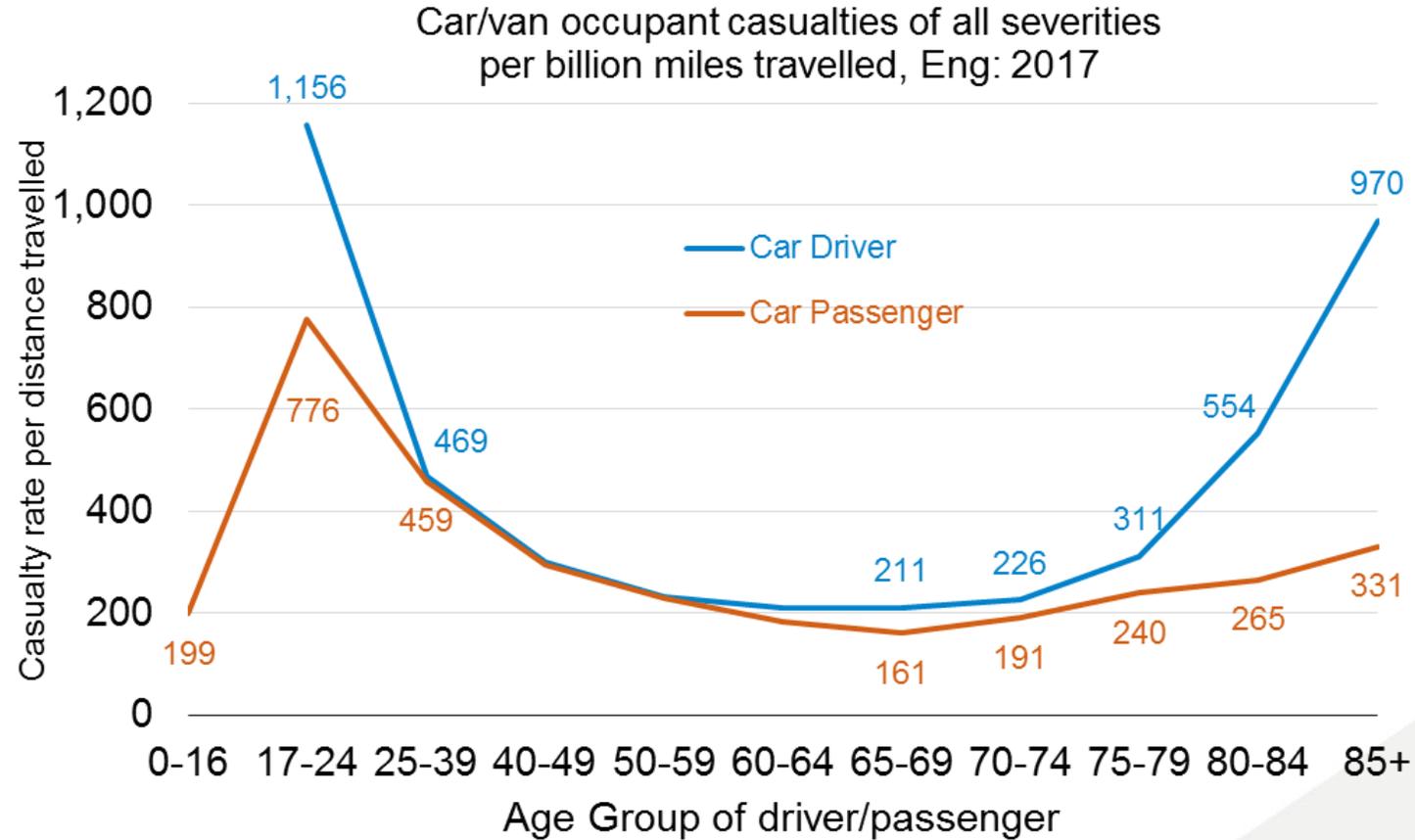


Understanding the driving task!

Engage 4th March 2019

Some stats!



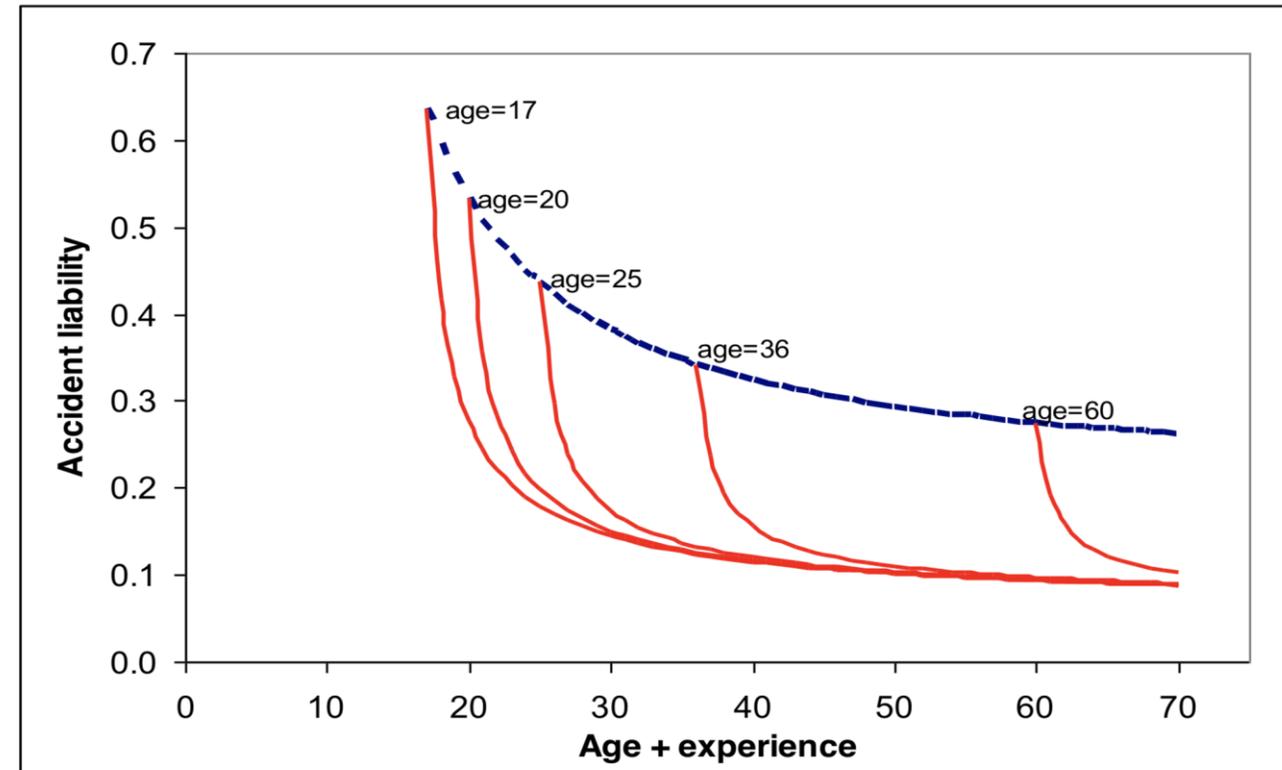
Collisions commonality

- They occur at night / early mornings
- No other vehicle is involved
- Multiple occupants are in the vehicle
- They occur on faster, free flowing roads
- The driver has lost control of the vehicle.

OECD, (2006) The road to safety

What makes young drivers vulnerable

- Youth
- Inexperience
- The OECD identified that inexperience as being the 'Universal problem' (p.14)
- Of these inexperience is thought to be the bigger issue.



Maycock et al (1991)

Inexperience

- This is not about car control - young people develop this quickly
 - Hall and West (1996) suggest that car handling skills can be acquired in as little as 15 hours
- It is more related to situational awareness - hazard perception.
 - Evans (1991) estimated the cognitive-perceptual skills needed to drive a car are many decades in their development

Hazard perceptions can be categorized as:

- Visual search of the environment
- Identification of potential dangers
- Reacting appropriately.

Hazard perception

Eye scanning

- Falkmer and Gregerson (2001) eye tracking study found that novice drivers concentrated their visual search on a smaller area closer to the front of the vehicle and that experienced drivers had a wider horizontal visual search pattern.

Situational awareness

- McKenna and Crick (1991) found that experienced drivers reacted quicker to hazards than novice drivers. This finding would suggest that experienced drivers are more able to identify hazards based on a greater level of situational awareness.

Reaction

- Klain et al (1986) called this approach Recognition Primed Decision Making. In his study into military front line commanders it was found that less than 12% consider options, and most relied on their experience to identify a prototype situation and relating course of action.
- There is evidence to suggest eye scanning is also linked to brain maturation (Isler, et al. (2011))

Maturity and impulsivity

The current thinking behind the poor decision making often seen in adolescents is conceptualised in the dual-systems model of adolescent brain development.

In this model (Casey et al. 2011; Steinberg 2008), the area of the brain associated with sensation-seeking reward (limbic system) outstrips the development of the self-regulatory system (executive function).

Executive function

These functions are associated with:

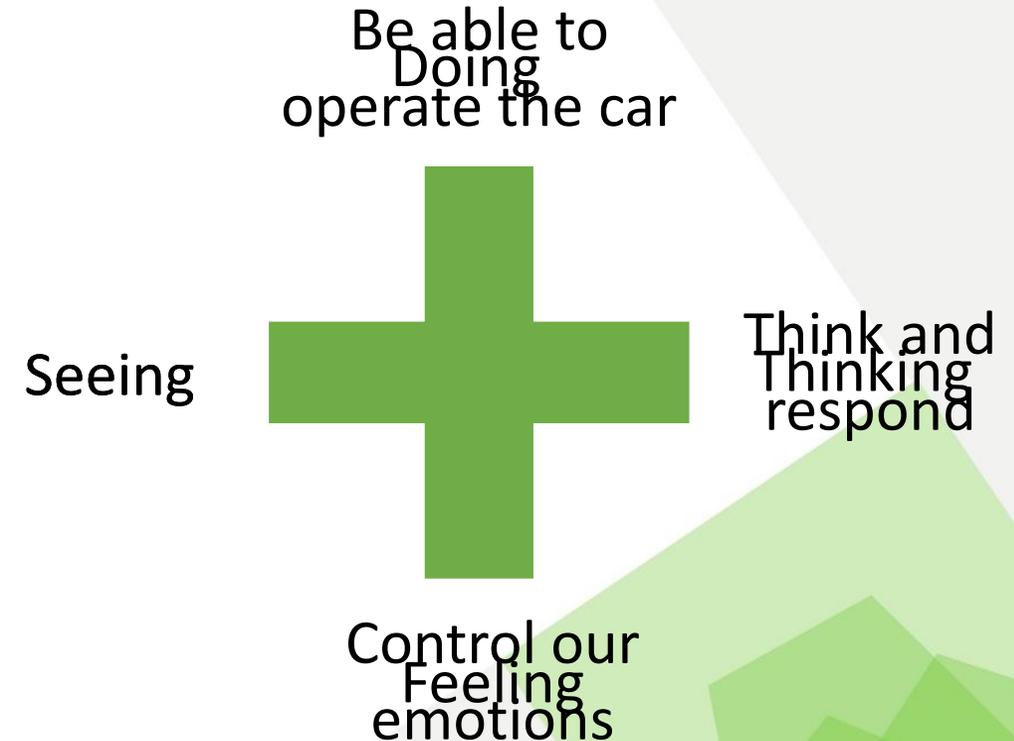
- Planning
- Selective attention
- Response inhibition
- Working memory

These functions are widely seen as being located within the frontal pre-frontal cortex (Mesulam, 2002), an area of the brain that is now understood not to be fully developed until possibly as late as 30 years of age (Sowell et al., 2001).

The driving task!

In pairs discuss, at a basic level what does a human have to do to be able to do to drive a car?

Any thing that impacts on any of these areas can have a significant impact on driver safety



Distraction

Discuss, who is most likely to suffer from the effects of distraction and why?

- Inexperienced drivers have been found to be more prone to the effects of distraction, as their newly acquired driving skills are less automated than those of an experienced driver (Young, et al, 2007).
- Type of distraction:
 - Visual (Looking at something in or outside of the vehicle)
 - Cognitive (Your mind is focused on another task)
 - Physical (Eating a sandwich or using a vehicle control)
 - Auditory (Music)
 - In pairs now discuss how the used of phones would impact on this?

Smart phones

A simulated study completed by the Transport Research Laboratory (2011) found that when using a smartphone to post a message on social media, drivers:

- Were more likely to miss visual clues to react
- If they did react, they were 30% slower to do so
- Had difficulty maintaining lane positioning.

Fatigue

Discuss why newly qualified drivers may be more prone to fatigue compared to the general population?

- They need more sleep
- The sleep-inducing hormone melatonin is released later in the day than for adults.
- Poor quality of the sleep

A number of studies have found an association with fatigue and the crash involvement of young drivers including:

- Summala and Mikkola (1994) when completing an in-depth study of Finnish collisions identified fatigue was more likely to be assessed as a causal factor in young drivers than in other age groups.
- Akerstedt & Keckland (2001) reported that the risk of collision involvement for young drivers when driving at midnight to 6pm were five times higher than at other times.

Drugs and alcohol

Discuss why the effects of alcohol may be greater on a young inexperienced than an older experienced driver?

- The effects of alcohol, and other mind altering substances, on young, novice drivers are profound even where the amount of alcohol / drug is well below legal limits.
- To put this into perspective, a Norwegian study (Glad, 1985) found that if the crash risk for a sober driver was set at 1,
 - the rating would increase to 142 for drivers who had a blood alcohol level (BAC) $>.05$ g/l and aged between 25-49 years.
 - However, this would increase to 901 if the driver was aged 18 to 25!

Key messages

The message should be:

- There is no safe amount to drink
- Anything that impacts on someone ability to see, feel, think and/or do will impact on a novice driver more than an experienced driver
- Many issues are not obvious so we need to take great care

Now look at the models

- Consider how you use them?
- When will you use them?
- Do you use them with every pupil?
- What can you do to use them more?

Questions?