

Self-representation by First-person and Impersonal Pronouns in English Research Articles of Four Disciplines

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Abstract

This paper addresses the issue of self-representation in English Research Articles of four disciplines by examining the use of first-person pronouns (*I/me/my/we/our/us*) and impersonal pronouns (*this/the/these*). The study first shows the similarities and differences in the frequency of the use of two types of self-representation pronouns in the corpora of 40 single-authored research articles in the area of Physics, Biology, Linguistics and Philosophy---10 articles in each discipline. Then, it goes further to the authorial roles of these pronouns. The results show that authors of RAs in all disciplines have the tendency to use first-person pronouns to refer to themselves and their studies, which accords with the more subjective mode of academic writing in recent years. The article also shows disciplinary differences in the four authorial roles realized by two types of pronouns and elaborates the specific discourse functions of RAs. Finally we show the tendency of using plural person pronoun “*we*” in addressing the single author in hard disciplines. The findings of this research carry important pedagogical implications for raising RA authors’ awareness to properly use self-representation pronouns for successful publications.

Keywords: self-representation; first-person pronouns; impersonal pronouns; English research articles; disciplinary differences; author roles; discourse functions

1. Introduction

In academic writing, “every word a writer writes contributes to the impression he is creating of herself to a reader”(Ivanič, 1994, p.5), therefore this impression, emerging from the text, creates *writer identity* (Hryniuk, 2018). Actually, there have been abundant studies concerning writer identity in the different terms. Ivanič and Camps (2001) discusses the same issue but uses the term *voice*, which is also used to represent writer identity in a given text. Under the Bakhtinian and social-interactionist view of language development, writers draw on *voices* to locate them historically and culturally and at the same time establish their identity. In this view, writing is a social and interpersonal process (Ivanič, 1998). Dontcheva-Navratilova (2013) also addresses the same issue by using *author presence*. In fact, either under the term *identity*, *voice*, or *presence*, the aim of these studies is to show how authors refer to themselves in academic writing. The current study also focuses on how the authors refer to themselves in RAs by examining first-person pronouns and impersonal pronouns.

Many studies have concentrated on the use of first-person pronouns (*I/me/my/we/our/us*) by the authors in referring to themselves in academic writings. The first type of studies are the explorations of first-person pronouns used by academic writers of different levels. For example, Harwood (2005) explored the differences of the use of first pronouns of novice writers and expert writers in methodology part of research articles. Hyland (2011) also studies the use of first pronouns in reports written by L2 undergraduates at Hongkong University and compared the results with the parallel corpus of 240 articles written by expert native-speaker writers and showed the frequencies and functions of the first pronouns are quite different.

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The second type of studies concerning first-person pronouns are cross-language studies, in which the researchers compare the first pronoun use in different languages, such as the exploration of I and we in five languages (German, English, French, Russia and Bulgarian) by Vassileva (1998) and also the native and non-native writers' use of first pronouns in different sections of biology research articles in English.

The third type of studies are the disciplinary studies. For example, Kuo (1999) explored the use of personal pronouns in research articles of computer science, physics and electronic engineering and found the different use of exclusive we and inclusive we in different disciplines. Hyland (2001, 2003& 2011) also focused on the use of first pronouns and determiners in English academic writings across various disciplines and found there exist great differences in soft disciplines and hard disciplines. Harwood (2005) also did the disciplinary studies of I and we used by English non-native academic writers and also found significant differences in hard disciplines and soft disciplines. From these studies, it can be seen that disciplinary factor is important in studying the writer identity, so our study also take the discipline factor into consideration.

The use of first-person pronouns to self-representation in RAs can be seen as the most explicit markers or stronger presence (Dahl, 2009:127) of academic authors. In addition, some researchers have noticed the alternative ways for implicit self-representation in academic writing such as passive voice (e.g. Atkinson, 1999; Swales, 1990), abstract rhetors (Hyland, 1998:172) or metonymic expressions, the personification of inanimate nouns (Dahl, 2009), metatext (Flottum et., 2006)), self-citation (Hyland, 2001) and other impersonal constructions, which also mark authors' presence although they introduce a greater distance to the statements in texts (Hynick, 2018). In Hyland's study of self-mention (Hyland, 1998), he took these impersonal pronouns (e.g. this paper) into his research, and considered it as a way of invisible self-mention in research articles. Molino (2010) studied both the first-person pronouns and the passive voice for authorial reference, which he called the personal and impersonal authorial reference. Runbald (2007) also examined the impersonal way of referring to authors by studying the use of passive voice and metonymy in medical discourse. He suggests that these impersonal forms of authorial reference enable writers to "signal credibility, reliability, objectivity, and ultimately authority to their readers and the research community" (2007, p.251). Our study of impersonal pronouns is greatly inspired by Dahl's (2009) research of author identity in economics and linguistics abstract. In this study, although the focus was on the first-person pronouns, his study also found that in some abstract there are no personal pronouns at all and nearly all the abstracts with no first-person pronoun for self-representation used this paper or the article for the same function. So academic author, at least in some disciplines, has the choice between stronger textual presence through personal pronouns ("I/we examines and presents") or weaker presence through personification of inanimate nouns ("The paper examines and presents"). Inspired by this research, both personal pronouns and impersonal pronouns for self-representation in RAs are examined.

Through the review of previous studies, it can be concluded that in academic writing, the authors have the option of making their presence explicit or concealing their presence. This visibility/invisibility may reveal something of how writers position themselves within the academic community they belong to, and also how they construct the relationship with their readers. In this study, we focus on both the first-person pronouns and the impersonal pronouns of authorial reference and aim to examine their forms and functions in RAs of four disciplines. Based on the previous disciplinary studies in this regard, we have the hypothesis that in different disciplines (soft and hard disciplines), the uses of author-reference pronouns vary.

The goals of our research are the following: 1) the frequencies of two types of self-representation in RAs of four disciplines; 2) disciplinary differences in the author roles performed by the two types of self-presentation; 3) The specific discourse functions of the self-representation pronouns in each type of author roles; 4) disciplinary differences concerning the use of *I* and *we*.

2. Corpus and procedure

The corpora for analysis consists of 40 single-authored research articles which were randomly taken from journals from Elsevier (<https://www.sciencedirect.com>) in four disciplines: Biology, Physics, Linguistics and Philosophy. The four disciplines are divided to soft and hard fields based on Becher & Trowler's (2001) taxonomy of disciplines. Ten articles were selected in each discipline. All of the articles were published in representative, peer-reviewed, highly reputable journals in the years 2015-2017. It should be noted that these articles were written by "international" writers whose native language may not be English.

In addition, all the RAs were single-, rather than multiple-authored, although in Physics and Biology multi-authored articles are very common. The corpus amounts to approximately 339,064 words. We refer to each discipline by abbreviating them as follows: Biology (BIOL), Physics (PHYS), linguistics (LING) and philosophy (PHIL). The corpus configuration was shown in Table 1.

Table 1. Text corpora used in the study

Discipline	Texts of research articles	Words
Hard field	20	156,518
Physics	10	49,942
Biology	10	106,576
Soft field	20	183,335
Linguistics	10	84,546
Philosophy	10	98,789
Total	40	339,853

The selected RAs were converted to TEXT format after all the abstracts, footnotes, endnotes, examples, and reference list were deleted. We first retrieve all the potential personal (*I/me/my/we/our/us*) and impersonal pronouns (*this/the/these*) in the concordancer and to exclude those that do not have the function of self-representation. For personal pronouns, only the cases of first person plural pronouns referring to the authors and their researches, known as exclusive *we*, were considered. For the impersonal pronouns, we just considered *this/the* which can function as the first personal pronouns though not in an explicit way. Look at one example from the corpus.

- (1) ***This work*** presents a new analytical model describing the operation of a photovoltaic-thermoelectric hybrid system assisted by a cooling device.(PHYS 6)

In the above case, *this* is considered as the impersonal pronoun for self-representation in RAs because in this case, the pronoun “*this*” can in fact be replaced by *our* or *my* or *this work* can be replaced by *we* or *I*. It can be seen that superficially the author is absent but in fact his/her presence is implicit. That is an alternative for self-representation in RAs. Therefore, in our study, we include both the personal pronouns and the impersonal pronouns.

Then we used the free software Antconc 3.2.4 to do the statistics of the frequencies of two types of self-representations. Because of the different length of each article and the total number of words in each discipline, the absolute frequency would not be an appropriate measure for our studies, so the frequencies need to be normalized (cf.Biber, Conrad & Reppen, 1998). The relatively frequencies are calculated by dividing the absolute frequencies by the total number of words. Since the relative frequencies are in general very small numbers, we choose to show the frequencies per 10000 words. Besides, in this process, all the occurrences of the pronouns were studied in their specific contexts to ensure that they really refer to the author and their researches. All the forms that refer to the participants or interviewees or that appear in examples in RAs other than the authors themselves were eliminated, therefore cases in Examples 2 were excluded in our analysis because in this example “*P*” is used to refer to the interviewee rather than the author..

- (2) For his TOFEL iBT courses, formulas were used for teaching structured responses, which Mike (one of the interviewees) argued “is the majority of what ***I*** teach because it is the root of what they do not get in their education system.....” (LING 4)

The contextual analysis of the forms also help to determine the different author roles and discourse functions. We looked at the immediate context where the pronoun occurs, such as the first and verb construction which is combined with the noun and also the met textual expressions surrounding it to decide which author role and specific discourse functions a pronoun has. For the categorization of author roles, in our study we followed the categorization of Flottum (2009:112). Four author roles are identified as follows: Author as writer: referring to the writing process or to the organizing of the article; typical discourse verbs are *describe, discuss, illustrate, outline, present, repeat, show, summarize, begin/start, move onto, turn to, conclude*.

1. Author as researcher: referring to the researching process itself; typical research verbs are *analyze, assume, consider, choose, conduct, explore, find, follow, study, test, use*.
2. Author as arguer: denoting the authors’ position and stance, concerning approval, promotion or rejection; typically position verbs are *argue, claim, dispute, maintain, propose, reject, think*.

3. Author as evaluator: typically manifested by evaluative constructions or emotion verbs, such as feel, find something +evaluative adjective.

But the verbs that come with the pronouns are not the only criteria to decide the author roles. The same verb in different context may have the different author role, therefore the close contextual consideration is necessary. Look at two examples.

- (3) **Our studies have shown** that the purely gravitational part of the theory is compatible with.....(PHYS 1)
 (4) **We show** in this section that this again reduces a single scalar equation.(PHYS 4).

In Examples (3) and (4), the same word *show* is used together with first-person pronoun *our* and *we*, however we cannot decide the author role only through the verb. We have to consider the wider context and metatext surrounding them before making a decision. In Example (3), the author is presenting the research findings, so the author role is *as researcher*, but in Example (4), from in this section, the author is actually guiding the reader and telling the content of *this section*, so the author role here is considered to be *as writer*. It should be pointed out in some context, the boundary between different author roles is unfortunately loose, and so it's hard to decide which author role a pronoun plays. In this case, our research group carefully studied the criteria of categorization of author roles and in extreme case the whole group will discuss together to make a decision.

Having outlined the corpus and procedure of our study, we now move to the analysis by beginning with the quantitative analysis of two types of self-representation and then move to the qualitative analysis of the authorial roles and discourse functions.

3. Results and discussions

3.1 Overall frequencies of self-presentation pronouns

The two most striking features of our data analysis are the saliency of self-representation pronouns and their distributions among the four disciplines. Overall, there are 782cases of author-representation pronouns in the RAs, roughly23 cases per 10000 words, amounting to an average of almost 19 cases in one article. The overall frequencies of both first-person and impersonal pronouns of self-representation are given in Table 1, which shows that in RAs there are sufficient cases of author-reference pronouns and first-person pronouns are the most frequently used(18/10000 vs. 5/10000), showing the promotional and interactional intentions of research articles.

Table2 Nominalized frequency per 10000 words of author-reference pronouns in the corpus

Disciplines	Total	First person pronouns	Impersonal pronouns
Average hard fields	21	17	4
Biology	7	4	3
Physics	50	45	5
Average soft fields	25	19	6
Linguistics	17	8	9
Philosophy	49	44	5
Overall	23	18	5

The disciplinary figures (see Table 2) show broad similarities in the overall use of self-representation pronouns in research articles. First, the overall average frequencies in hard fields and soft fields are almost the same (21 vs. 25), bearing no significant differences so we cannot say that there are more self-representation in soft-field than in hard field. Second, as for the frequencies of personal pronouns and impersonal pronouns, still there exist no difference in soft and hard field (17 vs. 19; 4 vs. 6).

However, the broad similarities do not mean there are no differences across four disciplines (see Table 3). First, the average frequencies of self-presentations in the four disciplines bear great differences. In Physics, the authors uses the pronouns most frequently while the biology authors uses the least ones. Second, in different discipline, the percentage of first-person pronouns and impersonal pronouns varies. In Physics and Philosophy, the first-person pronouns dominates, while in Biology and Linguistics, it is a balanced use of two types of pronouns. Third, there exist variations among research articles. One Physics article contains the most pronouns (149/10000) while a Biology article contains no pronouns at all. But this fact does not mean that in some articles there are no author presence for there are other alternatives for the author to choose to show their presence besides pronouns.

For example, when we look at the articles that contain few self-representation pronouns, we find passive voice is abundant, which also show the author’s trace implicitly. Look at a case from the corpus.

(5) Predicted peptides for tetracodon and pentacodon translations *were prepared* along the same principles.

In Example (5), the author concealed his/her explicit presence in the article by using the passive voice of the research verb *prepare*. The examples like this are abundant in the RAs, which is not the focus of this study.

Table3 Disciplinary comparison of frequencies of pronouns in the corpus (hits per 10000 words)

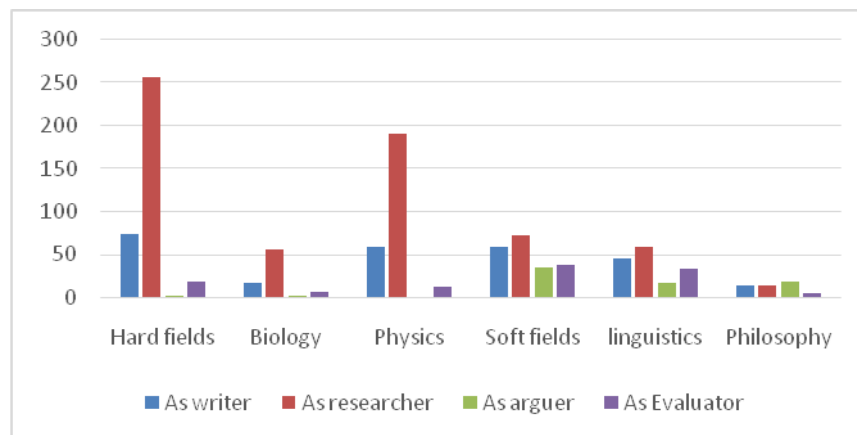
Disciplines	Average	Max	Mix	First person pronouns	Impersonal pronouns
Biology	7	24	0	4	3
Physics	50	149	2	45	5
Linguistics	17	48	6	8	9
Philosophy	49	116	6	44	5
Overall	23	149	0	18	5

3.2 Author roles and discourse functions

3.2.1 Overall frequencies of author roles in four disciplines

After presenting the overall frequencies of two types of self-presentation pronouns across the four disciplines, we now turn to the author roles performed by these pronouns and also elaborate in each author role what specific discourse functions they will have. Just as has been mentioned above, we based on the categorization of author roles proposed by Flottum (2009:112) and divide the author roles into four types: as writer, as researcher, as arguer, and as evaluator. The frequency of author roles in each discipline has been shown in Fig.1.

Fig.1 The frequency of author roles in the four disciplines



From Fig.1, we have the following findings. In hard and soft fields we can see considerable differences of distribution of author roles. In hard fields, the author role as researcher dominates while in soft fields the distribution is more balanced among the four disciplines, which shows in the RAs of hard fields, the authors lay more focus on what is related to their researches, for example, the goals, methodology, findings, procedure and so on, of their researches, while the authors in soft fields uses the pronouns also to guide the readers through the article, to express their opinion and viewpoints, to evaluate the work of other studies and their own, and to create an interaction between the author and the reader. In this aspect, we find Physics authors especially stand out in which the author role *as researcher* is clearly predominant.

However, we still cannot see the specific distribution of impersonal pronouns and personal pronouns and their specific discourse functions, so next we go further to each author role. Some studies have shown the discourse functions of first-person pronouns (Vessileva, 1998; Kuo, 1999; Hyland, 2002, 2003; Duenas, 2007; Molino, 2010; Martinez, 2005; Dontcheva-Navratilova, 2013 and so on). Based on these studies, we identify the specific discourse functions in each category of author roles, which will be elaborated one by one in following sections.

3.2.2 As researcher

Just as we have seen from Fig.1, the author role as researcher is the most frequent and foremost role in the four roles .First, we look at the distribution of person pronouns and impersonal pronouns that realize the author role of researcher.

Fig. 2 The distribution of person pronouns and impersonal pronouns in the author role as researcher

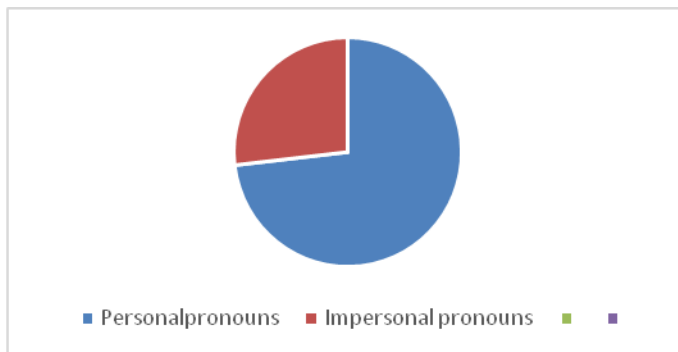


Fig.2 shows that when the author plays the role as a researcher, he/she tends to choose the personal pronouns rather than the impersonal ones. They explicitly show their presence by describing what they have carried out and what they have found during the research process. Here are some examples.

- (6) *We investigate* the effect of such transformation on the algebraic–geometric description of *T*–hyperelliptic soliton solutions..... (PHYS 5)
- (7)*we find* an expression for the phonon and electron thermoelectric conductivity.....(PHYS 6)
- (8) *This study found* that teachers primarily used TOEFL iBT textbooks for their main source of content in TOEFL iBT preparation courses. (LING 4) And the detailed discourse functions of research role are shown in Table 4.

Table 4 The discourse functions of authorial role as researcher (cases in the corpus)

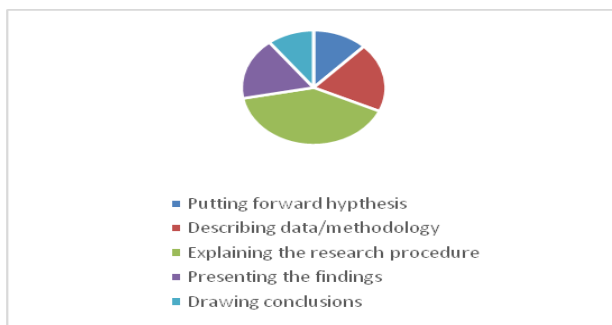
Discourse functions	Typical research verbs	Personal pronouns					Impersonalpronouns	
		we	our	us	I	my	this	the
Putting forward hypothesis	Hypothesize(hypothesis) assume(assumption) propose	32					17	
		27			5			
		21	6	0	2	3	12	5
Describing data/methodology	Use, Collect Refer to, deal with, employ,	55					23	
		48			7			
		40	8	0	3	4	14	9
Explaining the research procedure	Use, identify, investigate, observe, consider, integrate, recover, recognize, omit, derive, fix, lose, associate,	144					17	
		82			62			
		68	13	1	56	6	13	4
Presenting the research findings	Present, show, find	56					14	
		42			14			
		24	13	1	9	5	10	4
Drawing conclusions	Conclude, draw the conclusion, show, find	26					16	
		13			13			
		11	2	0	9	4	9	7

As Table 4shows, there are mainly five discourse functions of author role as researcher. RA authors always show their assumptions, and explain how they conduct the experiments and what they find from the researches. Besides, reaching a conclusion is also recognized as researcher. Among the five functions, *explaining the research procedure* occupies the largest percentage, which shows that in research articles, when the author plays the role as researcher, they like to explain how they carry out their researches, especially in hard fields which involve more research experiments.

We also find that in each discourse function, personal pronouns were more frequently used than impersonal pronouns. In this way, the authors make their explicit presence in the researches. The typical reporting verbs are also chosen to perform the specific discourse function for a researcher role.

From Fig.3, it can be seen, among the five author roles, “Explaining the research procedure” is the most important role that self-representation pronouns play in RAs.

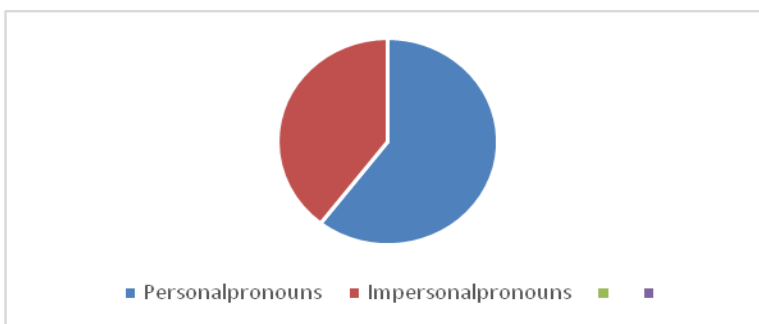
Fig 3 The percentage of discourse functions of pronouns as researcher



3.2.3 As writer

When the authors adopt pronouns to give the outline of their articles, organize the structure of RA, make the article more coherent, and direct the readers through the reading, the author role is as writer. This is also a predominant author role in RAs played by self-representation pronouns. The distribution of person pronouns and impersonal pronouns that serve as the author role of writer is shown in Fig. 4.

Fig. 4 The distribution of person pronouns and impersonal pronouns in the author role as writer



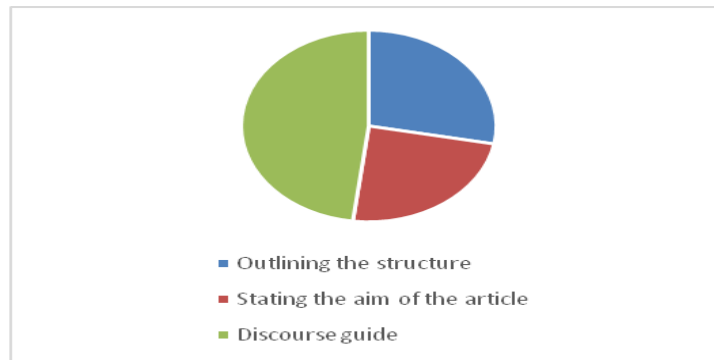
Quite different from the predominant role of personal pronouns in the author role as researcher, Fig.4 shows a relatively balanced distribution of personal pronouns and impersonal pronoun when they are used to refer to the author as writer. Their specific discourse functions and pronouns forms are shown in Table 5.

Table 5 The discourse functions of authorial role as writer (hits in the corpus)

Discourse functions	Typical discourse verbs or nouns	Personal pronouns					Impersonalpronouns	
		we	our	us	I	my	this	the
Outlining the structure of the RAs	Structure, summarize, start, introduce, divide, present	25					30	
		18			17			
		14	4	0	12	5	21	9
Stating the aim of the article	Goal, aim, try to prove, address, explore	24					23	
		15			9			
		2	13	0	2	7	14	9
Functioning as a discourse guide	Move onto, turn to, (next) show, begin with, continue, finally conclude, provide further.....	59					35	
		44			15			
		38	4	0	11	4	19	16

Table 5 shows the three specific discourse functions of the authorial role as writer. The first discourse function to outline the structure of RA. The RA authors adopt the verbs *outline*, *present* and *structure* to give an introduction of the structure of their RAs. The author as writer also introduces the aim or goal of RA and use various linguistic expressions to make their RAs coherent. For example, the author uses *we now*, *therefore*, *turn to...* to connect the paragraphs in a smooth and coherent way. The last one is *Functioning as a discourse guide* for the readers. By using the pronouns together with the metatext surrounding them, the authors make the RA more coherent and more reader-friendly, therefore directing the readers smoothly through the articles. And we can also see from Fig.5, *Functioning as a discourse guide* is the most important function in writer role, occupying almost half of all the functions, which shows the authors pay much attention to guide the readers to understand their articles and create an interaction with readers.

Fig 5 The percentage of discourse functions of pronouns as writer



3.2.4 As arguer

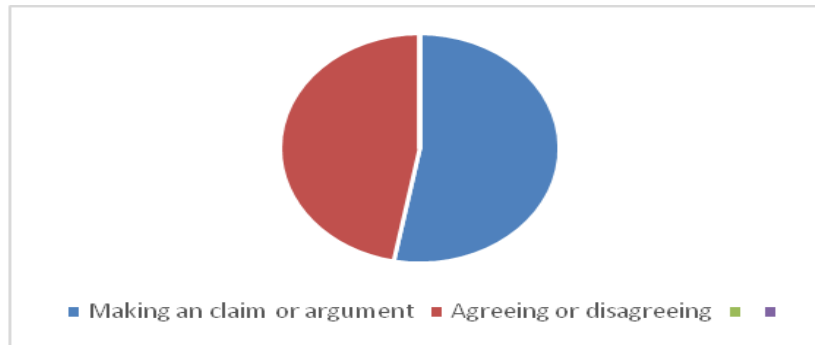
In addition to the author roles as researcher and writer, the RA authors also use personal pronouns and impersonal pronouns to make claims and argument and express their viewpoints. In this case, their author role is *as arguer*. As mentioned in the earlier part of this article, the percentage of the author role as arguer in our corpus is not as much as the roles as researcher and writer, but we can still examine how this role is realized by pronouns and what their specific discourse functions.

Table 6 The discourse functions of authorial role as Arguer (hits in the corpus)

Discourse functions	Typical position verbs or nouns	Personal pronouns					Impersonal pronouns	
		we	our	us	I	my	this	the
Making an claim or argument	Assume, claim, make my claim, believe, think, suppose, submit, say, argue,	42					12	
		18			24			
		13	5	0	12	5	8	4
Agreeing or disagreeing others	Agree, disagree, argue, support, opinion, viewpoint	25					23	
		16			9			
		11	5	0	6	3	14	9

From the Table 6 and Fig. 6 above, we can see that RA authors always adopt the verbs like *argue*, *believe*, *suggest*, *claim*, *submit*, *(dis)agree* and so on to express or share their own ideas or attitudes towards certain issues or (dis)agree with certain facts. And the two functions keep a relatively balanced distribution.

Fig.6 The distribution of person pronouns and impersonal pronouns in the author role as arguer



3.2.5 As evaluator

By using self-representation pronouns, the RA authors also evaluate or assess. In this case, the author role is as evaluator. This type of author role contains two sub-types, self-evaluation and evaluation of others, It is worth noting that evaluation may be negative, neutral or positive evaluation. We will show the specific discourse functions in Table 5.

Table 7 The discourse functions of authorial role as evaluator (the number of cases in the corpus)

Discourse functions	Typical evaluative adjective and verbs	Personal pronouns					Impersonal pronouns	
		we	our	us	I	my	this	the
Evaluation of other works	Inconsistent, plausible, significant, convincing, comprehensive	14					1	
		11			3			
		6	4	1	3	0	0	1
Stating the merits and contributions of the researches	Positive, original, new, further, important, highlight, plausible, open the way, count, play an important role, contribute to, reliable	23					12	
		15			8			
		4	11	0	3	5	9	3
Pointing out the limitations of the current researches	Do not know yet, point out the limitations of our study, doesn't confirm, is not suitable	16					8	
		13			2			
		4	9	0	1	1	5	3

In playing the author role as evaluator, the pronouns are mainly used to self-evaluate, while evaluating others, the pronouns are not chosen. This fact does not show that in RAs the authors seldom evaluate others' studies, in fact, some studies have shown the evaluative functions of reporting verbs. Through choosing different reporting verbs with various evaluative orientations, the authors' attitudes toward others' studies have been shown. But for self-evaluation, personal pronouns are relatively frequently chosen. And the two discourse functions are showing the contributions or merits of the current researches or pointing out the limitations of the research. From Table 5, we can see that authors adopt various linguistic expressions to evaluating their own researches positively and promote their RAs. For example, in the first sub-classification the author uses *further developed*, *original* and *reliable* to show the new methodology, new and original findings, and their contributions to the academic world. Consequently, the author role as self-evaluation sometimes could be considered as a promoter and play the self-promotion function by highlighting the importance and crucial position of their RAs, which is also seen from Fig.7 to be the most important role in the three author roles as evaluator.

Fig.7 The distribution of person pronouns and impersonal pronouns in the author role as evaluator

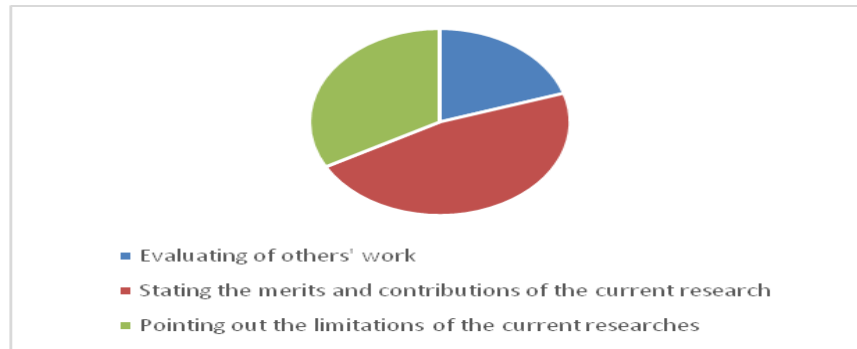
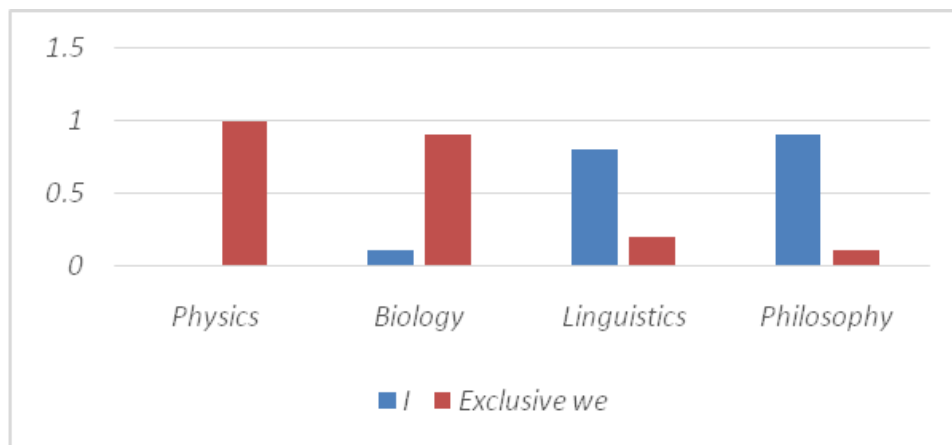


Fig. 8 The distribution of *I* and Exclusive *we* in four disciplines



3.3 Disciplinary differences of two types of self-representation pronouns and author roles

As has shown in the previous part, RA authors have the choice between first-person pronouns and impersonal pronouns to present themselves overtly or implicitly, through which they report their work and reflect the various aspect of their scientific activities showing such author roles as researcher, as writer, as arguer or as evaluator. And when playing various roles, they are performing various discourse functions. So are there any differences across the four disciplines in how the two types of pronouns manifest the four author roles and the specific discourse functions? This section will address this question.

3.3.1 Disciplinary differences in First-person pronouns and author roles

Table 8 Percentage of each author role performed by first-person pronouns in the four disciplines

	Physics	Biology	Average Hard fields	Linguistics	Philosophy	Average soft fields
	Raw %	Raw %	Raw %	Raw %	Raw %	Raw %
As researcher	172 74.8%	36 66.6%	209 72.8%	21 24.4%	34 26.6%	55 25.7%
As writer	51 22.2	13 24%	64 22.3%	45 52.3%	34 26.6%	79 37%
As arguer	0 0%	3 5.7%	3 1%	14 16.3%	50 39%	64 30%
As evaluator	7 3%	2 3.7%	9 3.9%	6 7%	10 7.8%	16 7.3%

The percentage of the author roles which first-person pronouns and impersonal pronouns perform in our corpus are listed in Table 8. We can observe a divergence in the percentage of one author occupy in the four roles realized by fir-personal pronouns. Overall, the hard fields favor the author role as researcher (72.8%) but there are fewer author roles as arguer (1%) and as evaluator (3.9%), while in soft fields we do not see any prominent role. It can be noticed that the roles as researcher, as writer, as arguer have a balanced distribution with the percentage of the role as writer (37%) is slightly higher than that of other two roles(25.7% & 30%).

And we still find very few author roles as evaluator realized by first-person pronouns, which shows that when the authors make the evaluation towards others' or their own work, first-person pronouns are not their favorite choices and do not want to make their presence explicit.

3.3.2 Disciplinary differences in impersonal pronouns and author roles

Table 9 Percentage of each author role performed by impersonal pronouns in the four disciplines

Author roles	Physics		Biology		Average Hard fields		Linguistics		Philosophy		Average soft fields	
	Raw	%	Raw	%	Raw	%	Raw	%	Raw	%	Raw	%
As researcher	18	60%	20	77%	38	67.9%	38	52.8%	1	33.3%	39	52%
As writer	7	23.3%	3	11.5%	10	17.9%	5	7%	2	66.7%	7	9.3%
As arguer	0	0%	0	0%	0	0%	2	2.8%	0	0%	2	2.7%
As evaluator	5	16.7%	3	11.5%	8	14.2%	27	37.4%	0	0%	27	36%

Table 8 has shown the disciplinary differences in the percentage of each author role performed by first-person pronouns, and now we refer to the disciplinary differences in the percentage of each author role performed by impersonal pronouns. From Table 9, in hard fields, we find that the prominent role performed by impersonal pronouns is still the role as researcher, which is similar to the situation in first-person pronouns. However, still with very low percentage of the role as arguer (0%), we find the percentage of the role as evaluator grows (14.2% in Table 6 vs. 3.9% in Table 5). The authors tend to choose impersonal pronouns to make evaluations which is a strategy to make themselves distant from the evaluation and slow the risk of performing face-threatening act. In soft field, the first and second author roles that are most frequently realized are the role as researcher (52%) and the role as evaluator (36%), but we still cannot say that that is the common characteristics of all the disciplines in the soft fields. It is surprising to see the great difference between Linguistics and Philosophy. In Linguistics, the role as evaluator is attested by 37.4% while in Philosophy we find no evaluating role realized by impersonal pronouns. Therefore, each discipline has its own conventions of how authors choose the different lexicogrammatical structures to play a certain author role.

3.3.3 First-person pronouns and impersonal pronouns and author roles compared

Table 10 Percentage of author roles by First-person pronouns (FP) and impersonal pronouns (PP)

Author roles	Biology		Physics		Average Hard fields		Linguistics		Philosophy		Average Soft fields	
	FP	IP	FP	IP	FP	IP	FP	IP	FP	IP	FP	IP
As researcher	64%	36%	91%	9%	85%	15%	36%	64%	97%	3%	74%	26%
As writer	81%	19%	88%	12%	86%	14%	89%	11%	94%	6%	91%	9%
As arguer	0	0%	0	0%	0	0	88%	12%	100%	0%	96%	4%
As evaluator	50%	50%	17%	83%	55%	45%	18	82%	100%	0%	37%	63%

Table 10 is a comparison of the percentage of first-person pronouns and impersonal pronouns when performing the author roles. We aim to see when performing a certain author role, what tendency the author has in choosing personal or impersonal pronouns. We find both similarities and differences. Overall, in both soft fields and hard fields, when playing the roles as researcher and as writer, first-person pronouns are favored, but when playing the roles as arguer and as evaluator, the impersonal pronouns are favored in soft field but in hard field we cannot see this tendency. In addition to the overall comparison in soft and hard fields, Table 9 also shows considerable differences in different disciplines. It is noticeable that Linguistics discipline is quite divergent from others in that when playing the author role as researcher, the authors tend to choose impersonal pronouns. Linguistics and Philosophy are also opposite to each other in that in playing the author role as evaluator, linguistics authors like to employ impersonal pronouns by concealing their overt presence while Philosophy authors prefer the first-person pronouns by showing their explicit presence.

3.4 A case study of *I* and exclusive *we*

In the current study, we just selected the single-authored research articles to build the corpus in order to whether exclusive *we* will not be used to refer to the author himself.

But our study shows a surprising result: in many single-authored articles, the author uses the exclusive *we* to refer to himself. For example: (6) We start by summarizing the main properties of three-dimensional topological insulators in the quantum-field-theory framework. (PHYS 1)

Example (6) is taken from a Physics article. This article is single authored, but in the whole article, the author used “we” instead of “I”. The case is not unique, but rather common in the discipline of Physics. In the ten articles we find no occurrence of *I* for self-representation except that in one article, neither *I* nor *we* are used. Instead, the impersonal pronouns are used for the roles and functions of *I* and *we*. In order to know whether in each discipline, there exists such a “we” tendency, we conducted a disciplinary analysis concerning the use of *I* and *We*. Here are our results.

We show the distribution of *I* and Exclusive *we* in four disciplines (the percentage of *I* or exclusive *we* occupying all the first-person pronouns in the corpus). It can be seen that in Physics and Biology, there is strong tendency to refer to the single author by using exclusive plural person pronouns, while in Linguistics and Philosophy there are some exclusive plural person pronouns used to refer to the single author, but the single person pronouns still stand out. The reason for the tendency may be that in Physics and Biology, the studies and researches are carried out by a research group, but when presenting the research, only one researcher is authored, so the author tends to use “we” not to refer to himself but to refer to all the research members. In fact, it is not very easy for us to collect the single-authored articles when we build the corpus for the common practice of a research group in hard fields. But in soft fields, this case is not common, so most of the single-authored articles use “*I*” to refer to the author.

4. Concluding remarks and pedagogical implications

The current study has investigated the first-person pronouns and impersonal pronouns in self-representation in research articles of four disciplines. Taking the impersonal pronouns into consideration in studying self-reference, the study should widen the research scope in this aspect. We have the following findings: The four disciplines bear considerable similarities in overall use of self-representation pronouns. In both hard and soft fields, both first-person pronouns and impersonal pronouns are employed by the RA writers to refer to themselves, but first-person pronouns are more frequently used. This finding is accord with the findings of Dontcheva-Navratilova (2013) showing the tendency towards a more subjective way in the academic writing despite the influential role of a scientific paradigm advising objectivity and avoidance of personality in academic writing. We also show that in each discipline, two types of pronouns help the author perform four types of roles and serve the specific discourse purposes within a context together with the surrounding metatext. In addition to the similarities, there are also differences. In hard fields, the author role as researcher dominates while in soft fields the distribution of author roles is more balanced. In performing different author roles, the first-person pronouns and impersonal pronouns are doing the different jobs. Our study also shows a surprising difference of the use of *I* and exclusive *we* in the four disciplines. Our studies of the distribution of *I* and exclusive *we* across the four disciplines, we find that in Physics and Biology, there is strong tendency to refer to the single author by using exclusive plural person pronouns, while in Linguistics and Philosophy there are some exclusive plural person pronouns used to refer to the single author, but the single person pronouns still stand out.

Although our study is a complement to the previous studies concerning authorial reference by including the impersonal pronouns, it has limitations. For example, the results should be verified by a larger-scale study exploring a more extensive corpus and considering more factors such as genre, culture, language and epistemologies and so on. In spite of the limitations, the message here is that it is vital for students and teachers alike to be aware of the ways in which the first-person pronouns and impersonal pronouns can be used for self-representation in RAs. For students, our findings can give them a better understanding of the choices available to them and help them to decide how best they can present themselves in the RAs. Our findings of the larger percentage of the first-person pronouns than that of the impersonal pronouns may reveal the interpersonal and interactional nature of RAs. The students should not be too shy to use the personal pronouns. For teachers, raising the consciousness is crucial. In the teaching process, our findings can help the teachers go beyond the conservative prescriptions of the writing guide books and into the context and conventions of their disciplines by knowing the preferred patterns of self-representation in different academic communities. The teachers’ clearer instructions for the discourse functions of the two types of self-representation pronouns will also help our learners to be better to gain control over their writing and meet the challenges of participating in international publications.

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