
Reflection Paper

Quantitative Methods: Basic Statistics, Their Significance and the Software

Simon Park

Asia University

This reflection paper describes and compares two different presentations concerning quantitative methods and analyses. The first is a poster presentation by Chris Pirotto and Robert Dykes that describes common errors in quantitative analysis. The paper details both the poster and the discussion that the writer had with the presenters. The paper then describes Caroline Handley's presentation on the usage of JASP, a free software for conducting quantitative analysis. The paper describes the presentation as well as the writer's impressions from it. The paper ends with a conclusion describing the writer's reflections of the two presentations.

I went to the JALT College and University Educators Special Interest Group (CUE SIG) 2018 Conference to develop my knowledge in order to conduct academic studies and write papers. Specifically, I was interested in learning about quantitative analysis and how I could apply it to my own research and study design for the upcoming semester. I wanted to use the social media application Instagram in my classes to see if it had any effect on student performance and motivation. To do this, I intended to collect large amounts of data and analyze them, two things I had very little experience with. Chris Pirotto and Robert Dykes' poster presentation, "Quantitative Methods: Learn From Our Mistakes", and Caroline Handley's workshop, "Quantitative Data Analysis With JASP", were both excellent in their own ways and taken together provided me with a useful introduction on statistics and quantitative analysis, the exact kind of

experience I had been hoping for heading into the conference.

After my first semester conducting research at a university, I spent the summer vacation designing a follow-up study that would allow me to collect much more data for the upcoming semester. However, I was a novice concerning statistics and came to the CUE SIG conference wanting to learn more about them. Piroto and Dykes' cleverly named poster presentation directly addressed the problems I had been struggling with. Both were knowledgeable on the subject of statistics and had conducted research using quantitative methods. Their poster detailed common mistakes and misconceptions about statistical analysis. Many useful topics were presented: the significance of non-significant findings, frequently omitted but vital statistical data, and mistakes with variable types. One point of emphasis for both Piroto and Dykes was effect size, an underreported statistical category that both presenters helped to clarify due in part to their passion for the topic.

A p -value helps you determine the significance of your results when you perform a hypothesis test in statistics (Rumsey, n.d.). As such, it is an important factor of statistical information that can seemingly validate a researcher's hard work. Traditionally, a small p -value (typically ≤ 0.05) has indicated evidence against the null hypothesis (Rumsey, n.d.), or more simply, that your study yielded a statistically significant result. However, Piroto and Dykes' poster demonstrated how increasing the population size increases the chance of finding any difference and that a low p -value does not tell you how big the difference is between groups in your study. Effect size does this as it quantifies the size (or magnitude) of the difference between groups. It is especially valuable for quantifying the effectiveness of a given treatment, relative to some comparison (Coe, 2002).

Effect size is the kind of statistical item that I came to the conference to learn about. How to measure and evaluate effect size was a point of emphasis from Piroto and Dykes' poster presentation. They informed me of developments concerning Cohen's d value and applied linguistics. Plonsky and Oswald (2014) urged L2 researchers to "adopt the new field-specific benchmarks of small ($d = .40$), medium ($d = .70$), and large ($d = 1.00$) in order to interpret the practical significance of L2 research effects more precisely" (p. 12). This information

would prove useful to me in a later workshop at the conference.

Perhaps the most beneficial part of the poster presentation was simply being able to discuss statistics with two researchers who had more experience with statistics than myself. It was informative and enjoyable to verbalize and discuss with others the concepts and problems I had been studying on my own. Both presenters were patient and clear in their explanations. Simply going over their poster together was a learning experience for my statistical education and a nice primer for properly employing quantitative methods going forward. They also brought several books and showed me relevant passages to emphasize their points. The poster itself contained QR codes linked to useful statistical websites that novice researchers can visit.

Their poster presentation served as both a useful review session and an informative lesson on the importance of effect size. As Plonsky and Oswald (2014) stated, “effect sizes have much to offer in terms of more precisely informing theory and practice in L2 research” (p. 27). This is certainly something an aspiring researcher should keep in mind.

I work with Caroline Handley at Asia University and in her role as the Professional Development Chair, she has helped me conduct my research. I have asked her questions about data analysis, and she has informed me about JASP, an open source software package for data analysis. JASP is easily downloadable at <https://jasp-stats.org>. It is also easy to use, and I recommend those interested in quantitative analysis to experiment with it. I attended Handley’s session immediately after Piroto and Dykes’ poster session. The timing was fortuitous as the poster presentation was a statistics lesson for me. As a result, I was able to understand and enjoy Handley’s presentation more comprehensively because of the experience.

In her workshop, Handley explained and demonstrated how JASP worked. The presentation was a practical demonstration of how to analyze data with this software. Handley detailed three common statistical tests used in SLA—*t*-tests, ANOVA, and repeated measures—and demonstrated how to perform them using JASP. Although Handley had intended for the audience to replicate what she was doing on their own devices, I simply observed and took note of

the various processes. Handley opened up Excel spreadsheets, copied and pasted data into the JASP software, analyzed the data, and detailed what each statistic and number on the resultant data tables indicated. She also showed us how to insert properly APA formatted data tables into papers. I found this to be a useful feature of JASP.

Handley also highlighted important statistical items like effect size and confidence intervals, concepts I had become familiar with from the quantitative methods poster presentation by Piroto and Dykes. After Handley showed the results of an example analysis, I saw that Cohen's d to measure effect size is available on JASP. At the start of the day, I would have had no comprehension of its meaning or significance. I felt a sense of achievement at seeing the effect size item and having some understanding of it. In fact I gained even greater clarity through the process of writing this reflection as I have since emailed the JASP website concerning Plonsky and Cohen's d value. I only wish the workshop had been longer. Based on my needs and current abilities, I would have enjoyed spending more time learning about JASP. Fortunately, I have since downloaded the software and as a result of Handley's workshop, I can experiment with the software on my own.

In my individual study of statistics, particular statistical procedures such as repeated measures ANOVA, independent sample t-tests, and delayed post-tests often seemed beyond my comprehension. Although I had started to study quantitative analysis on my own, I had always felt that I would need extensive training and study in addition to buying expensive software in order to progress to more advanced statistical analysis. However, in a short 30-minute workshop, Handley had demonstrated that these methods were not out of my reach intellectually or economically. Seeing her operate JASP, I realized that I would in fact be able to perform the type of analyses that I had struggled with in the past. This was an empowering and encouraging development. During the workshop itself I began re-thinking my study design and expanding my options, I and have adapted my study for this semester. Handley's session showed me a way to expand my research practices and approach my research from different perspectives.

In conclusion, I attended the JALT CUE SIG 2018 Conference with the

goal of developing myself as a researcher. Because of Pirotto and Dykes' poster presentation and Handley's workshop, I developed my understanding of basic statistics and their significance, learned more about statistical procedures, and began to learn how to operate a free software. This has allowed me to put what I had learned about statistics into practice, and that has expanded my research possibilities. By any measure, it was a successful day. The two sessions I have described worked in harmony to improve my understanding of quantitative methods and conducting research, something that could be said about the entire conference. None of this guarantees future success of course; however, as I embark on new studies, there is no question that the CUE SIG 2018 and specifically these two quantitative methods sessions have made me more confident as I endeavor to complete my own academic studies.

References

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Author bio

Simon Park was born and raised in the United States. He graduated from Boston University in 2003 and then spent several years teaching English. He received a Master's in Education at Temple University in 2014. He currently works at Asia University in Tokyo, Japan as a visiting faculty member. parksn@asia-u.ac.jp

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