

# Arwa Alkhalaf, MA, B.Sc.

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## Profile

An experienced researcher in program evaluation, applied statistics in behavioral, social, and educational contexts with five years of experience gained while working on many projects for a graduate degree. I am also a program evaluation practitioner specializing in higher education programs, during a three-year contract with the University of British Columbia. In addition I am a research methodology expert in quantitative methods. Currently I am working on my PhD dissertation on the effects of small sample size on logistic regression. I have preliminary findings in this area of research that will be published in the next two years. My skills include:

- Applied statistician
- Simulation expert in R
- Acquire knowledge quickly
- Social network analyst
- Research methodologist
- Validation of measures
- Meta-analysis
- Research-oriented
- Program evaluation practitioner
- Adapting to new scientific contexts
- Creating measures based on scientific criteria
- Teaching statistics courses

## EDUCATION

**Doctor of Philosophy, in Measurement, Evaluation and Research Methodology** Completion: July 2016  
*University of British Columbia, Vancouver, BC, Canada*

- Dissertation Title: The effects of small samples and skewed data sets on Type 1 error and Power of hypothesis tests in mixed and fixed –effects dichotomous logistic regression. Supervisor: Professor Bruno Zumbo
- Comprehensive exam: A paper titled: Application of logistic regression in higher education research.

**Master of Arts, in Measurement, Evaluation and Research Methodology** Oct. 2012  
*The University of British Columbia, Vancouver, BC, Canada*

- Thesis Title: The relationship among Process Use, Findings Use and Stakeholder Involvement in Evaluation. Supervisor: Professor Sandra Mathison

**Bachelor of Science, in Computer Science and Statistics** 2006  
*King Abdul-Aziz University (KAU), Jeddah, Saudi Arabia*

- Graduated Second of class, GPA: 4.57/5.00
- The Science faculty at KAU at that time had incorporated a double major program where bachelor students were able to study both Computer Science and Statistics with a minor in Math.

## Research Interests

My research interests are multifaceted focusing mainly on statistical methods and methodology or applied statistics, as follows:

- **Logistic regression:** This is an analysis technique that is suited in situations where the data are categorical. Not many studies have examined the effects of sample size or skewed categorical data on hypothesis tests. I am interested in understanding more about the performance of logistic regression in compromising situations, and how to overcome them without taking away from the integrity of the research.
- **Validity of measures:** The effects of concurrent, convergent, and content validity on the performance of a test in educational and medical contexts.
- **Multidimensional Item Response Theory:** Interested in developing and understanding the theory of scaling numerous abilities that one test item captures and how it differentiates among students.
- **Categorical data analysis:** I am generally interested in ordinal data analysis, loglinear models, and performance of hypothesis tests related to them.
- **Program Evaluation:** This area of research pertains to understanding whether an organization, policy, programs, and quality of products/services are achieving their aims and goals, through certain activities. I am particularly interested in methods of which goals are measured and how evaluations are used.
- **Generalized Linear Models**
- **Mixed-effects Models**
- **Structural Equation Modeling**

## Research Experience

### Research Assistant:

- I was informed with recent literature, collect and analyze data, interact with clients and publish.
- I dealt with a continuously changing environment to suit clients' needs. That is, the type of data and analyses changed over time.
- I was able to adapt to these changes and learn new techniques, such as social network analysis.
- Our methods were those of a mixed methods where both quantitative and qualitative data were used.
- I have a three year experience analyzing and collecting qualitative data.
- Working with quantitative data comes naturally to me as a result of more experience in the field.
- From my involvement in the program I was able to publish three posters, references are below.

**Master Thesis:** As part of my role as an evaluator of a higher education program in University of British Columbia I had a chance to develop a theory that sheds light on the different uses of evaluations within a higher education context. I created a one-of-kind measure as well as tested my theory using an innovative technique within the field of program evaluation called Delphi Technique. During that time I worked individually to create the measure but also worked with clients to understand more about their experiences with the evaluation. I have worked with graduate students, professors, as well as project coordinator to collect data. An abstract of my findings are as follows:

The evaluation use literature agrees that there is a set of consequences that result from involvement in the evaluation, namely use of process and findings. Recently, research is focusing more on the relationships between use of findings and process. The relationship between process and findings use has been examined in relation to involvement in the evaluation process. Empirical research shows that involvement plays a large role in enhancing use of findings and process, and the effects of process use on the use of evaluation findings. The purpose of this study is to examine the relationship among process use, use of findings, and stakeholder involvement in an evaluation and the effects of factors identified in the literature on use. The study considers use in the context of the evaluation of the "Working on Walls" (WOW) project. Through a Delphi technique with three rounds, perceptions of the ongoing evaluation of the project were elicited from WOW participants.

This research investigated process and findings use individually and the relationship between them and it provides an example of using the Delphi method in evaluation research. The Delphi survey results provided an accurate but incomplete view of the factors that were available in the evaluation. Although this study had some limitations, it provides an example that emphasises the importance of the personal factor on process and findings use of an evaluation. It also emphasizes the importance of decision-makers' attitudes towards evaluation on stakeholder's perceptions of an evaluation. Lastly, the survey created for this study is one of a kind that can be useful for future research on evaluation use.

**Doctoral Dissertation:** My upcoming doctoral dissertation is quite different focusing more on applied statistics. I conducted a simulation using the program R to look at skewness and sparseness in logistic regression models. I am extending my study to look at fixed and random- effects models. I am also looking at ways to solve issues related to deflated Type 1 error and increased power in situations where it is implausible in a logistic regression. For my doctoral work I am working with a renowned statistician and Psychometrist, Professor Bruno Zumbo, which I am very proud to be chosen as one of his elite students. Most of my work stems from being informed with classic and recent statistical literature, and creating the simulation experiment. Writing a simulation for a project this big was a new and rewarding experience. My background in computer programming helped to ease the process of writing itself. However creating the experiment is, so far, the highlight of my doctoral work. As of now, I have pilot results for three studies that I will be working on and publishing in the near future.

## PROFESSIONAL EXPERIENCE

### Peer Review

Present

Review an article for the Canadian Journal of Higher Education.

### Program Evaluation Practitioner

Feb 2010 – Feb 2013

*University of British Columbia* [Vancouver, Canada]

- Working with a team of evaluators and clients to create a logic map that agrees with the program's goals.
- Developed methodology for measuring program outcomes.

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- Collect qualitative data through individual and focus group interviews as well as analyze them.
- Collect quantitative data through program activity results and surveys as well as analyze them.
- Prepare technical reports by collecting, analyzing, and summarizing information and trends for clients.
- The first to apply Social Network Analysis in a program evaluation setting.
- Discussing program progress with clients, educating them about program evaluation and providing recommendations.

## Data Analyst

Jan 2007 – Present

- I have worked on many projects as a data analyst be it as part of my duties as a teaching assistant in King Abdulaziz University (KAU) at the Center of Teaching and Learning Development, or as research assistant and graduate student and working with different types of clients. Clients that I have worked with are individuals, such as graduate students or professors, as well as organizations, such as the university of British Columbia, Department of Botany and KAU.
- Within the Higher education sector I have a deep understanding of what scientists and scholars are looking for, what they are trying to accomplish, and the kinds of research questions they need to answer.
- I have worked to overcome many data analysis dilemmas, such as small samples, skewed data, missing data, overdispersion, outliers, sampling and structural zeros, sophisticated categorical data designs.
- The types of analyses that I have done range from hypothesis tests in ANOVA and multiple regression to sophisticated modeling. I have done multivariate analyses and discriminant analyses. I am also an expert in Hierarchical linear modeling or random-effects regression.
- Other types of analysis that I have done are social network analysis, the Delphi technique, narrative analysis, validating tests or measures, IRT and longitudinal analysis.

## Teaching Assistant

April 2007- Present

### King Abdul-Aziz University [Jeddah, Saudi Arabia]

- Working with a team to analyze the efficiency of programs provided through the Center of teaching and learning development.
- Create proposals for research ideas that would benefit the center and the University.
- Management of workshops starting from the speaker to the logistics.

In a different position at KAU as a teacher in the statistics department:

- Taught STAT 101 for psychology students and write tests
- Aid students with special needs understand and learn more about statistics.

## COMPUTER SKILLS

- MS Office: Project, Word, Excel, and PowerPoint
- Programming skills: C++
- **Statistical Software:** SPSS, R, Liserl, HLM, IRT, UCINET
- **Statistical Syntax writing:** SPSS, R, Liserl
- Qualitative research software: Atlas.ti
- Web Development: WordPress

## Publications

- Lo, C., Alkhalaf, A., Yang, K., & Mathison, S. (2012). *Working on walls: A social network case study on the effect of co-supervision and lab-rotation*. Poster presented at the annual meeting of the World Education Research Association.
- Lo, C., Alkhalaf, A., Yang, K., & Mathison, S. (2011). *Increasing the reference-making capacity of SNA metrics*. Poster presented at the annual meeting of the American Evaluation Association.
- Yang, K., Alkhalaf, A., & Mathison, S. (2010). *Technology Enabled Evaluation – Advantages and Disadvantages*. Poster presented at the annual meeting of the American Evaluation Association.

## COMMUNITY INVOLVEMENT

**Activities coordinator**, for the Saudi Student Society of British Columbia, Vancouver, Canada Jan 2014-Present

## References

### **Dr Bruno Zumbo**

Professor

University of British Columbia

Department of Statistics

Institute of Applied Mathematics

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### **Dr Amery Wu**

Assistant Professor

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### **Dr Nand Kishor**

Associate Professor Emeritus

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