

An introduction to neurodiversity in the Australian mining sector and practical adaptations in operational environments

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INTRODUCTION

Neurodiversity describes the natural variation in thinking, learning and behaving that exists amongst all human beings. There is no 'right' way of thinking, and these differences are not to be viewed as deficits or medical conditions requiring treatment (DACSSA 2023). The Neurodiversity Movement is a social justice movement that aims to improve the status of neurominorities (Singer 2016). Neurominorities are those who experience symptoms of neurodevelopmental conditions such as autism, Attention Deficit Hyperactive Disorder (ADHD), dyslexia and Developmental Coordination Disorder (DCD, previously referred to as dyspraxia). Less common specific learning disorders, Tourette syndrome and acquired neurological illnesses and injuries are also considered neurominorities (Doyle 2020) but fall outside the scope of this paper. Doyle (2020) estimates up to 2 in 10 people globally to be neurodivergent (identifying as having cognitive functioning that differs from what is considered 'normal' by society (CIPD & Uptimize 2018)). Mining employment in Australia has trebled from an average of 83,900 in 2002 to 286,100 in 2022 (ABS 2023). If 1 in 10 people in the mining workforce identifies as neurodivergent, this means at least 28,600 individuals are potentially struggling to perform optimally in roles designed for neurotypicals (those considered as having 'normal' cognitive function). The benefits of creating and enacting a robust diversity and inclusion policy are well known (including increased diversity of thought, productivity and competitive advantage), however data collected here in Australia reveals a lack of awareness and understanding of what it means to be a neurodiverse-friendly mining operation. Employers need to be responsible and consider more than just gender, sexual orientation and heritage identification. This paper serves as a starting point for simple and cost-effective ways that will assist neurodivergent employees to thrive in mining operations (specifically above and below ground operations, and processing plants).

COMMON NEURODIVERGENT CONDITIONS

Table 1 presents descriptions based on clinical definitions of the four most prevalent neurodivergent conditions worldwide, the challenges they may present and the strengths that can be nurtured with appropriate management. Diagnosis rate of autism and ADHD are strongly biased towards males (Table 1), as is the employment ratio of males in the Australian mining sector according to the Workplace Gender Equality Agency's (WGEA) Gender Equality Scorecard. The 2022 scorecard reported 77% of the workforce across 119 businesses within the mining sector was male. Given these statistics, providing a working environment that allows for the strengths in Table 1 to be unlocked represents an enormous competitive advantage for both individual companies and the industry.



	Description of neurodivergent condition	Proportion of population	Challenges	Strengths
Autism	'Autism spectrum disorders' are forms of a developmental disability characterised by rigid thinking, restrictive repetitive behaviours and social communication challenges	1.6% to 2% globally 4:1 male to female diagnosis ratio	<ul style="list-style-type: none"> - Social and communication difficulties - Difficulty in adapting to changes in structure and routine - Sensitive to overstimulation in a busy, noisy work environment 	<ul style="list-style-type: none"> - Innovative, detailed oriented thinkers who thrive at problem solving - Reliable, dedicated and values driven - Strong observation skills
ADHD	A brain-based disorder characterised by persistent patterns of inattention and/or hyperactivity and impulsivity due to under-stimulation of the brain	5% to 7.3% globally 3:1 male to female diagnosis ratio	<ul style="list-style-type: none"> - Restless, distracted and easily bored in roles that are not sufficiently stimulating - Difficult to switch focus when hyper-focused - Organisation and time management - Emotional self-regulation 	<ul style="list-style-type: none"> - Working under pressure - Visible enthusiasm and ability to complete urgent tasks - Ability to multitask and respond to changing work environments and demands - Hyperfocus, passion and courage - Visual-spatial ability
Dyslexia	A lifelong specific learning difficulty that mainly affects the development of literacy and language-related skills.	10% globally	<ul style="list-style-type: none"> - Reading and writing speed - Working memory, organisation, communication and self-esteem - Workplace participation and social interactions - Stress management 	<ul style="list-style-type: none"> - Practical, visual-spatial and storytelling skills - Pattern spotting - Big picture thinker and creativity - Qualitative reasoning
DCD	A complex neurological condition which affects muscle coordination and perception (includes vision, hearing and proprioception)	5% to 6% globally	<ul style="list-style-type: none"> - Driving and operating equipment (including computers) - Self care and organisation - Communication and self esteem - Processing speed and working memory 	<ul style="list-style-type: none"> - Big picture thinking - Pattern spotting - Inferential reasoning - Resourceful and determined problem solvers

TABLE 1 - Descriptions of the four most prevalent neurodivergent conditions (based on clinical definitions) with common challenges and strengths of each (CIPD & Uptimize 2018, Doyle 2020, The Institute of Leadership and Management 2020).

ADAPTATIONS

Before adaptations are implemented into any mining operation, training and knowledge sharing about what neurodiversity is and the considerable impact small changes could have is vital. Neurodiversity fails to make the top four priorities for improvement in the resources industry (AusIMM 2023). Fifty percent of respondents in a 2020 study revealed they would be uncomfortable employing or line managing someone with at least one neurodivergent condition (The Institute of Leadership and Management 2020). Efforts to improve working conditions in mining operations will not succeed until neurodiversity becomes a priority for the industry, and employers realise the benefits of employing those with neurodivergent conditions.

How written information is presented is one of the easiest and cost-effective adaptations that will benefit both neurodivergent and neurotypical employees. The British Dyslexia Association (BDA) released a style guide this year, a comprehensive guide to ensuring all written material is accessible to those with dyslexia. Additionally, Microsoft Office offers dozens of accessibility tools as part of its 365 package - a standard in most operating environments. Ensuring that all induction and training material utilises preferred styles and the accessibility tools gives all personnel the opportunity to learn important information effectively. Examples increasing readability from Microsoft and BDA:

- Use of sans serif fonts
- Font size 12-14 point
- Avoiding the use of underline or italics, use bold to emphasis
- Use a cream or soft pastel colour background for digital and printed material
- Using matte instead of gloss paper when printing

Doyle (2020) suggests understanding work-related interventions is about adjusting the fit between the person and their environment. Neurodivergent individuals have clear biological markers (known as a 'spiky profile') which lead to observable and measurable psychological differences (Doyle 2020). A 'spiky' skills profile, when plotted on a graph, can appear as a pattern of peaks and troughs (FIG 1). Neurotypical individuals often have a flatter profile.

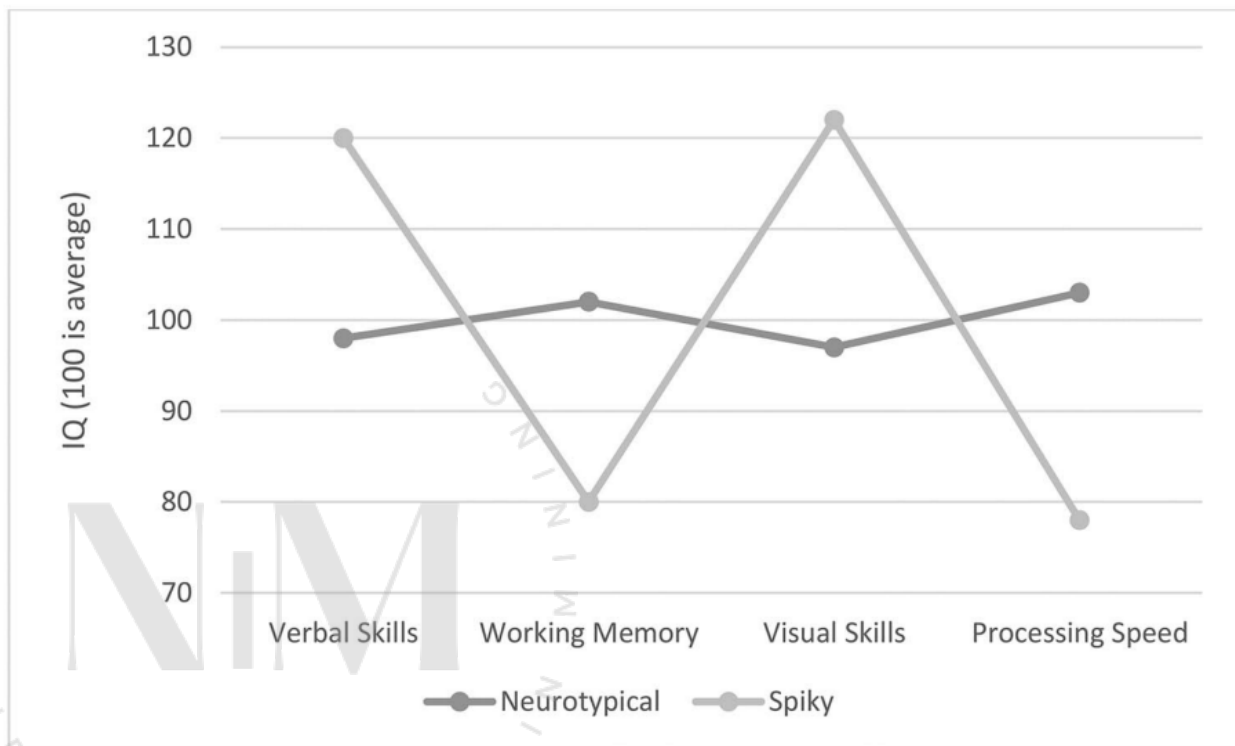


FIG 1: A 'spiky profile' showing example IQ scores adapted from a British Psychological Society report by Doyle 2020.

The challenges and strengths presented in Table 1 can be translated into a skills profile. Using this as a guide, along with conversations with the individual, can assist in ensuring the requirements of the role fit with their unique skills profile. For example, a role requiring an individual to work under pressure and adapt quickly to changing conditions is potentially better suited for someone with ADHD. Another example is a role with minimal literature requirements and strong practical and visual spatial skills would be more suited to someone with dyslexia.

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