Language Skills in Research Paper Writing

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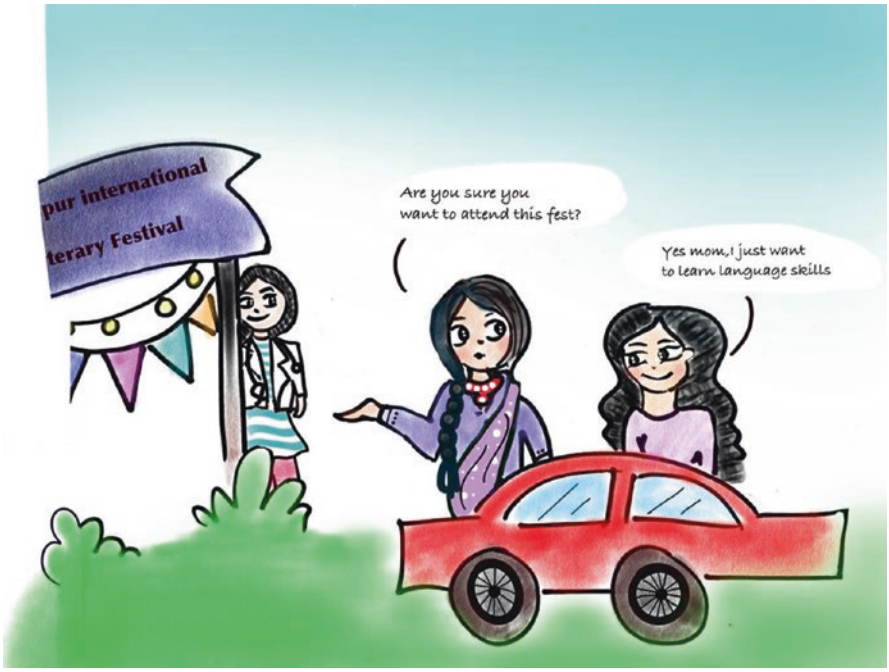

Language does matter in scientific communication—Adkoli and Parija

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14.1 Assess Need

Scientific communication is a blend of scientific facts presented in a language that everyone can understand and appreciate. Experts claim that an effectively written research paper is more about a story, and not a study [1]. In fact, one of the virtues discussed in conducting research points to telling the story in a cohesive manner, which depends upon a powerful and skillful use of language [2].

Language is one of the major barriers to the growth of science and its dissemination to the public. A study reported from Bangladesh indicates that language is a barrier that affects the health service of the country [3].

Researchers in medical sciences are facing a stiff competition of publishing or perish [4]. The higher the impact factor of a journal, higher the rejection rate. Under such situation, poor language can affect the chances of acceptance. In fact, the research publication in natural sciences has been dominated by metropolises as reported by the journal *Nature* [5]. We hear about the stories of many dedicated researchers whose papers are referred back for resubmission after polishing the language of the paper.

Language is a valuable addition to enrich your paper. Just because of poor language, your paper will not be knocked down. However, poor language can irritate the editor to return your paper for resubmission. Mastering language skill is an asset for the rapid growth of a researcher or scientist.

Many journals and publishing houses have also started language services to enhance the readability of papers, often with additional charges. Courses are also available for enhancing editing skills [6]. However, they are expensive and may not ensure your full involvement to express what you really want to express.

Recognizing the need for promoting skills in scientific writing, a large number of individuals and organizations have started training their faculty in this area. However, the focus of such workshops is on improving the scientific quality of a paper. Not much of published information is available on improving the language component. Most of the writers from non-English speaking countries face problems in getting their articles accepted for publication in international journals, mainly due to poor use of language. We, therefore, wish to address this issue and offer some practical tips by way of citing examples. We hope the research workers, especially from non-English speaking countries, will benefit from this chapter.

14.2 Brief

In this chapter, we argue that:

- Language by itself is not a major criterion for acceptance of your paper. However, a paper with rich scientific content but poor language can eliminate the chances of publication.
- One needs to master the rules of the game.
- Self-review and peer feedback are vital instruments for enhancing the language as well as the quality of the article.

14.3 Contextualize

14.3.1 Scenario

This is a story of Dr. EF (English fan), who recently returned from Oxford University. Dr. EF was invited as a Guest Speaker in a rural medical college in India to address the students on high blood pressure. Being strongly influenced by the richness of English and its accent, he started by telling *"Hi, guys the most enchanting physiological phenomenon which is surmounted by complicated human dynamics affecting innumerable systems, impinging upon the human generation in all spheres of life, including biological, social, economic, and even anthropological dimensions of life is hypertension. Many call it as blood pressure, without understanding either the hemodynamic of blood or an in-depth insight into the ramification of thermostatic pressure…blab…blab…blab."*

Slides after slides rolled out. Dr. EF went on with his flow of choicest words. Most of the students looked blank but did not dare to stop him. However, Ms. Comini, sitting in the last row, who came from a non-English medium school, stood up and asked Sir, can you speak in English Sir? Dr. EF was spell bound. He got a real taste of what high blood pressure is!

Exercise: Study the scenario and analyze the root cause of this problem.

14.4 Describe

14.4.1 Language Is a Value Addition

To be accepted for publication, one needs to follow a structured format decided by the journal policy. In addition, there are several factors, such as handling an ethical issue, the originality of the contribution, its applicability, utility, and reproducibility of results. Besides, there are technical aspects like IMRaD structure, graphic representation of data, statistical analysis, and bibliographic style, which are important. All these collectively decide the fate of a manuscript. Nevertheless, it is the language of the manuscript which plays important role in making the submission acceptable to the editor or the reviewers.

It is indeed difficult to separate language component from the content of a scientific paper, as they are interwoven. What editors want is clarity of message, accuracy in presenting the information, and to some excitement or "*wow factor*" to make the paper interesting to the readers. The language should aid in making an impact on the readers. It should be coherent and efficient in terms of economy of words.

14.4.2 Master the Rules of the Game

Most scientific papers have a fixed sequence starting with Title to Abstract, Introduction, Methods (sometimes Materials and Methods), Results, Discussion, Conclusions (often recommendations for further research), and References.

However, a beginner will be more comfortable in writing methods section, followed by other sections—Results, Discussion, and Conclusion, Introduction, Abstract, and Title in that order (Fig. 14.1). The reader will find a more detailed account of the sequencing and organization in another chapter on 'How to publish ethically and effectively'. We will not repeat those details but offer a summary in the form of tips (Table 14.1).

Fig. 14.1 The order in which a manuscript is to be written

Table 14.1 Components of various sections of a paper and tips for writing

Section	Broad components involved	Tips for writing
Methodology	Involves ethical issues, tools designed or borrowed, how are they administered, how the data were collected and analyzed	Narrate as per the sequence in which they were done (moving through times) Use past tense and preferably active voice
Results	This involves the presentation of data mostly in tabular or graphic form	Your text should only supplement the data avoiding repetition. Here, you will use mostly present tense Go on writing research question-wise
Discussion	Summary of your findings, How they are similar or different from others' findings, comment on your methods used, their strengths and limitations; make recommendations for further research	Begin with a summary of what all you did, using which method and what did you find. Compare and contrast your results with others Do not extrapolate or over-generalize your findings. Be neutral and modest in reporting results irrespective of whether they are positive or negative. Be reflective and self-critical. Support your statements with facts and figures drawn from your review of the literature Discussion section involves both past tense and present tense, at times even future tense
Introduction	Birds'eye of the context in which research problem is embedded; What is already known and what is unknown How you will tackle the problem Defining the objectives and scope of the study	Use "*helicopter approach*." Start with some broad, general statements to place your study in the present context of research or practice. Narrow down gradually to your actual study by defining the study aims, and objectives and research questions. Define your study population, sampling framework, and how that is decided
Abstract	Mostly based on IMRAD structure Structured or sometimes unstructured according to the journal's policies	Tailor your abstract strictly according to the requirement of the journal. Use words economically and effectively. Do not crossword count limit. Generate and list keywords keeping in mind the utility of your study

14.4.2.1 Appropriate Use of Past Tense, Present Tense, and Future Tense

Appropriate use of past tense, present tense, and future tense appears to be a problematic issue for many postgraduate residents when they write their dissertations. This is usually due to the fact that the residents submit their research protocols stating "*what will be done*", and later they copy-paste the same text while submitting their research dissertations. Care should be taken to avoid this mistake.

The methods section is invariably written in the past tense.

For example:

"*We obtained ethical clearance from the Institute Ethics Committee. In order to answer our research question, we chose to apply a quasi-experimental design*."

"*Renuka et al. (2008) reported that the practice of Yoga benefitted nursing students in reducing stress*."

The results section may require a mix of past tense and present tense.

For example:

"*The results of the analysis of variance clearly show the effectiveness of the treatment A over the treatment B*." (Present tense) OR "*The analysis of variance showed a higher degree of effectiveness of the treatment A over the treatment B. However the values were not statistically significant*." (Past tense)

The discussion section is generally written using the present tense.

For example:

"*There are many studies to support our findings.*"

"*Based on the study findings, we conclude that the practice of Yoga benefits nursing students in reducing stress*."

However, the last part of the discussion section may involve the use of future tense.

"*Further research using multi-centric studies will prove whether the practice of Yoga can benefit nursing students in reducing stress*."

14.4.2.2 Use of Active Voice Vs Passive Voice

Most of the scientific literature in the South Asian context is found in the passive voice. However, the current trend is to use the active voice (Table 14.2).

14.4.3 Four Common Problems Faced in the Language

14.4.3.1 Repetition

Some authors tend to repeat the same information in graphic form and text form, which is not a good practice in scientific writing. Reinforcement is needed only in

Table 14.2 The use of passive voice and active voice

Passive voice	Active voice
In the beginning, a detailed medical history of each subject was taken. All the subjects were then subjected to detailed intervention. A sudden increase was noticed after the intervention in many of the physiological parameters.	We took a detailed history of each subject. We then subjected them to detailed intervention. We noticed a sudden increase in many of the physiological parameters, after the intervention.

Table 14.3 An example of a repetitive statement

Poor	Better
We calculated the body mass index of each person using the formula. For this purpose, we used a simple mathematical calculation involving two variables, viz. person's height and weight. The scientifically proven, standard formula which we used was BMI = kg/m^2 where BMI is body mass index, kg is a person's weight in kilograms and m^2 is their height of the person in meters, squared.	We calculated body mass index by dividing a person's weight in kg by height in meters, squared.

Table 14.4 Examples of too long sentences; see how they can look better

Poor	Better
In order to find out the difference in the effect of treatment between the outcome variable and the dependent variable, we also conducted a statistical analysis so that the difference becomes crystal clear.	We compared the treatment effect on the outcome variable and the dependent variable.
There is a broad consensus among scientists with respect to the statement that air pollution is a significant source of lung disease.	Air pollution is a significant source of lung disease.
Our study was aimed at making a careful assessment of the extent of anemia among the school going children who were admitted and studying in the schools situated in the Union Territory of Puducherry.	We assessed the prevalence of anemia among the school going children of Puducherry.
When the investigator probed the history of this patient who was 50 year about his spouse, he suddenly burst into tears stating that she had died in a road traffic accident last year, which appears to be the main cause of his depression, as has also been reported by previous studies.	We took the history of a 50-year-old male. When we enquired about his spouse, he suddenly burst into tears. She had indeed died in a road traffic accident last year. Since then, he appears to have gone into depression. A similar case has also been reported.

teaching. A common pitfall noticed in scientific papers is the tendency to repeat the contents of the result section in the discussion section to re-emphasize the points. This can dilute the quality of your writing rather than improving the same. However, in order to reinforce the key message of an article, it may be necessary to write a brief summary. Some examples of repetition have been cited in Table 14.3.

14.4.3.2 Redundancy (Verbiage)

Redundancy refers to the use of language, which is unnecessary. It is called verbiage (in sync with garbage!). Long sentences are difficult to grasp. Often we notice long sentences, assuming that the readers would be impressed by the flowery language. It is not true. On the contrary, long sentences cause difficulty in comprehending. Besides, you are also wasting paper. A sentence consisting of a maximum of 8–10 words should be all right. A sentence consisting of more than 20 words should be avoided. We have shown some examples of long sentences and how they can be trimmed in Table 14.4. The last example in this table shows how you can break a long sentence into 3–4 short sentences to make it simple to understand.

Table 14.5 Examples of ambiguous statements; you can make them unambiguous

Poor	Better
Drinking lassi reduces heart disease.	Drinking one glass of lassi per day reduces the incidence of heart attacks in Indian males over 50—A cross-sectional study
The patients were asked to go to the lab for further necessary investigation.	The patients were directed to go to central lab (room no. 5) for lipid profile.
We conducted all the required tests, including physical examination, mental health assessment, etc., etc., for a detailed data collection.	We conducted mental health assessment using a Likert scale developed by Adkoli [1].

14.4.3.3 Ambiguity

Ambiguity means lack of precision or accuracy of communication. There is no place for ambiguity in scientific communication. The title of the study should be comprehensive. Check out the following examples given in Table 14.5.

Use of Punctuation

Punctuation marks are the hallmarks of a good language. Wrong placement of a punctuation mark can distort the meaning which we want to convey.

See this example: "*A woman without her man is nothing*."

You wanted to convey that "*A woman: without her, man is nothing*"!

Caution while using spell-check!

Nowadays, everyone types text and relies on the spell-check application to correct the mistakes. However, at times, this habit can be dangerous as the software may not be able to decipher the correct alternative. See the following sentences which were twisted by the spell-check software.

A sentence "*Experiment was done in two fases*," got corrected as "*Experiment was done in two faces*"(instead of phases)! "*Breast feading*" was corrected as "*breast fading*" instead of breastfeeding!

The moral of the story is that human intervention is needed to check after the spell-check.

14.4.3.4 Exaggeration

The authors of many scientific papers tend to exaggerate their findings, thinking that they are the pioneers in the field. On the contrary, such claims are not only egoistic but often far from the truth. See this statement.

"*We are reporting for the first time in the world that music therapy certainly reduces depression.*"

A modest way of telling the same is "*To the best of our knowledge, the evidence of the positive effect of music therapy on depression has not been reported in the literature (2000–2017).*"

14.4.4 Role of Self-Review and Peer Feedback

The role of feedback from peer scientists as well as lay public holds the key for enriching the quality of a paper. It has been cited as an important tip for the researchers [7].

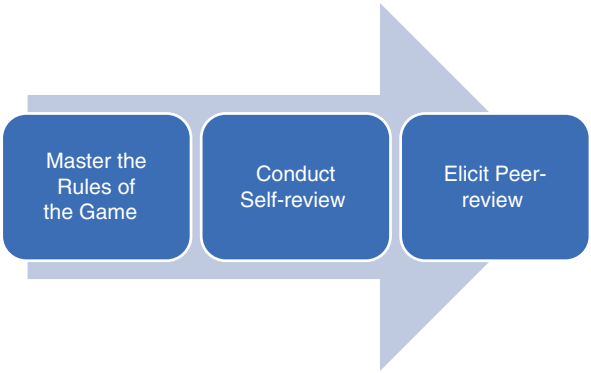

Fig. 14.2 Three-point formula to enhance your language skills

Self-review of a write up after a gap of few days results in a magical improvement. This technique not only helps in improving sentence construction but also in reorganizing contents in a logical manner. Many writers prefer to do this exercise a week after a paper is written. While doing a self- review, it is better to check one aspect at a time. For example, check only sub-headings throughout the document for their uniformity in font size and style.

There is nothing like peer review in enhancing language quality. Those who are the potential target population are best suited for picking up your lapses. In fact, you will be benefitted by an ardent critique rather than a beloved friend. Consulting a language specialist can also help in polishing your manuscript. Self-review and peer review combined with the mastery of rules of the game constitutes a three-point formula for acquiring language skills (Fig. 14.2).

The problem in our setting is that most writers are hesitant to show it to their colleagues fearing criticism or chances of plagiarism. Often the colleagues are not sincere to give a balanced picture. This is owing to the lack of "*feedback culture*." There is an urgent need for the leaders to promote and support a feedback culture in which critiquing plays a major role. The habit of giving constructive feedback rather than making it a 'fault-finding exercise' is vital for achieving effective language skill. Language services on payment basis have started mushrooming everywhere. Many journals have started providing language services at a cost. This may relieve a researcher's burden to some extent. However, we strongly recommend that the researcher should try to do on his own so that he is able to express clearly what he wants to express.

14.4.5 Conclusion

- Language is a major barrier in research publication.
- While language cannot replace the importance of content, it is an important value addition.

- Language skill is not a genetic attribute; it can be learnt by everyone.
- Master the rules of the game.
- Encourage self-review, feedback, and constructive criticism from colleagues or potential readers.

14.5 Evaluate

Let us have an exercise or rather fun. Just browse again the rules of the game which you studied in this article. Write down for each rule, a wrong example, and its correct version. Share with your colleague over a cup of coffee. If he/she agrees you will enjoy more!

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