



The theme of this issue was prompted by the last election when we were all flooded with charts, diagrams and even pendulums explaining what was happening or was about to happen. As professionals Data Analysis Australia cast its eye over this and decided the quality varied from the good to the ugly, with the average probably being just bad. Here we give our view on what makes good graphics for communication.

*Dr John Henstridge
Managing Director*

Imagining Numbers

The famous saying that “a picture is worth a thousand words” is paralleled by statisticians who might say that a picture can be worth a thousand numbers. In fact every day we are presented in newspapers or on television with graphics trying to get across some form of numerical message. A recent example in Australia was during the election where every day various trends were displayed as images. Perhaps the most controversial was the “worm”, a simple means of displaying an audience’s reaction during a debate.



Statisticians use graphics like this and are worried by them. They use them because part of a statistician’s role is to make sense of and communicate such results. They worry about them because a simplification in a graphic can produce a misleading message. Not for nothing did Darrel Huff’s famous book *How to Lie with Statistics* include many examples of graphics designed to hide facts or to mislead. In the example of the worm, the statistician would have concern about how representative the audience is and the significance of the fluctuations, while at the same time recognising that it clearly connects with the viewers.

Data Analysis Australia faces these issues daily, not regarding a project finished until the results have been properly communicated. The right graphics are part of this. Data Analysis Australia uses some of the best techniques developed by statisticians over the past forty years, since the advent of computers with graphic displays meant that it was possible to readily produce information rich, if not artistically good, graphics to help understand data. (This started when a graphic display device cost about the same as a large house!) More recently the statistician (and political scientist) Edward Tufte has done much to bring back the aesthetics into statistical graphics, starting with his classic text *The Visual Display of Quantitative Information* and subsequent books. These provide guidelines for good graphics in Data Analysis Australia.

The area that is perhaps least well served today with quality graphics is business. Modern spreadsheet software makes it easy to generate charts, but the defaults rarely give good graphics – too much clutter, poor choice of scales and few methods of displaying many variables. Data Analysis Australia uses a range of software to augment standard spreadsheets to create graphics with total control.

What Makes A Good Statistical Graphic?

Charts, diagrams and graphs have been used to present statistical data and results for centuries. The purpose is to present a finding or a summary of information in a manner where it can be readily understood. However they also have a dark side, where graphics are

used to present a particular view or a biased interpretation of the data. A discussion on what is important to consider when making a "good" graphic is available on our website.

See www.daa.com.au/analytical-ideas/statistical-graphics/

Staff Profile - Rhiannon Marchant

Rhiannon graduated from the University of Western Australia in mid-2005 with a degree in Computer and Mathematical Sciences. She majored in Applied Statistics and Economics and also completed Honours in Applied Statistics.

Since joining Data Analysis Australia she has worked on numerous projects covering a wide area of topics such as road crash data, mineral laboratory data, native title claims, electricity demand, gas usage and demand, population forecasting and modelling.

Rhiannon was a major part of the Data Analysis Australia team that developed a forecasting system that uses factors such as day of the week, forecast weather and seasonal effects to predict total energy demand. A key feature of the model was the incorporation of accuracy bounds to accommodate errors in the weather forecasts. This work was expanded to enable comparable forecasts to be made for budgeting and analysis purposes.

Rhiannon is currently planning a holiday to Vanuatu in August. She is looking forward to having her home renovations finished so she can sit back, relax and have a few drinks with friends.



Rhiannon having a bouncy birthday.

Company News

Data Analysis Australia conducted a statistical analysis of data collected in 2006 during the benthic macrofauna community and sediment habitats comprehensive baseline survey for the metropolitan desalination plant on behalf of Oceanica Consulting. Recently, Data Analysis Australia combined their efforts with Oceanica Consulting in the collection of benthic samples as part of their 2008 Desalination Plant Survey within Cockburn Sound. **Rian Caccianiga** was lucky enough to join their team for a day of sampling out on the water.

John Henstridge, **Anna Munday** and **Rian Caccianiga** attended the Woylie Symposium held at Murdoch University in February 2008. Data Analysis Australia presented the results of the meta-analysis conducted on the Woylie population in the Upper Warren region, South-West WA. The analysis investigated temporal population trends, change in demographics and any associations the woylie may have with other species. We all thoroughly enjoyed the symposium and contributed to a broader understanding and an appreciation of the factors influencing the decline in woylie numbers.

Jason Rabbitt and **Rian Caccianiga** have been actively involved in the organisation of the Young Statisticians' component of the upcoming Australian Statistical Conference in Melbourne. Data Analysis Australia is proud to be sponsoring the Young Statisticians' stream, with **John Henstridge** invited as a guest speaker to encourage and inspire Young Statisticians.

Data Analysis Australia recently organised an intensive internal training program for all consultants as part of our commitment to professional development. The topics covered included correspondence analysis, segmentation analysis, modelling techniques such as regression and the use of generalised linear models, conducting and running surveys, and efficient programming techniques (to name but a few).

John Henstridge is currently supervising **Tom Lawrence**, an Honours student from the University of Western Australia, who is writing his thesis on energy consumption using single index models.

Classic Quote

"Not everything that can be counted counts, and not everything that counts can be counted."

Albert Einstein (1879-1955), Attributed

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