

## A Corpus-driven Cross-disciplinary Study of Inclusive and Exclusive *We* in Research Article Abstracts

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### Abstract

With its distinct characteristics, the research article (hereafter RA) abstract has been a major area of interest within the field of metadiscourse. Investigating authorial presence displayed in RA abstracts can play an important role in illuminating the nature of the interaction among the writer, the text, and the reader. This study aimed to shed light on the disciplinary variation on how much, and for what purposes, authorial presence is shown in RA abstracts through the use of the first-person plural pronoun *we* as an engagement marker (the inclusive form) and a self-mention device (the exclusive form) using a corpus of RA abstracts in the fields of Bioengineering and Software Engineering (hard sciences), and Psychology and Sociology (soft sciences). The inclusive *we* was found to be very rare, therefore, the majority of the analysis focused on the exclusive *we*. The results indicated a considerable variation across the sampled disciplines and a general tendency to use self-mention when explaining purposes, procedures, and results, but not when introducing and concluding, or elaborating arguments. The findings of this study will

contribute to a deeper understanding of the disciplinary variation in the use and communicative functions of <i>we</i> , which could enhance academic writing practices.
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## Introduction

Academic writing is a major area of interest within the field of applied linguistics. Academic texts, especially scholarly ones, have so far attracted considerable attention because of their critical role in providing an understanding of their disciplines (Hyland, 2004). Writing is “what academics principally do”, and written texts, as products of disciplinary discourses, are full of information about their social practices (Hyland, 2004, p. 2). This is because academic writing is never a solitary activity. On the contrary, with the writer interacting with the text and the members of the discourse community as the future readers, it may well be considered as “a social and communicative engagement” (Hyland & Tse, 2004, p. 156). In this regard, looking at academic writing through the lens of metadiscourse, which can be defined as “the set of tools enabling the involved parties to establish relationships” (Akbaş & Hatipoğlu, 2018, p. 767), allows researchers to shed light on the interaction among the writer, the text, and the reader.

In Hyland’s (2005) interpersonal model, metadiscourse is comprised of two dimensions: the interactive dimension, which helps to guide the reader through the text with the use of *transitions*, *frame markers*, *endophoric markers*, *evidentials* and *code glosses*, and the interactional dimension, which involves the reader in the text with the use of *hedgies*, *boosters*, *attitude markers*, *engagement markers* and *self-mentions*. While there is a considerable amount of research on the five sub-categories of each dimension mentioned above in the context of academic writing (i.e., Akbaş, 2012; Akbaş, 2014; Akbaş & Hardman, 2018; Cao & Hu, 2014; Chen & Hu, 2020; Gillaerts & Van de Velde, 2010; Golmohammadi et al., 2014; Hu & Cao, 2015; Hyland & Jiang, 2016; Jiang & Hyland, 2017; Kawase, 2015; Kim & Lim, 2013; Mu et al., 2015; Mur-Dueñas, 2011), there have been fewer studies (Harwood, 2005a, 2005b) on the pronoun *we*, which could belong to both ‘engagement markers’ and ‘self-mention’ subcategories of the interactional domain with its inclusive and exclusive forms. The need to address the complex nature of the inclusive and exclusive *we* is critical because “[c]onflicting advice in textbooks and style guides and the apparently diverse conventions of

different disciplines” (Hyland, 2001, p. 207) make it difficult for students, teachers, and even for experienced writers to decide how much, if any, authorial presence is acceptable. In this respect, knowing more about the diverse disciplinary practices might help them make more conscious choices. As Becher (1994) argues, an awareness of disciplinary variations is instrumental, and sometimes fundamental, whilst carrying out research. Therefore, the present cross-disciplinary study aims to contribute to research by investigating the use and communicative functions of the inclusive and exclusive *we* in a critical section of one of the most common genres of academic writing, more specifically in research article (RA) abstracts.

### Literature Review

There is a growing body of research that recognises the importance of RA abstracts as a distinct genre in the context of academic writing (Akbaş, 2012; Gillaerts & Van de Velde, 2010; Hyland, 2004; Jiang & Hyland, 2017; Salager-Meyer, 1990). RA abstracts attract increasing interest due to various reasons. First, in their abstracts, which represent a “crystallization of the whole article” (Salager-Meyer, 1990, p.367), writers usually perform certain rhetorical moves with useful functions creating an organizational pattern that is similar to the RA itself, as can be seen in Hyland’s (2004) classification (see Table 1).

**Table 1**

*Hyland’s (2004) Classification of Rhetorical Moves in Article Abstracts*

Move	Function
Introduction	Establishes context of the paper and motivates the research or discussion.
Purpose	Indicates purpose, thesis or hypothesis, outlines the intention behind the paper.
Method	Provides information on design, procedures, assumptions, approach, data, etc.
Product	States main findings or results, the argument, or what was accomplished.
Conclusion	Interprets or extends results beyond scope of paper, draws inferences, points to applications or wider implications.

Second, considering the enormous amount of the published research in any given discipline, academics may use abstracts to keep up with the recent publications, and then briefly looking at the remaining parts (Salager-Meyer, 1990). Another reason for their importance is that abstracts, being the first thing read after the title, have a significant effect on the readers' decision on whether they continue reading or not (Hyland, 2004). Thus, the writer of an abstract would need to make important organizational and linguistic decisions regarding both the structure and the propositional content of it.

One of these decisions might also be related to how and how much authorial presence will be shown. Some writers might take on the role of, echoing Hyland's (2001) metaphor, 'humble servants of the discipline' and use impersonal language to reflect the empirical and objective nature of their research and/or to stress the collective nature of academic knowledge or responsibility. Some may prefer to place themselves somewhere towards the end of Tang and John's (1999) continuum of authorial presence, displaying a powerful authorial presence by taking on the roles of "I as opinion-holder" or "I as originator" (p. 29). However, for many, the question may be that of seeking a balance between their "authority as expert-knower" and "humility as disciplinary servant" (Hyland, 2005, p. 91). Kuo (1999) draws our attention to the dilemma writers could face when trying to claim the significance and contributions of their research and at the same time, trying to display modesty seeking approval and acceptance. Here, as one of the metadiscoursal devices that could help to achieve a balance, the first-person plural pronoun *we* could serve writers with its inclusive and exclusive forms. While the inclusive *we* is an engagement marker referring to the writer and the potential reader together, and thus establishing a shared membership to the same disciplinary community, the exclusive *we* is a self-mention device referring to the writers as the agents. Indeed, data from several studies suggest that *we*, with both its forms, is the most commonly used personal pronoun in RAs (Jasim Al-Shujairi, 2020; Wang et al., 2021).

In his studies, Harwood (2005a, 2005b) provides in-depth analyses of the use and functions of inclusive and exclusive *we* in RAs. Writers sometimes move between the inclusive and exclusive forms to construct novelty or use inclusive *we* to describe disciplinary practices and sometimes to critique them (Harwood, 2005b). They also elaborate

arguments, ask questions on behalf of the community, provide methodological description, and act as a discourse guide through the use of *we*. In addition, the pronoun *we* can also be used to create a self-promotional tone to the RAs when personalizing claims, highlighting procedural soundness and uniqueness and giving self-citations (Harwood, 2005a). As can be seen Table 2, Hyland (2002) also identifies certain functions of self-mentions in his study that compares student reports and RAs.

**Table 2**

*Hyland's (2002) Classification of Discourse Functions of Self-mention*

Function	Explanation
Stating a goal/purpose	Stating discursual purposes to signal intentions and provide an overt structure for the texts
Explaining a procedure	Describing the research procedures used
Stating results or claims	Stating results and making knowledge claims
Expressing self-benefits	Commenting on what was personally gained from the project
Elaborating an argument	Giving opinions

Hyland's (2002) classification has been taken as a starting point and adapted by several studies. Walková (2019) compares L1 English, L1 Slovak, and L2 English writing by Slovak writers and finds that *describing or explaining a research decision or procedure* and *stating a purpose, intention or focus* are used more frequently than other functions. Using a corpus of linguistics RAs from the Institute for Scientific Information (ISI) and Iraqi local journals, Jasim Al-Shujairi (2020) further supports the finding that *explaining a procedure* and *stating a goal/purpose* are the most common functions attached to the uses of self-mentions as in Hyland's (2002) study. Furthermore, in their longitudinal study, Hyland and Jiang (2017) discuss the informal tone that the use of self-mention pronouns could add to the language used in RAs of different disciplines and report an increase in their uses in hard sciences. In another longitudinal study, Hyland and Jiang (2018) confirm their previous findings related to the increasing use of self-mention pronouns, especially in hard sciences, and indicate a growing trend towards more explicit authorial presence. The hard versus soft science distinction that appeared in these studies is a convenient way of looking at the

disciplinary groups that Becher (1994) refers as “academic tribes, each with their own set of intellectual values and their own patch of cognitive theory” (p.153). These disciplinary variations can manifest themselves in the ways research is communicated to its audience in academic texts (Becher & Trowler, 2001). As highlighted by Omidian et al. (2018), researchers from hard and soft sciences do have different priorities when presenting their research in their abstracts. In light of the above-mentioned research, the present study attempts to contribute to a deeper understanding of the disciplinary variations in the uses and communicative functions of the inclusive and exclusive *we* in RA abstracts.

### Methodology

For the present corpus-driven cross-disciplinary study, a corpus of a total of 200 RA abstracts was constructed, with 100 abstracts from hard sciences and 100 abstracts from soft sciences using the corpus generation tool, *AntCorGen Version 1.1.2* (Anthony, 2019). For the hard sciences, an equal number (50) of RA abstracts from the disciplines of Bioengineering (hereafter BE) and Software Engineering (hereafter SE) was randomly chosen based on the criterion of the biggest numbers of RAs representing Engineering and Technology (9,573 and 5,129, respectively) in the PLOS ONE research database that AntCorGen operates on. In the same vein, disciplines of Psychology (hereafter PSY) and Sociology (hereafter SOC) were chosen to represent soft sciences (with 37,846 and 11,552 RAs respectively under the title of Social Sciences by AntCorGen). As a result, a corpus of 45,683 words was compiled as shown in Table 3 below.

**Table 3**

*Number of RA Abstracts and Words in the Corpus*

Major Discipline	Minor Discipline	Number of RA abstracts	Words
Hard Sciences	BE	50	13,689
	SE	50	10,206
Soft Sciences	PSY	50	10,203
	SOC	50	11,585
Total		200	45,683

*AntConc Version 3.5.9* (Anthony, 2020) was used to find the instances of *we* in the corpus. Although the uses of *our* and *us* also existed in the corpus, they were not included in the present study since this study only focuses on the subject pronoun form of the inclusive and exclusive *we*. We then manually analysed each instance to determine whether it functions either inclusively or exclusively. After this initial analysis, instances of inclusive and exclusive *we* were categorized based on their communicative functions, using the framework developed by the present researchers (see Table 4) based on Hyland's (2002) framework of discourse functions of self-mentions and Hyland's (2004) framework of rhetorical moves in article abstracts.

**Table 4**

*Communicative Functions of Inclusive and Exclusive We in RA Abstracts*

Function	Explanation
Introducing the study (INT)	Establishing the context or motivation for the research
Stating a discursual purpose (DP)	Providing a structure for the paper
Stating the purpose of the study (PS)	Indicating the purpose of the study or the hypothesis behind it
Explaining a procedure (PRO)	Providing information on research procedures/methodology
Stating results (R)	Stating main results/findings or what was accomplished based on the results
Elaborating an argument (A)	Giving opinions
Concluding the study (C)	Interpreting or extending the results or pointing to applications or wider implications

There were a number of reasons for developing a new framework for the purposes of the present study. Firstly, two functional categories, introducing the study and concluding the study, were added since initial analysis revealed that some instances of *we* do not fit into the existing categories in Hyland's framework. In addition, two categories for the 'purposes' were added because writers of certain disciplines were found to show more tendency to use the exclusive *we* to state the purpose of their study while the others used it more to provide the purpose of their paper. *Since* Hyland's (2002) framework did not make a distinction on the

different nature of these purposes that RA abstracts commonly serve, it was decided that as a distinct genre, RA abstracts required a broader set of discourse functions. Finally, because the 'expressing self-benefits' function in Hyland's (2002) framework did not occur in the sampled RA abstracts and, as in Hyland's (2002) sample of RAs, it was excluded from the framework developed for the present study.

While coding the functions, the abbreviations shown in Table 2 were used. After the first group of 50 RA abstracts from both the hard and soft disciplines was coded, another researcher was asked to code the communicative functions using the classification provided by the present researcher. The first author and a researcher from the field of Applied Linguistics coded over 35% of the data to test for reliability, including 119 cases of 'we' with a range of functions based on the framework of the study. Following the completion of the coding by the two raters, we calculated a Cohen's Kappa statistic to test for interrater reliability between coders. We particularly chose Cohen's Kappa since it is 'a robust statistic useful for either interrater or intrarater reliability testing' (McHugh, 2012, p.279) between coders. The result suggested an almost perfect level of agreement with a score of .832 between coders. Instances of differences in the coding were discussed until a consensus was reached. The rest of the coding was completed by the present researchers, and each pronoun in the corpus was assigned one function. However, in three (one in SOC and two in SE) cases of elliptic uses, as exemplified below, the pronouns were assigned two functions.

**We compared** the performance in computing time for this example data on two computer architectures and **[we] showed** that the use of the present functions can result in several-fold improvements in terms of computation time.

SE12 -Explaining a procedure (PRO)+ Stating results (R)

Finally, a chi-square test was administered to explore if there were statistically significant differences between the sampled disciplines.



## Results and Discussion

### Uses of Inclusive and Exclusive *We*

One of the purposes of the present study was to investigate disciplinary variations in terms of the use of inclusive and exclusive *we* in RA abstracts. The occurrences of the inclusive and exclusive *we* in the corpus in Table 5 indicated a clear preference for the exclusive forms when the normalized frequencies per abstract are taken into account.

**Table 5**

*Raw and Normalized Frequencies (per Abstract) of Inclusive and Exclusive We in RA Abstracts*

Major Discipline	Minor Discipline	Inclusive <i>We</i>		Exclusive <i>We</i>	
		raw	per abstract	raw	per abstract
Hard Sciences	BE	0	0	64	1.28
	SE	0	0	91	1.82
	<b>Total</b>	0	0	155	1.55
Soft Sciences	PSY	2	0.04	53	1.06
	SOC	0	0	111	2.22
	<b>Total</b>	2	0.04	164	1.64

In hard sciences, there is no instance of the inclusive *we*, and in soft sciences, there were only two, both in the same discipline, PSY, and both in the same RA abstract. Therefore, it can be concluded that writers mostly use *we* as a self-mention device, but not as an engagement marker. This finding was also reported by Wang et al. (2021). One reason for this could be that authors are more concerned about achieving ‘a self-promotional effect’, as Harwood (2005a) puts it, rather than about acknowledging their readers as disciplinary equals. As Salager-Meyer (1990) argues, readers do not always read beyond abstracts. Thus, abstracts could be a writers’ one and only chance for self-promotion. Furthermore, the self-promotional tenor created in abstracts may increase the chances that readers will continue reading. Therefore, instead of using the inclusive *we* as an engagement marker “to describe the practices or the beliefs of the community as a whole” (Harwood,

2005b, p.355), the writers of the RA abstracts sampled in the present study might be tempted to use the exclusive *we* as a self-mention device to promote themselves and their research. Additionally, Lorés-Sanz (2006) indicated that the use of *we* as an inclusive marker in English RA abstracts is almost non-existent since it is generally used to establish shared knowledge and RA abstracts do not seem to call for performing such a rhetorical role.

In terms of instances of exclusive *we*, there was no clear distinction between the hard and soft sciences. In addition, one discipline from each group, SE and SOC, was found to be using the exclusive *we* more than their counterparts. The discipline which showed the least preference for self-mention was PSY, presenting a sharp contrast to the other soft science, SOC, which had more than twice as many instances of the exclusive *we*. Therefore, it can be concluded that the writers of academic disciplines from different fields may show similar explicit author presence preferences, while writers from the same fields may be very different in their use of exclusive *we* as a self-mention device. These findings are consistent with those of Hyland's (2001), but differ from those of Hyland's (2002), Hyland and Jiang's (2017, 2018), and Hyland and Tse's (2004), which indicate a hard/soft science split in the use of self-mention.

In conclusion, although the findings of the present study revealed a disciplinary variation both in inclusive and exclusive forms of the pronoun *we*, a distinction between the hard and soft sciences was only found in the very few instances of inclusive *we*, but not in the overwhelmingly more use of exclusive *we*.

### **Communicative Functions of the Exclusive *We***

The present study also aimed to investigate cross-disciplinary variations in the communicative functions assigned to the uses of inclusive and exclusive *we* in RA abstracts. While coding, the co-text and the verbs used after the pronoun *we* determined the communicative functions. In most cases, however, it was also observed that the same pronoun-verb combination was used to fulfil different functions of RA abstracts. The examples below respectively show how the verb 'conclude' can be used to fulfil a discoursal function by referring to the ending of the paper or to draw attention to the applications and/or

implications of the results of the study. Therefore, caution was taken to avoid snap judgements.

**We conclude** by describing in detail the semantic transformations defined for our language.

SE1-Stating a discorsual purpose (DP)

**We conclude** that ScriptingRT can be used to test response latency effects online.

SE11-Concluding the study (C)

As previously stated, there were only two instances of inclusive *we* in the corpus and, because the coding revealed that they both fulfilled the same communicative function, the inclusive *we* was not included in the table below. Therefore, Table 6 summarizes the findings related to the functions assigned to the instances of the exclusive *we* only. The chi-square tests revealed that there were only two such functions assigned to the exclusive *we*, and these functions were *stating a discorsual purpose* ( $\chi^2=13.51$ ,  $p<.05$ ) and *elaborating an argument* ( $\chi^2=16.06$ ,  $p<.05$ ).

**Table 6**

*Communicative Functions of Exclusive We in RA Abstracts*

Disciplines		INT	DP	PS	PRO	R	A	C
Hard Sciences	BE	1	6	11	24	18	3	1
	%	1.56	9.37	17.19	37.50	28.13	4.69	1.56
	SE	0	26	17	25	19	2	4
	%	0.0	27.96	18.28	26.88	20.43	2.15	4.30
Total		1	32	28	49	37	5	5
	%	0.64	20.38	17.84	31.21	23.57	3.18	3.18
Soft Sciences	PSY	0	2	12	24	7	8	0
	%	0.0	3.77	22.64	45.28	13.21	15.10	0.0
	SOC	0	6	29	41	34	1	1
	%	0.0	5.36	29.89	36.61	30.36	0.89	0.89
Total		0	8	41	66	40	9	1
	%	0,0	4.85	24.85	40	24.24	5.45	0.61
	$\chi^2$	3.45	13.51*	1.64	2.36	4.41	16.06*	4.52
	p	0.32	0.00	0.64	0.49	0.21	0.00	0.21

As can be seen, in both fields, introducing the study and concluding the study functions were not common functions, but stating the purpose of the study, explaining a procedure, and stating results were. On the other hand, elaborating an argument function was used significantly more often in soft sciences ( $\chi^2=16.06$ ,  $p<.05$ ), and stating a discursal purpose was significantly more frequent in hard sciences ( $\chi^2=13.51$ ,  $p<.05$ ). Each communicative function category for both the inclusive and exclusive *we* will be discussed under separate headings in the next sections of the paper.

### *Introducing the Study*

This communicative function is fulfilled when the writers of RA abstracts prefer to show authorial presence while establishing the context of and/or the motivation for their research. The findings revealed that the inclusive *we*, which was only used twice in the same RA abstract in the discipline of PSY, was, in both cases, used to perform the ‘introducing the study’ function by establishing the context for the study:

Can **we use** mobile technology to make people more empathic?

PSY15- Introducing the study (INT)

In doing so, **we can learn** more about empathy and its multifaceted nature.

PSY15- Introducing the study (INT)

In the first example above, the writers use the inclusive *we* to ask a question on behalf of the whole community. According to Harwood (2005b), “by asking a couple of eye-catching questions which the writer promises to answer later on, our interest is maintained, and we keep reading” (p.360). In other words, this provides the readers with the motivation to read the text by including the readers in the discourse. The second example shows how the writers go on to answer their question and create a research gap that they will address. However, as mentioned above, this use occurred infrequently in the corpus. Therefore, it can be concluded that although introductions were common moves in the RA abstracts in the present corpus, especially in the soft sciences, the writers did not prefer to use the inclusive *we* as an engagement marker. Similarly, they did not use the exclusive form as a self-mention device to

perform this function in their abstracts. There was only one instance (1.56 %) in an abstract from BE in the form of self-citation, which established the context for the writers to introduce the purpose of their new study:

Previously, **we created** a modular, multienzyme system for the heterologous production of intermediates of the bacteriochlorophyll (BChl) pathway in *E. coli*. In this study, **we extend** this pathway to include a substrate promiscuous 8-vinyl reductase that can accept multiple intermediates of BChl biosynthesis.

BE11-Introducing the study (INT) + Stating the purpose of the study (PS)

Indeed, although not common in the sampled RA abstracts of the present study, self-citations may be frequent forms of self-mention. In his corpus of 240 RAs from eight disciplines, Hyland (2001) found that self-citations formed 60% of all the instances of self-mention. The reason why self-citation was rare in the corpus of the present study could be because only abstracts, but not the whole RAs as in Hyland's (2001) study, were analysed. Nevertheless, the only example in the corpus given above demonstrates how writers could use self-mention in the form of self-citation as "a powerful weapon in the quest for disciplinary ratification and credibility" (Harwood, 2005a, p. 1213), showing they deserve to be taken seriously by referring to their earlier studies. It also shows how writers could use self-citation as partial justification for their new research (Harwood, 2005a). Thus, it can be argued that self-mention in the form of self-citation could serve writers' purposes of establishing credibility and creating a research gap at the same time.

### ***Stating a Discoursal Purpose***

This function is performed when the exclusive *we* is used to provide a structure for the paper. The examples below show how the writers fulfilled the communicative function of 'stating a discoursal purpose' in different sections of their abstracts.

Here **we report** a package of open source software tools that **we developed** specifically to meet bioprinting requirements.

SE35- Stating a discorsal purpose (DP)+ Stating the purpose of the study (PS)

**We illustrate** our approach with three examples of Python scripting.

SE9- Stating a discorsal purpose (DP)

In this article, **we have proposed** a framework to evaluate the existing imperative, and object-oriented languages for their suitability as an appropriate FPL.

SE16- Stating a discorsal purpose (DP)

This approach is specifically concerned with declarative languages, and throughout the paper **we note** some of the limitations inherent to declarative approaches.

SE1- Stating a discorsal purpose (DP)

Although not common in other disciplines, and especially rare in PSY (3.77%), it was found to be the most common function of exclusive *we* instances in SE (27.96%), reflecting a disciplinary variation. The abstracts in this discipline were found to be used more for providing a structure of the paper, instead of being used for providing information about the study as in other disciplines. Therefore, the writers of the abstracts in SE appeared to assume the role of 'the writer of the paper' more than the role of 'the researcher of the study' when they used the self-mention device exclusive *we*. The writers in other disciplines were also found to be acting as 'discourse guides', in Harwood's (2005b) words, in their abstracts. Nevertheless, looking at the total numbers of this communicative function category, there seems to be a clear distinction between the hard and soft sciences, as suggested by the results of the chi-square test ( $\chi^2=13.51$ ,  $p<.05$ )

### ***Stating the Purpose of the Study***

This communicative function refers to the use of exclusive *we* to indicate the purpose of the study or the hypothesis behind it. Some examples of this category of communicative functions are provided below:

In this study, **we hypothesized** that the degradation of PBDEs (e.g., BDE-209) would be enhanced under microbial electricity generation condition.

BE7- Stating the purpose of the study (PS)

Across four studies, **we set out** to investigate the role of positive moods on cognitive and behavioural measures of self-regulation in an ego-depletion paradigm.

PSY 17- Stating the purpose of the study (PS)

Here **we examine** the ecological and cultural factors underlying the worldwide distribution of prejudice.

SOC 39- Stating the purpose of the study (PS)

In hard sciences (17.84%), *stating the purpose of the study* was not used as frequently as in soft sciences (24.85%). This could partly be due to the stronger preference of writers in SE for expressing their research purposes in the form of discursal purposes, as in 'in this paper we present' instead of 'in this study we explore'. In social sciences, on the other hand, this function was frequent. It was the second most common function with a percentage of 22.65% in PSY, and its highest percentage was in SOC (29.89%). In line with these findings, previous studies also found that stating a goal/purpose (Jasim Al-Shujairi, 2020), stating purpose/intention or focus (Walková, 2019), or research aims (Wang et al., 2021) was one of the two most frequently used function of self-mention (the other one being explaining a procedure or methods in all studies).

### ***Explaining a Procedure***

This communicative function is fulfilled when authorial presence is shown while providing information on research procedures/methodology. The findings of the study revealed that the explaining a procedure was the second most common function in SE (26.88%), and the most common function assigned to the exclusive *we* in the remaining three disciplines included in the study (37.50% in BE, 45.28% in PSY, 36.61% in SOC). Although social sciences were found to attach this function to the exclusive *we* more, the data highlighted the fact that writers in all disciplines preferred to show authorial presence when explaining their procedures and methods. This finding is consistent with that of Jasim Al-Shujairi (2020) who also found explaining a

procedure to be the most common realization of self-mentions. The passive structures may also be used to avoid showing authorial presence, yet the subject pronoun *we* lends itself more easily to this function. While it may be the ‘paper’ which presents or illustrates, or it may be the ‘study’ which aims, explores or investigates, it is usually ‘we’ who use, collect, analyse, and so on, as the examples below show:

**We use** mapping techniques to identify how synthetic biology can best be understood and the range of institutions, researchers and funding agencies involved.

BE2- Explaining a procedure (PRO)

**We analyzed** repository metadata, source code, development activity, and team dynamics using data made available publicly through the GitHub API, as well as article metadata.

SE37-Explaining a procedure (PRO)

**We collected** the most comprehensive data set of personality and emotion dynamics of an entire community of work.

PSY 14-Explaining a procedure (PRO)

Nevertheless, Harwood (2005a) argues for the existence of a different agenda, as can be seen in the last example above, which includes one of the many instances of self-promotion that could be found in the corpus of the present study. As Harwood (2005a) points out, writers often “promote their work and underscore its uniqueness” by showing authorial presence in the methodology section of their research (p. 1209). The findings of the present study reveal a similar preference for visibility in the methodological explanations of the RA abstracts.

### ***Stating Results***

This communicative function refers to the use of exclusive *we* while stating main results/findings or what was accomplished based on the results. The highest percentage of it was in SOC (30.36%), whereas the lowest percentage was in the other soft science, PSY (13.21%), indicating a disciplinary variation. Therefore, it cannot be claimed that the soft sciences in the corpus followed a similar pattern when it comes to the ‘stating the results’ function of the exclusive *we*, while the hard sciences were found to be more similar to each other (28.13% in BE and



20.43% in SE). When the total percentages were compared (23.57% in hard sciences and 24.24% in soft sciences), the data showed that there was not a distinction between hard and soft sciences, and that this function comprised almost a quarter of the communicative functions attached to the uses of the exclusive *we*.

Furthermore, **we show** the STN-tST linkage is more stable against forces applied by optical tweezers than the commonly used biotin-Streptavidin (STV) linkage.

BE6- Stating results (R)

**We find** that people are able to consistently route information in a targeted fashion even under increasing time pressure. **We derive** an analytical model for social-media fueled global mobilization and use it to quantify the extent to which people were targeting their peers during recruitment.

SOC5-Stating results (R)

According to Harwood (2005a), “the effect is to flag up the researchers’ worth by linking them to their (noteworthy) data” (p. 1218) when they use exclusive *we* with the reporting verbs such as the ones exemplified above. Similar to when they explain the procedures of their research, writers prefer to show ownership when they explain the results. After all, it is their procedures and results that differentiate them from the many more researchers in their disciplines who study similar or even the same phenomena.

### *Elaborating an Argument*

There were some RA writers in the corpus of the present study who gave their opinions and interpretations in the abstracts of their articles, and thus performed this communicative function by displaying the second most powerful form of authorial presence in Tang and John’s (1999) taxonomy, ‘I as the opinion holder’. Some examples of this function are provided below:

**We (A) argue** that such a focus hinders progress in explaining behaviour.

PSY26- Elaborating an argument (A)

**We (A) believe** that this approach can significantly advance the state of the art of software knowledge reuse by supporting novel knowledge-project associations.

SE47-Elaborating an argument (A)

PSY, a soft science, had the highest percentage (15.09%) of this function, yet SOC, another soft discipline, had the lowest (0.89%). Thus, disciplinary variation between PSY and SOC was evident, and the findings from the chi-square test also revealed a clear distinction between the hard and the soft sciences ( $\chi^2=16.06$ ,  $p<.05$ ).

### *Concluding the Study*

Even though conclusions were common in the RA abstracts in the corpus of the present study, only a small percentage (3.18% in hard sciences and 0.61% in soft sciences) of the writers preferred to show authorial presence while pointing to applications or wider implications of their study. Doing so, as shown below, the writers could also add a self-promotional tone to their abstracts by highlighting the important contributions of their research:

As a step forward in this process **we make** existing data on the scientific literature on synthetic biology available in an online interactive workbook so that researchers, policy makers and civil society can explore the data and draw conclusions for themselves.

BE2- Concluding the study (C)

**We expect** our software tools to be helpful not only to manufacture customized in vitro experimental chambers, but for applications involving printing cells and extracellular matrices as well.

SE 35- Concluding the study (C)

The highest percentage of this function was in the discipline of SE (4.30%), and the percentages for BE and SOC were 1.56% and 0.89% respectively. Writers from the discipline of PSY, on the other hand, never used exclusive *we* to show authorial presence while concluding their studies.

## Summary of the Findings

The use of inclusive *we* was very rare in the corpus of the present study. With regard to the use of exclusive *we*, a clear distinction between the hard and soft sciences was not found. However, there was an evident disciplinary variation within the major knowledge domains, which further suggested a different categorization, SE and SOC versus BE and PSY as a result of their similarities in the use of the exclusive *we*. As for the various communicative functions assigned to the uses of inclusive and exclusive *we*, although a hard versus soft science distinction was occasionally observed, disciplinary variation was still more evident. Therefore, such a distinction between hard and soft sciences could be an oversimplification, at least for some disciplines such as the ones sampled in this study.

## Pedagogical Implications

There is a critical need for properly preparing writers for the realities of the academic conventions of their chosen disciplines since “[s]uccessful academic writing depends on the individual writer’s projection of a shared professional context” (Hyland, 2004, p.1). In this regard, cross disciplinary metadiscourse studies of academic writing could be of use by allowing a deeper insight into the similarities and differences, and thus raising an awareness of them. Authorial presence is one of the issues that needs to be addressed by such studies because, as Hyland (2001) points out, the issue of how much explicit authorial presence is acceptable is problematic for students, teachers, and even for expert writers. Although the majority of the RA writers in the present study chose to use exclusive *we* to project their authorial identity in their abstracts, there are various textbooks which advise against it or totally ignore it (Harwood, 2005b). Therefore, students or writers’ avoidance in using the inclusive and exclusive *we* could simply be a matter of misguidance or lack of awareness. Thus, only by making corpus-informed decisions, textbook writers could, and we believe they should, reflect how the pronoun *we* is really used in actual academic writing. As argued by Tang and John (1999), writing education programmes also have a responsibility for making the different ways and degrees of authorial presence that are already present in academic writing known so that

writers can make their own conscious choices with regard to how and how much authorial presence they want to show.

Hyland (2001) also finds it crucial to raise awareness on the matter and suggests that different methods and techniques could be utilized to this end. EAP/ESP practitioners of these disciplines could open up classroom discussions on the uses and functions of engagement markers and self-mention and ask their students to explore authentic models and compare them. Baker (2010) proposes a five-step process that could be used for each article. First, students read the article before coming to class. Then, in the classroom, a discussion is held on students' reaction to the article followed by a discussion of the rhetorical use of the language features they have underlined such as citations, rhetorical phrases, lexis and signpost language. Finally, students write a three-paragraph reader response. Furthermore, Hyland (2001) adds that students should be encouraged to try and experiment with their writings. Harwood (2005b) also discusses how teachers could effectively build awareness by designing classroom activities. To him, asking students to identify instances of inclusive and exclusive *we* and discuss the effects they have on the reader, and later compiling mini corpora of novice and expert writing to quantitatively and qualitatively analyse them could be instrumental in creating such awareness. Having analysed their own assignments too, students could then try to come up with a set of guidelines and check their validity with their lecturers (Harwood, 2005b).

It is clear that there are many ways of fostering this much-needed awareness of authorial presence in academic writing, which could include but not limited to the ones mentioned above.

## Conclusion

This study set out to investigate the use and communicative functions of the inclusive and exclusive *we* in RA abstracts across four disciplines from hard and soft sciences. Although it did not find a clear-cut distinction between hard and soft sciences, there was considerable variation across the sampled disciplines in the use and communicative functions of inclusive and exclusive *we*. Furthermore, it can be concluded that writers, once they have decided to show authorial presence, do not stick to one role, that of either a “disciplinary servant” or “persuasive originator” (Hyland, 2001, p. 223). Rather, they move along ‘a continuum

of authorial presence', as Tang and John (1999) suggest, showing both humility and presence, the former especially when introducing and concluding their study and elaborating arguments, and the latter when explaining their purposes, procedures and results.

The findings of this study should be interpreted in the light of its samples and would benefit from further testing. Notwithstanding the relatively limited sample size, this study offers insights into the use and communicative functions of inclusive and exclusive *we* and adds to the growing body of research that recognises the importance and the conflicting nature of authorial presence in academic writing.

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