngase en cuenta*, *supóngase*, *advuértase*, *añádase*, *compárese*, *consúltase*, *piénsese*, etc.), (2) other verb forms, such as modal verbs and periphrasis, which imply a command or suggestion (e.g. *consultar*, *observar*, *recordar*, *se puede ver*, *se puede consultar*, *puede verse*, *puede encontrarse*, *sería bueno ver*, *debe recordarse*, etc.), and (3) the abbreviation of an imperative form in Latin which means either confront/compare (e.g. *Cfr.*, *cf.*) or see (e.g. *Vid.*, *V.*, *v.*).

The fourth category corresponds to endophoric markers (END), also known as phorics (Ädel, 2006). Hyland (1998) defines endophoric markers as those linguistic expressions which serve the function of pointing or signaling, either anaphorically or cataphorically, to other sections of the text which is being read or written. In this sense, they can be compared to traffic lights in that they help readers navigate through the text (Ädel, 2006). The complete list of endophoric markers which emerged from the corpus can be found in Appendix 4. These are subdivided into the following groups: (1) anaphorics, if they point backward in the text (e.g. *previo(a)*, *anteriormente*, *arriba*, etc.), (2) cataphorics, if they point forward in the text, (e.g. *posteriormente*, *más abajo*, *más adelante*, etc.) (3) a group of phorics which function as deictics, in the sense that they point to what is being said at that precise moment or place in the written text (e.g. *ahora*, *aquí*, *he aquí*, *(el/la) presente*, etc.), and (4) a last group of phorics which does not fit into any of the other categories (e.g. *a lo largo de*, *durante todo*, *en el transcurso de*, etc.).

The last category of Impersonal Metadiscourse corresponds to code glosses (CG) (Vande Kopple, 1985; Hyland, 2005; Ädel, 2006). Vande Kopple (1985) defines code glosses as those linguistic expressions which assist the reader in understanding and interpreting the meaning of words, phrases and idiomatic expressions or the specific sense of a particular element in the text (e.g. *es decir*, *o sea*, *esto es*, *en otras palabras*, etc.). These devices reformulate, explain, define or clarify the sense of a term. The complete list of code glosses which was found in the corpus is available in Appendix 4.

4.3. Quantitative analysis

Here, I will present the results of the quantitative analysis, which aimed to determine whether there were statistically significant differences between the three corpora of RAs in terms of the rate of occurrence of the lexicogrammatical features that signal personal and impersonal metadiscourse. Comparisons between the three subcorpora were made using non-parametric signed rank tests (Kruskal–Wallis and Wilcoxon Test) as many of the distributions were not normal.

First, as regards the overall average relative frequency of Metadiscourse (MD), the results, as shown in Table 2, indicate that in Linguistics there is an average of 11 metadiscourse markers per 1000 words (corresponding to 1%), whereas in Economics and Medicine there is an average of 7.7 metadiscourse markers per 1000 words (0.7%). To compare these frequencies, a Kruskal–Wallis test was used, which showed a significant difference between the 3 groups of data ($p = 0.000$).

Further statistical tests (Wilcoxon, Mann–Whitney U , Z-test for two proportions) revealed that the Linguistics subcorpus is the one which is statistically different from the other subcorpora. The Wilcoxon test did not show any significant differences between the Medicine and the Economics corpora. The results obtained from the Wilcoxon test can be compared in Table 3.

If we now turn to Personal Metadiscourse (MDP) in particular and compare its distribution between the three disciplines, the result is similar. That is, the differences are statistically significant only between the Linguistics subcorpus, which exhibits a higher average of occurrences of personal metadiscursive markers, and the other two corpora, as can be seen from Table 4 below.

Turning now to the specific case of Impersonal Metadiscourse (IMD), the same can be observed. As shown in Table 5, the Linguistics subcorpus exhibits significantly more IMD markers than the other two subcorpora.

The single most striking observation to emerge from the data comparison was the consistency of the results concerning the overall metadiscourse (MD) frequencies and its two variants (PMD and IMD). In all three cases, the Linguistics subcorpus differs markedly from the other two corpora, while the frequencies in the medicine and economics RAs are consistently similar. Contrary to expectations, this study did not find a significant difference between the Economics and the Medicine subcorpora. Other studies (e.g. Fløttum et al., 2006a,b) have reported an unequal exploitation of these devices across RAs from the three disciplines written in English, French and Norwegian. A possible explanation for this might be that linguists, unlike their counterparts in the other two disciplines, are more aware of the use of metalanguage, due to their disciplinary knowledge. This would explain why they deploy a higher rate of metadiscourse devices. This finding may also be interpreted as evidence of a “cooperative side of rhetorical discourse” (Fløttum et al., 2006a:21) which, in Spanish, would be particular of the field of linguistics. Possibly due to their epistemological orientation

Table 2
Total frequency of metadiscourse markers.

	Corpus size in words	Raw frequency	Frequency per 1000 words
Linguistics	706.529	947	11
Economics	694.199	878	7.71
Medicine	223.972	161	7.75

Table 3
Results of the Wilcoxon test for metadiscourse (MD).

MD	LING (11.99) and ECO (7.71)	$p = 0.00000711$	Statistically significant differences
MD	LING (11.99) and MED (7.75)	$p = 0.0000007$	Statistically significant differences
MD	ECO (7.71) and MED (7.75)	$p = 0.62$	Statistically non-significant differences

Table 4
Results of the Wilcoxon test for personal metadiscourse (PMD).

PMD	LING (4.94) and ECO (2.94)	$p = 0.0008245$	Statistically significant differences
PMD	LING (4.94) and MED (3.06)	$p = 0.001021$	Statistically significant differences
PMD	ECO (2.94) and MED (3.06)	$p = 0.5742$	Statistically non-significant differences

Table 5
Results of the Wilcoxon test for Impersonal Metadiscourse (IMD).

MDI	LING (7.05) and ECO (4.76)	$p = 0.003921$	Statistically significant differences
MDI	LING (7.05) and MED (4.68)	$p = 0.008411$	Statistically significant differences
MDI	ECO (4.76) and MED (4.68)	$p = 0.6441$	Statistically non-significant differences

Table 6
Comparison of PMD and IMD frequencies per discipline.

	PMD mean	IMD mean	<i>P</i> value	Are there statistically significant differences?
Linguistics	4.942	7.056	0.00785	Yes
Economics	2.948	4.768	0.000007	Yes
Medicine	3.060	4.689	0.00013	Yes

Table 7
Relative frequencies of personal metadiscourse (PMD) categories (see Appendix 2 to read the labels). The three aggregated categories are in bold.

	SMPSSG	SMP SPL	SMVSSG	SMV SPL	SMs	PDIR	INCN	RMs	REFPs
LING	0.13305	1.09301	0.50560	2.07450	2.58010	0.11048	0.97942	1.09789	0.03879
ECON	0.08512	0.47190	0.31931	1.70250	2.02182	0.08023	0.21565	0.29589	0.07554
MED	0.00565	1.41237	0.04615	1.15706	1.20321	0	0.20307	0.20307	0.22624

and the disciplinary community expectations, linguists construct an appropriate discursive ethos by frequently signaling their presence in their writing (even when switching between personal and impersonal forms), by overtly interacting with their readers and by openly providing the reader with numerous signposts throughout the text.

Another interesting finding was the fact that the writers from all three disciplines deploy significantly more IMD markers than PMD ones. Table 6 shows the results of the Wilcoxon test.

Similarly, there are statistically significant differences between the three subcorpora in the frequencies of all the PMD subcategories, with the exception of the following three: (1) the “Yo” pronoun ($p = 0.226$) as a marker of self mentions realized through the pronominal system using a first-person singular ending (SMPSSG), (2) the “Nosotros” (NTOS) pronoun ($p = 0.065$) as a marker of self mentions realized through the pronominal system using a first-person plural ending (SMP SPL), and (3) the references to the Reader (REFR) ($p = 0.402$). This result may be explained by the fact that all three of these PMD markers had a very low occurrence in the MEL-2011 corpus as can be seen from Table 7 below (the three relevant categories are in bold).

Unlike what happens in the case of PMD, Table 8 shows that there are statistically significant differences between the three subcorpora in all the Impersonal Metadiscourse (IMD) categories.

The results obtained from the analysis of the MEL-2011 corpus are presented in Fig. 1. The complete list of labels in English for the categories which emerged from this study is available in Appendix 2.

As shown in Fig. 1, there are statistically significant differences between the three subcorpora in the eight aggregated categories and in nineteen disaggregated categories out of a total of 22 (for details of the three disaggregated categories in which there is no variation, see Table 7 above).

Regarding the presence of the author, data from Fig. 1 shows that the three disciplines vary greatly in the deployment of self mentions realized by means of the pronominal system, especially those self mentions which are realized through

Table 8
Relative frequencies of impersonal metadiscourse (IMD) categories (see Appendix 2 to read the labels).

	REFC	ISMs	IDIR	END	CG
LING	1.896	0.151	0.497	1.594	0.864
ECO	2.968	0.153	0.689	2.259	0.568
MED	2.422	0.049	0.023	0.714	0.288

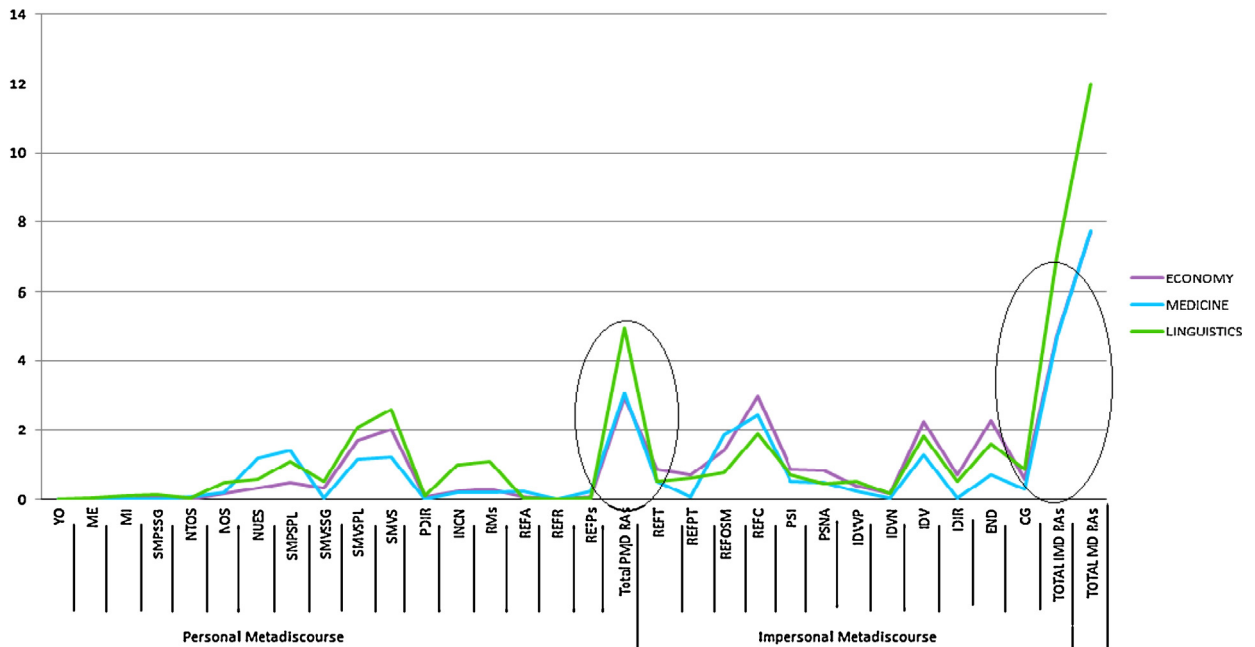


Fig. 1. Results of the analysis of the MEL-2011 corpus.

the use of first-person plural endings (SMPSPL). Linguists used substantially more SMPSPL (4 markers per 1000 words) than economists (2.8) and medical doctors (0.8). Thus, linguists are found to have a higher level of writer visibility than their counterparts in the other two disciplines.

As regards self mentions realized by means of the verbal system, which includes those using first-person singular endings (SMVSSG) and those using first-person plural endings (SMVSPL), there are no statistically significant differences between Economics (0.31 and 1.70, respectively) and Linguistics (0.50 and 2.07, respectively), whereas Medicine RAs exhibit a lower occurrence of these PMD markers (0.04 and 1.15, respectively). Despite the fact that the RAs are single-authored, the three groups of scientific writers show a clear preference for self mentions through the use of discourse verbs with first-person plural endings (SMVSPL) over the other three options. In the case of linguistics, this result confirms those of Sheldon (2009), who found that most of the self mentions of her corpus of Spanish RAs in Applied Linguistics and Language Teaching were realized through first-person plural forms embedded in the verb conjugation. It seems possible that these results are due to modesty, a trait valued in Spanish-speaking scientific discourse (García Negroni, 2008; Sabaj et al., 2013), which contributes to position scientific writers in relation to their discourse community as aligned with values, such as objectivity and neutrality. It could also be argued that this signals a “culturally imbricated tendency to favor involvement and in-groupness” (Mur Dueñas, 2011:3074), rather than individuality and self-promotion. This also raises the question of whether scientists writing in Spanish are members of the same or different disciplinary community or tribe (Becher, 1989) as those writing in English, since it has been argued that self-promotion is a feature of scholarly writing in English (Hyland, 2001).

Finally, the data does not show a clear tendency towards personal forms at the expense of impersonal forms. In fact, there are no statistically significant differences between the aggregated category of impersonal discourse verbs (IDV) and self mentions through the verbal system using first-person plural (SMVSPL) in any of the three disciplines. This means that across the three disciplines, scientific authors tend to intersperse in the same text direct self-presentation with more oblique self mentions, as the italicized parts of the following examples show. The fact that there are not statistically significant differences between SMVSPL, SMVS and IDVs may also be interpreted as a signal of the Spanish preference for stylistic variation (at a lexical but also at a syntactic level).

- (1) Contabilidad aditiva. Hemos destacado ya la linealidad del VAN en su valoración de bienes. Como es conocido, esta linealidad significa en una función de utilidad una disposición a sustituir los bienes que considere a tasas constantes entre sí (ECON, Zurita, 2005).

[Accounting additive. We have already highlighted the linearity of NPV valuation of goods. As is known, this linearity means a utility function a provision to replace the goods at constant rates to consider each other]

- (2) La racionalidad de este criterio es muy conocida, pero *me permito repetirla* en virtud de la importancia del argumento en el análisis que sigue (ECON, Zurita, 2005).
 [The rationale for this approach is well known, but *let me repeat it* in view of the importance of the argument in the following analysis]
- (3) En la tabla siguiente *se exponen* las frecuencias correspondientes a cada uno de los países (LING, Hurtado González, 2009).
 [In the following table the frequencies corresponding to each of the countries *are shown*]
- (4) En cambio, en Bolivia, *como ya hemos adelantado*, el perfecto compuesto ha desplazado, asumiendo sus contenidos funcionales, al perfecto simple (LING, Hurtado González, 2009).
 [In contrast, in Bolivia, *as we have already mentioned*, the perfect compound has shifted, assuming its functional content, the simple perfect]
- (5) En la tabla III *se presenta* la comparación de medias por grupos (MED, López-Olmos, 2005).
 [In table III, the comparison of group means *is presented*]
- (6) Entonces apunté la idea para un trabajo de la medida de la longitud vaginal, sólo por curiosidad científica, y esa idea quedó aparcada años, hasta poder llevar a cabo este estudio prospectivo de un año y un análisis multivariante que ahora *presentamos* (MED, López-Olmos, 2005).
 [Then I wrote down the idea of a study on vaginal length measurement, only for the sake of scientific curiosity, and that idea was filed away for years, until we were able to carry out this prospective study of a year and the multivariate analysis that *we present* here]

Turning now to writer–reader interaction, it can be seen from the data in Fig. 1 that there is cross-disciplinary variation, particularly by observing the frequencies of the aggregated category of relational markers (RMs). The prose in the RAs written by linguists exhibits a much more explicit interaction with the reader. They use 1.09 relational markers per 1000 words, while economists (0.29) and medical doctors (0.20) barely interact with their readers by means of personal directives (examples 7–8) or the inclusive “nosotros” (examples 9–11). In fact, there are no occurrences of personal directives in the Medicine subcorpus.

- (7) *Supongamos* ahora que las dos aseguradoras escogen una comisión común de manera que maximizan la suma de sus ganancias (ECON, Medrano, 2008).
 [Let us suppose now that the two insurers choose a joint commission so that maximize the sum of their earnings]
- (8) *Recordemos* que los procesos transitivos son o medios o efectivos, de manera que el mismo verbo no puede realizar un proceso medio y uno efectivo, lo que queda confinado a los verbos del sistema ergativo (LING, Arús, 2006).
 [Let us recall that transitive processes are either middle or effective, so that the same verb cannot carry out both at the same time, which is confined to verbs belonging to the ergative system]
- (9) *Si resolvemos* el sistema de ecuaciones para la tasa de crecimiento económico *obtenemos* (ECON, Guerrero de Lizardi, 2006).
 [If we solve the system of equations for the rate of economic growth *we obtain*. . .]
- (10) *Si nos fijamos* en la estructura formal del cuantificador dentro de una expresión nominal del tipo de ‘Todo niño quiere un coche de carreras’, *veremos* que el cuantificador liga una variable individual introducida por el nombre ‘niño’ (LING, Rodríguez Ramalle, 2005).
 [If we look at the formal structure of the quantifier within a nominal expression of the type . . . , *we will see* that the quantifier binds an individual variable introduced by the name ‘niño’]
- (11) *Si observamos* la tasa cruda, la mortalidad fue en aumento (exceptuando el primer período 1984–1987) (MED, Marinovich, 2009).
 [If we look at the crude rate, mortality was increasing (except during the first period 1984–1987)]

These results confirm those of Sheldon (2009) and Valero-Garcés (1996). Sheldon (2009) also reports a high frequency of inclusive “nosotros” in articles written by linguists, which signals a high level of writer responsibility (Hinds, 1987),

while Valero-Garcés (1996) claims that texts written in Spanish by economists exhibit fewer explicit references to the broader content, and signal the unfolding text less explicitly.

Finally, in relation to the deployment of metatext, there is also cross-disciplinary variation. Medical articles tend to exhibit the lowest frequencies in several categories which realize it. In the references to the code (REFC) category (examples 12–14), economists are the ones who rely more heavily on them (2.96), in contrast with medical doctors (2.42) and linguists (1.89). This result may be explained by the fact that Economy RAs in the MEL-2011 corpus exhibit the greatest mean length (see Table 1), which may require the deployment of metatextual devices to assist readers in the tracking of information throughout the text, as it has been found to be the case in Economy RAs written in Norwegian (Fløttum et al., 2013). It may also be speculated that Economy authors writing in Spanish, as those writing in English, consider metatext more useful for the intelligibility and clarity of a longer text (Peterlin, 2005).

- (12) *En esta sección se analiza con más detalle algunas consecuencias teóricas de los resultados hallados y, en particular, se hace hincapié en los efectos que presentan la incertidumbre de estas variables en las tasas de crecimiento del PIB real y las tasas de inflación (ECON, Lanteri, 2005).*
 [This section discusses in more detail some theoretical implications of the results found and, in particular, emphasizes the effects of the uncertainty of these variables on the growth rates of real GDP and inflation rates]
- (13) *En el siguiente apartado 1 se presentan las bases teóricas en las que se sustenta este trabajo; a continuación, en el apartado 2, se detallan las unidades que se analizan [. . .] (LING, López, 2006)*
 [In the next section 1 the theoretical basis on which this paper is based are presented; then in Section 2, the units that were analyzed are listed]
- (14) *En el Cuadro 1 se observan los modelos ARIMA estudiados con la estrategia de avance descrita en Métodos (MED, Rodríguez, 2008).*
 [Table 1 shows the ARIMA models studied with the progress strategy described in the Methods section]

The same is apparent in relation to the deployment of code glosses (CG), with medical doctors being the ones who use them the least (0.28), followed by economists (0.56), and linguists (0.86) being the ones who use them more substantially (see examples 15–17 below).

- (15) *Asimismo, el cambio en la distribución de tamaños de la industria española se debe sobre todo al “efecto tamaño”, es decir, en la mayoría de las actividades productivas ha tenido lugar un aumento de la participación de los establecimientos pequeños (ECON, Villalba, 2005).*
 [Also, the change in the size distribution of the Spanish industry is due mainly to the “size effect”, that is, in most productive activities has been an increased participation of small establishments]
- (16) *Esta gradación tiene un comportamiento fractal, lo que quiere decir que se replica al interior de cada uno de los términos del sistema (LING, Gutiérrez, 2008).*
 [This gradation has a fractal behavior, which means that it replicates itself within each of the terminals of the system]
- (17) *Ninguno tuvo síndrome carcinoide ni de Zollinger-Ellison y todos dieron manifestaciones clínicas similares a los adenocarcinomas gástricos, esto es, los pacientes cursaron con pérdida de peso, ataque al estado general, vómito y hemorragia de tubo digestivo (MED, Angeles-Angeles, 2005).*
 [None had carcinoid or Zollinger-Ellison syndrome and all evidenced clinical manifestations similar to gastric adenocarcinomas, that is, the patients presented weight loss, malaise, vomiting and gastrointestinal bleeding]

Finally, in terms of the use of endophoric markers (see examples 18–20 below), again medical articles show the lowest frequency (0.71), while RAs from linguistics take a “middle position” (1.59) and economic articles reveal the highest frequency (2.25).

- (18) *Como veremos líneas abajo, la consideración de una política global óptima tiene importantes consecuencias cuantitativas para la evaluación de las reformas fiscales. . . (ECON, Antón Sarabia, 2005)*
 [As we will see lines below, consideration of an optimal global policy has important implications for quantitative assessment of tax reforms]

- (19) Por otro lado, como ya hemos avanzado *al comienzo* de este apartado, existe una serie de contextos en los que la presencia del grado incide negativamente en la distribución del adjetivo (LING, Pastor, 2008).
[On the other hand, as we have advanced *at the beginning* of this section, there are a number of contexts in which the presence of grade negatively affects the distribution of the adjective]
- (20) Como se ha comentado en los párrafos *anteriores*, el AF de los medicamentos y el utilizado para la fortificación de alimentos está en forma de PGA, que es un análogo sintético, y muy barato, que no se encuentra en la naturaleza (MED, Martínez-Frías, 2007).
[As discussed in the *preceding* paragraphs, the AF of drugs and used for food fortification is in the form of PGA, which is a synthetic analog, and very inexpensive, not found in nature]

These findings can be interpreted in relation to the concept of reader responsibility in scholarly writing in Spanish. In this sense, linguists and economists tend to assume greater responsibility for guiding the reader than medical doctors. This result could also be related to the length and structure of medical articles. They are the shortest in the MEL-2011 corpus – 3338 words on average, as opposed to 7469 and 8984 in linguistics and economics, respectively – and its text structure is more standardized, which has been established in the literature (e.g. Fløttum et al., 2006a,b). Just as it has been observed in cross-disciplinary studies of RA writing in English and other languages, in medical articles the combination of both characteristics would make metatext extraneous (Fløttum et al., 2013).

5. Discussion

In this section, the results of the current study will be compared with those of other corpus-based studies which have also used quantitative methods. Two of them (Ädel, 2006; Pérez-Llantada, 2010) draw on the reflexive model of metadiscourse, so appropriate *tertia comparationes* (Connor, 2004), that is, a common platform of comparison or shared similarity between analyses, is secured.

This study set out with the aim of identifying the realizations of metadiscourse at the lexico-grammatical level in a corpus of RAs written in Spanish by drawing on the reflexive model (Ädel, 2006). The top-down bottom-up approach which was adopted when analyzing the data yielded similar results to those reported in the literature (Hyland, 2005; Ädel, 2006) in terms of identifying distinct metadiscourse categories, namely: self mentions, relational markers, reference to the participants, references to the code, endophoric markers and code glosses. However, the morpho-syntactic system of the Spanish language allows for three particular realizations which do not have an equivalent in the English language: (1) self-mentions realized by means of the verbal system in which the personal pronoun is elided (both in singular and plural instantiations), (2) some impersonal discourse verbs realizations (e.g. through verbal periphrasis, IDVVP, and nominalization, IDVN), and, perhaps the most interesting, (3) impersonal directives (IDIR) which, as mentioned above (see Section 4.2), may take three different realizations. To the best of my knowledge, this is the first taxonomy of metadiscourse for scientific prose proposed for the Spanish language: eight aggregated categories and 22 disaggregated categories.

Regarding the frequency of metadiscursive markers in scholarly articles written in Spanish, the findings of the current study are consistent with those of Ädel (2006), Pérez-Llantada (2010) and Fløttum et al. (2006a,b) who found that metadiscourse material has a low occurrence in RAs, in contrast to other findings (Hyland, 1998; Cubo de Severino, 2005; Hernández-Guerra and Hernández-Guerra, 2008). In the current study, the frequencies of MD markers range from 0.7% in medical and economic RAs to 1% in linguistic RAs. This finding has important implications for the choice of theoretical framework. As mentioned above, while the non-integrative approach to metadiscourse (Ädel, 2006) delimits the scope of metadiscourse leaving out other phenomena such as attribution, evidentiality and evaluation, the integrative approach to metadiscourse (Hyland, 2005) does not. Taking into consideration the objections that have been raised against the term metadiscourse (Mauranen, 1993a; Sinclair, 2005), the rigor introduced by the reflexive model is a welcome standard for this line of research.

Contrary to expectations, there were no significant differences between Economics and its counterparts in terms of the overall frequencies of metadiscourse in both manifestations, personal (PMD) and impersonal (IMD). This was an unexpected finding as Economics has been characterized in the literature as the quintessential social science and previous research has found that Economy scholars writing in English use more metadiscourse features than scholars from other disciplines also writing in English (Fløttum et al., 2006a,b; Silver, 2006). Thus, it had been hypothesized that this subcorpus would take a “middle position”, exhibiting lower rates of MD than Linguistics (a humanity subject) and higher rates than Medicine (a natural science). A possible explanation for this finding is that scientific writers in general, regardless of their disciplinary membership, tend to deploy low frequencies of metadiscourse in their prose, with the notable exception of the writers in the humanities, such as linguistics. There is some evidence in favor of this claim in prior studies which are directly comparable (Fløttum et al., 2006a,b; Pérez-Llantada, 2010).

Now, in the specific case of the MEL-2011 corpus, what distinguishes the Linguistics subcorpus from the other two subcorpora is, on one hand, a higher level of visibility of the author, instantiated at the lexico-grammatical level in the pronominal and verbal systems (total frequency of self mentions: 3.8 per 1000 words). On the other hand, linguists tend to interact more with their readers than their counterparts, as evidenced by a greater exploitation of relational markers (overall frequency for this aggregated category: 1.5 per 1000 words).

Turning now to the presence of the author, the results of this study indicate that the scholars from all three disciplines tend to signal their presence through self mentions realized by means of the verbal system (SMVS) instead of the pronominal system (SMPS), which is the case of English authors (Hyland, 2005; Fløttum et al., 2006a,b). The fact that Spanish is a pro-drop language allows Spanish authors to opt between these two realizations. And overwhelmingly, in the MEL-2011 corpus they favor self mentions through the verbal system using the first-person plural endings (SMVSPL) over first-person singular endings (SMVSSG), even though all the RAs have a single author. This is not an unexpected finding though. Prior studies (Gallardo, 2002; García Negroni, 2008) have noted that Spanish scientific prose tends to hide the individual writer. This study confirms that the “royal we” (“nosotros de modestia” or “nosotros del autor” in Spanish), with an elided first-person plural pronoun, is characteristic of Spanish scientific prose and suggests this is a strategy to decrease the visibility of the writer in favor of the findings (García Negroni, 2008). Interestingly, Hyland (2001) has argued that self mentions in RAs written in English by Anglophones serve self-promotional purposes. Further research, with a larger corpus which includes RAs from other disciplines, should be done to investigate if this rhetorical option signals adherence to certain values of the scientific community, such as selflessness and modesty (Elam and Bertilsson, 2003).

Despite the relatively high frequencies in SMVSPL, the MEL 2011 writers also rely on oblique references to the writer, such as impersonal discourse verbs (IDV). In fact, there are no statistically significant differences in any of the three disciplines between the aggregated categories self mentions realized by means of the verbal system (SMVS) and impersonal discourse verbs (IDVs). These impersonal realizations of metadiscourse in the prose of the three disciplines may illustrate the impersonal style characteristic of Spanish scholarly writing (Montolío, 1999; Cassany, 2002).

As regards writer–reader interaction, the quantitative analysis carried out in the current study suggests that the persuasive nature of academic and scientific writing, which has been highlighted in the EAP literature, may not be so prominent in scholarly writing in Spanish, as evidenced by low frequencies of relational markers. Rather, the findings are consistent with those of Biber (1988) who found that scientific prose is informationally dense, with few features of open persuasion and characterized by an impersonal style. However, there are statistically significant differences in the frequencies of relational markers (MREL) between the RAs written by medical doctors and their counterparts. Furthermore, a descriptive analysis of the use of personal directives (PDIR) and inclusive “nosotros” (INCN), which cannot be summarized within the scope of this paper, evidences considerable variation across disciplines in relation to degrees of interpersonal engagement and persuasion. There is scarcely any deployment of directives, both personal (PDIR) and impersonal (IDIR) and hardly any markers of inclusive “nosotros” (INCN) in medical articles. This finding corroborates the ideas of Hyland (2005), who suggests that writers in the different disciplines are required, by the social conventions of their disciplinary communities, to engage their readers more or less openly. This is so also when scholar writers communicate in Spanish.

Finally, this study produced results which corroborate those of Fløttum et al. (2006a,b) regarding the use of metatext in Spanish RAs. Both in the KIAP corpus and the MEL-2011 corpus, economic RAs exhibit higher rates of endophoric markers (END), references to the text (REFT) and to parts of the text (REFPT) than linguistic RAs, while medical RAs present the lowest rates in all three MD categories. These findings suggest that writer responsibility, that is, the degree to which the author is responsible for guiding the reader along the text, varies across disciplines, also in Spanish texts, although with a corpus of only three disciplines, the findings might not be transferable to other disciplines.

6. Conclusions

The purpose of the current study, which focuses on Spanish scientific writing, was to identify which lexico-grammatical features signal MD in a corpus of RAs from three different disciplines and to determine whether there was cross-disciplinary variation in terms of the frequencies of MD markers. This study has shown that there is indeed variation across Linguistics, Economics and Medicine in terms of the frequencies of eight aggregated MD categories. However, one of the most conspicuous findings of the study was the fact that, contrary to expectations, economic RAs exhibited similar frequencies to medical RAs. If we only consider the overall frequencies of MD, PMD and IMD, there is only a significant difference between Linguistics and the other two subcorpora, but not between Medicine and Economics.

Regardless of the similarities in the overall frequencies of MD and its two variants between Economics and Medicine, the statistically significant differences in all but three MD categories suggest that the RA varies greatly in terms of the

manner and the extent to which scientific writers from different disciplines are expected to signal their authorial presence, interact with their audience and guide the reader. An implication of this is the need to raise awareness of the rhetorical options which are open to scientific writers in a given discipline (Hyland, 2001), which is a challenge for those who teach academic and scientific writing in Spanish-speaking countries.

One of the more significant findings to emerge from this study is that three MD categories, namely, self mentions realized by means of the verbal system (SMVS), impersonal discourse verb realizations, and impersonal directives (IDIR), are particular to the Spanish language. To the best of my knowledge, this result has not been previously described. These findings enhance our understanding of how the different linguistic systems, cultures and disciplinary communities interact and influence the rhetorical choices made by scientific writers.

Furthermore, this work contributes to existing knowledge of metadiscourse in the Spanish language by proposing a taxonomy of MD markers which are typical of scientific prose. This taxonomy is organized in eight broad categories which emerged from a manual annotation of a corpus of 238 RAs by using a top-down bottom-up approach. By top-down, I mean the data analysis drew on the criteria set out by Ädel (2006), and by bottom-up, the emerging categories were not constrained by any previous taxonomy of MD features proposed for the English language (Hyland, 2005; Ädel, 2006).

This research has several practical applications. Firstly, the proposed taxonomy will make a contribution towards the semi-automatic interrogation of large corpora of Spanish texts. As mentioned before, a completely automatic search of metadiscursive features may not be feasible given the fuzzy nature of the phenomenon. And yet, the existence of an exhaustive list of metadiscursive markers in scholarly writing in Spanish can enhance our capacity to make generalizations by speeding up the process of interrogating large text corpora. Secondly, and as regards pedagogical implications, the proposed taxonomy of metadiscursive markers in scholarly writing in Spanish may facilitate the modeling of the appropriate use of metadiscursive features, according to the norms and conventions of each of the three disciplines studied here. This would be of great value to faculty working in academic literacy programs in the Spanish-speaking world, both at the undergraduate and graduate levels. Finally, the development of Spanish academic writing manuals – of which there is currently a dearth – is another potential application of this metadiscursive expressions inventory.

Two caveats need to be noted regarding the present study. First, as this research did not receive any funding, I did not rely on extra judges during the manual annotation of the corpus. This would have been preferable, especially considering its size (over 1,600,000 words). Another weakness of this study is the lack of identification of areas or fields within each of the three macroareas (Medicine, Economics and Linguistics), especially as previous research has revealed significant differences across closely related fields, such as Marketing, Finance and Management (Lindeberg, 2004). However, this study aimed to examine inter-disciplinary variation, not intra-disciplinary.

Future research could look into distributional differences to match metadiscourse functions to particular communicative purposes of the RA or it could include further disciplines.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Appendix 1. List of journals included in the MEL-2011 corpus

Code	Name of Medical Journal	Journal website
RCC	Revista Chilena de Cirugía	http://www.scielo.cl/scielo.php?script=sci_serial&pid=0718-4026
GMM	Gaceta Médica México	http://www.scielo.org.mx/scielo.php?script=sci_serial&pid=0016-3813
RECOT	Revista Española de Cirugía Ortopédica y Traumatología	http://www.sciencedirect.com/science/journal/18884415
RCE	Revista Clínica Española	http://www.sciencedirect.com/science/journal/00142565
RMC	Revista Médica Chile	http://www.scielo.cl/scielo.php?script=sci_serial&pid=0034-9887
RCI	Revista Chilena de Infectología	http://www.scielo.cl/scielo.php?script=sci_serial&pid=0716-1018&lng=es&nrm=iso
H	Revista Latinoamericana de Hipertensión	http://www2.scielo.org.ve/scielo.php?script=sci_serial&pid=1856-4550&lng=es&nrm=iso
AP	Atención Primaria	http://www.semfyec.es/es/informativo/revista+Atenci%F3n+Primaria/
GS	Gaceta Sanitaria	http://scielo.isciii.es/scielo.php?script=sci_serial&pid=0213-9111&lng=en&nrm=iso
REN	Revista Ecuatoriana de Neurología	http://www.medicosecuador.com/revecuatueneurol/revistas_anteriores.htm
RIC	Revista de investigación clínica	http://www.scielo.org.mx/scielo.php?script=sci_serial&pid=0034-8376
CE	Cirugía Española	http://www.sciencedirect.com/science/journal/0009739X
CIGO	Clínica e Investigación en Ginecología y Obstetricia	http://www.sciencedirect.com/science/journal/0210573X
CM	Colombia Médica	http://colombiamedica.univalle.edu.co/indexingles.html

Appendix 1 (Continued)

Code	Name of Medical Journal	Journal website
NDYT	Revista de Nefrología, Diálisis y Trasplante	http://www.scimagojr.com/journalsearch.php?q=144825&tip=sid&clean=0
MC	Medicina Clínica	http://www.sciencedirect.com/science/journal/00257753
EYN	Endocrinología y Nutrición	http://www.sciencedirect.com/science/journal/15750922
ADS	Actas Dermo-Sifilográficas	http://www.sciencedirect.com/science/journal/00017310
REQ	Revista Española de Quimioterapia	http://recyt.fecyt.es/index.php/REQ
CIA	Clínica e Investigación en Arteriosclerosis	http://www.sciencedirect.com/science/journal/02149168
AB	Archivos Bronconeumológicos	http://www.sciencedirect.com/science/journal/17310435

Code	Name of Economics Journal	Journal website
IE	Investigación Económica	http://www.economia.unam.mx/publicaciones/web_invesecon/index.html
ETE	El Trimestre Económico	http://dialnet.unirioja.es/servlet/revista?codigo=4264
REA	Revista de Economía Aplicada	http://dialnet.unirioja.es/servlet/revista?codigo=1155
EEEE	Estudios de Economía	http://redalyc.uaemex.mx/src/inicio/HomRevRed.jsp?iCveEntRev=221
IIEE	Investigaciones Económicas	http://redalyc.uaemex.mx/src/inicio/HomRevRed.jsp?iCveEntRev=173

Code	Name of Linguistics Journal	Journal website
EMERITA	Emerita. Revista de Lingüística y Filología Clásica	http://emerita.revistas.csic.es/index.php/emerita
RLA	Revista de Lingüística Teórica y Aplicada	http://www.scielo.cl/scielo.php?pid=0718-4883&script=sci_serial
SIGNOS	Revista Signos. Estudios de Lingüística	http://www.scielo.cl/scielo.php?script=sci_serial&pid=0718-0934&lng=es&nrm=iso
EEFF	Estudios Filológicos	http://www.scielo.cl/scielo.php?script=sci_serial&pid=0071-1713&lng=es&nrm=iso
CLAC	Círculo de lingüística aplicada a la comunicación	http://www.ucm.es/info/circulo/

Appendix 2. Labels for the metadiscourse categories which emerged from the analysis of the MEL-2011 corpus

I. Personal metadiscourse

Self-Mentions (SMs)

SMPS: Self-mentions realized by means of the pronominal system

- SMPSSG (singular pronouns): yo, me, mi(s)
- SMPSP (plural pronouns): nosotros, nos, nuestro/a(s)

SMVS: Self-mentions realized by means of the verbal system

- SMVSSG (first-person singular ending)
- SMVSPL (first-person plural ending)

Relational Markers (RMs)

PDIR: Personal directives

INCN: Inclusive “nosotros”

Reference to the participants (REFPs)

REFA: References to the author

REFR: References to the reader

II. Impersonal Metadiscourse

REFC: References to the code

- REFT: Reference to the full text
- REFPT: Reference to a part of the text
- REFOSM: Reference to other semiotic modes

Impersonal self-mentions (ISMs) realized through discourse verbs

- PSI: Passive forms with “se impersonal”
- PSNA: Passive forms with “be” and no agent
- IDVVP: Verbal periphrasis
- IDVN: Nominalization

IDIR: Impersonal directives

END: Endophoric markers

CG: Code glosses

Appendix 3. List of discourse verbs

aclarar	destacar	mencionar
acotar	detallar	notar
admitir	discutir	observar
advertir	ejemplificar	plantear
afirmar	emplear el término	postular
agradecer	enfatizar	preguntarse
agregar	enunciar	profundizar
aludir	esbozar	proponer
anotar	esclarecer	recalcar
añadir	especificar	recomendar
apuntar	explicar	reiterar
argüir	exponer	referirse
argumentar	denominar	reportar
aseverar	formular	resaltar
bosquejar	fundamentar	reseñar
citar	hacer hincapié	revisar
comentar	hacer mención	resumir
conceder	hacer notar	sostener
concluir	ilustrar	señalar
decir	indicar	subrayar
definir	informar	sugerir
dejar constancia	insistir	tratar una cuestión
desarrollar (un argumento)	llamar	volver sobre una cuestión
describir	matizar	

Appendix 4. Inventory of metatext markers found in the MEL-2011 corpus

Code glosses (CG):

es decir, o sea, esto es, i.e., en otras palabras, a saber, se relaciona con, equivale a decir, corresponde a, quiere decir que, equivale a, esto es equivalente a decir que, se entiende como, que no es otra cosa que, puesto en otros términos, vale decir, mejor dicho, dicho de otra manera/forma, dicho en otros términos, dicho de otro modo, en términos sencillos, en otras palabras, tiene que ver con, está relacionado con, en el sentido de, entendido como, esto quiere decir que, en términos más precisos, esto (no) significa, entiéndase, o mejor dicho, vale decir, por así decirlo, mutatis mutandis, en sentido laxo, ceteris paribus, o lo que es lo mismo, dicho llanamente, o más estrictamente hablando, en pocas palabras, en resumidas palabras, en forma resumida, equivaldría a señalar, entendiendo por ello.

Endophoric markers (END):

Anaphoric markers: previo(a), anteriormente, arriba, más arriba, al principio, ya, anterior(es), acaba de, antes, allí, líneas arriba, volviendo a, con anterioridad, precedente(s), al comienzo, recién, antes de, al inicio, supra, en un principio, previamente, más atrás, de entrada, inicialmente, previo(a), esto último, lo anterior, hasta aquí.

Cataphoric markers: posteriormente, más abajo, más adelante, siguiente(s), próximo(a), a continuación, líneas abajo, como sigue, lo que sigue, seguidamente, en lo que sigue, en adelante, en lo sucesivo, luego, ulterior, próximo, enseguida, infra, luego, posterior (es), de aquí en adelante, (en) el resto de.

Deictics: ahora, aquí, he aquí, (el/la) presente.

Other phorics: a lo largo de, durante todo, en el transcurso de, primero, segundo, tercero, finalmente, antes de, último (a), por último, en primer lugar, en segundo lugar, de momento, de aquí en más, al final, tras, de aquí, primeramente, hacia el final.

References

- Abdi, Reza, 2011. *Metadiscourse strategies in research articles: a study of the differences across subsections*. *J. Teach. Lang. Skills* 3 (1), 1–15.
- Ädel, Annelie, 2005. *On the boundaries between evaluation and metadiscourse*. In: Tognini-Bonelli, En E., Del Lungo Camiciotti, G. (Eds.), *Strategies in Academic Discourse*. John Benjamins, Amsterdam, pp. 153–162.
- Ädel, Annelie, 2006. *Metadiscourse in L1 and L2 English*. Amsterdam, John Benjamins.
- Ädel, Annelie, Mauranen, Anna, 2010. *Metadiscourse: diverse and divided perspectives*. *Nord. J. Engl. Stud.* 9 (2), 1–11. [Available at <http://ojs.ub.gu.se/ojs/index.php/njes/issue/current>]

- Afros, Elena, Schryer, Catherine, 2009. Promotional (meta) discourse in research articles in language and literary studies. *Engl. Specif. Purp.* 28, 58–68.
- Aguirre, Luis Alejandro, 2010. La construcción de la intersubjetividad en los informes de práctica profesional de Ingeniería. In: Castel, V.M., Cubo de Severino, L. (Eds.), *La renovación de la palabra en el bicentenario de la Argentina. Los colores de la mirada lingüística*. Editorial FFyL, UNCuyo, Mendoza, pp. 47–54.
- Anthony, Lawrence, 2004. *AntConc: a learner and classroom friendly multi-platform corpus analysis toolkit*. In: *IWLeL 2004: An Interactive Workshop on Language e-Learning*, pp. 7–13.
- Becher, Tony, 1989. *Academic Tribes and Territories: Intellectual Inquiry and the Cultures of Disciplines*. Milton Keynes: SRHE/OUP.
- Becher, Tony & Trowler, Paul (2001). *Academic Tribes and Territories: Intellectual Inquiry and the Culture of Disciplines*. The Society of Research into Higher Education & Open University Press, Philadelphia, PA.
- Beke, Rebecca, 2005. El metadiscurso interpersonal en artículos de investigación. *Rev. Signos* 38 (57), 7–18.
- Biber, Douglas, 1988. *Variation Across Speech and Writing*. Cambridge University Press, Cambridge.
- Biber, Douglas, 2004. Representativeness in corpus design. In: Sampson, En G., McCarthy, D. (Eds.), *Corpus Linguistics: Readings in a Widening Discipline*, pp. 174–197.
- Biber, Douglas, Jones, James, 2009. Quantitative methods in corpus linguistics. In: Anke, Lüdeling, Merja, Kytö (Eds.), *Corpus Linguistics: An International Handbook*. Mouton de Gruyter, Berlin, pp. 1286–1304.
- Blagojevic, Savka, 2004. Metadiscourse in academic prose: a contrastive study of academic articles written in English by English and Norwegian speakers. *Stud. Lang.* 5, 1–7.
- Bolívar, Adriana, Beke, Rebecca, Shiro, Martha, 2010. Las marcas lingüísticas del posicionamiento en las disciplinas: Estructura, voces y perspectivas discursivas. In: Giovanni, Parodi (Ed.), *Alfabetización académica y profesional en el siglo XXI: Leer y escribir desde las disciplinas*. Ariel, Santiago, pp. 95–125.
- Bruce, Ian, 2009. Results sections in sociology and organic chemistry articles: A genre analysis. *Engl. Specif. Purp.* 28, 105–124.
- Bunton, David, 1999. The use of higher level metatext in Ph.D. theses. *Engl. Specif. Purp.* 18, 41–56.
- Carcu, Oana Maria, 2009. An intercultural study of first-person plural references in biomedical writing. *Ibérica* 18, 71–92.
- Cassany, Daniel, 2002. *La cocina de la escritura*. Anagrama, Barcelona.
- Connor, Ulla, 2004. Intercultural rhetoric research: beyond texts. *J. Engl. Acad. Purp.* 3, 291–304.
- Crismore, Avon, 1989. *Talking with Readers: Metadiscourse as a Rhetorical Act*. Peter Lang, New York.
- Cubo de Severino, Liliiana, 2005. Representación mental del modelo de situación comunicativa en la lectura de manuales universitarios y artículos de investigación. *Signo Señá* 14, 141–157.
- Dafouz-Milne, Emma, 2003. Metadiscourse revisited: a contrastive study of persuasive writing in professional discourse. *Estud. Ingl. Univ. Complut.* 11, 29–52.
- Dahl, Trine, 2004. Textual metadiscourse in research articles: a marker of national culture or of academic discipline? *J. Pragmat.* 36, 1807–1825.
- Dahl, Trine, 2008. Contributing to the academic conversation: a study of new knowledge claims in economics and linguistics. *J. Pragmat.* 40, 1184–1201.
- Diani, Giuliana, 2014. Multivoiced interaction in English and Italian academic review discourse. In: Luz, Gil-Salom, Carmen, Soler-Monreal (Eds.), *Dialogicity in Written Specialised Genres*. John Benjamins, Amsterdam, pp. 87–112.
- Elam, Mark, Bertilsson, Margareta, 2003. Consuming, engaging and confronting science: the emerging dimensions of scientific citizenship. *Eur. J. Soc. Theory* 6 (2), 233–251.
- Fløttum, Kjersti, Kinn, Torodd, Dahl, Trine, 2006a. “We now report on . . .” versus “Let us now see how . . .”: Author roles and interaction with readers in research articles. In: Hyland, Ken, Bondi, Marina (Eds.), *Academic Discourse Across Disciplines*. Peter Lang, New York, pp. 203–224.
- Fløttum, Kjersti, Kinn, Torodd, Dahl, Trine, 2006b. *Academic Voices*. John Benjamins, Amsterdam.
- Fløttum, Kjersti, Dahl, Trine, Didriksen, Anders Alvsåker, Gjesdal, Anje Müller, 2013. KIAP – reflections on a complex corpus. *Bergen Lang. Linguist. Stud.* 3 (1), 136–150.
- Flowerdew, John, 2013. English for research publication purposes. In: Brian, Paltridge, Sue, Starfield (Eds.), *The Handbook of English for Specific Purposes*. Wiley-Blackwell, West Essex, UK, pp. 301–321.
- Fuertes-Olivera, Pedro, Velasco-Sacristán, Marisol, Arribas-Baño, Ascensión, Samaniego Fernández, Eva, 2001. Persuasion and advertising English: metadiscourse in slogans and headlines. *J. Pragmat.* 33, 1291–1307.
- Gallardo, Susana, 2002. La inscripción de los interlocutores en artículos científicos y libros de texto. In: *Actas del IX Congreso de la Sociedad Argentina de Lingüística*, pp. 1–7.
- García Negroni, María Marta, 2008. Subjetividad y discurso científico-académico, Acerca de algunas manifestaciones de la subjetividad en el artículo de investigación en español. *Rev. Signos* 41 (66), 5–31.
- Halliday, Michael Alexander Kirkwood, 1970. Language structure and language function. In: Jonathan, Webster (Ed.), *On Grammar*, vol. 1. Continuum, London, pp. 173–195.
- Harwood, Nigel, 2005. We do not seem to have a theory. . . The theory I present here attempts to fill this gap: inclusive and exclusive pronouns in academic writing. *Appl. Linguist.* 26 (3), 343–375.
- Hernández-Guerra, Concepción, Hernández-Guerra, Juan, 2008. Discursive analysis and pragmatic metadiscourse in four sub-areas of Economics research articles. *Iberica* 16, 81–108.
- Hinds, John, 1987. Reader versus writer responsibility: a new typology. In: Ulla, Connor, Kaplan, Robert B. (Eds.), *Writing Across Languages: Analyses of L2 Texts*. Addison-Wesley, Reading, pp. 141–152.
- Hyland, Ken, 1998. *Hedging in Scientific Research Articles*. John Benjamins, Amsterdam.
- Hyland, Ken, 1999a. Academic attribution: citation and the construction of disciplinary knowledge. *Appl. Linguist.* 20 (3), 341–367.
- Hyland, Ken, 1999b. Talking to students: metadiscourse in introductory coursebooks. *Engl. Specif. Purp. Int. J.* 18 (1), 3–26.
- Hyland, Ken, 2000. *Disciplinary Discourses: Social Interactions in Academic Writing*. Longman, London.
- Hyland, Ken, 2001. Humble servants of the discipline? Self-mention in research articles. *Engl. Specif. Purp.* 20 (3), 207–226.

- Hyland, Ken, 2002. *Activity and evaluation: reporting practices in academic writing*. In: Flowerdew, En John (Ed.), *Academic Discourse*. Longman, Londres, pp. 115–130.
- Hyland, Ken, 2004. *Disciplinary Discourses. Social Interaction in Academic Writing*. The University of Michigan Press, Ann Arbor, Michigan.
- Hyland, Ken, 2005. *Metadiscourse: Exploring Interaction in Writing*. Continuum, London.
- Hyland, Ken, 2007. Applying a gloss: exemplifying and reformulating in academic discourse. *Appl. Linguist.* 28 (2), 266–285.
- Hyland, Ken, Tse, Polly, 2004. *Metadiscourse in academic writing: a reappraisal*. *Appl. Linguist.* 25 (2), 156–177.
- Hyland, Ken, Tse, Polly, 2005. Hooking the reader: a corpus study of evaluative *that* in abstracts. *Engl. Specif. Purp.* 24 (2), 123–139.
- Infantidou, Elly, 2005. *The semantics and pragmatics of metadiscourse*. *J. Pragmat.* 37, 1325–1353.
- Jakobson, Roman, 1985. *Lingüística y poética*. Cátedra, Madrid.
- Keshavarz, Mohammad Hossein, Kheirich, Zahra, 2011. *Metadiscourse elements in English research articles written by native English and non-native Iranian writers in Applied Linguistics and Civil Engineering*. *J. Engl. Stud.* 1 (3), 3–15.
- Khedri, Mohsen, Heng, Chan Swee, Ebrahimi, Seyed Foad, 2013. An exploration of interactive metadiscourse markers in academic research article abstracts in two disciplines. *Discourse Stud.* 15 (3), 319–331.
- Lafuente-Millán, Enrique, 2013. Reader engagement across cultures, languages and contexts of publication in business research articles. *Int. J. Appl. Linguist.* 24, 201–223.
- Lafuente-Millán, Enrique, Lorés-Sanz, Rosa, Mur-Dueñas, Pilar, Vázquez, Ignacio, 2010. *Interpersonality in written academic discourse: three analytical perspectives*. In: Lorés-Sanz, Rosa, Mur-Dueñas, Pilar, Lafuente-Millán, Enrique (Eds.), *Constructing Interpersonality: Multiple Perspectives on Written Academic Genres*. Cambridge Scholars Publishing, Newcastle upon Tyne, pp. 13–39.
- Leech, Geoffrey, 2007. *New resources, or just better old ones? The Holy Grail of representativeness*. In: Hundt, En M., Nesselhauf, N., Biewer, C. (Eds.), *Corpus Linguistics and the Web*. Rodopi, Amsterdam, pp. 133–149.
- Lindeberg, Ann-Charlotte, 2004. *Promotion and Politeness: Conflicting Scholarly Rhetoric in Three Disciplines*. Åbo Akademi University Press, Åbo.
- Lorés-Sanz, Rosa, 2011a. *The construction of the author's voice in academic writing: the inter play of cultural and disciplinary factors*. *Text Talk* 31 (2), 173–193.
- Lorés-Sanz, Rosa, 2011b. *The study of authorial voice: using a Spanish–English corpus to explore linguistic transference*. *Corpora* 6 (1), 1–24.
- Luuka, Minna-Riitta, 1994. *Metadiscourse in academic texts*. In: Britt-Louise, Gunnarson, Per, Linell, Bengt, Nordberg (Eds.), *Text and Talk in Professional Context*. ASLA, Uppsala, pp. 77–88.
- Markkannen, Raija, Steffensen, Margaret, Crismore, Avon, 1993. *A quantitative study of metadiscourse: problems in the design and analysis of the data*. In: Jacek, Fisiak (Ed.), *Papers and Studies in Contrastive Linguistics*. Mickiewicz University, Poznan, pp. 137–151.
- Martínez, Iliana, 2005. *Native and non-native writers' use of first person pronouns in the different sections of biology research articles in English*. *J. Second Lang. Writ.* 14 (3), 174–190.
- Mauranen, Anna, 1993a. *Cultural Differences in Academic Rhetoric: A Textlinguistic Study*. Peter Lang, Frankfurt.
- Mauranen, Anna, 1993b. *Contrastive ESP rhetoric: metatext in Finnish–English Economics texts*. *Engl. Specif. Purp.* 12, 3–22.
- Mauranen, Anna, 2003. *'But here's a flawed argument.' Socialisation into and through metadiscourse*. In: Pepi, Leistyna, Meyer, Charles F. (Eds.), *Corpus Analysis. Language Structure and Language Use*. Rodopi, Amsterdam, pp. 19–34.
- Mauranen, Anna, 2004. *Contrastive ESP rhetoric: metatext in Finnish–English economics texts*. In: Saracino, En Grazia (Ed.), *Writing for Scholarly Publication in English: Issues for Nonnative Speakers*. Manni Editori, San Cesario di Lecce, pp. 126–156.
- Mauranen, Anna, 2010. *Discourse reflexivity – a discourse universal? The case of ELF*. *Nord. J. Engl. Stud.* 9 (2), 13–40.
- Montero-Fleta, Begoña, Montesinos, Anna, Pérez, Carmen, Turney, Edmund, 2004. *The reader and the writer in technical texts in English, Spanish and Catalan*. *RESLA* 16, 155–164.
- Montolio, Estrella, 1999. *Manual de Escritura Académica*. Ariel, Barcelona.
- Moreno, Ana, 1997. *Genre constraints across languages: causal metatext in Spanish and English RAs*. *Engl. Specif. Purp.* 16 (3), 161–179.
- Moreno, Ana, 1998. *The explicit signalling of premise-conclusion sequences in research articles: a contrastive framework*. *Text* 18 (4), 545–585.
- Moreno, Ana, 2004. *Retrospective labelling in premise-conclusion metatext: an English–Spanish contrastive study of research articles on business and economics*. *J. Engl. Acad. Purp., Spec. Issue Contrastive Rhetor.* 3 (4), 321–340.
- Müller, Gisella, 2007. *Metadiscurso y perspectiva: Funciones metadiscursivas de los modificadores de modalidad introducidos por 'como' en el discurso científico*. *Rev. Signos* 40 (64), 357–387.
- Mur Dueñas, María Pilar, 2003. *Analysing stance in American and Spanish business management RAs: the case sentence-initial "retrospective labels"*. *J. Engl. Stud.* 4, 137–154.
- Mur Dueñas, María Pilar, 2007. *'I/we focus ony': a cross-cultural analysis of self-mentions in business management research articles*. *J. Engl. Acad. Purp.* 6, 143–162.
- Mur Dueñas, María Pilar, 2011. *An intercultural analysis of metadiscourse features in research articles written in English and in Spanish*. *J. Pragmat.* 43, 3068–3079.
- Murillo, Silvia, 2012. *The use of reformulation markers in Business Management research articles: an intercultural analysis*. *Int. J. Corpus Linguist.* 17 (1), 64–90.
- Myers, Greg, 1989. *The pragmatics of politeness in scientific articles*. *Appl. Linguist.* 10, 1–35.
- Parodi, Giovanni, 2010. *Lingüística de Corpus: de la teoría a la empiria*. Iberoamericana Vervuert, Madrid.
- Pérez-Llantada, Carmen, 2010. *The discourse functions of metadiscourse in published academic writing: issues of culture and language*. *Nord. J. Engl. Stud.* 9 (2), 41–68.
- Peterlin, Agnes, 2005. *Text-organising metatext in research articles: an English–Slovene contrastive analysis*. *Engl. Specif. Purp.* 24, 307–319.
- Polgar, Stephen, Thomas, Shane, 2000. *Introduction to Research in the Health Sciences*. Churchill Livingstone, Melbourne, Australia.
- Poorestahani, Ailin, Khajavy, Gholam, Vahidnia, Fateme, 2012. *A contrastive study of metadiscourse elements in research articles written by Iranian applied linguistics and engineering writers in English*. *Engl. Linguist. Res.* 1 (1), 88–96.
- Sabaj, Omar, Fuentes, Miguel, Matsuda, Ken, 2013. *Verbal inflection in research article sections*. *Estud. Filol.* 52, 129–142.
- Sheldon, Elena, 2009. *From one I to another: discursive construction of self-representation in English and Castilian Spanish research articles*. *Engl. Specif. Purp.* 28 (4), 251–265.

- Siepmann, Dirk, 2006. Academic writing and culture: an overview of differences between English, French and German. *META* 51 (1), 131–150.
- Silver, Marc, 2006. *Language Across Disciplines: Towards a Critical Reading of Contemporary Academic Discourse*. BrownWalker Press, Boca Raton, FL.
- Sinclair, John, 2005. Language as a string of beads: discourse and the M-word. In: Elena, Tognini-Bonelli, Gabriella, Del Lungo Camiciotti (Eds.), *Strategies in Academic Discourse*. John Benjamins, Amsterdam, pp. 163–168.
- Swales, John, Ahmad, Ummul, Chang, Yu-Ying, Chávez, Daniel, Dressen, Dacia, Seymour, Ruth, 1998. Consider this: the role of imperatives in scholarly writing. *Appl. Linguist.* 19 (1), 97–121.
- Taki, Saeed, Jafarpour, Fatemeh, 2012. Engagement and stance in academic writing: a study of English and Persian research articles. *Mediterr. J. Soc. Sci.* 3 (1), 157–168.
- Teubert, Wolfgang, Čermáková, Anna, 2004. Directions in corpus linguistics. In: Halliday, En Michael Alexander Kirkwood, Teubert, Wolfgang, Yallop, Collin, Čermáková, Anna (Eds.), *Lexicology and Corpus Linguistics: An Introduction*. Continuum, London, pp. 113–166.
- Tosi, Carolina, 2010. Discursive traditions in the pedagogic discourse. A comparative analysis in three disciplines. *J. Lang. Lit.* (February), 55–63.
- Toumi, Naouel, 2009. A model for the investigation of reflexive metadiscourse in research articles. *Lang. Stud. Work. Pap.* 1, 64–73.
- Valero-Garcés, Carmen, 1996. Contrastive ESP rhetoric: metatext in Spanish–English economics texts. *Engl. Specif. Purp.* 15 (4), 279–294.
- Vande Kopple, William, 1985. Some exploratory discourse on metadiscourse. *Coll. Compos. Commun.* 36, 82–93.
- Vassileva, Irena, 2014. Bulgarian “we” and audience involvement in academic writing. In: Theodossia-Soula, Pavlidou (Ed.), *Constructing Collectivity: ‘We’ Across Languages and Contexts*. John Benjamins, Amsterdam, pp. 287–308.
- Vázquez, Ignacio, Lafuente-Millán, Enrique, Lorés-Sanz, Rosa, Mur Dueñas, María Pilar, 2006. How to explore academic writing from metadiscourse as an integrated framework of interpersonal meaning: three perspectives of analysis. In: Alastrúe, Ramón, Pérez-Llantada, Carmen, Neumann, Claus-Peter (Coords.), *Proceedings of the 5th AELFE Conference*. Prensas Universitarias, Zaragoza, pp. 197–208.
- Williams, Ian, 2010. Cultural differences in academic discourse: evidence from first-person verb use in the methods sections of medical research articles. *Int. J. Corpus Linguist.* 15 (2), 214–240.
- Zarei, Gholam Reza, Mansoori, Sara, 2007. Metadiscourse in academic prose: a contrastive analysis of English and Persian research articles. *Asian ESP J.* 3 (2), 24–40.

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