The Tool of Making Quantitative Researches for Foreign Language Teachers

Review on "Learning Statistics From Examples of Second Language Research"

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ABSTRACT
Quantitative statistical method is an "important tool" for foreign language teachers to display their skills in second language research. The main content of this paper is to review the book “Learning Statistics from Examples of Second Language Research” published by Foreign Language Teaching and Research Press in July 2013. The method of content analysis is adopted to present the review. Based on the previous literature summary and analysis, it is concluded the beginners who intend to skillfully manipulate their quantitative method in second language research may choose this book.

Keywords: "Learning Statistics from Examples of Second Language Research", quantitative research, review

I. INTRODUCTION

The "Guiding Opinions on Accelerating the Construction of "Double first-class" in Institutions of Higher Learning" issued by the ministry of education, the ministry of finance and the national development and reform commission in 2018 put forward the request of constructing "double first-class" universities. Specifically, it calls for "improving the level of scientific research" and emphasizes the important supporting role of first-class scientific research in the construction of first-class universities to be engaged in first-class scientific research requires teachers to have excellent scientific literacy and ability. Doing scientific research is an important way for teachers to obtain professional development and academic pursuit, and mastering scientific and reasonable research methods is particularly critical for high-level scientific research.

The research on foreign language teaching is inseparable from empirical research, and quantitative research is inseparable from empirical research, so quantitative research method has been playing a leading role in applied linguistics research (Wen Qiufang et al., 2004). Open a foreign journal of applied linguistics and one will find that many articles adopt the method of quantitative research. To understand these articles, one must master some basic "quantitative" analysis methods, namely statistical analysis methods (Han Baocheng, 2000). The so-called "quantification", to put it simply, is digitization, which uses the number to illustrate the issue. It is more objective, accurate and convincing to describe things by numbers than by words. Through quantitative analysis, university teachers can not only test and develop foreign language teaching theories, but also understand the overall characteristics of language development of foreign language learners, and explore multiple factors restricting language development of learners (Bao Gui, 2012). For teachers who are engaged in foreign language teaching and research, there is always a fear when they start to use statistics: they worry that they cannot learn and cannot use mathematics because they do not have a mathematical basis. For many foreign language teachers, even if they want to do quantitative research, are sometimes unable to do so. Therefore, mastering statistical analysis methods is an obstacle for foreign language teaching and research. Liu Runqing (1998) once said, "Foreign language teachers are a little afraid of statistics. Fret not. It can be understood and learned with a little effort. And to make the research better is worth the effort."

"Learning Statistics from Examples of Second Language Research" is a book on how to conduct quantitative research in foreign language teaching, published by Foreign Language Teaching and Research Press in July 2013. This book is one of the "National Series of Foreign Language Teachers in Colleges and Universities". It is a series of books carefully planned and grandly launched by the higher English education publishing branch of foreign language teaching and research press. As one of the series of scientific research methods, this book is written by Professor Xu Hongchen, a teacher of language statistics and a researcher who often uses statistical methods, with an
accumulation in quantitative research for many years. The book consists of ten chapters. The main contents of each chapter are briefly introduced and then briefly evaluated.

II. BRIEF DESCRIPTION OF THE CONTENT

There are four parts in the book. The first part is the introduction of the basic concepts of statistics, namely the chapter 1. This section focuses on the basic concepts of statistics. Statistics is an important method in quantitative research. As a system scientific method, those who are engaged in scientific research need to master its basic concepts. In this chapter, the author introduces the concepts of population, sample, sampling and sampling error, descriptive statistics and inferential statistics, research problems and hypotheses, hypothesis testing, significance levels and effect sizes, variables and their measurements, central tendency and discrete tendency through cases in second language research. Although there are many basic concepts in statistics, considering some common problems in second language research, the author focuses on the above core concepts to help readers quickly grasp the key to quantitative research in second language research.

The second part is an overview of statistical methods, that is, chapter 2. This section focuses on two methods of inferential statistics: statistical methods for finding differences and statistical methods for finding associations. Foreign language teachers are often faced with the problem of what method to adopt in scientific research and this part mainly helps readers to choose what method to adopt according to the specific problems in the research. Based on years of research and practice, the author first concludes that the statistical method for finding differences has a lot to do with the nature of the dependent variable, the number of independent variables, the number of levels of independent variables and the measurement times of the subjects. Then he explains the relationship between the four factors and the differential inference statistics and the underlying principle. Then, the author still summarizes: the statistical method to find the correlation is closely related to the number of variables and the properties of variables. The above two aspects are important reference criteria for choosing the statistical method of correlation inference. In order to let readers have a more intuitive understanding of which statistical method to choose, the author compares and analyzes how to choose statistical method of difference inference and statistical method of correlation inference. At the end of this chapter, the author lists four steps on how to choose a statistical method so that readers can understand and choose a statistical method.

From chapter three to chapter seven is the third part of the book. The author systematically introduces the statistical method of finding the difference. In these five chapters, from simple to complex, five statistical methods of independent sample $t$ test, paired sample $t$ test, inter-group univariate analysis of variance, inner-group univariate analysis and two-factor inter-group analysis of variance are introduced successively. When introducing the five kinds of statistical method, the author stands in the reader’s shoes from the case, firstly makes an instance analysis, namely to select an example of this statistical method in a second language study, and then puts forward the research question and hypothesis, followed by SPSS procedures, fourthly interprets the SPSS output, and at last gives examples of reporting results of APA academic papers, listed in both English and Chinese version respectively.

From chapter eight to chapter ten is the fourth part of the book. The author introduces the hypothesis testing methods to find the correlation: correlation analysis, multiple linear regression and chi-square test. Correlation analysis is used to measure the degree of linear correlation between two variables. This degree is expressed as a correlation coefficient. There are different types of correlation analysis, depending on the type of variable. When both variables are fixed distance variables, the Pearson $r$ correlation is used. When both variables are ordinal, the Kendall correlation or Spearman $p$ correlation is used. Spearman $p$ correlation is used when one variable is spaced and the other is ordinal, or when two spaced variables do not satisfy a normal distribution. According to the three kinds of correlation, the author explains the three kinds of correlation analysis with three typical examples. Chapter 9 explains regression analysis. It is a statistical analysis method to interpret and predict dependent variables by one or more independent variables. There are connections and differences between it and the correlation analysis; correlation analysis does not distinguish independent variables from dependent variables, and only discusses the covariant strength and direction between variables; regression analysis distinguishes independent variables (predictive variables) from dependent variables (outcome variables), and discusses the explanatory and predictive power of independent variables to dependent variables on the basis of a certain covariant relationship. Chapter 10 explains the chi-square test. It has two main uses: independence test and fit test. The former mainly investigates whether there is a correlation between two or more nominal levels or ordinal variables. The latter is to investigate whether a definite class or ordered variable in units of number conforms to some theoretical distribution state. Unlike the statistical tests introduced in the previous chapters, chi-square tests can use both raw and aggregated data.
III. EVALUATION AND REFLECTION

The prevailing view in the educational community is that teaching and research go hand in hand (Niu Duan, 2018). Teaching and scientific research are two main duties entrusted to university teachers (Li Junyi, 2018). Mastering certain scientific research methods is the basis for foreign language teachers in colleges and universities to engage in scientific research, and the quantitative statistical method is an "important tool" for foreign language teachers to display their skills in scientific research.

Statistics is a discipline with complete system and strict logic in its origin. Mastering the basic principles of statistics helps university teachers to deeply understand statistical methods and use them correctly. There are many books on the principles of statistics on the market, but the biggest feature of this book is that it focuses on the quantitative statistical methods often used in foreign language teaching research, and does not involve too many complicated theories in statistics. The design idea is to analyze and explain statistical methods in the way of "operating instructions". Easier for beginners, this book is a "shortcut" to quantitative research. It is ideal for anyone who wants to know or engage in quantitative research. When time is ample, readers should also read some books on educational statistics to increase a certain amount of statistical knowledge. This not only gives them a more solid foundation — knowing how and why, but also enables me to develop stronger self-study ability and lay a foundation for learning other advanced statistical methods.

Another feature is the reader-centered case method. The book uses 11 cases to explain the statistical methods commonly used in second language research, namely t test, variance analysis, correlation analysis, regression analysis and chi-square test. The statistical analysis methods used in these cases are the most fundamental in second language research. Mastering these basic statistical methods is helpful for learners to learn other multivariate statistical methods. Case explanation method can facilitate the reader to have an intuitive understanding of the statistical knowledge involved in the specific research situation. Of course, cases are more based on experience, and foreign language teachers may not encounter similar situations when engaged in scientific research. Therefore, readers with critical thinking should adopt corresponding quantitative research methods based on specific problems in actual research.

The third characteristic is to promote learning through practice. Statistical analysis is practical and requires learners to practice more. Each chapter ends with exercises that are closely related to the cases in the chapter. After completing each chapter, learners can consolidate the knowledge they have learned through practice, which can help them to strengthen the concept of knowledge and realize the transfer of knowledge. There are also reference answers at the back of the book to facilitate learners to check their own learning results.

The research of Zhang Huiqin et al. (2008) found that one of the current research situations of foreign language teachers in comprehensive universities is that scientific research methods are single and theoretical knowledge related to scientific research is lacking. The survey results show that the most commonly used scientific research methods by teachers are still in empirical description. Nearly 50% of teachers adopt literature research method, and relatively few teachers can apply educational experiment, investigation and other research methods to scientific research.

Chen Hua and Wang Haixiao (2013) found in a survey on the scientific research attitudes of college English teachers that among the 747 surveyed college English teachers, 381 (51%) believed that one of the factors affecting their scientific research was lack of methods. Zhang Yunqing (2017) found in his investigation that knowledge and intelligence are the main factors influencing teachers’ scientific research development, including scientific research awareness, methods and skills. To sum up, scientific research method is an important factor that affects the academic development of foreign language teachers.

IV. CONCLUSION

"A handy tool makes a handy man". Quantitative analysis of specific research problems is not only an important skill for foreign language teachers in doing empirical research, but also an effective way to improve their level of scientific research. If one wants to try to use quantitative research to solve the problems in foreign language teaching research, this book may open the door to statistics and take him or her into the world of quantitative analysis in a second language. If foreign language teachers want to do good research, they must polish their tools, and this book is a tool to help them open the way of quantitative research. Of course, "What's learned from books is superficial after all; it's crucial to have it personally tested somehow". To do quantitative research well, it is necessary to use good tools and practice according to specific research problems.

References


