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Academic writing is a necessary skill for graduate students. Because every graduate student should write academic paper, which makes academic writing one of the important way to express their opinions. In addition, language plays an important role in academic writing and decides the paper’s formality. As a Statistical Science student, I will analyze the language used in the article “Statistical Applications of the Poisson-Binomial and Conditional Bernoulli Distributions”, which was written by Sean X. Chen and Jun S. Liu (1997) and published by *Statistica Sinica*. The objective of writing this paper is to analysis the language used in statistic article and help students in the same field to learn how to write a formal article.

In analyzing the language of the article, I noticed that there was a complex noun phrases “prespecified marginal probabilities”. Two adjectives modified the noun probability. That means that probability here is not only just prespecified but also marginal. The authors put them together to avoid the article rigmarole and enhanced the level of formality of this article. Though the authors used less complex noun phrases and maybe the article looked like not formal enough, I think no more complex noun phrases can be used in it. Fortunately, only one technical vocabulary was used in this article. In general, “joint” means a point where two bones meet in the body, but in statistical field, “joint” is a kind of probabilities and it can be described as combine of multiple marginal probability. Because of the less technical vocabulary, readers will understand it easier and will not feel confused when they reading the article. By the way, “based on” was the only phrasal verb used in this article. Using less phrasal verb was a practical way to improve the level of the formality.

This article used present tense almost all the sections. For instance, “The rest of the article is organized as follows” (Chen & Liu, 1997, p.877) and “This view helps us easily identify the connection and iterative weighted least squares method for maximizing the conditional likelihood, similar to the one used in analyzing a prospective GLM” (Chen & Liu, 1997, p.877). However, past tense was used in this article when the authors reviewed the lecture. For example, “Method 2 was first proposed by Howard (1972) in her discussion of Cox (1972) for analyzing proportional hazard models with discrete survival times” (Chen & Liu, 1997, p.878). Because the lectures have finished and happened in the past, it is better to use past tense. For readers, they can easily be informed what the researches had done. In addition, the authors also used the present perfect tense especially in conclusion section. For instance, “We have compared different methods for computing the exact distribution functions of Poisson-Binomial and conditional Bernoulli models and analyzed their computational complexities” (Chen & Liu, 1997, p.891). The conclusion was the summary about the article and it included the knowledge and idea that the authors mentioned before, so it was more appropriate to use present perfect tense in this part. Furthermore, several passive voice had been represented in this article. From my perspective, the articles which have high level of formality are tend to have a lot of passive voice expression.

According to *Academic Writing for Graduate Students* written by John Swales and Christine Feak (2004)，there were several features of how to use the language in academic writing to make it more formal. First, avoid using contractions in academic paper (Swales & Feak, 2004). In the article, I noticed that the authors paid more attention about contractions, such as “In many surveys, the individual units are not necessarily drawn with equal probabilities” (Chen & Liu, 1997, p.876). The authors used “are not” instead of “aren’t” to make the article looks like formality. Second, Swales and Feak (2004) described that, “Research indicates that I or We can be used in academic writing, but many new authors are very reluctant to use I”. This means that it is better to avoid using first pronoun. However, I observed that the authors used “we” almost in all the sections. For instance, “we always use D to denote a conditional Bernoulli random vector on the space $D^{n}$”(Chen & Liu, 1997, p.876) , “ We can compare the costs for computing R(n,s) by the two methods above”(Chen & Liu, 1997, p.878) and “In the article, we are able to connect several seemingly unrelated statistical problems by the Poisson-Binomial and conditional Bernoulli distributions”(Chen & Liu, 1997,p.891). In my opinion, the reason why the authors used the first pronoun is to introduce the study directly and help the readers to understand it easily. Third, passive voice should be used in many fields should use passive voice (Swales and Feak, 2004). There are some examples, “These methods can be viewed as direct generalizations of methods for conducting simple random sampling, and can be useful to both applied statisticians and computer scientists” (Chen & Liu, 1997, p.891). The authors used passive voice to avoid using the second pronoun and express it directly. Finally, try not to use too many words because readers may can not follow the point (Swales and Feak, 2004). For example, “Section 2 illustrates and compares two methods for computing the Poisson-Binomial distribution, identifying circumstances under which one method is more efficient than the other” (Chen & Liu, 1997, p.877). In this sentence, the authors used “identifying” instead of create a new independent sentence, to shorten the words they need and make the article formal.

Based on what have been discussed before, in my opinion, the level of the formality of this article is more formal. The authors paid attention to the problem of contractions, they avoided it and wrote in long form way. “Based on” was the only phrasal verb used in the article, actually, I can not find a verb instead of “based on”. Though Chen and Liu (1997) used the first pronoun in the article, but they had avoid using the second pronoun. To be noted, there was no question has appeared in this article. Authors had changed the direct questions to be statement. According to these reasons, it can be concluded that the level of the formality of this article is more formal.

In conclusion, after analyzing the article “Statistical Applications of the Poisson-Binomial and Conditional Bernoulli Distributions” by Chen and Liu (1997), the language followed formal rules. It made the article looked very formal. What I have learned is that pay more attention on Swales and Feak’s (2004) book and learn the academic style features from it. In statistic field, there will be a lot of formulas and theory. When we want to talk about the theory, we can use passive voice. In this way, the readers can immediately find what information authors want to send out. We should avoid using the second pronoun in any field of articles, but I think it is difficult to use the third pronoun in statistic article. Therefore, it is a good choice to use the first pronoun just like Chen and Liu’s (1997) article. At the same time, the articles in Statistic field tend to follow academic styles and grammar choices. For example, using single word instead of phrasal verb and avoid use “you pronoun”.

Reference:

Swales, J., & Feak, C. (2004). *Academic writing for graduate students*. Ann Arbor, Mich.: University of Michigan Press.

Chen, S., & Liu, J. (1997). Statistical Applications of the Poisson-Binomial and Conditional Bernoulli Distributions. (1997). *Statistica Sinica*, (7), 875-892.