| Personal details | |
|---|---|
| **Full name:** | Christopher James **BRIEN** |
| **Work address:** | The Plant Accelerator,<br>School of Agriculture Food and Wine<br>University of Adelaide<br>PMB 1<br>GLEN OSMOND  SA 5064 |
| | UniSA STEM<br>University of South Australia<br>GPO Box 2471<br>ADELAIDE  South Australia  5001 |
| **Telephone (work):** | +61 8 8302 5535 or +61 8 8313 0809 |
| **Telephone (home):** | +61 8 8269 1485 |
| **EMAIL:** | chris.brien@adelaide.edu.au or chris.brien@unisa.edu.au |
| **WWW Home page:** | http://chris.brien.name or https://researchers.adelaide.edu.au/profile/chris.brien |

## Academic qualifications

PhD, University of Adelaide, (1993); thesis entitled *Factorial Linear Model Analysis*.

M.Agr.Sc., University of Adelaide, (1982); thesis entitled *Patterns in Correlation Matrices Arising from Wine-tasting and Other Experiments.*

B.Sc.Agr., Sydney University (1972); majored in Biometry

## Employment record:

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| 2020 – present | *Adjunct Associate Professor in Statistics*, UniSA STEM at the University of South *Australia*. |
| 2018 – 2020 | *Adjunct Associate Professor in Statistics*, School of Information Technology and Mathematical Sciences at the University of South *Australia*. |
| 2015 – present | *Senior Biostatistician*, The Plant Accelerator, School of Agriculture, Food and Wine at the University of Adelaide. |
| 2009 – 2018 | *Adjunct Senior Lecturer in Statistics*, and *Biometrics Group Leader* in the Phenomics and Bioinformatics Centre at the University of South Australia |
| 1989 – 2009 | *Senior Lecturer in Statistics*, University of South Australia (formerly South Australian Institute of Technology) |
| 1988 – 1989 | *Lecturer in Statistics*, South Australian Institute of Technology |
| 1978 – 1988 | *Lecturer in Applied Statistics*, Roseworthy Agricultural College, South Australia |
| 1972 – 1978 | *Biometrician*, Division of Horticultural Research, CSIRO, South Australia |

## Membership of professional societies

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| 1972 – present | Biometric Society;<br><br>Statistical Society of Australia |
| 1990 – present | Institute of Mathematical Statistics |

## Professional experience

### 1.  Statistical Research

**Design and linear model analysis of experiments**

I have pioneered the development of a multitiered approach to experiments involving multiple randomizations, defining this class in Brien (1983). I have published papers and written a PhD thesis that describes a strategy for mixed model analysis that facilitates the analysis of complicated experiments, especially multitiered experiments (Brien, 1983, 1989, 1992a). Forms of multiple randomizations that are employed in multitiered experiments and the formulation of randomization-based mixed models for such experiments are discussed by (Brien and Bailey, 2006). This has been expanded and extended to cover longitudinal experiments in Brien and Demétrio (2009) and has been investigated more fully in Bailey and Brien (2013). Brien and Payne (1999) outline the computation of their analyses of variance, and this has been implemented in the widely available statistical package Genstat (Brien and Payne, 2006). Brien and Demétrio (1998a and b) give a detailed study of the method's implications for the design and analysis of grazing trials The structure of multitiered experiments and the conditions under which they are balanced has been reported by Brien and Bailey (2009, 2010) and Bailey and Brien (2016). The design of multiphase experiments that involve a laboratory/measurement phase subsequent to an initial phase is described by Brien, Harch, Correll and Bailey (2011) for orthogonal experiments and by Brien (2019) for nonorthogonal experiments. A review and bibliography for multiphase experiments is in Brien (2017). Current work is focused on the randomization analysis of experiments with multiple randomizations, the analysis of experiments for which the residuals are not identically and independently distributed, and the multiphase experiments in medical research. I maintain a web site at http://chris.brien.name/multitier that provides an introduction and an overview to the design and analysis of multitiered experiments.

**The analysis of structure in correlation matrices**

In association with A.T. James, W.N. Venables and O. Mayo, I have developed methods for analyzing correlation matrices for equal correlation patterns (Brien *et al.*, 1984 and 1988).

**The design and analysis of agricultural and other biological experiments**

The design of experiments to study different species of native plant species, soils and soil-preparation treatments in incubator and greenhouse experiments has been investigated by T. T. Tran and C. J. Brien, in association with R. A. Bailey and J. Boland. This has resulted in the formulation of general methods for constructing quasi-Latin square designs and their extension to quasi-Latin rectangles, a new class of designs (Brien et al., 2012). Also, there has been the development of split plot designs in which both main plots and sub-plots employ two-dimensional designs and in which sub-plot treatments are latinized.

My coworkers, B. Berger, M. Tester and H. Rabie, and I have also investigated the design of experiments in greenhouses with conveyor systems (Brien et al, 2013). It was concluded that there were trends in the greenhouse and that plants should also return to the same position after watering and imaging. We have published a method for analysing growth in these experiments (Brien et al. 2020), which can be used as a basis for a genetic analysis.

My Brazilian colleagues C. Demétrio, A. dos Santos and R. A. Semarini have been collaborating on the design and analysis of sugar cane experiments. We have been investigating whether the models required for Australian sugarcane experiments are also appropriate for Brazilian experiments. We are also investigating the use of optimal designs for these experiments that employ check plots and partial replication and have published Sermarini et al. (2020).

**Design and analysis of sensory evaluation experiments**

I have formulated an approach to the design and analysis of wine sensory evaluation experiments that is appropriate given the variation in judges and that enables judge performance to be measured as part of each experiment. This work began as part of Master's thesis but has been taken further since then (Ewart and Brien, 1986; Brien, 1987; Brien et al., 1987). It led to the work described under the first two headings.

**Research students**

I was the principal supervisor for Dr T. T. Tran and, an associate supervisor for both Dr M. J. Goss and Dr H. C. Lee, the last two from the School of Management. I co-supervised Dr. A. dos Santos, from the University of São Paulo, who spent 12 months in Australia in 2015-16 and Dr. R. A. Sermarini for a 12-month postdoc visit in 2017-18.

## 2. Statistical Consulting

My key areas of consulting are in the design of experiments and their analysis using modern statistical modelling techniques such as mixed modelling, generalized linear models (GLMs) and their combinations.

The lecturing positions that I held from 1978 to 2009 involved the provision of a part-time statistical consulting service to students and staff. I have consulted in a wide range of areas including: agriculture, business and marketing, information technology, environmental sciences, oenology, pharmacy and physiotherapy. On occasion, I have also undertaken consulting for commercial companies.

My employment with the CSIRO Division of Horticultural Research was as a consulting biometrician and I was involved in the planning, analysis and interpretation of biological and chemical experiments.

Since retiring, I have been consulting extensively with scientists and students at the Australian Centre for Plant Functional Genomics and The Plant Accelerator in Adelaide and in the School of Natural and Built Environments at the University of South Australia.

For the statistical software environment R, I have developed three packages, `dae`, `asremlPlus` and `growthPheno`, to implement statistical analyses and to facilitate available analyses. They are available on CRAN (https://cran.r-project.org/web/packages).

## 3. Lecturing

At the University of South Australia I have given units on Statistical Quality Control and on Advanced Design and Analysis of experiments to students in the Honours Degree in Industrial and Applied Mathematics and a unit on linear models to Statistics majors in the degree in Mathematics and Computer Studies. From 2000-08 I delivered short course and external mode versions of the Design and Analysis of Experiments, Tests and Trials for professional development courses for Engineering students. I have given introductory statistics subjects in several University courses: the degrees in Accounting, Business and Management, Health Sciences, Building Studies, Library Studies and Planning; the associate diplomas/certificates in Civil Engineering, Mechanical Engineering and Industrial Metallurgy. For the years 1994 to 2000 I was responsible for establishing and coordinating the subject Statistical Analysis in Business, a core subject in the Division of Business with 1400 students a year. I was an author of the textbook written for this subject. In 2006 I redeveloped this course to become Statistics for Business and, from 2007 to 2008, I coordinated this course.

At Roseworthy Agricultural College I was responsible for the development and teaching of the statistical and information technology service courses to agriculture, natural resource management, oenology and wine-marketing courses.

I was particularly interested in the development service statistics courses that emphasize the application of statistical methods and the use of computers. In the service teaching of Statistics, I established the use of assessable tutorial tests to promote student learning and feedback and exercises for lectures to attempt in lectures to break up the lecture and promote engagement. I have also been involved in promoting the use of PowerPoint presentations to appropriately deliver material in service courses. I maintained web sites containing student information and resources.

## 4. Administration

From July 2002 to February 2003, I was Acting Head, School of Mathematics and Statistics. I undertook this role again for a month in February 2007 followed by supporting the new Head for several months.

In 2005 and from March 2003 to July 2003 I was Leader of the Applied Statistics Group within the School and a member of the School Executive Committee. From the beginning of 1997 until the beginning of 2000, I was the Administrative Head of the School of Mathematics and Statistics at the City West Campus and a member of the School Executive Committee. I also undertook these roles in 1993.

From 2004–9 I was Program Director of both the Bachelor and Masters of Quantitative Finance. In 1995 I was the Coordinator for the Bachelor of Applied Science (Honours) in Industrial and Applied Mathematics.

At Roseworthy Agricultural College, I was responsible for establishing, coordinating, planning and administering the computing facilities at the College during the period 1978–88.

I was also Head of the Department of Applied Science for 1985–86. In this capacity my activities included: membership of the College's fund-allocating committee; administration of recurrent expenditure in the department; involvement in personnel matters such as promotion, work assignment and staff appointments; making submissions for funds and staff on behalf of the department; and overseeing teaching within the department.

## 5. Professional Activities

**Professional offices**
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| 2010 – 2011 | Vice-President, S.A. Branch, Statistical Society of Australia Inc. |
| 2010 – 2012 | Member, Organizing & Programming Committees, Australian Statistical Conference 2012 |
| 2008 – 2011 | Member, Organizing Committee, GenStat Conference 2011 |
| 2008 – 2013 | Associate Editor, Journal of Agricultural, Biological and Environmental Statistics |
| 2004 | Member of Council, S.A. Branch, Statistical Society of Australia |
| 1995 – 2000 | Consulting Biometrician, Australian Journal of Wine and Grape Research |
| 1986 – 1987 | Immediate Past-President, S.A. Branch, Statistical Society of Australia |
| 1984 – 1986 | President, S.A. Branch, Statistical Society of Australia |
| 1982 – 1984 | Vice-President, S.A. Branch, Statistical Society of Australia |
| 1975 – 1981 | Member of Council, S.A. Branch, Statistical Society of Australia |
| 1973 | Secretary, S.A. Branch, Statistical Society of Australia |
| 1984 – 1986 | S.A. representative, Australasian Regional Council, Biometric Society |
| 1976 – 1977 | Secretary, Australasian Region, Biometric Society |

**Study leave and visits**
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| 1986–7: | 3 months at the Statistics Department, Rothamsted Experiment Station and 3 months at the Mathematics Department, Imperial College of Science and Technology. |
| 1992–3: | 4 months at the Center for Quality and Product Improvement, University of Madison, 6 weeks at the Statistics Department, Rothamsted Experiment Station |

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| | and 10 days the Escola Superior de Agricultura "Luiz de Queiroz" at ESALQ, Piracicaba to give a short course (Brien, 1992b). |
| 1996: | 1 month at Queen Mary & Westfield College, London. |
| 2000 | 3 months at ESALQ of the Universidade de São Paulo at Piracicaba, São Paulo, including several brief visits to other Brazilian universities. |
| 2001 | 7 weeks at Queen Mary, University of London, and 6 weeks at the Statistics Department, IACR-Rothamsted. |
| 2003 | 3 weeks visiting ESALQ of the Universidade de São Paulo at Piracicaba, São Paulo and Universidade de Lavras, Lavras, Brazil. |
| 2004 | 3 weeks at Queen Mary, University of London. |
| 2006–7 | 4 months at Queen Mary, University of London, 4 weeks at ESALQ of the Universidade de São Paulo at Piracicaba, São Paulo and 6 weeks at Biomathematics and Bioinformatics Division, Rothamsted Research, UK. |
| 2008 | A Visiting Fellow at the Isaac Newton Institute for Mathematical Sciences, Cambridge, UK, during the four-week Design of Experiments programme. |
| 2010 | 4 weeks visiting ESALQ of the Universidade de São Paulo at Piracicaba, São Paulo and 5 weeks visiting Queen Mary University of London. |
| 2011 | A Visiting Fellow at the Isaac Newton Institute for Mathematical Sciences, Cambridge, UK, for five weeks during the Design of Experiments programme. |
| 2013 | 3 weeks visiting the School of Mathematics and Statistics at the University of St Andrews, St Andrews, Scotland. |
| 2014 | 2 weeks visiting ESALQ of the Universidade de São Paulo at Piracicaba, São Paulo. |
| 2015 | 3 weeks visiting the School of Mathematics and Statistics at the University of St Andrews, St Andrews, Scotland. |

## Selected publications and manuscripts
### (for a full list see http://orcid.org/0000-0003-0581-1817)

Brien, C. J., Sermarini, R. A., & Demetrio, C. G. B. (2023). Exposing the confounding in experimental designs to understand and evaluate them, and formulating linear mixed models for analyzing the data from a designed experiment. *Biometrical Journal,* **65**(7), 2200284. https://doi.org/10.1002/bimj.202200284.

Brien, C. J. (2022). Designing, understanding and modelling two-phase experiments with human subjects. *Statistical Methods in Medical Research*, **31**(4), 626-645. https://doi.org/10.1177/09622802211031612.

Sermarini, RA, Brien, C, Demétrio, CGB, dos Santos, A. (2020) Impact on genetic gain from using misspecified statistical models in generating p-rep designs for early generation plant-breeding experiments. *Crop Science.* **2020**; 1– 13. https://doi.org/10.1002/csc2.20257.

Brien, C., Jewell, N., Garnett, T., Watts-Williams, S. J., & Berger, B. (2020). Smoothing and extraction of traits in the growth analysis of noninvasive phenotypic data. *Plant Methods*, **16**, 36.

Brien, C. J. (2019). Multiphase experiments with at least one later laboratory phase. II. Nonorthogonal designs. *Australian & New Zealand Journal of Statistics*, **61**(2), 234-268.

Bustami, R.A., Brien, C., Ward, J., Beecham, S., Rawlings, R. (2019) A statistically rigorous approach to experimental design of vertical living walls for green buildings. *Urban Science*, **3** (3), 71.

Ward, B, Brien, C, Oakey, H., Pearson, A., Negrão, S., Schilling, R.K., Taylor, J., Jarvis, D., Timmins, A., Roy, S.J., Tester, M., Berger, B., van den Hengel, A. (2019). High-throughput 3D modelling to dissect the genetic control of leaf elongation in barley (*Hordeum vulgare*). *The Plant Journal*, **98**, 555-570.

Brien, C. J. (2017). Multiphase experiments in practice: A look back. *Australian & New Zealand Journal of Statistic*s, **59**(4), 327-352.

Campbell, M. T., Du, Q., Liu, K., Brien, C. J., Berger, B., Zhang, C., & Walia, H. (2017). A Comprehensive Image-based Phenomic Analysis Reveals the Complex Genetic Architecture of Shoot Growth Dynamics in Rice (Oryza sativa). *The Plant Genome,* **10**(2).

Atieno, J., Li, Y., Langridge, P., Dowling, K., Brien, C., Berger, B., Varshney, R.K., Sutton, T. (2017). Exploring genetic variation for salinity tolerance in chickpea using image-based phenotyping. *Scientific Reports,* **7**, 1300.

Ferdous, J., Sanchez-Ferrero, J.C., Langridge, P., Milne, L., Chowdhury, J., Brien, C. and Tricker, P.J. (2017) Differential expression of microRNAs and potential targets under drought stress in barley. *Plant, Cell & Environment*, **40**, 11-24.

Al-Tamimi, N., C. Brien, H. Oakey, B. Berger, S. Saade, Y. S. Ho, S. M. Schmöckel, M. Tester and S. Negrão (2016). Salinity tolerance loci revealed in rice using high-throughput non-invasive phenotyping. *Nature Communications*, **7**: 13342.

Hardner, C. M., K. Evans, C. Brien, F. Bliss and C. Peace (2016). Genetic architecture of apple fruit quality traits following storage and implications for genetic improvement. Tree *Genetics & Genomes*, **12**: 20.

Bailey, R.A. & Brien, C.J. (2016) Randomization-based models for experiments: I. A chain of randomizations. *Annals of Statistics*, **44**, 1131–1164.

Campbell, M. T., Knecht, A. C., Berger, B., Brien, C. J., Wang, D. and Walia, H. (2015). Integrating Image-Based Phenomics and Association Analysis to Dissect the Genetic Architecture of Temporal Salinity Responses in Rice. *Plant Physiology*, **168**, 1476-1489.

Razzaghmanesh, M., Beecham, S. and Brien, C. J. (2014), Developing Resilient Green Roofs in a Dry Climate, *Science of the Total Environment*, **490**, 579-589.

Demétrio, Clarice G.B., Menten, José F. M., Leandro, Roseli A. and Brien, Chris. (2013) Experimental power considerations — justifying replication for animal care and use committees. *Poultry Science*, **92**(9): 2490-2497.

Brien, C. J., Berger, B., Rabie, H. and Tester, M. (2013) Accounting for variation in designing greenhouse experiments with special reference to greenhouses containing plants on conveyor systems. *Plant Methods*, **9**:5.

Smith, Gavin; Brien, Chris and Ashman, Helen (2012) Evaluating implicit judgements from image search click-through data. *Journal of the American Society for Information Science and Technology*, **63**, 2451–2462.

Brien, C.J., Bailey, R.A., Thao, T.T. and Boland, J. (2012) Quasi-Latin designs. *Electronic Journal of Statistics*, **6**, 1900-1925.

Brien, C. J. (2012) Comment on "Therapist variation within randomised trials of psychotherapy: implications for precision, internal and external validity". *Statistical Methods in Medical Research*, **21,** 215–216.

Brien, C.J., Harch, B.D., Correll, R.L. and Bailey, R.A. (2011) Multiphase experiments with at least one later laboratory phase. I. Orthogonal designs. *Journal of Agricultural, Biological and Environmental Statistics*, **16**: 422--450.

Brito E Abreu, S., Brien, C. & Skinner, W. (2010) ToF-SIMS as a new method to determine the contact angle of mineral surfaces. *Langmuir*, **26**, 8122–8130.

Brien, C.J. and Bailey, R.A. (2010) Decomposition tables for multitiered experiments. II. Two-one randomizations. *Annals of Statistics*, **38**, 3164–3190.

Brien, C. J. & Bailey, R. A. (2009) Decomposition tables for multitiered experiments**.** I. A chain of randomization. *Annals of Statistics*, **37**, 4184–4213.

Brien, C. J. & Demétrio, C. G. B. (2009) Formulating mixed models for experiments, including longitudinal experiments. *Journal of Agricultural, Biological and Environmental Statistics*, 14(3), 253-80.

Brien, C.J. and Payne, R.W. (2006) AMTIER procedure. In R.W. Payne and P.W. Lane. (Eds) *Genstat Reference Manual Release 9, Part 3. Procedure Library PL 17*, 73–75. VSN International, Hemel Hempstead. <`http://www.genstat.co.uk`>

Brien, C.J. and Bailey, R.A. (2006) Multiple randomizations (with discussion). *Journal of the Royal Statistical Society, Series B (Methodology)*, 68(4), 571–609.

Brien, C.J., Bailey, R.A., Correll, R.L., Harch, B.D., Payne, R.W. and Demétrio, C.G.B. (2003) Multitiered experiments web site. <http://chris.brien.name/multitier/>

Brien, C.J. and Payne, R.P. (1999) Tiers, structure formulae and the analysis of complicated experiments. *The Statistician*, 48(1), 41-52.

Brien, C.J., and Demétrio, C.G.B. (1998b) Using the randomisation in specifying the ANOVA model and table for properly and improperly replicated grazing trials. *Australian Journal of Experimental Agriculture*, 38(4), 325-34.

Brien, C.J. (1992) *General method for determining the analysis of variance for experiments*. Escola Superior de Agricultura "Luis de Queiroz", Universidade de Sao Paulo, Piracicaba.

Brien, C.J. (1989). A model comparison approach to linear models. *Utilitas Mathematica*, 36, 225–54.

Brien, C.J., James, A.T., and Venables, W.N. (1988). An analysis of correlation matrices: variables cross-classified by two factors. *Biometrika*, 75, 469–76.

Brien, C.J., May, P., and Mayo, O. (1987) Analysis of judge performance in wine-quality evaluations. *Journal of Food Science*, 52, 1273–9.

Brien, C.J. (1987) Wine-quality scores - what do they tell us? In *Tasting Seminars Chardonnay and Pinot Noir* edited by T.H. Lee, 47-63. Australian Society of Viticulture and Oenology, Urrbrae.

Brien, C.J., Venables, W.N., James, A.T., and Mayo, O. (1984). An analysis of correlation matrices: equal correlations. *Biometrika*, 71, 545–53.

Brien, C.J. (1983). Analysis of variance tables based on experimental structure. *Biometrics*, 39, 133–9.

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**Presentations since 2010**
**(for slides see http://chris.brien.name/multitier/MTTalks.html)**

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[†]Invited Addresses

*Tiers in gene expression microarray experiments* (an expanded version), presented at Departmento de Ciêncas Exatas in Escola Superior de Agricultura "Luiz de Queiroz" (ESALQ) of the Universidade de São Paulo, Piracicaba, Brazil in 2010.

*Formulating mixed models for experiments, including longitudinal experiments*, presented at Departmento de Ciêncas Exatas in Escola Superior de Agricultura "Luiz de Queiroz" (ESALQ) of the Universidade de São Paulo, Piracicaba, Brazil in 2010.

[†]*Formulating mixed models for experiments, including longitudinal experiments*, an invited address in the JABES Showcase session at the XXVth International Biometrics Conference held in Florianópolis Brazil in 2010.

[†]*Principles in the design of multiphase experiments with a later laboratory phase: orthogonal designs*, an invited address presented at the 4th ASEARC Conference held in Parramatta, Sydney in 2011.

*Principles in the design of multiphase experiments with a later laboratory phase: orthogonal designs* (a longer version), presented at the AGM of the Statistical Society of Australia Inc. in Adelaide in 2011.

†*Factor allocation in gene-expression microarray experiments*, an invited address presented at the 3rd International Conference on the Design of Experiments held in Memphis, U.S.A. in 2011.

†*Robust microarray experiments by design: a multiphase framework*, an invited address presented at Design of Experiments: Recent Advances in Methods and Applications (DEMA 2011) held in Cambridge, U.K. in 2011.

†*Multiphase experiments in the biological sciences*, an invited address presented at the Cambridge Statistics Initiative One-Day Special Meeting held in Cambridge, U.K. in 2011.

*Principles in the design of multiphase experiments with a later laboratory phase: orthogonal designs*, presented at the Australian Applied Statistics Conference (Genstat and ASReml) held in Palm Cove, Queensland in July 2011.

†*Robust microarray experiments by design: a multiphase framework*, an invited address presented at Design of Experiments: Recent Advances in Methods and Applications (DEMA 2011) held in Cambridge, U.K. in 2011.

†*Multiphase experiments in the biological sciences*, an invited address presented at the Cambridge Statistics Initiative One-Day Special Meeting held in Cambridge, U.K. in 2011.

*Robust microarray experiments by design: a multiphase framework*, an extended version presented presented to the Biomathematics and Bioinformatics Department, Rothamsted Research Harpenden, and to the Systems Biology Centre, University of Warwick, Coventry, U.K. in October 2011.

†*Principles in the design of multiphase experiments with a later laboratory phase: orthogonal designs*, an invited address presented at the40th Annual meeting of the Statistical Society of Canada held at the University of Guelph, Canada in June 2012.

†*Formulating mixed models for experiments, including longitudinal experiments*, an invited address presented in the Department of Statistics and Actuarial Science at Simon Fraser University, Vancouver in June 2012.

*Robust microarray experiments by design: a multiphase framework*, presented at Australian Statistics Conference 2012 held in Adelaide, Australia in July 2012.

*Principles in the design of multiphase experiments with a later laboratory phase: orthogonal designs*, presented at the XXVIth International Biometrics Conference held in Kobe, Japan in 2012.

*Designing the Microarray Phase of Two-Channel Microarray Experiments* presented by Dr Andrew Mead (principal author) at the XXVIth International Biometrics Conference held in Kobe, Japan in 2012.

*Accounting for plant variation in designing Plant Accelerator experiments*, presented at CSIRO Mathematics, Informatics and Statistics (CMIS), Adelaide in 2012.

*Accounting for plant variation in designing greenhouse experiments*, presented at the Australasian Applied Statistics Conference 2012, Queenstown, NZ in 2012.

*A tale of randomization: randomization versus mixed model analysis for single and chain randomizations*, presented at CSIRO Mathematics, Informatics and Statistics (CMIS), Adelaide in August 2013, at the School of Mathematics and Statistics, University of St Andrews, St Andrews, Scotland in 2013, and at †the I Workshop on Experimental Statistics e o IV Encontro dos Alunos do PPG em Estatística e Experimentação Agronômica held at the Escola Superior de Agricultura "Luiz de Queiroz" (ESALQ) of the Universidade de São Paulo, Piracicaba, Brazil in September, 2014.

*Accounting for variation in designing high-throughput greenhouse experiments*, presented at †Statistics and Its Interaction with Other Disciplines 2013, a conference held in Ho Chi Minh City, Vietnam in 2013, at James Hutton Institute, Scotland in 2013 and at CPIB, University of Nottingham, Nottingham, England in 2013.

*A tale of randomization: randomization*, presented at Biometrics by the Canals, Mandurah, Western Australia in December 2013.

†*Design and analysis of high-throughput greenhouse experiments*, presented at the I Workshop on Experimental Statistics e o IV Encontro dos Alunos do PPG em Estatística e Experimentação Agronômica held at the Escola Superior de Agricultura "Luiz de Queiroz" (ESALQ) of the Universidade de São Paulo, Piracicaba, Brazil in September, 2014.

*Growth analysis of data from high-throughput phenotyping facilities*, presented at the Australasian Applied Statistics Conference 2014, Port Lincoln, Australia in December 2014.

*Randomization inference for a chain of randomizations*, presented at the School of Mathematics and Statistics, University of St Andrews, St Andrews, Scotland in 2015.

*Randomizing and checking standard and multiphase designs using the R package* dae, presented at the XXVIIIth International Biometrics Conference held in Victoria, Canada in 2016.

*Anatomies of experimental designs: a case study for a p/q-rep multiphase design*, presented at the Australasian Applied Statistics Conference 2016, Barragga Bay, New South Wales in December 2016.

*Anatomies of experimental designs: how good is my single-phase design?* presented at The Biometry Hub, The Waite Campus, University of Adelaide, Adelaide in May 2017.

*Always randomize?*, presented in November 2017 at The Biometry Hub, The Waite Campus, University of Adelaide, Adelaide and at Biometrics by the Border, The International Biometric Society Australasian Region Conference, Kingscliffe, NSW.

*Mimicking anova in reml mixed-modelling of comparative experiments using the R-package asremlPlus*, presented at The Biometry Hub, The Waite Campus, University of Adelaide, Adelaide in September 2018 and a shortened version at the Australasian Applied Statistics Conference held in Rotorua, New Zealand in December 2018.

†*The R-package asremlPlus: I. Mixed model selection; II. Prediction production & presentation*, presented at the SAGI Symposium, Rottnest Island, W.A., in May 2019.

*Identifying, randomizing, canonically analyzing and formulating mixed models for designs for comparative experiments using R*. One-day workshop presented at the International Biometrics Society Australasian Region Conference, Adelaide, S.A., in December 2019.

*Smoothing and extraction of traits in the growth analysis of noninvasive phenotypic data*, presented at The Biometry Hub, The Waite Campus, University of Adelaide, Adelaide, in August 2020.

*The design and analysis of a two-phase experiments involving human subjects: a case study*, presented at the Statistical Society of Australia, S.A. Branch meeting, Adelaide, in August 2022.

*Employing the factor-allocation paradigm for designing comparative experiments*, a short course presented on 19-20th April 2023 at The Komo, Redcliffe, Qld.

*Exposing the confounding in experimental designs to understand and evaluate them, and formulating linear mixed models for analyzing the data from a designed experiment*, presented in September 2023 at The Biometry Hub, The Waite Campus, University of Adelaide, Adelaide.