Jenny Gribbin, OT Driver Assessor
Driving Well Occupational Therapy
Ph: 0488005093, e: jenny@drivingwell.com.au

"Potential to Drive" - A better approach to assessing young adults' readiness for driving

Learning to drive with a physical/psychosocial disability, returning to driving after an accident, and maintaining driving through ageing, are all rated as top priority goals for people in these situations. With the roll-out of the NDIS, exploring the feasibility of "learning to drive" has become a possibility for many young Australians who are on the Autism Spectrum, or who have other psychosocial disabilities (eg Asperger's, anxiety or mental health conditions). This has been a growing area for Occupational Therapists, with the actual practice of driving assessment and training being delivered at a higher frequency than research and evidence being able to take place.

At Driving Well Occupational Therapy in Brisbane, we have continued to service the population of young people with psychosocial disabilities, as well as drivers with brain injuries/neurological conditions wishing to return to driving or continue driving. This area is extremely challenging, with client expectations usually extremely high, and outcomes of being successful difficult to predict.

Aside from driving lessons with a specialized driving instructor (utilizing NDIS funding), there didn't seem to be many other strategies or tools available to optimize this populations chances of being successful with their goal. I was reliant on the standard driving assessment approach which wasn't giving me the information I needed… I was faced with "giving them a go" with lessons, only to find that some young people quickly plateaued despite significant effort, and then I had to tell them the devasting news that driving was not going to be feasible for them. I kept thinking… "there has to be a better way".

At the start of the pandemic when driving assessments weren't possible due to social distancing requirements, I used the time to learn more about Autism and driving. Through a web search, I found Dr Miriam Monahan from a small town near San Francisco… an Occupational Therapist and driver rehabilitation specialist, clinician researcher and Adjunct Professor at the University of Florida.

Together with Janelle Lotz from Downs Driver Rehab in Toowoomba, I connected with Dr Monahan within a few days, and learned about her approach to assessing this population – what she has coined "Potential to Drive" and about the Drive Focus app which she co-founded.
The discussion lead to Driving Well facilitating a series of four "**Potential to Drive" workshops for more than 80 driver trained OTs and more than 20 rehabilitation driving instructors across the country in 2020 and 2021,** as well as webinars to generalist OTs, allied health assistants and support workers.

Dr Monahan is an experienced presenter – I had the pleasure of facilitating all four workshops and other webinars, and was ever in awe about her knowledge and how generously she shared her learnings. In her workshop, she outlined various research studies that have been completed regarding how young people with autism are able to learn to drive and continue to drive - it is estimated that approximately 62% of the American population with ASD have high functioning ASD, more than half will pursue learning to drive, and one in three teens with ASD will become licenced drivers[i].

The research
Dr Monahan explained that research findings indicate that individuals with autism have microscopic differences in neurological development, which overall means that there is reduced connectivity in the brain regions. These measured neurological differences may result in difficulties with sensory discrimination, processing sensory stimuli, visual spatial skills, timing of movement, initiation of

motor movement, motor planning, motor learning, attention deficits, problem solving, prioritising, social behaviour, emotional regulation, imagination.

Because of these neurological changes and reduced connectivity within the brain, when compared with neuro-typical teens/youth, research has found that learning to drive with autism has common challenges such as[ii]:
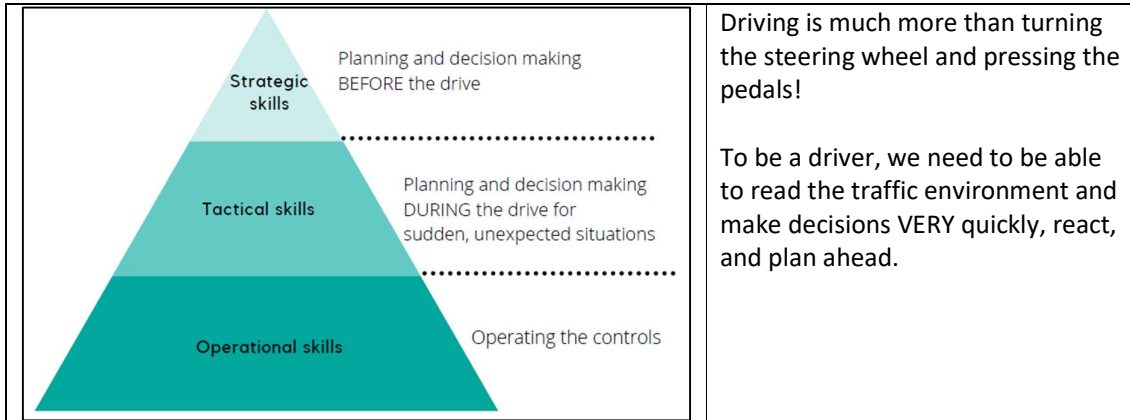
- learner drivers require three times longer to learn to drive
- make more errors than peers in visual scanning, speed management, lane maintenance and adjustment to stimuli
- driving habits are typically that they drive less, and tend to drive more in the local area to defined routes and destinations

Autism characteristics that may impact driving include:

- reduced motor coordination: coordination of limbs for physical control (steering, braking, accelerating), and visual motor integration
- social challenges: literal interpretation of things, interpreting non-verbal cues eg lights, tailgaters, intentions of other drivers when changing lanes etc
- executive functions: often not able to see the big picture and overall understanding of traffic flow through intersections; problem solving; planning ahead; mental flexibility; divided attention
- visual search skills: "look but do not see", focusing on the horizon versus scanning near and far, take longer to find critical information, experience cognitive overload
- Anxiety is a very common disorder associated with ASD; learner drivers found anxiety to be a barrier for learning to drive[iii]

With a solid grasp on the research, Dr Monahan then explained Michon's model of driving performance[iv] which outlines three areas of skill required for driving:

1) operational skills: basic operation and decision in routine situations - eg operating the pedals and steering wheel for basic control of the vehicle - managing intersections, speed control, observing traffic environment.

2) tactical skills: complex decision making in non-routine situations - eg more complex intersections and decision making (eg busy multilane roundabouts/cross intersections), highspeed situations, managing complex carparks, roadworks zones, detours, traffic jams, adverse weather conditions, self-navigating in unfamiliar areas, wrong turns.

3) strategic skills: being able to plan driving ahead of time - eg need to be at work at 11, therefore have to start getting ready by 10 and leave by 10:30am; need to get fuel, need to check tyres/air pressure, need to check for flooded roads.

Driving is much more than turning the steering wheel and pressing the pedals!

To be a driver, we need to be able to read the traffic environment and make decisions VERY quickly, react, and plan ahead.

Dr Monahan also introduces Rizzo's[v] information processing model, which explains the complexities of the driving task – that it involves a constant, repeating cycle of

<u>"vision –> processing/decision making –> motor response"</u>
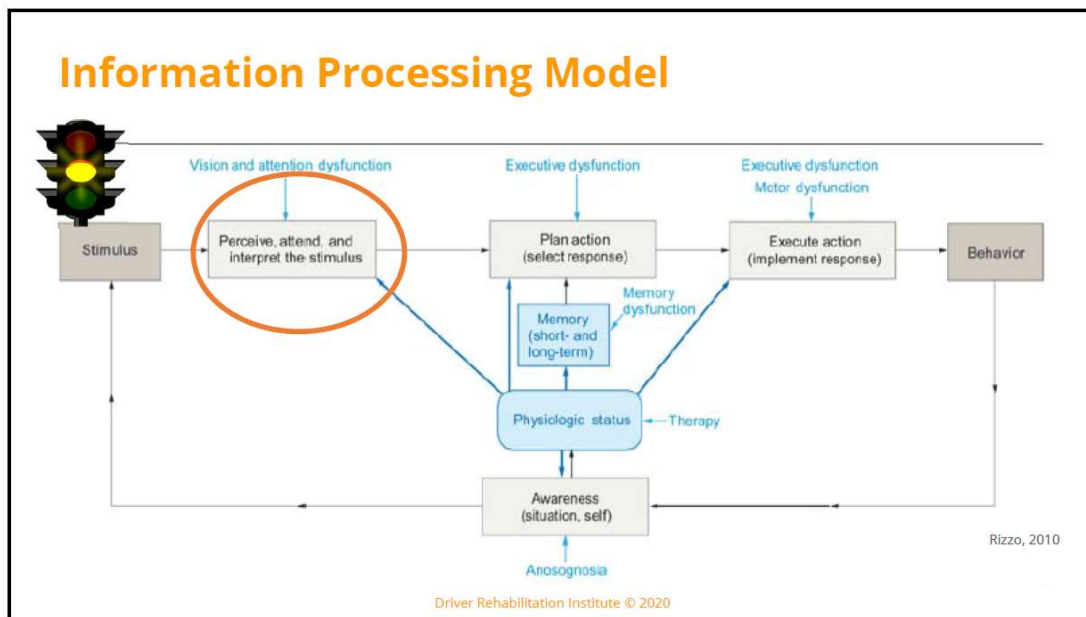
For example:
we **see** a yellow traffic light up ahead –>
we **process and make a decision**, referencing our memory of the road rules and safe attitude/behaviour (is it safe to slow down?) –>
then we **execute the motor action** (squeeze the brake and come to a stop at the line).

Potential to Drive assessment
Dr Monahan has pulled all the research together and outlines an approach to enable OT driver assessors to set-up the assessment environment to minimize anxiety, optimize chance of success, provide a positive experience, and enable best clinical reasoning and decision making about "potential to learn to drive".[vi]

Clinical assessment:
Clinical assessment is similar to the standard OT driving assessment approach, however will include assessment of visual motor integration, intelligence (where applicable) and an introduction to the "critical items" concept – the critical things we need to pay attention to as a driver.

Lifeskills review:
Parent/support worker is asked to complete a lifeskills questionnaire, to look for evidence of operational, tactical and strategic skills.

Where the young person is doing things independently in the community such as catching public transport, organizing themselves for school or a part-time job, doing household tasks such as cooking and washing, and being able to be out in the community, they are showing evidence of tactical and strategic skills which provides a solid foundation for driving.

Where a young person is completely reliant on others and unable to do basic tasks, be a pedestrian and be alone in the community (or even at home), they are not showing sufficient tactical and strategic skills for driving at the moment. Some may benefit from working on these skills with their community OT and waiting until they are a little older and more mature, to re-visit driving then; others will never have the skills for driving and are best supported to learn some community independence.

The *"$5 test"* is a suitable indicator for readiness to drive:
Young person needs to be able to be given a $5 note and told to cross the street to go to the local shop and purchase a loaf of Tiptop multi-grain bread. At the store, they are out of this brand and the person needs to make a reasonable substitution (eg another brand of multi-grain), purchase at the check-out, make change, and return with the bread and change.
If a person cannot independently complete this task, it is likely that they are not ready for learning to drive.

Passenger activities:
Applying the research, it makes sense that a new learner driver with autism will likely become cognitively overloaded, overwhelmed and anxious, when placed immediately behind-the-wheel. It is too much to expect them to be able to learn to operate the steering wheel, indicators, follow instructions, look at where the car is in space, start to learn driving procedures…. all in a verbal/auditory learning context (when they are visual learners!). Dr Monahan recommended that to best assess potential to learn to drive, that a series of 'Passenger activities' are completed – the specialised driving instructor would be driving their dual-controlled car, young person in the front passenger seat, OT driver assessor <u>and main parent or support worker</u> in the rear.

The passenger activities look at various components of the driving task ONE-AT-A-TIME in a structured / semi-standardised manner and provides valuable information about the young person's ability to complete each of these tasks.

Breaking down the underlying tasks required for driving provides the OT Driver Assessor a much better look at the Participant's ability, without putting them under cognitive overload or too much

anxiety. This method also enables assessment of potential to learn, when the young person is a pre-learner and is interested to see if it is worthwhile / feasible for them to pursue obtaining their Learner's permit.

Behind-the-wheel
For learner drivers, I usually include a short behind-the-wheel assessment – even if it is the first time, we are able to gauge ability to follow instructions, ability to put a few things together (steering, scanning, following procedures, problem solving and ability to make little improvements).

Resources to support learning to drive – or improving readiness for driving

- *Passenger activities:*
  Learners/pre-learners who have had the Potential to Drive assessment with their family can benefit from practicing these skills with their family/support worker, as well as working with their OT driver assessor to work on these skills between their driving lessons. We use the term "levelling up" (this resonates with many of our young clients who are into gaming), and explain that it is easier to level up visual search skills and gap selection when working on these one-at-a-time, and then it becomes easier to integrate these when behind-the-wheel. Passenger activities can evolve into hazard awareness, hazard management, understanding procedures for lane changes, learn to recognize what other drivers are doing (driving is a non-verbal communication task!), and practicing problem solving tasks.

- *Drive Focus app:*
  Dr Monahan and the Driver Rehabilitation Institute (not-for-profit in USA) had co-created the tablet-based app "Drive Focus" which was being used in the USA and Canada for new drivers as well as individuals with medical conditions. I nearly fell off my chair when I learned about this app – it is truly a game changer, there is nothing else like it.

  Here's what you need to know about the app:
  - This app is available on ipad and android tablet devices and links in with the information processing cycle (Rizzo) and the "11 critical items" concept to develop visual search skills, processing and prioritizing, and execute a motor response.
  - Users watch high-definition videos filmed from the driver's perspective and "tap" on the critical items – whilst reacting as quickly as possible and prioritizing critical items in the correct order (eg brake lights of the car in front before the green traffic light).
  - The app is American with tours of 3 or 4 cities including San Francisco and Vermont – and **yes, we have "Australian-ised" the app, with a Brisbane "tour" available** – this includes 7 drives lasting three to four minutes, that have a levelling-up element and can be practiced over and over again.
  - Visual cues for critical items can be turned on and off, and the videos can be slowed down to allow more processing time.
  - The user's score is presented at the end of each practice, and android users can email the results to their OT.
  - The app costs approximately $17AUD (once-off fee) which includes access to all tours.
  - A university study identified that six one-hour sessions of Drive Focus significantly reduce driving errors among already licenced drivers. The subjects also rated Drive Focus as valuable for improving their driving skills[vii].
  - There are other studies taking place in the USA and Canada to examine the efficacy of Drive Focus with populations such as stroke, autism, and combat veterans with post-traumatic stress.

Jenny Gribbin, OT Driver Assessor
Driving Well Occupational Therapy
Ph: 0488005093, e: jenny@drivingwell.com.au

Many attendees of the workshops were OTDAs with focus on brain injury and all agreed that the potential to drive approach and the Drive Focus app has clinical significance in supporting this population. Indeed, in clinical practice, the app is useful for learner drivers, but also for drivers with neurological conditions (eg stroke and brain injury), older drivers, returning drivers….ALL drivers can benefit from this app.

Exciting news!
The app is coming to Melbourne!
Drive Focus will be an exhibitor booth at the upcoming OT Exchange conference in Melbourne in June, and we have plans underway as I write, for filming of Melbourne to add these drives to the app. Huge thankyou to Megan Coulter who is doing the filming, and then it will take Dr Monahan and her team about 120 hours work to edit the video into short clips and add all the tap-able 'hotspots'.
We also have some refresher workshops planned – contact Jenny for details!

About the author
Jenny Gribbin is an OT Driver Assessor in Brisbane; she founded her business Driving Well Occupational Therapy in 2017 and has a small team working with clients with driving and vehicle modifications needs across the lifespan. Contact details: jenny@drivingwell.com.au

[i] Autism and Developmental Disabilities Monitoring Network 2012, Huang et al 2012, Curry et al 2017.

[ii] Curry, A. E., Yerys, B. E., Huang, P., & Metzger, K. B. (2017). Longitudinal study of driver licensing rates among adolescents and young adults with autism spectrum disorder. *Autism*, 1-10. doi:10.1177/1362361317699586

[iii] Chee, D., Lee, H., Patomella, A., & Falkmer, T. (2017). Driving Behaviour Profile of Drivers with Autism Spectrum Disorder (ASD). *Journal Of Autism And Developmental Disorders*, *47*(9), 2658-2670. doi: 10.1007/s10803-017-3178-1

[iv] Michon, J. A. (1985). A critical view of driver behavior models: What do we know, what should we do. In L. Evans & R. C. Schwing (Eds.), Human behavior and traffic safety (pp. 485–520). New York: Plenum Press.

[v] Rizzo, M. (2011). Impaired driving from medical conditions: A 70-year-old man trying to decide if he should continue driving. *Journal of the American Medical Association, 305*(10), 1018-1026. doi:10.1001/jama.2011.252

[vi] Monahan, M., Classen, S., & Helsel, P. (2013). Pre-driving evaluation of a teen with attention deficit hyperactivity disorder and autism spectrum disorder. *Canadian Journal Of Occupational Therapy*, *80*(1), 35-41. doi: 10.1177/0008417412474221

[vii] Alvarez, L., Classen, S., Medhizadah, S., Knott, M., & He, W. (2018). Pilot efficacy of a DriveFocus™ intervention on the driving performance of young drivers. *Frontiers in Public Health, 6*(125), 1-9. doi:10.3389/fpubh.2018.00125