

In honour of Prof. Sunday Martins Ogbonmwan at retirement

Professor Sunday Martins Ogbonmwan: Our Dearest Sir

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Abstract. Professor Sunday Martins Ogbonmwan has been our friend, teacher, guide, mentor, research collaborator and a wonderful companion at the Department of Statistics at University of Benin, Benin City. This paper provides a glimpse of his profound impact in the world of Statistics as well as his life and work at the University of Benin, Benin City.

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Prof. S. M. Ogbonmwan, FNSA

1. Introduction

Born on January 6, 1951, Professor Sunday Martins Ogbonmwan (respectfully, SMO hereinafter) spent his initial years at his hometown at Ugbor in Benin

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City, where he received his primary education, before gaining admission in 1963 into the famous Western Boys' High School also in Benin City. He obtained the West African School Certificate at Western Boys' High School in 1967. Between 1968 and 1969, he was at Government College, Ughelli, and there he obtained the Advanced Level General Certificate of Education. He proceeded to the University of Nigeria, Nsukka in 1970 for his Bachelor of Science degree programme in Statistics. He completed his studies there in 1978 with MSc in Statistics. His academic sagacity propelled him to pursue his PhD programme at the highly respected Imperial College of the University of London. He received his PhD as well as DIC in Statistics in 1986. During his PhD programme, he worked with H. P. Wynn, who introduced him to resampling methods.

SMO joined the prestigious University of Benin in 1980 as an Assistant Lecturer. Given his zeal, perseverance and excellence in research, teaching and administrative prowess, he rose through the ranks progressively to become a Professor of Statistics in 2003. His research interests, as we know, focused primarily on nonparametric statistics including resampling techniques. By his analytic dexterity in applied statistics, the Women's Health and Action Research Centre (WHARC) and the World Health Organisation (WHO) in Geneva offered him sabbatical and internship, respectively, between 1999 and 2000, to analyse data on family health. As an astute academic, SMO served as the Editor-in-Chief of Journal of the Nigerian Statistical Association from 1995 to 1999 and has been a Fellow of the Association since 2010. His resolutions to expand the frontiers of research in Statistics propelled him to create the Statistics Research Group (SRG) in 2010 as a forum for communication and collaboration among researchers in Statistics within and outside Nigeria and to build a network of researchers. The Group, which is now in the Department of Statistics, continues to grow in range and significance. It is also important to mention here that he was instrumental to the establishment of Department of Statistics at the University of Benin in 2018. Among his monumental contributions to Statistics is the development of the W_N statistic for multi-sample testing, and this had won him the first prize in an International Award for Young Statisticians in Developing Countries, organised in 1983 by the International Statistical Institute at Madrid, Spain. The W_N statistic may be said to be a footprint in the sands of time in the world of Statistics.

2. The illustrious career in a nutshell

SMO has researched in diverse and substantive areas. He himself selected the following three topics as ones he regarded the most significant in his work: multi-sample testing, bootstrap likelihood and permutation likelihood (Ogbonmwan, 2016). His publications in these areas reflect an amazing versatility and depth and are immensely enriched in theory and applications.

2.1 *Multi-sample testing*

In multi-sample testing, it has always been a problem, prior to Ogbonmwan (1983), on how to identify treatments that differ from the others when the null hypothesis of “no difference” is rejected. SMO made a path-breaking contribution to this problem by developing the W_N statistic via the use of tools in nonparametric statistics. The W_N statistic has been found to be robust for cases with or without ties, balanced or unbalanced and two sample cases (Ogbonmwan and Ozobokeme, 1997; Ogbonmwan and Aitusi, 1999). This statistic is asymptotically efficient and the critical values are readily available (Aiyelo and Ogbonmwan, 1994; Ogbonmwan and Odiase, 2004). The W_N statistic deserves special mention because it circumvents the limitations of the Fisher’s F-test, the Kruskal-Wallis H statistic and the Friedman’s test statistic, which all fail to perform further analysis on the treatments when the null hypothesis of no difference is rejected.

2.2 *Bootstrap likelihood*

SMO took interest in resampling methods, wherein the bootstrap or bootstrap likelihood is a very special case, at Imperial College, London. Given the profound depth of his research in this aspect of statistics, it is no wonder that his work has been published in one of the very best journals of our discipline, *Annals of Statistics* (Wynn and Ogbonmwan, 1986). SMO made very remarkable contributions to resampling methods via construction of the Accelerated Resampling Technique (ART). The ART does resampling using any well-defined distance metric in the selection of the bootstrap configurations (Ogbonmwan, 1991). This technique may be said to be a quasi-Monte Carlo method.

Apart from his intuitive contributions to the bootstrap likelihood, he also opens up some perturbing questions, which are potential future research directions, viz.

- How many simulations/bootstrap configurations do we need for accurate results?
- Which are the effects of the number of configurations on the accuracy of the bootstrap estimates?
- Has the bootstrap any other benefits to the practice of Statistics, apart from finding estimates?

2.3 *Permutation likelihood*

The need to obtain the exact distribution of a variable or variables has led to a complete enumeration of the configurations/permutations. SMO has some influential journal publications to his credit on the permutation likelihood. He constructed the exact permutation distribution for the Ansari-Bradley test statistic, the Wilcoxon rank sum test statistic, the Savage test statistic, the Kruskal-Wallis

test statistic, the mood test statistic and so on (Odiase and Ogbonmwan, 2005; 2006; 2007; 2008; Ogbonmwan et al., 2007). In this sense, the rigour in finding asymptotic distributions, which are approximations to the exact distributions, has now been laid to rest as the exact p-values are now readily available. This giant stride has been applauded by the research community in a publication by International Encyclopaedia of Statistical Science, wherein SMO and his co-author were listed as one of the 610 distinguished authors in Statistics from 105 countries (cf. Odiase and Ogbonmwan, 2011).

2.4 Teaching and administrative experiences

SMO joined the services of the University of Benin as an Assistant Lecturer in 1980. Although his stay at the University was interrupted in 1983 to enable him pursue his PhD programme and in 1999 owing to sabbatical leave, yet he contributed immensely to the academic and administrative growth of the University. Apart from being a researcher, SMO has an amazing flair for teaching. He has a wonderful rapport with his students while engaging them professionally. By maintaining a soft personal connection, he would dwell deep in a subject and instil the appropriate behavioural objectives in his students and encouraged them to question and disagree with him. His witty presence in class made learning a pleasurable venture for all students. Before his retirement on January 6, 2021, he had successfully supervised and graduated seven Ph.D. students and several other M.Phil. and M.Sc. students.

SMO held many key administrative positions. He was Head of Department of Mathematics (2000 – 2002; 2006 – 2009), Dean of Faculty of Physical Sciences (2009 – 2014), Chairman of Post Unified Tertiary Matriculation Examinations/Direct Entry (PUTME/DE) Committee (2014 – 2015), President of SRG (2010 till date), Director of National Centre for Energy and Environment and has also served in several other university boards and committees. His hard work in service to the Nigerian Statistical Association (NSA) and scholarship earned him a Fellow of NSA. SMO belongs to several professional bodies including Bernoulli Society of Probability and Mathematical Statistics and Institute of Mathematical Statistics.

3. SMO: Family

SMO is happily married to Mrs. Juliet Imuetinyan Ogbonmwan and they are blessed with four children (two boys and two girls), namely: Nosakhare, Osamudiamen, Osarogie and Osadebamwen. He made sure that his children got the best of education and encouraged them towards continuous learning. Today, his efforts have paid-off: Nosakhare is a banker, Osamudiamen is an entrepreneur, Osarogie, who studied Medical Laboratory Science, developed his natural talent as a broadcaster and Osadebamwen is a barrister at laws. Since

he was extremely well read on a vast number of subject areas, he did not compel his children to study a particular field including Statistics. As at the time of writing this paper, three of his children are happily married.

4. SMO and I

Even though I was not one of his supervisees at any level in the University of Benin, I had the unique opportunity to have him as a mentor and a motivating and excellent teacher. He taught me in my B.Sc. (Mathematics and Economics) and M.Sc. (Industrial Mathematics) programmes. During my days as a student at the University, I could see the enthusiasm in him in delivering his lectures and in fulfilling his administrative duties. As I completed my National Youth Service Corps (NYSC) at Bayero University, Kano, with a Certificate of Commendation from the NYSC Board, Kano State, I applied to the University of Benin for the position of Graduate Assistant. As at then, he was the Head of Department (HOD). He supported my application with a very strong recommendation. I joined him as a colleague in 2007. I saw his excellent administrative skills as HOD and this made some of his colleagues nicknamed him as “Your excellency”.

As a mentor, he did not only offer me research guidance, but also advice on several personal and professional matters. Although most of my publications are co-authored with Prof. Augustine A. Osagiede, my all-round supervisor, yet my research interactions with SMO were fascinating. In fact, I was thrilled by his depth of knowledge and analytical ingenuity. So far, our fruitful academic interactions have produced three papers (Ekhosuehi and Ogbonmwan, 2014; Oyegue, Ogbonmwan and Ekhosuehi, 2015; Ekhosuehi and Ogbonmwan, 2021). The opportunity to be in his company has always been a pleasure. He cared for me (and perhaps also his PhD students) like a father. He was instrumental to my appointment to several university committees. He introduced me to techniques of external assessment of thesis and evaluation of candidates for appointment/promotion to top academic ranks. He taught me that: although the number of publications is a universal precondition for academic advancement in the university system, the quality of scholarly publications indexed by international bibliographic databases (such as SSCI, SCI, AHCI, Scopus, etc.) provides useful information on the bibliometric strength of the author.

5. Conclusion

SMO is an accomplished statistician, whose monumental contributions have gained prominence in the world of Statistics. He prefers a quiet environment and loves reading spiritual literature that could lift his soul up for meditation. From the outset, his quest to discover new results has assisted him in the un-

derstanding of the real world. He achieves this by studying the distribution of a realised data set through intensive computing without prior knowledge of the functional form of the parent distribution. Unlike the classical bootstrap, the approach proposed by SMO is defined within the high dimensional Euclidean space using a well-defined distance metric. This approach is not well-known and so it requires further research. The W_N statistic is of particular interest to the statistical community since the multi-sample testing is embedded in it. Further improvements on this statistic and its implementation to data from a real world experience are a worthwhile venture.

SMO's retirement enables him to spend some time with his family and countrymen. We hope and pray that he continues to enjoy good health and continues to provide guidance to the younger generations for years to come.

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