
A new argument for more women in engineering

The engineering profession has an imbalance between people who prefer an analytical approach to decision-making and those who prefer a human values approach. While both types are equally represented in the general population, the analytical types are over-represented in engineering. **Mark Toner** argues the profession needs more values types and the best way of achieving that would be by attracting more women into engineering.

About half the general population makes judgements and decisions using logical, objective and impersonal analyses of situations, while the other half uses processes based on personal and individual values. Both approaches, identified by the eminent Swiss psychologist Carl Jung, are rational and valid ways to make decisions. Jung called people who prefer logical, analytical thought “thinking” types, and those who prefer to use human values “feeling” types.

Although Jung used these terms in a defined way, they are capable of being misunderstood and confused with their everyday meanings. So in this paper, the terms “analytical” and “values-based” will be used instead of the terms “thinking” and “feeling” respectively.

Jung published his seminal work *Psychological Types* in 1921. He classified people’s personalities into eight categories after he discovered that “people are different in similar ways”.

Two psychologists, Briggs and Myers, extended Jung’s work over the next two decades and expanded his eight personality categories to 16. Their work

resulted in the Myers Briggs Type Indicator (MBTI), which is used today by about three million people annually and is the best-known and most useful personality-typing instrument in the world.

The MBTI is readily available and widely used to help people understand their own orientation to the external world, and how they make decisions. In particular, the theory covers people’s preferences as to:

- how much energy they get from themselves or others (the introvert/extrovert scale)
- how much they experience the current world through details and facts, or think about opportunities and principles in a more abstract way (sensing and facts versus ideas and opportunities)
- whether they make decisions objectively or from personal values (logical analysis versus values)
- how they plan and organise their own and others’ lives (planning versus flexibility).

The four scales above are dichotomies because an individual can have a

preference for one of only two choices on each scale. The third dichotomy, the analytical/values (A/V) based preference, is the subject of this paper. In many individuals it is the most difficult dichotomy to analyse.

As an illustration of the difference between an A and V approach, consider the example of a manager of a large team who is ordered to reduce the size of the team for cost reasons, but is given a free hand as to how this will be done.

An A-type person will tend to be concerned in general about the health of the organisation and in particular about the effectiveness of the reduced team. He/she will be less concerned with the team’s morale or distress about colleagues leaving. He/she will consider how to develop a fair process for deciding which roles are to be made redundant and will be keen to be seen as able to make tough decisions while being fair and just through implementation.

A V-type person will tend to first explore other ways of saving costs than through redundancies. He/she will be more concerned about the welfare of those who will lose their jobs, and how the organisation plans to look after them.

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V-types, any organisational unit, such as a team, a department or a company, will be stronger if there are both types in it. This way, the best solutions to problems are far more likely to be found, as long as one type does not dominate the other.

The only one of the four Myers Briggs dichotomies to exhibit a correlation with gender is the A/V scale. General populations in Western countries (where most of the available data has been collected) typically comprise equal numbers of A and V types overall, but generally men are assumed to have an A/V ratio of 60/40 and women 40/60.

Samples in recent years from 17,288 members of the Australian workforce, however, (covering many professions and some trades) give men an A/V ratio of 79/21 and women 42/58 (see I Ball in *Australian Psychological Type Review*, 2002).

Different personality types favour different types of careers. A-types are attracted to professions where logic, argument, analysis and structure are required, such as the “hard” sciences (maths, physics and chemistry), engineering, accounting and law. V-types favour professions directly helping people, such as aid work, nursing, health care, counselling, religion and primary teaching (see Myers in *Consulting Psychologists Press*, 1998). In the corporate world, V-types are typically found more in the HR and training functions, and in industries such as retail and hospitality.

The preference of different personality types to select particular careers can be measured by the Self-Selection Ratio (SSR), defined as the proportion of people of a certain type found in a particular career versus the proportion



Dr Mark Toner with Gunilla Burrowes at the leadership conference in Melbourne last August.

of people of the same type in the base population.

The SSR has a value of 1 if there is no career preference, and it can be high or low for particular Myers Briggs types. For instance, in 1980 Myers found an SSR of 2.94 for introverted, abstract, logical, organised types choosing engineering. This means the proportion of this type of person is almost three times higher in engineering than in the base population.

Equally, some types are less represented in engineering than in the base population. For instance, Myers found

that extroverted, detailed, values-based, flexible types had a SSR for engineering of 0.21.

Unfortunately, A/V ratios for the worldwide engineering profession are rare, with even less information available for each gender. Most studies only cover engineers in Canada and the US. There is only one small set of data on Australian male engineers, compiled by Ball earlier this year, which gives a mean A/V ratio of 88/12.

Although there are no meaningful data on A/V ratios for female engineers in Australia, it is reasonable to assume that they will have significantly lower A/V ratios than their male colleagues, but higher than women in the general workforce. Figures from overseas found an A/V ratio for female engineers of about 58/42.

Given that the Australian engineering profession comprises only about 10% women, it can be calculated from the data on the general Australian male workforce (with an A/V ratio of 79/21)

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and using a typical SSR type increase of 10% in the A value, that the A/V ratio for the Australian engineering profession is probably about 85/15, with the A value slightly lower than the all-male value of 88.

These A/V ratios suggest that the engineering profession in Australia severely lacks V types who are more people-oriented. Other major professions don't have this problem because they have a better A/V balance with far more female members.

If it is accepted that Australia's engineering profession would be stronger with a more balanced mix of A- and V-

types, how can this be achieved? It would be an extremely impractical and unwise practice to recruit V-types (male or female) by type alone. But if the profession had more female members, its A/V ratio would be improved, even though female engineers overall may comprise slightly more A-types than the female base population.

Hence this is a new argument for more women in engineering. A technical profession such as engineering will probably always have a majority of A-types. The profession should recognise, however, the benefits of more values-based practitioners who will focus more

on the relevant people issues to generate a diversity of approaches for tackling problems and finding new solutions.

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