DATA STATISTICS

ANALYSIS MATHEMATICS

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NEWSLETTER

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The role of statisticians in surveys is often seen as just "getting the numbers right". However there are many contexts where the statistician is required to "get the questions right". Trade-off analysis is just one where the questions must have the analysis in mind and where the logic of the mathematician is critical.

Dr John Henstridge
Managing Director

Trade-offs - Asking the Right Questions

Deciding which product to buy is rarely easy, particularly when offered a wide range of choices. While we would ideally like the best of everything for the lowest price, we inevitably have to ask "What am I willing to give up?" and "How much am I prepared to pay?". Since we can't have everything, these types of trade-offs are unavoidable.

Businesses must also make trade-off decisions when offering products to a market, which can affect product development, sales and service delivery. Making the right decisions means meeting customers' needs economically – the customer can buy what they want and the company profits from the sale. Determining the optimal balance of trade-offs is where statistics plays an important role.

Trade-off analysis is known by many names, for example, conjoint analysis, choice modelling and contingent valuation. What these techniques have in common is analysing decision-making where a choice is presented. Trade-off analysis is a collection of standard statistical techniques that provide objective insight into consumer preferences using a quantifiable and repeatable approach. There is a perception that trade-off research is an expensive and difficult exercise but, with the right design, it is surprisingly efficient and flexible.

Trade-off analysis can work in many ways, including allocating a "worth" to every feature being researched on a common scale to determine the combination of features with the greatest value. This allows a dollar value to be assigned to abstract qualities such as colour and shape, thereby letting companies know, for example, how much more customers value (and will pay for) red products compared to blue products.

By understanding the statistics behind trade-off studies, statisticians can design surveys that are shorter and more interesting for the respondent and are also good value to the client. To really benefit from trade-off research, the analysis must be taken into account before the design of the survey, making the statistician's role more important than ever.

The applications of trade-off analysis extend to informed policy planning, setting of fees and charges, understanding consumer behaviour, and identifying values and priorities.

Data Analysis Australia has the expertise to design a balanced questionnaire, analyse the data in the context of the research questions and interpret the results and has demonstrated this expertise in a range of applications.

Recreational fishers were presented with a scenario of a way to pay for the next fish they catch using realistic methods such as fishing licences or fish tags with the money raised going to improving fish stocks. Fishers placed value on the next fish by choosing to accept the priced scenario or stay with things as they are.

Water utility customers were presented with various billing options and payment methods were ranked in order of preference. They were trading off frequency of bills against means of payment and discounts.

Trade-off techniques can be used for any research where there is a need to investigate consumer behaviour, preferences and decision-making. Data Analysis Australia can assist in designing the right study and providing meaningful results. For more information, contact Meredith Regan.

ANALYTICAL IDEAS

The second paper in Data Analysis Australia's discussion series covers the quintessential question when any survey is undertaken – "What size sample do I need?". This is not an easy question to answer and it often has a big impact on the cost of a survey. The paper discusses the issues that need to be considered when selecting an appropriate sample size and some of the alternative sampling methods that can be utilised to reduce sample sizes.

The paper can be found at www.daa.com.au/analyticalideas/2004/samplesize1.html.

Classic Quote

"An approximate answer to the right question is worth a good deal more than the exact answer to an approximate problem."

John Tukey (1915 - 2000), Statistican

Company News

As part of the commitment of Data Analysis Australia to the development of the statistical profession we are hosting **Angeline Lim**, a 3rd year practicum student from the University of Western Australia. Under the supervision of **Anna Munday**, Angeline is investigating techniques to improve forecasting methodologies for mortality rates in Australia.

At the AGM of the WA branch of the Statistical Society of Australia, **Jodie Thompson** and **Anna Munday** were re-elected to the WA Branch Committee. Anna is also serving as the WA and National Young Statisticians representative.

The Market Research Society of Australia runs professional development seminars for the benefit of their members. **John Henstridge** was invited to speak at the February seminar and presented a talk on the use of surveys as legal evidence. This talk can be found at http://www.daa.com.au/presentations/mrsa-surveys-in-court.pdf.

Meredith Regan and **April Rutkay** received Graduate Statistician (GStat) accreditation from the Statistical Society of Australia. GStat is awarded to recent graduate statisticians to provide professional recognition of their qualifications.

Congratulations go to two of our staff members who graduated this month. **Rebecca Gordon** received her Masters of Business Administration and **Elspeth M^{ac}Kay** her Bachelor of Computing and Mathematics (Honours) from the University of Western Australia.

Staff Profile - Anna Munday

Anna graduated in 2000 with an honours degree in statistics from the University of Western Australia. She then set off to Canberra to join the Australian Bureau of Statistics, where she had been employed as a Cadet during her honours year at university.

After spending two years in Canberra working in the Methodology Division, Anna was persuaded to return home to Perth by the variety of work undertaken by Data Analysis Australia.

Anna has particular expertise in stochastic and mathematical modelling, data analysis and sampling and survey methodologies. She has a major role in the Perth and Regions Travel Survey that we are conducting for the Department for Planning and Infrastructure. Anna has also worked on developing population forecasts and will be speaking on this topic at the Australian Statistical Conference in July.

As the National Young Statisticians' representative of the Statistical Society of Australia, Anna has an important role in ensuring that the Society is relevant to and inclusive of young statisticians. As part of this Anna is organising a session for Young Statisticians at the Australian Statistical Conference.

Being something of a tennis player and sporting fan, it is easy to spot Anna's work area as the one adorned with posters of the West Coast Eagles and Steffi Graf.

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