Driving and Aging

Does confidence matter?

Older Adults on the Road

Some interesting statistics
• 70% of seniors drive
• Those over 80 years the fastest growing driver group
• Up to 17% of collisions involve older drivers
• Usually multi-vehicle
• Usually in good environmental conditions

Statistics Canada (2006); Canada Safety Council (2000)
Driving Avoidance

- Many seniors avoid driving situations they believe to be high risk
- Avoidance related to confidence
- Avoiders, over 75 years, female, not principle driver
- Not related to performance
- Related to vision, attention, previous collision

(Charton et al 2006; Baldock et al. 2006; Ball et al. 1998; Owsley et al, 2003; West et al, 2003)

Driving Self Restriction

- Some researchers believe self-restriction of driving is helpful (Owsley et al. 2003)
- Others have shown some self-restrictions lead to increased risk (Hakemies-Blomquist et al.; 2002)
So what evidence supports driving self-restriction?

- Changes in vision
- Changes in cognition
- Self-perception of driving

Vision Loss: Acuity

- Up to 28% of older adults show acuity loss
- Acuity significantly declines after age 70 (Bergman & Sjostrant, 2002)
- Only mildly predictive of crash involvement ****
- Acuity does not reflect the complexity of vision in driving but associated with self-restriction of driving
Vision Loss: Contrast

- Between 40 and 100% of seniors show contrast losses (Reed & Rowe, 2002)
- Many of these have normal acuity
- Some studies show contrast loss affects driving (USDOT, 1994)

Cognitive Loss: Attention

- Between 30 and 52% of seniors show visual attention loss (Rubin et al., 1999)
- Difficulties with search and clutter
- Visual attention loss predictive of driving performance (Ball et al. 2006)
Cognitive Loss: Processing Speed

- Seniors are slower to process information
- Processing speed loss is predictive of driving performance, driving cessation and driving avoidance (Joy et al. 2000)

So we know that

- Many older adults drive after age 65
- Usually for short distances
- Collisions are not frequent
- Poorer vision, attention, contrast, processing speed may contribute to problems
- Many self-restrict or avoid driving
- Some researchers worry that this leads to poor practice in risky situations.
My research

Several questions
1. What about driving at night do adults have difficulty with?
2. Can these be mitigated with changes in light
3. Is the performance of those who avoid driving different from those who do not?
4. Is this an issue of confidence?

What about driving at night do adults have difficulty with?

- 39% avoid night driving citing vision
- Few can completely avoid night driving

Most difficult night situations include
- Freeways
- Rural roads
- Low light level roads
- Undivided roads
- High traffic volume roads
- Reading signs
To compensate for difficulties seniors

- Try to increase concentration
- Try to increase attention
- Drive slower
- Avoid distractions

Can difficulties be mitigated with changes in light?

- We increased light levels in highway driving (in a simulator from standard 0.6 cd/m2 to 2.5 cd/m2)
- Sign recognition improved
- Accuracy in navigating curves got worse!
Is the performance of those who avoid driving different from those who do not?

- those who avoid night driving got even less accurate under more light

Is this an issue of confidence?

- Those who avoid night driving less precise-likely due to confidence
- Difficulties in night driving are not general, but occur at times where concentration and attention are needed (going on curves and ramps)
- Predictions of performance relate to these high concentration areas ‘I have difficulties with freeway driving at night’
Is confidence an issue

- Avoiding night driving and self predictions of difficulties seem to relate to times when concentration is needed. It may be older adults just cannot control attention, but it is more likely that they are under confident at these times and their driving reflects this.