METADISCOURSE PATTERNS IN ACADEMIC PROSE BY NON-NATIVE ENGLISH WRITERS: A CROSS-DISCIPLINARY PERSPECTIVE

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Abstract

This article scrutinizes metadiscourse in English-medium academic prose by Russian writers from two different discourse communities focusing on the ways they interact with the reader and present themselves and their research results. It is assumed that the distribution of interactional metadiscourse elements varies across disciplines. The theoretical basis of the study is Hyland's (2005) model of interactional metadiscourse which offers a pragmatically-grounded method of studying metadiscourse in academic texts. The study was carried out on a corpus of 156 abstracts derived from two Russian journals in the field of linguistics and computer engineering. The study confirmed Hyland's findings about research article abstracts in the humanities and hard sciences, though it revealed some distinctive features of English-medium research article abstracts by Russian writers. The findings can enhance English L2 novice academic writers' familiarity with the academic writing conventions in the discipline.

Keywords

academic prose, research article abstract, metadiscourse, Hyland's taxonomy, interactional metadiscourse devices

1 Introduction

A large number of EAP studies deal with how English is used by non-native academic writers. The present paper focuses on the context of Russia, where English has been used as language of academic prose only since the last decade. To meet the requirements of the international academic community and publish their research findings in academic journals in English in order to get promoted in their disciplinary communities, researchers need to gain a good command of academic English. Knowledge of international genre conventions contributes to building up their confidence to present their research results. Being familiar with conventional metadiscourse markers and moves of a research article in the field empowers non-native English academic writers to comply with the existing writing conventions and raises their consciousness about the existing rhetorical norms (Supranont 2012).

Research article (RA) abstracts play a crucial role in settling the fate of academic articles since they serve as screening devices (Huckin 2005) that

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affect the decisions for accepting or rejecting the research article, and convince editors and reviewers of the relevance of the research and the competence of the author (Kozubíková Šandová 2021: 79). Being "significant carriers of discipline's epistemological and social assumptions, and therefore a rich source of interactional features", they are organized in a way "as to encourage further examination and draw the reader into the more detailed exposition" (Hyland 2004: 63-64).

To date, studies on the RA abstract have described their rhetorical organization following Swales's (1990) move analysis (e.g. Ji 2015, Gessesse 2016) or Hyland's (2004) five-move model (Saidi & Talebi 2021), examined their linguistic features (e.g. Kuhi & Mousavi 2015, Kozubíková Šandová 2021), cross-disciplinary and cross-cultural variations (e.g. Martín 2003, Lorés Sanz 2006, Van Bonn & Swales 2007, Hu & Cao 2011, Perales-Escudero & Swales 2011, Yang 2013, Alonso- Almeida 2014, Belyakova 2017), interpersonal features (e.g. Lorés Sanz et al. 2010), and subjectivity, evaluation and engagement elements (e.g. Stotesbury 2003, Biber 2006, Lyda & Warchal 2014). It has been revealed that rhetorical structures and linguistic features are not universal in RA abstracts from different disciplines (Hyland 2005, Hu & Cao 2011, Abarghooeinezhad & Simin 2015, Takimoto 2015, Belyakova 2017). However, there have not been sufficient studies on metadiscourse patterns in RA abstracts by non-native English writers representing different discourse communities. Producing English-medium abstracts by this type of writers deserves a more detailed investigation for the purposes of discourse analysis and teaching academic writing.

In an attempt to contribute to literature on the linguistic features of RA abstracts, the present study analyses English-language RA abstracts written by Russian researchers in the field of linguistics and computer engineering representing the soft and hard sciences respectively, seeking to achieve the following objectives:

(1) To reveal the cross-disciplinary distribution of interactional metadiscourse markers in Russian authors' English-medium RA abstracts from linguistics and engineering.

(2) To reveal the frequency of occurrence of interactional metadiscourse in Russian authors' English-medium RA abstracts.

(3) To compare metadiscourse patterns in the RA abstracts written by Russian authors and those revealed in the study on metadiscourse markers employed in articles published by international journals (Hyland 2005).

Thus, interactional linguistic devices used in English-language RA abstracts written by Russian writers, such as boosters, hedges, attitude markers, engagement markers and self-mentions, are the main focus of research in the

current study, which starts from two hypotheses: engineering sciences tend to produce more impersonal texts, and metadiscourse patterns reflect the knowledge domains; Russian writers follow the international academic writing conventions, including those on the use of metadiscourse markers. Metadiscourse interactional markers will be therefore described from a cross-disciplinary perspective. More specifically, the aim is to explore any variation in the use of interactional metadiscourse markers in the journals from two different disciplines. Even though Russian researchers follow generally accepted academic writing conventions when producing RA abstracts in English, cross-disciplinary variation in the distribution of interactional metadiscourse elements is expected.

The present study will focus on interactional metadiscourse markers following the taxonomy of metadiscourse proposed by Hyland (2005). The classification of interactional metadiscourse markers will be introduced in the Theoretical framework section. The Current study section will describe the methods employed to analyze the metadiscourse markers and the corpus. The analytical section will focus on the analysis of interactional metadiscourse markers found in the corpus. Finally, conclusions will be drawn and further research avenues will be outlined in the Conclusion section.

2 Theoretical framework

2.1 RA abstracts as an object of research

Research into RA abstracts has mainly focused on their rhetorical organization, linguistic features, discourse and metadiscourse patterns investigated from various perspectives. The first group of studies comprises those that deal with scientific abstracts in individual disciplines. Farjami (2013), for example, has investigated RA abstracts in the field of applied linguistics. Abarghooeinezhad and Simin (2015) have studied linguistic features in engineering RA abstracts. Nurhayati (2017) has dealt with EFL RA abstracts. Shabani and Emadi (2021) investigated the rhetorical move structure of English-medium dental sciences research article abstracts by Iranian scholars to find the frequency of rhetorical moves and steps. Hu and Cao (2011) have compared the use of hedges and boosters in applied linguistics RA abstracts by native English and Chinese writers. Wang and Pramoolsook (2021) have adopted a comparative approach to study stance expression in terms of the distribution of metadiscourse markers in translation studies abstracts. Gillaerts (2014) and Kuhi and Mousavi (2015) have adopted a diachronic perspective to examine linguistic features of RA abstracts in applied linguistics and biology, respectively. Kozubíková Šandová (2021) has explored linguistics RA abstracts from the same diachronic perspective.

Unlike research that focused on individual disciplines, an equally important line of research has been dedicated to the linguistic features of RA abstracts from a cross-disciplinary perspective (e.g. Graetz 1985, Stotesbury 2003, Muñoz 2013). Stotesbury (2003), for example, has revealed that humanities RA abstracts contained more citations, as compared with those in the social and natural sciences. He has also found that the writer's voice was most often heard in natural science abstracts, while in humanities abstracts the passive voice is typically employed. Bondi (2014) has explored self-mention and authorial voice in history, economics, and linguistics abstracts and revealed some diachronic changes in the metadiscourse patterns. Saeeaw (2014) has investigated the rhetorical moves in RA abstracts from environmental science and applied linguistics and revealed that in both groups of abstracts the Introduction-Method-Results-Discussion (IMRD) framework was similar. Khansari (2016) has investigated RA abstracts in applied linguistics and chemistry as representatives of soft and hard sciences in order to reveal cross disciplinary differences in terms of rhetorical moves and linguistic realizations. Belyakova (2017) has investigated RA abstracts written by Russian novice researchers and native English-speaking experts in geoscience from a cross-linguistic approach in order to explore discipline-specific and culturally determined linguistic and discourse features such as the use of personal pronouns, tense, articles, and sentence length. The cross-linguistic approach was also adopted in the study by Alonso-Almeida (2014), who compared linguistic features of English and Spanish RA abstracts from medicine, computing, and legal science.

Ren and Li (2011) adopted a different approach to compare the abstracts of Chinese Master's English theses and published RAs in applied linguistics with the aim to reveal stance-taking changes as researchers gain experience in academic writing. The findings revealed distinctions in the use of rhetorical patterns emerging between novice writers and advanced writers which indicates a clear developmental trajectory in terms of rhetorical moves. Kim and Na (2012) have compared linguistic features of master's theses abstracts of Korean graduate students with those of expert writers publishing their research articles in leading applied linguistics journals and found out differences in the tense distribution and the use of modal verbs. From the same perspective, Wang (2015) examined the rhetorical variation of abstracts written by Chinese experts and undergraduates by analyzing applied linguistics RA abstracts using Santos's (1996) model.

Thus, the review of previous studies has shown that abstracts have been examined from the intra-disciplinary, cross-disciplinary, cross-linguistic, diachronic and developmental perspectives. In terms of the linguistic features explored, the studies have focused on hedges and boosters, tenses, stance adverbs,

self-mentions and writer's stances. However, little is known about metadiscourse patterns employed in English-medium RA abstracts written by non-native scholars from different disciplines. It was discovered that Russian academic discourse has less emphasis on achieving maximum structural clarity than English (Prozorova 1997), Russian writers tend to produce a highly objective academic style by disguising themselves through depersonalization devices and agentless passive constructions (Vassileva 1998), they prefer wordier sentences, tend to avoid personal pronouns and employ passive and impersonal structures instead (Pyankova 1994). However, it seems that English-language RA abstracts written by Russian researchers have not received their deserved attention in terms of metadiscourse markers. Furthermore, RA abstracts published in Russian journals have scarcely been analyzed from a cross-disciplinary perspective. To fill this void, the current study focused on metadiscourse employed in English-language RA abstracts published in two Russian journals from different disciplines in order to reveal interactional trends, which can serve as guidelines for novice researchers. In this regard, it seems that the next logical step should be to provide a definition of metadiscourse in general and focus on metadiscourse elements employed in academic texts.

2.2 Metadiscourse and metadiscourse elements

Until recently academic discourse has been regarded as impersonal. However, more research into research articles and other academic genres has changed this approach. Academic texts have started to be considered as a product of social interaction between the writer and the reader expressing writer's attitudes towards the propositional content and the audience. As a product of social interaction, academic texts contain various metadiscourse markers defined as "self-reflective expressions used to negotiate interactional meanings in a text, assisting the writer (or speaker) to express a viewpoint and engage with readers as members of a particular community" (Hyland 2005: 37). These linguistic devices "help relate a text to its context by assisting readers to connect, organise, and interpret material in a way preferred by the writer and with regard to the understandings and values of a particular discourse community" (Hyland & Tse 2004: 157).

Hyland (2005) defines metadiscourse as an open functional category expressed by various linguistic means which can be supplemented by new ones. Metadiscourse is "self-reflective linguistic material referring to the evolving text and to the writer and the imagined reader of that text" (Hyland & Tse 2004: 156). What is important, "metadiscourse cannot be regarded as a strictly linguistic phenomenon at all, but must be seen as a rhetorical and pragmatic one" (Hyland

2005: 25). It includes both linguistic features and strategies that writers use in producing those linguistic features in their discourse.

Over the last decades, there have been several taxonomies developed for metadiscourse elements (Crismore 1984, Vande Kopple 1985, Beauvais 1989, Hyland 2005). Most of them divide the linguistic markers into two types: textual and interpersonal. Vande Kopple's (1985: 87) taxonomy is one of them. The textual markers, according to Vande Kopple, include illocution markers, attitude markers and commentaries. The interpersonal ones include text connectives, code glosses, validity markers, and narrators. Textual metadiscourse markers show "how we link and relate individual propositions so that they form a cohesive and coherent text and how individual elements of those propositions make sense in conjunction with other elements of the text" (ibid.). Interpersonal metadiscourse markers "can help us express our personalities and our reactions to the propositional content of our texts and characterize the interaction we would like to have with our readers about that content" (ibid.).

Crismore et al. (1993) have refined Vande Kopple's taxonomy and divided textual metadiscourse markers into interpretive (code glosses illocution markers, and announcements) and textual (logical connectives, sequencers reminders, and topicalizers) ones. The group of interpersonal metadiscourse markers has been expanded. The researchers have included hedges, certainty markers and attributors into this group.

Thompson and Thetela (1995) have revised this taxonomy and classified metadiscourse markers into interactional and interactive. The latter ones are used to manage the information flow to guide readers through the text, and interactional markers are used to comment on and evaluate material.

Ten years later, Hyland (2005: 48) developed a model of metadiscourse, "encompassing the interactional aspects of discourse, using the criteria of external and internal relations". It is this taxonomy I turn to in the next sub-section.

2.3 Hyland's taxonomy of metadiscourse markers

Viewing metadiscourse as an explicit set of language items, Hyland (2005) has argued that metadiscourse markers can only be recognized through analysis of the text and described metadiscourse elements as facets of the text that signify writer-reader interactions. Interactive metadiscourse markers are employed to interact with the reader, explicitly convey views and attitudes, and involve the audience by allowing them to respond to the unfolding text, anticipating their objections and responding to an imagined dialogue with readers (ibid.: 49-50).

Hyland (2005) has distinguished between five types of interactional metadiscourse markers: hedges, boosters, attitude markers, self-mentions,

and engagement markers. Let us examine these categories of interactional metadiscourse markers more closely.

Hedges and boosters are "communicative strategies for recognizing contingency and indicating the room the writer is willing to offer for negotiation" (Hyland 2005: 144). Hedges are used to acknowledge alternative viewpoints, to withhold commitment to the proposition, and to steer the reader to the conclusion or reasoning of the writer's choice.

(1) *The paper contends that "Basic Human"* ***may*** *provide a secure basis for a non-Anglocentric global discourse about questions that concern us all, such as global ethics, the earth and its future, and the health and well-being of all people on earth.* (SC1)

The hedge employed by the writer casts a proposition as contingent by highlighting its subjectivity. According to Hyland (2005: 145), this expresses the writer's willingness to negotiate a claim thereby reducing commitment and conveying respect for alternative views.

Boosters are used to "suppress alternatives, presenting the proposition with conviction while marking involvement, solidarity and engagement with readers" (ibid.). Boosters can also be employed to strengthen an argument by suggesting the reader draw the same conclusions as the writer.

(2) *It* ***argues*** *that the shift can and will be a key factor, challenge and opportunity in the onward development of applied translation studies as it seeks to adequately address the situated realities of professional translation.* (SC1)

The writer is steering the reader to draw the same conclusion that the writer has chosen by using the verb *to argue* as a booster metadiscourse marker.

According to Hyland (2005: 53), "the balance of hedges and boosters in a text thus indicates to what extent the writer is willing to entertain alternatives and so plays an important role in conveying commitment to text content and respect for readers".

Attitude markers are employed to express the influence on the information by the presence of attitude verbs (*agree*, *disagree*, *prefer*), adverbs (*unfortunately*, *hopefully*, *fruitfully*) and adjectives (*logical*, *amazing*, *appropriate*, *important*). They demonstrate importance, surprise, agreement, frustration, obligation and help the writer create a convincing discourse and establish disciplinary competence.

(3) *There are several* ***important*** *humanitarian and scientific reasons for engaging in language preservation.* (SC1)

As Hyland (2005: 148) puts it, self-mentions send "a clear indication to the reader of the perspective from which their statements should be interpreted, distinguishing their own work from that of others". The degree of authorial presence in the text is signaled explicitly by the first person singular or plural pronouns and corresponding possessives.

(4) *A few years later it was taken up in **my** own work and in 1972 in my book "Semantic Primitives" a first hypothetical set of "universal semantic primitives" was actually proposed.* (SC1)

The writer uses the first person possessive *my* as a self-mention marker to draw the reader into the text and influence the reader's position.

Engagement markers are used to focus readers' attention or include them as discourse participants (ibid.: 53). They can also involve rhetorical positioning of readers, guiding them to interpretations. These are reader pronouns (*you* and *your*), personal asides, questions, and directives.

(5) *We have a historic opportunity to preserve languages spoken in Russia, and this is an opportunity that **one should use**.* (SC1)

The author uses the engagement marker to instruct the reader how to perform actions in the real world.

In the following section, the corpus compiled for the present study of interactional metadiscourse markers, together with the method employed, will be described.

3 The current study

3.1 Corpus design

The present study was carried out on a corpus of abstracts taken from two prestigious Russian journals in the field of linguistics and computer engineering: *Russian Journal of Linguistics* (four issues per year) and *Computer Optics* (six issues per year). Linguistics and computer engineering are members of two different categories of the soft and hard sciences. They were selected based on the assumption that these disciplines would be maximally different in terms of metadiscourse patterns.

One hundred and fifty-six abstracts were selected from the recent issues of *Russian Journal of Linguistics* and *Computer Optics* and divided into two parts by the journal they have been taken from. The number of tokens in each sub-corpus was 18,976 and 10,163, respectively, which made 29,139 tokens

altogether. To prevent the corpus being contaminated by the influence of time of publication, only recent RA abstracts published over the last three years were selected for the analysis.

Both journals have a large readership and high prestige in their fields (Q1 in 2020). Sub-corpus 1 (SC1) (abstracts taken from *Russian Journal of Linguistics*) consisted of 78 English-language abstracts written by Russian experts in linguistics in the last three years. The judgements on the origin of the authors were made according to their names and affiliation. Articles published in the journal cover a wide range of linguistics sub-disciplines, such as semantics, cross-cultural studies, translation studies, discourse studies, genre studies, sociolinguistics, etc. The journal "covers functional and socio-cognitive aspects of different languages and publishes a wide range of interdisciplinary studies that focus on the effect of sociocultural contexts on language development and use" (http://journals.rudn.ru/linguistics).

Sub-corpus 2 (SC2) (abstracts taken from *Computer Optics*) also consisted of 78 English-language abstracts written by Russian experts in computer engineering in the last three years. The articles published by *Computer Optics* cover a wide range of sub-disciplines, such as diffractive optics, information optical technology, nanophotonics and optics of nanostructures, digital processing of signals and images, intelligent video analysis, etc.

Abstracts are an integral part of RAs published in these two journals. The journals impose strict requirements on the quality of English language in the abstracts, which is not always the case with other Russian journals in these fields. This is the reason why these journals were chosen as a source of abstracts for the current study. Furthermore, despite national academic conventions, the international academic tradition remains dominant in these international journals.

3.2 Method

In order to investigate interactional metadiscourse markers in RA abstracts, this study adopted corpus-based and computational techniques together with multidimensional quantitative and qualitative analysis. Since the interactional metadiscourse markers are diverse, and the context of their occurrence is crucial for their classification, the corpus was tagged manually. In order to reveal the frequency of metadiscourse markers in RA abstracts selected to build the corpus, the quantitative analysis was assisted with WordSmith Tools 5. The frequency of each category of interactional metadiscourse in the sub-corpora was calculated both in percentages of the total number of metadiscourse devices in each sub-corpus[1] and per 1,000 words since the average length of RA abstracts selected to build each sub-corpus was different: the computer engineering RA abstracts

were usually 1.5 or 2 times as short as the linguistics ones. The frequency of different types of interactional metadiscourse devices in each category was calculated as a percentage of the total number of these devices separately for each sub-corpus.

Hyland's (2005) classification of metadiscourse markers was utilized to analyze RA abstracts. According to this classification, the markers were divided into five groups: boosters, hedges, attitude markers, self-mentions, and engagement markers. The frequency of occurrence of each category was identified and calculated for each sub-corpus.

A qualitative analysis was conducted to interpret the findings of the quantitative analysis. According to Creswell (2012), a qualitative analysis is helpful when you do not know the variables and need to explore the data. It does not use statistical data concerning the quality of data. A combination of the qualitative and quantitative methods contributed to more explanatory findings on potential disciplinary differences in the use of metadiscourse devices in the corpus. The quantitative analysis identified the frequency of occurrence of interactional metadiscourse markers in the two sub-corpora. The frequency of occurrence of these markers in the two sub-corpora was summarized in a table format.

4 Results and discussion

To investigate the possibility of disciplinary variation in the use of metadiscourse devices, let us now turn to the corpus for results. Table 1 summarizes the results of a comparative analysis of interactional metadiscourse markers occurring in the linguistics and engineering RA abstracts.

Interactional metadiscourse markers	**Linguistics**		**Engineering**	
	Per 1,000 words	**% of the total number**	**Per 1,000 words**	**% of the total number**
Hedges	17.0	39.5	2.1	15.1
Boosters	7.2	16.7	7.0	50.0
Attitude markers	10.3	24.0	3.6	25.9
Self-mentions	7.5	17.4	1.2	8.6
Engagement markers	1.0	2.4	0	0
Total	**43.0**	**100.0**	**13.9**	**100.0**

Table 1: The frequency of interactional metadiscourse markers in the two sub-corpora

Table 1 shows that that the overall frequency of metadiscourse, both raw and normalized to 1,000 words, was different across the disciplines. More than two-thirds of all interactional markers occurred in the linguistics sub-corpus. The most striking aspect of these frequencies is the far heavier use of self-mentions in the humanities abstracts. In the linguistics sub-corpus, the most frequent interactional devices were hedges and attitude markers comprising 39.5 per cent and 24 per cent, respectively. In engineering, boosters (50.4%) were employed more frequently than the other types. The difference between engagement markers in the two disciplines was not striking. Thus, it is clear that writers in linguistics and engineering represent themselves, their work and their readers in different ways. Our observation is congruent with Hyland's (2005: 145) conclusion about the occurrence of hedges in the two fields of knowledge: hedges tend to be more common in humanities and social science articles because the soft sciences are "typically more interpretive and less abstract than the hard sciences and their forms of argument rely more on a dialogic engagement and more explicit recognition of alternative voices". Since attitude markers foreground the writer, they are found more frequently in the humanities RA abstracts where they establish a link with the scientific community. Engagement markers rarely appeared in both sub-corpora since they are not typical of this genre.

The study confirmed Hyland's (2005) findings about abstracts in the humanities and engineering sciences, though it revealed some distinctive features of English-language abstracts written by Russian researchers: the less frequent use of hedges and self-mentions and the more frequent use of boosters by Russian researchers in the field of engineering and the more frequent use of attitude markers by Russian linguists. Now let us examine the five categories of interactional metadiscourse markers more closely.

4.1 Hedges

As regards the distribution of hedges across the two disciplines, their share in the total number of occurrences in each of the sub-corpora was different: 39.5 per cent in linguistics vs 15.1 per cent in engineering. The number of occurrences per 1,000 words also differed considerably (more than eight times). It might be due to the fact that using hedges the writer weakens the propositional content of knowledge claims and reduces the degree of reliability for authorial statements, which is more typical of the humanities rather than hard sciences. Furthermore, due to the fact that research results in linguistics are more variable, writers need more space for their interpretation (Kozubíková Šandová 2021). Engineering writers deal with numerical data and are more likely to generate a more precise picture of their findings. The use of hedges can distort facts from the empirical

evidence (Takimoto 2015). It is interesting to note that in Hyland's (2005) study, hedges were the most frequent metadiscourse devices both in hard sciences and humanities papers. In the latter, their number per 1,000 words was twice as many. Here are some examples of hedges from the corpus under consideration.

(6) *Superpixel-based image processing and analysis methods **usually** use a small set of superpixel features.* (SC2)

(7) *In doing so, it considers approaches from cognitive translatology, based **largely** on a 4EA cognitive paradigm, and translatorial linguistic ethnography, where researchers are gradually but progressively going out into the field to explore and describe the complex socio-cognitive, socio-technical activity of translation in situ.* (SC1)

The hedges employed in Examples (6) and (7) cast the propositions as contingent by highlighting their subjectivity and expressing the authors' willingness to negotiate a claim thereby conveying respect for alternative views, because "it is generally accepted that members of academia cannot make categorical statements about their own hypotheses or findings" (Lafuente Millán 2008: 68).

In the following example, the hedge is used as the writers' invitation to the reader to get involved in an open discussion about the nature of the writers' view.

(8) *The results show that being polite **seems** to be the norm (hence being politic), while being rude or offensive is the exception.* (SC1)

In Examples (9) and (10), hedging might be connected with authorial modesty:

(9) *I **seek** to elaborate and refine the analysis given in some earlier publications.* (SC1)

(10) *The authors **make an attempt** to define which tools contribute to the implicit or explicit nature of the utterances.* (SC1)

Using hedging markers, the writer can also distinguish between information as a fact and information as an opinion. The following sample provides an example of this:

(11) *The analysis of grammar in the ethnocultural aspect enables us to reveal the ethnocultural factors which **might** have served as the backbone of certain grammatical categories or **might** explain the grammatical changes happening here and now.* (SC1)

The above example contains the marker of evidential modality *might* which enables the writer to produce more interpersonal signals to the reader and present the information as an assumption.

Hedging markers in the corpus of RA abstracts were mainly expressed by the modal verbs *can*, *may*, *might*, the adjectives *possible*, *apparent*, the verbs *to seem*, *to try*, *to seek*, the adverbs and adverbial expressions *possibly*, *probably*, *rather*, *supposedly*, *somewhat*, and *apparently*. The most frequent linguistic devices used as hedges are the modal verb *may* (42% of all hedging devices found in the linguistics sub-corpus and 37.8% of all hedges in the engineering RA abstracts) and the adjective *possible* (24.3% of all hedges found in the linguistics sub-corpus and 17.2% of all hedges in the engineering RA abstracts) (see Table 2).

Hedging device	Linguistics	Engineering
may	42.0	37.8
possible	24.3	17.2
can	15.6	9.4
rather	11.2	11.2
probably, possibly	4.1	15.5
seem, try, seek	1.5	1.2
other	1.3	7.7

Table 2: Distribution of hedging devices in the sub-corpora (% of the total number of hedging devices)

4.2 Boosters

It was revealed that boosters were less frequent in linguistics abstracts. This result does not coincide with those reported in Hyland (2005), in which boosters were almost evenly distributed across the humanities and hard sciences.

In the corpus, writers used boosters to emphasize their assertions and to produce persuasive arguments.

(12) *The authors examine the dictionaries' coverage of non-Inner Circle varieties of English and,* ***in particular****, analyze culture-loaded borrowings from Northeast Asian countries.* (SC1)

Boosters were also employed to suppress alternatives. Authors anticipate possible responses from the reader but choose to prevent them. The following sentence gives an example of this:

(13) *The results **show** a possibility for the recognition of a large variety of vegetation types, including the narcotic plants.* (SC2)

The boosting device is used to express conviction with which the author communicates his research results, constructs "rapport by marking involvement with the topic and solidarity with an audience, taking a joint position against their voices" (Hyland 2005: 53).

Boosters such as discourse-oriented verbs (e.g. *to indicate*, *to show*) were often employed to emphasize author invisibility and produce more accurate description of findings, as for instance, in Example (14).

(14) *The research **indicates** that during its long and contradictory history, the term 'political correctness' had both positive and negative connotations.* (SC1)

Boosting devices such as *obvious(ly)* and *clear(ly)* were employed to indicate a mutual understanding between the writer and the reader based on shared community membership (Takimoto 2015). The use of the booster contributes to a strong tone of confidence.

(15) *The two areas where the speaker's decision is most **clearly** visible are the choice of sentence-enders, modulated up to six levels, and the choice of personal reference, e.g. pronouns and address terms.* (SC1)

In the above example, the author adopts a metadiscourse strategy to close off possible alternative views.

In the corpus, boosting devices were expressed by the modals *must*, *have to*, the verbs *to show* and *to demonstrate*, the adverbs and adverbial expressions *definitely*, *mainly*, *very*, *especially*, *particularly*, *indeed*, *in general*. The most frequent boosting device in the linguistics sub-corpus was the expression *in particular* (36% of all boosters found). In the engineering sub-corpus, the boosting verb *to show* was the most frequent (23.6%) (see Table 3).

Boosting device	Linguistics	Engineering
in particular	36.0	20.5
to show, to indicate	20.3	23.6
in general	16.6	13.4
mainly	11.2	12.2
definite(ly), clearl(ly), obvious(ly)	6.5	17.1
must/have to	5.5	6.6
Other	3.9	4.7

Table 3: Distribution of boosting devices in the sub-corpora (% of the total number of boosting devices)

4.3 Attitude markers

The attitude markers rank second in both sub-corpora. This finding is in line with the result obtained by Hyland (2005) for the humanities sub-corpus. As for the hard sciences sub-corpus compiled by Hyland (2005), the frequency of occurrence of attitude markers was lower.

Attitude markers convey explicit opinions of writers, they "create a research space and bring into being a linkage with the disciplinary community" (Khedri et al. 2015: 311). They explicitly indicate authorial judgements and convey different types of assessment. The following samples provide an example of this:

(16) *Main characteristics of the presented algorithm are calculated and discussed, confirming its* ***effectiveness*** *in comparison with the current approaches for person tracking in an indoor environment.* (SC2)

(17) *Besides, some light will be thrown on the advancements and* ***debatable*** *questions arising within discourse theory as reflected in its methodology.* (SC1)

As Hyland (2005: 53) puts it, "attitude markers indicate the writer's affective, rather than epistemic, attitude to propositions". In the following example, instead of commenting on the relevance and reliability of the algorithm, the authors use the attitude marker that conveys subjective evaluation of the research result.

(18) *The authors designed and* ***successfully*** *implemented an innovative 11 stage-algorithm of revealing patterns of a printed text comprehension.* (SC1)

As can be seen from the examples, attitudinal statements foreground the author, contribute to an author's persona and establish a link with the academic community. Therefore, they were more frequently found in the linguistics abstracts rather than in the engineering sub-corpus (cf. 10.3 attitude markers per 1,000 words in the linguistics sub-corpus vs 3.6 attitude markers per 1,000 words in the engineering sub-corpus). Humanities writers are less able to rely on quantitative methods to establish their claims and this enhances the need for more explicit evaluation through the use of attitude markers.

In the corpus, attitude markers were expressed by adjectives, adverbs and nouns showing author's attitudes and encoding positive or negative values: *important/importance*, *interesting*, *useful*, *fruitful*, *effective/effectiveness*, *correctly/correctness*, *persuasively*, *problematically*. The adjectives *important* and *efficient*, comprising 33.2 per cent and 34.6 per cent, respectively, were the most frequent attitude markers in the linguistics sub-corpus. The adverb *correctly* and the adjectives *efficient* and *effective* were most frequently used in the engineering RA abstracts (see Table 4).

Attitude marker	Linguistic	Engineering
important / importance	33.2	17.8
efficient	34.6	26.7
effective / effectiveness	9.1	29.2
useful	8.2	10.2
correctly / correctness	9.1	9.5
other	5.8	7.1

Table 4: Distribution of attitude markers in the sub-corpora (% of the total number of attitude markers)

4.4 Self-mentions

Table 1 shows that writers from both disciplines used personal pronouns to construe their authorial presence, although the distribution of this group of interactional markers across the two disciplines was uneven. The largest number of all cases of self-mention were in the linguistics RA abstracts, with an average of 7.5 per 1,000 words, compared with only 1.2 per 1,000 words in the engineering sub-corpus. It appears that computer engineering writers tended to adhere to the traditional recipe for objective and impersonal presentation and downplayed their personal role in the research to highlight the phenomena under study. By choosing an impersonal style, they suggested that research findings are unaffected by individuals, which strengthens the objectivity of results. In contrast, in linguistics, the first person singular and plural pronouns helped writers make a personal standing and demarcate their own studies from those of other researchers. In 61 per cent of all linguistics RA abstracts, one or more occurrences[2] of self-mention were found. The findings may show that linguistics writers have a higher level of confidence in the claim they have made in their research, since self-mention is a powerful rhetorical strategy in claiming a writer's contributions (Hyland 2001). It is interesting to note that in Hyland's (2005) study, self-mentions were used more frequently in hard science RA abstracts than in the humanities sub-corpus.

In the linguistics sub-corpus, self-mentions were signaled by the use of the first person singular and plural pronouns *I* and *we*, and the corresponding possessive forms *my* and *our*.

(19) *In this essay, **I** report what **I** had to do to carry out this complex and ambitious project, what forms and kinds of linguistic and cultural competence **I** had to acquire ...* (SC1)

What is interesting is that in both sub-corpora the first person plural pronouns were used both in single- and co-authored RA abstracts. Here are examples from the single-authored RA abstract:

(20) ***We** apply corpus methods to the data from the Russian National Corpus, RuTenTen Corpus on Sketch Engine and RuSkell corpus. **We** analyze absolute corpus frequencies and collocation patterns of Russian non-reduplicated colour terms … Drawing on this data, **we** establish that absolute frequencies of non-reduplicated colour terms in Russian reflect both Anna Wierzbicka's "universals of visual semantics" … **We** also argue that the Russian reduplication construction with a hyphen (belyj-belyj 'white-white') is semantically and prosodically different from the construction of repetition with a comma*. (SC1)

(21) *In this paper, **we** address this task using the following three-step procedure. First, **we** reduce the dimensionality of the hyperspectral images. Then, **we** apply one of classical segmentation algorithms (segmentation via clustering, region growing, or watershed transform). Finally, to overcome the problem of over-segmentation, **we** use a region merging procedure based on priority queues. To find the parameters of the algorithms and to compare the segmentation approaches, **we** use known measures of the segmentation quality (global consistency error and rand index) and well-known hyperspectral images.* (SC2)

The use of *we* instead of *I* in Russian writers' academic prose might be rooted in sociocentrism and totalitarism of the former Soviet regime as well as unconscious fear of manifesting writer's individual contributions to the field (Krapivkina 2014). Collectivism as one of the most evident features in the mentality of the Russian people makes scholars write on behalf of a larger academic community and hide their authorial ego.

In the computer engineering RA abstracts, no occurrences of the singular personal and possessive pronouns were found (see Table 5). The possessive pronoun *our* did not appear very commonly (0.26 per 1,000 words). The following sentence gives an example of this:

(22) ***Our** algorithm performs real time processing for object detection and tracking using CUDA technology and a graphics card NVIDIA GTX 1060.* (SC2)

Self-mention	Linguistic	Engineering
I	13.4	0
we	41.3	78.2
my	8.2	0
our	29.5	21.3
us	5.9	0.5
me	1.8	0

Table 5: Distribution of self-mentions in the sub-corpora (% of the total number of self-mentions)

4.5 Engagement markers

As can be seen from Table 1, engagement markers are the least frequently used interactional metadiscourse markers in both sub-corpora. These showed disciplinary variation: while in the linguistics sub-corpus they were rare, but appeared, in the engineering RA abstracts, no instances of these devices were found.

(23) *When **we** are looking at the books displayed in the window of a bookshop, what first catches the eye is the title.* (SC1)

The inclusive *we*-pronoun was one of the two engagement devices found in the linguistics sub-corpus. As Hyland (2005: 151) puts it, "reader pronouns are the most explicit way that readers are brought into a discourse". The following case of *we* in the linguistics sub-corpus works to construct readers as members of the disciplinary discourse community:

(24) *This strategy is in contrast to what **we** call "empathy" strategy.* (SC1)

One more engagement marker employed in this sub-corpus was the modal of obligation *should* which direct readers to particular lines of thought or action:

(25) *When translating notices in national parks into English, translators **should** predominantly consider the function of the TT …* (SC1)

Surprisingly, no occurrences of engagement markers, the functions of which are to enhance dialogicity, were found in the computer engineering sub-corpus, which indicates that the engineering writers avoided positioning themselves as members of a larger community or chose not to make efforts to involve the readers in their argumentation and to seek agreement for their contribution to the field. Explicit engagement is a feature of the RA as an academic genre, where authors "bring readers into the discourse to relate to them and anticipate their possible objections" (Hyland 2005: 151). Even in the linguistics RA abstracts, whose writers rely less on accepted procedures, the occurrence of engagement markers was extremely low (2.4% of all the metadiscourse devices found in the sub-corpus). These findings are congruent with Hyland's (2005) results for the humanities and hard science sub-corpora.

5 Conclusions and limitations

This study revealed several important cross-disciplinary differences in the use of metadiscourse markers in the RA abstracts from the fields of applied linguistics and engineering. It was found that writers in the soft sciences take far more explicitly involved positions than those in the hard sciences. These differences are the proof of the existence of disciplinary writing conventions, which should be taught to novice writers in order for them to gain a good command of academic English for performing various academic tasks and to build up confidence to present their research results. Being familiar with conventional metadiscourse markers of a research article in the field empowers novice academic writers to comply with the existing writing conventions. Teaching of metadiscourse to EAP learners can, therefore, improve their academic writing skills and help construct appropriate stance when arguing own views.

The findings contribute to a better understanding of disciplinary variation in the metadiscourse features of research article writing and carry pedagogical implications for the academic writing course designers and instructors. They can also help novice writers from non-English backgrounds facilitate their acculturation into the international academic community.

It should be admitted that the research results presented in the article are limited due to a small extent of the corpus and should be understood as trends in the two disciplines belonging to two different categories of the soft and hard sciences. The results can be confirmed or disproved by a large-scale comparative research. Further research involving more disciplines would be required to verify findings on cross-disciplinary variation in the metadiscourse patterns. Interactional metadiscourse devices could be also investigated from other perspectives. It would be interesting to compare the distribution of metadiscourse markers in English-medium RA abstracts by Russian scholars and the ones from other cultural backgrounds, including native English speakers. In this way, we will be able to reveal differences in the employment of metadiscourse devices by native and non-native English writers and provide EAP learners with guiding principles regarding the use of metadiscourse in academic prose. Diachronic variation in the use of interactional metadiscourse markers in RA abstracts could be also of interest. Last but not least, future research could involve interviews of non-native academic writers to analyze considerations they take into account when using metadiscourse in their research articles. Thus, despite the above-mentioned limitations, this study could be taken as a starting point for future studies of metadiscourse in academic prose from cross-disciplinary, cross-cultural or diachronic perspectives.

Notes

[1] In order to estimate the relative values of interactional metadiscourse devices, they were taken separately as 100 per cent each for both sub-corpora. This methodology made it possible to establish the correlations between the five types of metadiscourse devices within each discipline under study.

[2] Up to six occurrences per RA abstract.

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