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English for research publication purposes: The case of scholarly peer review comments

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Abstract

This study was an attempt to investigate the English for Research Publication Purposes (ERPP) needs of Iranian non-native speakers of English (NNSE) researchers. To this end, a questionnaire, semi-structured interview, and a corpus of the referees' comments were used. The corpus comprised 621 comments drawn from 78 reviews on 45 full-length manuscripts from three broad disciplinary groups, i.e. engineering, science, and humanities. The results of corpus analysis suggest that, regardless of discipline, Iranian NNSE researchers, as off-network researchers, seem to have more problems with the use of language than with technical contents when writing a scientific manuscript. Moreover, the results of corpus analysis show that coping with syntactic and lexical use of English was much more problematic than discourse and rhetoric. Whereas science researchers believed in the primacy of lexis and syntax over discourse and rhetoric due to the existence of some definite moves in their papers, humanities researchers stressed the significance of knowing the moves of different sections of an article. The paper ends with some pedagogical implications for different disciplinary groups.

Keywords: academic writing, English for research publication purposes needs, peer review comments, English-only research world, Iranian researchers.

Resumen

El inglés y la publicación de resultados científicos: un estudio de caso de los comentarios de los revisores

Este artículo analiza las necesidades linguísticas de investigadores iraníes que utilizan la lengua inglesa para la publicación de los resultados de su investigación. El análisis está fundamentado en datos recogidos mediante un cuestionario, entrevistas semi-estructuradas y un corpus de comentarios de revisores. El corpus utilizado está formado por 621 comentarios extraidos de 78 revisiones de 45 manuscritos de tres grandes áreas disciplinares (i.e. ingeniería, ciencias y humanidades). Los resultados del análisis del corpus sugieren que, independientemente de la disciplina a la que pertenecen, los investigadores iraníes tienen a tener problemas relacionados con el uso de la lengua y no tanto con los contenidos que plasman en sus manuscritos. Asimismo, los resultados del análisis del corpus muestran que la sintaxis y el léxico son más problemáticos para ellos que los aspectos de discurso y la retórica. Mientras que los investigadores de las disciplinas científicas creen que la sintaxis y el léxico son más importantes que el discurso y la retórica de los textos, ya que existen patrones discursivos estandarizados. Los investigadores en las disciplinas de humanidades destacan la importancia de conocer los patrones discursivos estandarizados en las dsitntas secciones de los artículos para revistas. A la luz de los resultados, el artículo valoras varias implicaciones pedagógicas para los distintos grupos disciplinares.

Palabras clave: escritura académica, inglés para la publicación de resultados científicos, inglés para fines académicos, comentarios de revisores, investigadores iraníes.

1. Introduction

There has been growing interest in the last few decades among academics to publish in mainstream indexed journals. Many factors have resulted in this "publish or perish" competition (Van Dalen & Henkens, 2012: 1). In the first place, the current research system running rampant around the world seems to have pressed researchers to publish as many papers as possible in international high profile journals in order to achieve world-wide recognition among peers. Second, academics' success in continued higher education, employment, promotion, and tenure depends to a large extent on their publication records. Last, publication in high profile journals is key to financial eminence for academicians.

With the visibility of scientific journals calculated by the number of citations they receive (Impact Factor), high profile journals are more likely to publish papers in English to reach a wider audience (Lillis & Curry, 2010; Mungra & Webber, 2010). This has brought about the dominance of English as the

global lingua franca of scientific publication. This inequitable dominance of English in research publication has led to the emergence of a network of researchers comprising only those scholars whose native language is English, referred to as "networked researchers" (Belcher, 2007: 1). Networked scholars enjoy the "free ride" (van Parijs, 2007) that their mother tongue brings to them, as they do not have to suffer the hardship of learning a new language (Flowerdew, 2013). On the other hand, many non-native speakers of English (NNSE) researchers around the world, referred to as "off-network" researchers (Swales, 1987: 43), may find themselves marginalized and placed off the research community network, due to the less-advantaged status of their first language. These off-networked researchers have to invest time, energy, and money in learning this new language (Flowerdew, 2013).

As Ammon (2007) points out, networked scholars, because of their greater facility in using English, may take on more gatekeeping functions and establish rules for scientific publication. According to the commonly used principle of the survival of the fittest, only researchers who are best adapted to the expectations of these Anglophone journals are likely to survive in this English-only competition. Iranian researchers are no exception to this. As "off-network" researchers, some Iranian researchers, in spite of the substantial number of their submissions, seldom or never see them published. This is mainly because getting acceptance in an indexed international journal entails having scientific manuscripts undergo a peer review process whereby the novelty, significance, and credibility of authors' claims, and the scientific quality and rigor of the manuscripts are evaluated (Flowerdew, 2001; McKay, 2003). This process, as Belcher notes, is a high stake game "fraught with frustration and disappointment" (2007: 2), the passing of which requires "reviewer patience and author persistence" (2007: 11).

As peer review remains the sole norm for assessing the scientific quality of a manuscript (Flowerdew, 2001; Gosden, 2001; McKay, 2003), more attention should be drawn to investigating its features and impact on publication efforts. Due to its very limited accessibility and hidden status as an "occluded genre" (Swales, 1996: 45), peer reviewer comments were neglected before. However, over the last two decades, this genre has attracted much attention. The controversial nature of the peer review process put aside, Lillis and Curry (2006: 4) have pointed out the facilitative roles of "literacy brokers" such as editors, referees, and academic peers. A great deal of attempt has gone into analyzing the discourse features of this occluded genre and its impact on publication outcomes (e.g., Gosden, 2003; Gupta et

al., 2006; Belcher, 2007; Fortanet, 2008; Mungra & Webber, 2010; Lillis & Curry, 2015).

Drawing on interviews with scientific journal editors, Flowerdew (2001: 135) concludes that "parochialism, or failure to show the relevance of the study to the international community", rather than language use, as the most salient problem of international researchers when writing scientific manuscripts. Investigating referees' comments on letter manuscripts of native and non-native speakers of English (NSE and NNSE) researchers by applying a framework generally drawn on Halliday's (1985) metafunctional organization of language, Gosden (2003) found interactional deficiencies of NNSE researchers' manuscripts as the most frequently commented theme by referees. Gosden attributes this to the concern of the referees being more directed towards the interpersonal function of the manuscripts, that is "the effectiveness of the writer's interaction with the reader in the text" (2003: 87) than towards the ideational, i.e. technical information.

In an attempt to investigate the role that peer reviewers play in accepting or rejecting manuscripts with off-network provenance, Belcher (2007) examined the submission history of an applied linguistics journal. This author found that language use and style are the most frequently highlighted aspect, with 90% of the critical commentary from the reviewers.

Mungra and Webber (2010) investigated medical research manuscripts of Italian NNSE researchers in order to determine the most frequent linguistic problems they face when writing a scientific paper. They found technical content the most frequent category, followed by lexical and grammatical use of language, clarity, and verbosity. This finding is related to the role of referees to critique the technical content of the manuscript, rather than the use of language.

Tahririan and Sadri (2013) examined a corpus of comments made on manuscripts of engineering, medical, and social sciences solicited from Iranian NNSE students. The students whose manuscript comments were gathered were graduate students in Isfahan, Iran. The manuscripts were full research articles associated with their M.A. or Ph.D. theses. The analysis of their corpus revealed content comments as the most frequently mentioned category for all the three broad disciplines, which is again attributed to the role of reviewers to criticize the technical content of submissions.

More recently, drawing on a longitudinal research project, Lillis and Curry (2015) explored 95 text histories from applied linguistics scholars based in

Slovakia, Hungary, Spain, and Portugal. The purpose of the study was to investigate the ideologies reflected in the peer reviewers and editors' comments made during the peer review process on papers submitted for publication consideration to English-medium journals. Lillis and Curry problematized three basic categories in the text histories of applied linguistics, i.e. "(1) the treating of English as a single stable semiotic resource over which the 'native' speaker is attributed a privileged evaluative position; (2) the overriding transparency approach to language and communication; (3) the focus on production as distinct from uptake" (2015: 127).

No doubt, the studies that have focused on peer review and referees' comments to date have contributed a lot to understanding the discourse features of reviewers' comments, the concerns of referees, and the problems they bring about to early career researchers. However, the need to conduct studies that associate the concerns of referees with the needs of early career researchers for international publication is felt. This study was informed by the belief that investigating the comments of referees may shed light on the English needs of non-native researchers for publication purposes. To this end, an approach drawing on analyses of the feedback of peer reviewers, and perceptions of researchers of their own needs through questionnaire and semi-structured interview was followed.

2. Material and methods

In order to determine the ERPP needs of Iranian researchers as NNSE, three procedures were followed: 1) a questionnaire, 2) a semi-structured interview, and 3) a corpus of peer reviewers' comments. The aim of the questionnaire and semi-structured interview was to elicit information regarding the researchers' concerns for international scholarly publishing. The corpus of peer reviewers' comments was analyzed to obtain information regarding the referees' concerns as criteria for publication in international high profile journals.

2.1. Corpus and participants

A corpus of 621 referees' comments drawn from 78 reviews on 45 full-length manuscripts was compiled. This corpus was solicited from 45 Iranian researchers-MA or PhD holders-specialized in the three broad disciplines of engineering (en), science (sc), and humanities (hu). The manuscripts on

which the comments had been made dealt with issues in civil engineering, computer engineering, materials engineering, chemical engineering, electrical engineering, mechanical engineering, physics, mathematics, chemistry, biology, statistics, and applied linguistics. All these manuscripts had been finally accepted for publication between 2009 and 2014 in one of the international high profile journals published by such publishers as *Elsevier*, *Wiley*, *Springer*, *Sage*, *IEEE*, and *Taylor* & *Francis* that subject papers to a peer-review evaluation.

Table 1 presents a description of the data, the proportion of manuscripts in each field, the number of reviews, and the total number of comments throughout the entire corpus. Here, comments are points which are raised by the reviewer and seek modification in some part of the manuscript. Due to the confidentiality and inaccessibility of this occluded genre, that is, reviewer's comments, purposive sampling was followed to compile these comments. Anonymity and informed consent of the authors were taken into consideration.

Field	No. of comments	Subfield	No. of manuscripts	No. of reviews
Engineering	177	Civil engineering	1	1
		Computer engineering	6	9
		Materials engineering	1	2
		Chemical engineering	2	3
		Electrical engineering	7	14
		Mechanical engineering	1	2
Humanities	103	Applied linguistics	5	10
Science	341	Physics	14	27
		Mathematics	1	1
		Chemistry	1	2
		Biology	1	2
		Statistics	5	5
Total	621		45	78

Table 1. Description of the data.

All the participants whose manuscripts had been solicited were asked to complete an online questionnaire. Also, from among the 45 participants of this study, 15 (five per each broad discipline) were chosen for the semi-structured interview. The aim of conducting interviews was to complement the results of corpus and questionnaire analysis by asking the authors to provide their perspectives on issues that were not covered in the questionnaire or corpus. That is why the same participants took part in different stages of the investigation.

2.2. Instruments

An online questionnaire (Appendix A) and a semi-structured interview (Appendix B) were designed in Persian, based on Mungra and Webber's (2010) framework (Table 2) to determine Iranian researchers' ERPP needs. The questionnaire comprised two major independent sections: a) technical content, with 10 items dealing with the technical details of the manuscripts, and b) language-use with nine items dealing with language related issues. Language related categories included six items of lexis and syntax, and three items of discourse and rhetoric. The items were in 5-point Likert-type scales ranging from 1 (not problematic at all) to 5 (extremely problematic).

The semi-structured interview consisted of four questions dealing with the main skills, problems, and improvement of writing for international research publication, as well as factors considered by peer reviewers when evaluating manuscripts. The content of the interview protocol was grounded in the quantitative results from the first phase of the study. As the goal of the interview was to elaborate on the results of the questionnaire, we wanted to better understand the reviewers' perceptions and, to a limited extent, the authors' deficient skills in writing for international research publication.

After audiotaping and transcription, each interview was analyzed at two levels: individually and transversally by following these steps: (1) preliminary exploration of the data by reading through the transcripts, (2) coding the data by segmenting and labeling the text, (3) verifying the codes, (4) using codes to develop themes by putting similar codes together, (5) connecting themes, (6) constructing a case study narrative composed of descriptions and themes, and (7) cross-case thematic analysis (Creswell & Plano Clark, 2011).

2.3. Data analysis

From among the existing methodological choices (e.g., Gosden, 2003; Belcher, 2007; Mungra & Webber, 2010), we chose Mungra and Webber's (2010) framework to analyze the corpus of referees' comments. This was mainly because their model incorporates both content-related and language-related comments, dividing them into specific relevant subsections. Although Mungra and Webber's model seems to be comprehensive, some additions are suggested in the conclusion and implications section (Section 4.1) for ease of classification of the reviewers' comments.

After compilation, following Mungra and Webber (2010), we investigated the corpus in terms of comments categories. To this end, the entire corpus was explored to discover potential examples of comments. As mentioned earlier, a comment was defined as any point raised by the reviewer seeking modification in some part of the manuscript. Based on this definition, only points implying change in the text of the manuscript qualified as a comment. Many positive comments of appreciation were sifted out, accordingly. As Table 1 illustrates, the number of comments throughout the whole corpus totaled 621. Subsequently, each comment was manually investigated by the researchers to see to which category it belonged in Mungra and Webber's model. In case, the researchers' opinions diverged on the categorization of reviewers' comments, the authors of the manuscripts were asked to provide their views on the purpose of the comment. The reason this was done was because of the fact that in some cases, it was difficult to determine if the comment raised questions about the technical details of the paper or language use issues.

In Mungra and Webber's (2010) model, comments fall into either content or language-use categories, as Table 2 illustrates.

I. Content comments
1. Incomplete literature
2. Lack of association between claim and data
3. Procedural infelicities and lack of rigor
4. Explain why data are unusual
5. Scientific reasoning errors of own data
6. Terminology or definitions
7. Statistical irregularities
8. Incorrect scientific interpretation of other authors
9. Lack of association between claim and prior research
10. Sampling errors
II. Language-use comments
A. Lexis and syntax comments
1. Not well written/use of English
2. Lack of clarity
3. Typos or suggestions for text editor
4. Verbosity
5. Repetitions
6. Incoherent
B. Discourse and rhetorical comments
7. Improve information flow
8. Up-tone or give more salience to novelty feature
9. Down-tone claim or hedge

Table 2. Comment categories (adapted from Mungra and Webber, 2010: 46).

Each major category is divided into specific subsections. In the following section, examples of each category extracted from the corpus of this study are presented. In the examples, Gosden's (1995) convention was followed to ensure anonymity of the authors and the scientific details of the comments. Technical details of the manuscripts were encoded as [td] and its subsets as [td 1], [td 2], etc. Likewise, citations were referred to as [citations] and quotations from the manuscript were given as [text] in the examples.

I. Content comments

Example I.1. Incomplete literature:

> There is also a strand of historical research that is not mentioned at all, for instance [citation $_1$]'s work, and [citation $_2$] has also addressed some historical aspects. (hu02rev)

Example I.2. Lack of association between claim and data:

> This seems to be a glued-on [td $_1$] - which does not follow from the present study. Even if other researchers have argued for its [td $_2$] usefulness, none of those referred to have dealt with [td $_3$]. (hu09rev)

Example I. 3. Procedural infelicities and lack of rigor:

> How ALL [citation]'s categories are [text $_1$] also requires clear arguments to support it. The categories are different, and while some may contain [text $_1$] elements I want to see how these contrast with [text $_2$]. If all examples with one of these [td $_1$] is [text $_1$], but nothing else is, what happens with [td $_2$]? (sc11rev)

Example I.4. Explain why data are unusual:

> In Table X, first case, it is quite strange that the [td $_1$] increases with [td $_2$]. (en22rev)

Example I.5. Scientific reasoning errors of own data:

> I am not convinced. For instance, [citation] found [td $_1$]. It may not have appeared in the narrow scope of your data of [td $_2$], but this is no guarantee of [td $_1$] never appearing in [td $_3$]. Moreover, you did not find them in [td $_4$] either, and [text] does not come in there. (hu05rev)

Example I.6. Terminology or definitions:

> What is this? You have not defined the concept [text] in your background section. (sc25rev)

Example I.7. Statistical irregularities:

> Page X, line X: [td $_1$] is 1.5418 A and not 1.54056 which corresponds to [td $_2$]. (sc04rev)

Example I.8. Incorrect scientific interpretation of other authors:

> [citation] does not employ the concept at all, and this is only the interpretation of some [td] scholars. Most have very different backgrounds. (hu02rev)

Example I.9. Lack of association between claim and prior research:

> [citation] highlighted the importance of a [td $_1$]. Yes, but in relation to [td $_2$], and you are talking about [td $_3$]. (sc31rev)

II. Language-use comments

A. Lexis and syntax comments

Example II.1. Not well written/use of English:

> It might be helpful to indicate in the text itself that this is [citation]'s definition, given that there are different ones. This paragraph would be better if it was not in the passive voice because there is no consensus of either these views or about the change in its perception. (hu06rev)

Example II.2. Lack of clarity:

> Vague. Please specify what advances this confers to [td] - or else leave out. (en28rev)

Example II.3. Typos or suggestions for text editor:

> Page X, lines X and XX: It is not [text $_1$] but [text $_2$] (typo). (sc16rev)
>
> Replace [text $_1$] with [text $_2$] (suggestion). (en29rev)

Example II.4. Verbosity:

> The 'results and discussions' part may be further shortened. (sc03rev)

Example II.5. Repetitions:

> To me, this is a completely tautological sentence. What is it that is meant to be warranted here? (hu05rev)

Example II.6. Incoherent:

> There are no [td] in the paper, so the reader may wonder where this came from. (hu10rev)

B. Discourse and rhetorical comments

Example II.7. Improve information flow:

> In this discussion I think you should write out the [td] you are using and then show how it leads to the result. (sc21rev)

Example II.8. Up-tone or give more salience to novelty feature:

> I am not sure this makes the present paper special. [td $_1$] and [td $_2$]have been the main focus of most [td $_3$] studies. (hu04rev)

Example II.9. Down-tone claim or hedge:

> How the [A] claims that this can be [td] for mass production? Don't use such a general claim. (en10rev)

Upon completion of the corpus analysis, a non-parametric data analysis was run to see if the difference between the distributions of comments across the three disciplinary groups was significant. A chi square test was run, as our data were categorical and we could not use parametric data analyses which are appropriate for continuous data.

The results of corpus analysis were then complemented with those of the questionnaire and semi-structured interviews.

3. Results and discussion

3.1. Corpus analysis

This section deals with the results of the quantitative analysis of the corpus of comments, the general and detailed distribution of the comments presented and discussed.

Table 3 summarizes the results of the quantitative analysis of the distribution of comments across the three broad disciplinary groups.

Comments	en		hu		sc	
	no.	%	no.	%	no.	%
I. Content comments	62	35	31	30	57	17
II. Language-use comments						
A. Lexis and syntax comments	88	50	64	62	252	74
B. Discourse and rhetorical comments	27	15	8	8	32	9
Total	177	100	103	100	341	100

Table 3. Distribution analysis of comment categories.

As Table 3 shows, comments are distributed between content and language-use categories. This is in line with the findings of Sionis (1995) investigating French NNSE scholars' manuscripts, Kourilová (1996) examining research manuscripts of Slovak NNSEs, Gosden (2003) focusing on letter manuscripts of NSEs and NNSEs, and Mišak, Maruši , and Maruši (2005) examining medical research manuscripts of Croatian NNSEs. This indicates that for the referees of international high profile journals, what is important in NNSE researchers' manuscripts is both technical content and language-related issues. This may be accounted for by the fact that the researchers whose manuscripts constituted the corpus of this study were early career researchers with procedural incompetency to conduct a scientific study and limited language ability to prepare a well-written report.

As Table 3 displays, language-use comments accounted for 65%, 70% and 83% of the comments on manuscripts of engineering, humanities, and science disciplines, respectively. Content comments constituted roughly one-third (35% and 30%) of the comments on engineering and humanities manuscripts and less than one-fifth (17%) of the comments on manuscripts of science. In line with the findings of Gosden (2003) and Belcher (2007), language-use comments exceeded content comments. These results may indicate that, as far as the referees' criteria are concerned, no matter which discipline they were specialized in, NNSE researchers seemed to have more problems with the use of language than with the technical contents when writing their manuscripts. This, however, runs counter with the findings of Flowerdew (2001), Mungra and Webber (2010), and Tahririan and Sadri (2013).

This shared finding is attributed to the main role of peer reviewers to provide feedback on the content of the manuscript (Mungra & Webber

2010). Tahririan and Sadri (2013), however, note that many content comments they found in their examples were not necessarily related to scientific content infelicities but revealed the researchers' limited language ability.

Considering the fact that all the manuscripts that made up the corpus of this study had been written by Iranian NNSEs with limited language abilities, this substantial difference in the proportion of language-use comments to content comments is reasonable. Besides, as technical contents of a manuscript are conveyed through language forms, improper use of language may affect clarity of the scientific content and thereby elicit peer reviewers' comments of language-use.

Content comments	en		hu		sc	
	no.	%	no.	%	no.	%
1. Incomplete literature	10	5.6	2	2	15	4.4
2. Lack of association between claim and data	3	1.7	6	5.8	2	0.6
3. Procedural infelicities and lack of rigor	35	19.7	7	6.6	13	3.8
4. Explain why data are unusual	3	1.7	-	-	2	0.6
5. Scientific reasoning errors of own data	2	1.2	3	3	6	1.8
6. Terminology or definitions	8	4.5	3	3	16	4.7
7. Statistical irregularities	-	-	1	1	1	0.3
8. Incorrect scientific interpretation of other authors	-	-	8	7.7	-	-
9. Lack of association between claim and prior research	1	0.6	1	1	2	0.6
10. Sampling errors	-	-	-	-	-	-
Total	62	35	31	30	57	17

Table 4. Distribution analysis of content comments.

Content comments refer to the points raised by the peer reviewer about the technical details of the manuscripts, including the literature, procedure, statistics, reasoning and interpretation of data and prior research studies (Mungra & Webber, 2010). With engineering manuscripts, around one-fifth (19.7%) of the comments dealt with "procedural infelicities", followed by "incomplete literature" (5.6%), and "missing terminologies and definitions" (4.5%). Likewise, with science manuscripts, "missing terminologies and definitions" (4.7%), "incomplete literature" (4.4%), and "procedural infelicities" (3.8%) were the most frequent problems with slight variations in their sequence. Given the fact that almost all the researchers whose manuscripts were solicited for this study were early career researchers, their incompetency in conducting scientific analyses may have led to these problems. These findings are in line with those of Mungra and Webber (2010), who report "lack of procedural rigor", "incomplete literature", and "errors of claim" as the most frequent themes among content comments of

medical manuscripts. Moreover, the results support Tahririan and Sadri's (2013) observation that for manuscripts of medicine and engineering, procedural issues, followed by incomplete literature, rank the most frequently commented aspects.

However, a quite different pattern was observed in the comments made on the manuscripts of humanities. As Table 4 displays, "incorrect scientific interpretation of other authors" (7.7%), along with "procedural infelicities" (6.6%), and "lack of association between claim and data" (5.8%), with slightly more or less frequency, were the most common categories among the comments. On the contrary, in manuscripts related to social sciences Tahririan and Sadri (2013) observe "incomplete literature" as the most frequent comment category and "procedural infelicities" in the second place. The inconsistency of the results of the humanities papers may be accounted for by the small number of the manuscripts (5 papers) investigated in this study.

In line with the findings of Mungra and Webber (2010), and Tahririan and Sadri (2013), other comments such as "lack of association between claim and data", "explaining why data are unusual", and "lack of association between claim and prior research" was raised less frequently by the referees for engineering and science manuscripts. "Scientific reasoning errors of own data" was more common with science papers than with papers of engineering and humanities.

"Incorrect interpretation of other authors" was totally absent in engineering and science manuscripts, whereas it was the most frequently raised theme for the humanities papers. "Statistical irregularities and sampling errors" were either entirely absent or the least frequently commented themes.

These findings may reveal Iranian NNSE researchers' areas of difficulty when preparing a well written report of their scientific studies, as far as the peer reviewers' criteria are concerned. What commonly elicited the referees' critical commentary in the manuscripts of the three broad disciplines was incompetency of Iranian NNSE researchers in describing procedural issues of their papers clearly and thoroughly. The fact that peer reviewers from different disciplines provided feedbacks more frequently dealing with procedural infelicities than with other technical issues stresses its importance in the eyes of referees. In addition, "incomplete literature", "incorrect scientific interpretation of prior studies", and "lack of association between claim and data" were also of great importance to the referees, which may indicate Iranian researchers' needs of academic writing to be met.

Table 5 reports the detailed distribution of language-related comments.

Lanuage-use comments	en		hu		sc	
	no.	%	no.	%	no.	%
A. Lexis and syntax comments						
1. Not well written/use of English	24	13.5	32	31	124	36.3
2. Lack of clarity	24	13.5	13	12.6	28	8.2
3. Typos or suggestions for text editor	37	21	10	9.7	95	27.8
4. Verbosity	2	1.2	2	2	2	0.6
5. Repetitions	1	0.6	6	5.8	2	0.6
6. Incoherent	-	-	1	1	1	0.3
B. Discourse and rhetorical comments						
7. Improve information flow	14	7.9	6	5.8	25	7.3
8. Up-tone or give more salience to novelty feature	12	6.7	1	1	6	1.8
9. Down-tone claim or hedge	1	0.6	1	1	1	0.3
Total	115	65	72	70	284	83

Table 5. Distribution analysis of language-use comments.

As Table 5 shows, language-use comments encompass two distinct subcategories, i.e. "lexis and syntax", and "discourse and rhetoric". "Lexis and syntax" comments refer to the criticisms levelled against sentence-level structure, or lexically and grammatically appropriate use of language. These include features of lexical and grammatical choice, clarity, spelling and reformulations, overuse of the words (verbosity), repetitions, and coherence. "Discourse and rhetoric" comments, on the other hand, refer to the effective use of language above sentence level, including moves, discourse, and rhetorical features (Mungra & Webber, 2010).

A look at Table 5 reveals that, regardless of discipline, "lexis and syntax" were more considerably commented than "discourse and rhetoric". Throughout the entire corpus, "lexis and syntax" comments accounted for 50, 62, and 74%, whereas "discourse and rhetoric" made up 15%, 8% and 9% of the comments on engineering, humanities, and science manuscripts, respectively. In line with Mungra and Webber (2010) and Tahririan and Sadri (2013), a notable discrepancy was observed in the frequency of "lexis and syntax", and "discourse and rhetoric". Clearly, this indicates that referees of international high profile journals find syntactic and lexical use of English much more problematic than text structure in Iranian NNSE researchers' submissions.

A closer look at the distribution of each comment category in Table 5 shows that among "lexis and syntax" comments, "not well written/use of English", "lack of clarity", and "typos or suggestions for text editor" ranked the most frequently commented themes in the manuscripts of the three disciplines.

This is in line with Mungra and Webber (2010) and Tahririan and Sadri (2013). Whereas "not well written/use of English" was the most frequently commented theme in science and humanities manuscripts (31% and 36.3%, respectively), "typos or suggestions for text editor" ranked top in engineering manuscripts, totaling 21%. Regardless of discipline, verbosity, repetitions, and incoherence were less frequently commented by the referees. This, however, may not be construed as their triviality. Instead, this finding may indicate that, in the eyes of peer reviewers, Iranian NNSE researchers, regardless of discipline, had fewer problems when dealing with coherence of the text than with accurate use of English.

In the manuscripts of engineering, humanities, and science, among "discourse and rhetoric" comments, "improve information flow" ranked first, constituting 7.9%, 5.8% and 7.3% of the comments, followed by "up-tone or give more salience to novelty feature" with 6.7%, 1% and 1.8%, and "down-tone claim or hedge" making up 0.6%, 1% and 0.3% of the comments, respectively. In line with Mungra and Webber (2010), these results may point to the importance attached to text structure and readability of the information flow by reviewers. Therefore, regardless of discipline, Iranian NNSE researchers need to work on their text structuring skills in order to improve the information flow of their scientific papers.

Subcategories of "up-tone or give more salience to novelty feature", and "down-tone claim or hedge" deal with issues of authorial stance such as the strength or modesty of claims. Interestingly, among these features, "up-tone or give more salience to novelty feature" was more frequently commented than "down-tone claim or hedge" with manuscripts of engineering and science. While this supports the results of Mungra and Webber (2010) and Tahririan and Sadri (2013), it may be construed as a flaw for Iranian NNSE researchers in engineering and science disciplines. Hence, when reporting the results, these researchers need to make salient the novelty and results of their scientific studies.

In general, the results of the quantitative analysis of the corpus of comments show that language-use commentary outnumbers technical content comments. However, we should note that quantitative supremacy does not necessarily mean supremacy of one over another, as technical aspects of the article seem to be more severely judged than language-use issues and lead to the rejection of the manuscript.

Table 6 shows the results of the non-parametric test.

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	23.709[a]	2	.000
Likelihood Ratio	23.563	2	.000
Linear-by-Linear Association	22.850	1	.000
N of Valid Cases	621		
Pearson Chi-Square	23.709a	2	.000

Table 6. Chi-square tests.

The results of chi square test (P < .05, df: 2, X2: 23.709, Sig: .000) indicate that the difference between the three disciplines in the frequency of content and language-use comments was significant. Although, the quantitative analysis of the corpus revealed language-use comments as the most frequent category among the comments made on the manuscripts of the three field groups, the results of chi square test point to a significant association between discipline and comment type. This significant discrepancy between these three broad groups of disciplines, in terms of commented themes in general, and each specific subcategory in particular, may indicate that the amount of stress attached to different features of a manuscript by the referees of international high profile journals is field-specific.

3.2. Questionnaire

The results of the online questionnaire are presented and discussed below.

Descriptive statistics were run to determine which areas of academic writing were problematic for NNSE researchers and to what extent they faced difficulty dealing with them. Figure 1 displays the results of the descriptive statistics.

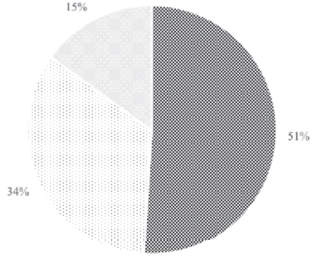

Figure 1. Distribution of problematic areas.

As Figure 1 shows, "content", "lexis and syntax", and "discourse and rhetoric" accounted for 51%, 34% and 15% of the problematic aspects, respectively. What seems to be evident here is that technical content (51%) and language-use (49%) were equally problematic for all the researchers from different fields of study. Moreover, the importance of "discourse and rhetoric" in academic writing for the authors was close to the results of the corpus analysis.

Contrary to the findings of the corpus analysis, the results of the questionnaire analysis revealed that for them dealing with scientific content and use of appropriate English were equally challenging. In practice, however, most of the problems that peer reviewers found with their manuscripts were related to the appropriate use of English.

Mungra and Webber (2010) and Tahririan and Sadri (2013) found a rather close distribution of content and language-use comments with content comments slightly more frequent. Whereas these authors attribute this to the role of peer reviewers to critique content rather than language, we observed that regarding clarity of scientific content, the peer reviewers are more concerned with the accurate use of language than with technical content, as clear description of the latter is dependent on the appropriate use of the former.

A detailed analysis of the responses to the online questionnaire shows that for technical content, "procedural aspects", "explaining why data are unusual", and "covering the entire relevant literature", with 8.6%, 8.6% and 6.5% levels of challenge, were the most problematic skills of academic writing. For language-use, the participants' responses to the questionnaire show that a good use of English, and a clear description of the content, with 9.8% and 9.01% levels of challenge, were the most problematic. A simple comparison of these rates reveals that among all the items in the questionnaire, those related to the good and clear use of English were more problematic than technical content or procedural issues in the eyes of the authors.

3.3. Interview

This section deals with the results of the semi-structured interview. The responses of engineering researchers can be divided into two major themes. First, some felt that language-use-related problems were quite common, along with technical content problems, when writing a scientific manuscript.

Their technical content problems were mainly concerned with the accuracy of their experiments, and the association between their experiments and the strength of their claims. Among their language-use problems, typos and suggestions for lexical choices, and clarity of the language were more problematic than others.

> (1) Most of the problems that the reviewers found with my paper were related to the scientific content of my article, not to mention that typos were also noted. But typos were not serious. The comments also dealt with the relationship between data and findings, how much data we gathered and our claims based on them. (en03int)
>
> (2) I remember one of the reviewers asked about a sentence that s/he couldn't understand about one of my algorithms. So he had asked me to revise it. (en04int)

Second, some other engineering researchers pointed out that language was not a challenge for them, as their manuscripts were edited by their advisors and overseas colleagues, or the reviewers' comments regarding language use were not serious. Engineering researchers believed that bringing up a novel research question by identifying the gap in the literature and coping with procedural issues were particularly problematic. It is important to note that even this group of engineering researchers pointed to their problems with clear description of their scientific contents which they attributed to either sentence structure or lexical choice of the scientific terminology.

> (3) I'm not saying that language is not important at all. They found many grammar mistakes and some poor terminology choices. However, comments related to the experiments were more serious. (en05int)

Science researchers felt that, among content skills, other than procedural issues, covering the entire literature, and establishing association between claim and data were very challenging for them. Besides, almost all the science researchers who were interviewed for this study believed that language played a significant role in their publications. With their papers following certain moves, researchers of theoretical physics and mathematics referred to lexis and syntax as the sole area of difficulty in writing scientific papers. Level of discourse and rhetoric was not challenging for them, accordingly. Among their language-use needs, they enumerated sentence level structure, clear description of the content, typos and accurate choice of the terms.

(4) The sentences that we use in articles are certain. They are used frequently in articles. Only the equations change. From here we get to …, and then … (sc03int)

Humanities researchers also felt that both scientific content and appropriate use of language were problematic for them. More important than other issues in writing scientific manuscripts was covering the entire relevant literature. Regarding the use of language, their problems were related to both "lexis and syntax", and "discourse and rhetoric". They listed balance in the use of active and passive voice, consistency in the use of tense, and natural sequence of the parts of speech, which are all related to the good use of English at the sentence level, as the most important and problematic issues. Clarity of the language, verbosity, and coherence were also mentioned as issues causing difficulty. While acknowledging the importance of lexis and syntax, they attributed their difficulty in writing scientific papers mostly to their ignorance of the register of a scientific article, the moves and transitions of each subsection of the article, and keeping a balance in the strength of claims, which are considered as discourse and rhetoric problems.

(5) I believe it has become an etiquette for publishing to have your paper polished by a native speaker. … There are certain transitional steps to follow from each section to another. (hu05int)

Some of the interviewees referred to peer-review as a "blind process", pointing out that in the peer review process it has become a cliché for referees to ask NNSE to have their paper polished by a native speaker of English, regardless of the quality of the language.

4. Conclusion and implications

This study was an attempt to investigate the English needs of Iranian NNSE researchers for publication purposes. Taking into consideration the fairly small sample we investigated in this study and the fact that the results of the questionnaire and corpus are based on quantitative analysis, any generalization is essentially tentative. Additionally, as our main data relate to a corpus of peer review comments which highlight the reviewers' concerns, not necessarily the needs of the researchers for publication in English, and the fact that the actual manuscripts were not investigated, any generalized conclusion should be avoided. Yet, some possible implications are worth considering.

In line with the findings of Sionis (1995), Kourilová (1996), Gosden (2003), Mišak, Marušić, and Marušić (2005), the results of our analyses indicate that Iranian NNSEs as off-network researchers seem to be in need of both language-use and procedural content training. This was pointed out by the participants from different disciplines in the interviews and questionnaires, and by the peer reviewers in their comments. Whereas university students in Iran receive "Research methods" courses during their M.A./M.S. programs, aimed at improving their scientific competence in how to conduct a study, their English language instruction courses are limited to those they take during the B.A./B.S. program, which mainly focus on their reading skills, with no attention to their academic writing needs. Therefore, the need for offering a course in relation to the use of language in academic writing is felt. The finding that language-use problems accounted for 65%, 70% and 83% of all the comments of peer reviewers for engineering, humanities, and science manuscripts, respectively, may suggest the primacy of the appropriate use of language over methodological competence in different fields of studies. Whereas some assume that peer reviewers are mainly concerned with the scientific quality of the analyses and papers (Mungra & Webber, 2010; Tahririan & Sadri, 2013), the analysis of peer reviewers' concerns indicated that as far as clarity of technical details is concerned, improper use of language may elicit critical commentary from peer reviewers.

Regarding the issues of scientific content, the procedural infelicity of the manuscripts was found common among researchers from different fields, which reveals the demands of the referees for international publication and thus the need for more training in scientific competence.

Concerning language use, we observed that coping with the syntactic and lexical use of English was much more problematic than discourse and rhetoric. As Tahririan and Sadri (2013) point out, lexis and syntax comments feature important aspects of clarity and precision, which are the building blocks of academic writing. Iranian NNSE researchers need to consider these aspects of academic texts when preparing a scientific research report. Academic writing training, hence, should address such issues as balance in the use of active and passive voice, consistency in the use of tense, natural sequence of the parts of speech, lexical choice of scientific terminology, clarity, and brevity.

Whereas the science researchers believed in the primacy of lexis and syntax over discourse and rhetoric, due to the existence of some definite moves in

their papers, the humanities researchers stressed the superiority of the knowledge of the moves of the different sections of an article. The academic writing training of this group of researchers may need to focus on how to manage the transitions of the different sections of an article. Moreover, Iranian NNSE researchers need to make the novelty features of their papers more salient.

With regards to Mungra and Webber's (2010) model, although it seems to be comprehensive, during the analysis of our corpus, we came up with three new subsections which may be added to the comment categories for ease of classification. These include deficient information, irrelevant reference, and content similarity (plagiarism).

By and large, the findings of our investigation reveals the universal problem of Iranian NNSE researchers with clear description of technical contents, using lexically and grammatically appropriate language, while benefiting from rhetorical and discourse features of effective writing. Our results may inform early career NNSE researchers who seek publication in international English-only high profile journals of the concerns and demands of peer reviewers for manuscripts in different fields. In order to survive in this English-only research network, NNSEs, as off-network researchers, need to become aware of the concerns of peer reviewers and adapt themselves to their expectations.

While our study investigated a very limited number of manuscripts and participants from each broad discipline, more field-specific studies focusing specifically on every aspect of the use of language are desirable.

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Appendix A

Problematic areas of Academic Writing (Online questionnaire)
The following questionnaire is part of a research project intended to investigate the academic writing needs of Iranian non-native speakers of English researchers.
All the items present problematic skills of academic writing. Each statement is followed by five numbers, 0, 1, 2, 3, and 4 with the following meanings:
'0' means 'Not problematic at all'.
'1' means 'Slightly problematic'.
'2' means 'Moderately problematic'.
'3' means 'Very problematic'.
'4' means 'Extremely problematic'.
After reading each statement, please mark the number (0, 1, 2, 3, and 4) that applies to you. Note that there are no right or wrong responses.
Background information
Surname (optional): ……..
Discipline ……..

	Statement	Response				
	I. Technical content					
1.	Covering the entire relevant literature	0	1	2	3	4
2.	Establishing sound association between claim and data	0	1	2	3	4
3.	Procedural aspects	0	1	2	3	4
4.	Explaining why data are unusual	0	1	2	3	4
5.	Scientific interpretation of own data	0	1	2	3	4
6.	Providing accurate terminology and definitions	0	1	2	3	4
7.	Running correct statistical analyses	0	1	2	3	4
8.	Scientific interpretation of prior authors	0	1	2	3	4
9.	Matching claims with those of the former researchers	0	1	2	3	4
10.	Selecting an appropriate sample	0	1	2	3	4
	II. Language use					
11.	Well use of English	0	1	2	3	4
12.	Clear description of the content	0	1	2	3	4
13.	Choosing the right terms and avoiding typos	0	1	2	3	4
14.	Conciseness	0	1	2	3	4
15.	Avoiding repetitions	0	1	2	3	4
16.	Maintaining coherence	0	1	2	3	4
17.	Readability in the flow of information	0	1	2	3	4
18.	Giving salience to novelty features	0	1	2	3	4
19.	Maintaining modesty in claims of novelty	0	1	2	3	4

Appendix B

Semi-structured Interview Protocol

1. What are the main skills essential for writing and publishing a scientific paper?
2. What are the major problems you face when writing a scientific paper?
3. What factors are considered by peer reviewers when evaluating your paper?
4. How can we improve your writing for publication skills?

List of codes: technical content, language-use, typos, lexis, and syntax

Definitions of codes

Technical content: interviewees' remarks on the scientific aspects of articles and experiments
Language-use: interviewees' remarks regarding the use of language in scientific articles
Typos: typographic mistakes
Lexis: poor choice of terminology in articles
Syntax: inaccurate use of English structure in the language of scientific articles