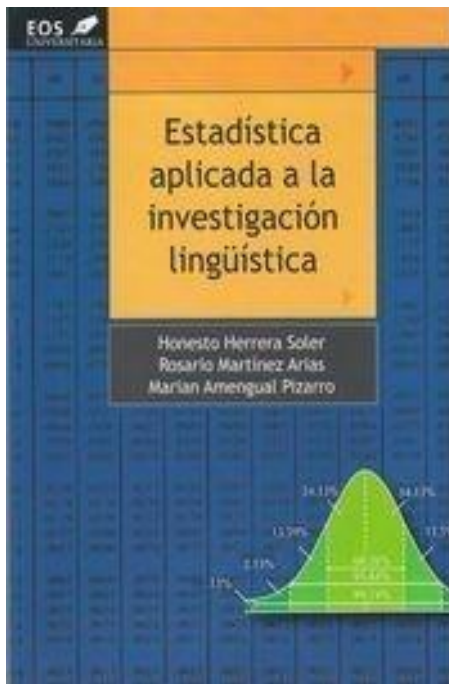# Book Review

Herrera-Soler, H., Martínez-Arias, R. & Amengual-Pizarro, M. (2011). *Estadística aplicada a la investigación lingüística (Statistics Applied to Linguistic Research).* **Madrid: Editorial EOS. 376 pages. ISBN: 978-84-9727-430-2**

As one reads this book two aspects draw our attention: the clear and well-structured text and style of language when addressing people in this topic, which could have been complicated for non-initiated readers, and their mastery to raise and make accessible an issue of such magnitude.

So far, there is still no room in the curricula of Humanities in the Spanish University for a teaching plan which helps researchers to deal with statistics in applied linguistics. Therefore, it is not surprising to see graduates involved in their master or doctorate degree facing no few difficulties if their research has an empirical dimension when they read the required literature or when they have to design their own research. As a result of these needs, the authors have tried to fill in this gap, that most of the times, researchers of applied linguistics or second language acquisitions have. They offer a book which facilitates the access to what is considered basic when doing empirical approaches in the field of linguistics research. They are concerned, first of all, with the understanding of qualitative and quantitative studies and, secondly, with the idea of supplying researchers the basic tools to design and carry out their own research. By doing that, teachers may share their well-founded empirical evidences with other researchers.

Estadística aplicada a la investigación lingüística comprises an introduction, eleven chapters, answers to the proposed activities in each chapters and appendixes, where you will find eight distribution tables covering the tests statistics studied, a glossary, and all formulae needed in case researchers have problem to access any of the Software Statistical Packages. In the introduction, the authors set out the aims of the book as well as the structure of the book, the working method, the structure of each chapter, and finally, the contents of the book, all in an orderly, clear and structured manner, following the pattern of the book.

The book is divided into three large blocks. The first one, which includes chapters 1 and 2, defines what must be taken for granted when dealing with scientific research. Some basic designs are also presented together with the most basic statistical techniques according to the sort the studies we are intended to do. The second block, comprising chapters 3, 4 and 5 focuses on the organization, description, presentation of data, the basic principles for inferences and the formulation of hypotheses. The third block, which is the most extensive and covers from chapter 6 to 11, concentrates on the inferential statistics and discusses the most commonly tests statistic in second language acquisition: parametric tests, non-parametric tests for the comparisons between groups, analysis of variance (ANOVA henceforth), correlation, and linear regression.

Let us go step by step pointing out the most remarkable contributions in each chapter.

In "Linguistic Research", the reader will find very useful information on issues such as: the sort of investigation to be carried out, the research questions, the most suitable strategies for the research intended, definition of variables, samples, data analysis and how to present a report of your research. Finally, the different types of validity and its threats are highlighted. In "Main designs of research and classification of statistical techniques", an introduction to the main designs and statistical techniques that researchers most frequently resort to when dealing with empirical linguistic studies is provided. Concepts such as experimental, quasi-experimental and non-quantitative research are expanded. An introduction to the different statistical techniques either for qualitative and quantitative analysis appears in the appendix of this chapter.

"Organization of data and its presentation", which has an eminently practical character, focuses on how to codify data so as to work with them in Statistical Packages. They go beyond tables and highlight the importance of presenting data throughout different types of graphs. In the next chapter, "Description of some basic statistical", measures of central tendency: mean, mode, median and measures of variation: range, standard deviation and variance are presented. On the grounds of the information provided, readers can easily follow from now on, either the option of working with the Statistical Package for Social Sciences (SPSS) or with very simple formulae to compute the test statistic required. The chapter that closes this block "Statistical Inference" focuses on concepts such as hypotheses testing, on the one hand, and power and effect size on the other. It is interesting to see how

power and effect size of all tests statistics studied are highlighted in this book as they are taken as the seal of quality of any empirical research.

The third block, starts with "Parametric tests. Differences between two means with T-tests for independent and repeated samples". It is perhaps one of the most practical chapters in the book. As in applied linguistics most of the studies focus on the comparison of means between groups or within groups and in the contrast of proportions either in independent or in related samples. It is very useful for the reader to pay attention to the research model proposed. This model is going to be the pattern to test any of the hypotheses studied throughout this part of the book. Thus, the following steps should be taken into account:

1- state the hypotheses,

2- set the criterion for rejecting H0,

3- compute the Test Statistic,

4- construct the confidence interval

5- Interpret the result.

Finally, it points out the precautions that must always be taken to interpret the results obtained in tests of significance. In "Contingency tables when all variables are categorical", various techniques for the analysis of data of categorical variables are described. Frequency, conditional and marginal distributions are studied. But, perhaps, the main contribution in this chapter is not only to see in the reporting Chi-Square test results if the variables studied are independent or not but also to know the effect size of the association and how each cell contributes to the Chi-Square. It should also be highlighted the introduction in this chapter Cohen's kappa to analyze the level of agreement between two evaluators. "Non-parametric tests for comparisons between groups" shows other test statistics: Mann-Whitney as a non-parametric alternative to the Independent-Samples T-tests, Kruskal-Wallis as a non-parametric alternative to the One-Way ANOVA, and Wilcoxon Signed Ranks Test as a non-parametric alternative to the Paired-Samples T-Test, which are used when samples are small or the distribution is not normal. In "Analysis of variance (ANOVA)" group differences are studied either with a One-Way Analysis of Variance or with Factorial Analysis of Variance when there is more than one independent variable. Contrast and multiple comparisons "a priori" and "a posteriori" are introduced. In "The correlation" chapter a scatterplot introduces this topic. A description of the Pearson, Spearman and Tau de Kendall's coefficients is given. Finally, in "Linear regression" readers find the basic concepts of the model, its inferences and the procedures to carry out either the linear regression or the multiple regression. To avoid problems with formulae, as it happens with the Variance chapter, the test statistic is computed with SPSS.

Comments on the different chapters of this book would not be completed if I left aside mentioning the great help that we can find in the Appendices, where we come across basic distribution tables and their websites, formulae to compute the statistic tests we may need, a glossary where we will find explanation to any term that come up in our reading, and the answer to the exercises proposed in each chapter, where theory is illustrated with practice.

In sum, the reading of the book *Estadística aplicada a la investigación lingüística* is highly recommended on the one hand to those who have problems to interpret the data and results that usually appear in applied linguistics and, on the other hand, to those who, immersed in the Education, want to validate their data. This book, the first published in Spanish language for researchers in applied linguistics, is not only useful and attractive but also I would dare to say that is *a conditio sine qua non* for those who deal with research in the field of Applied Linguistics.

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