Texting and driving

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Learning objectives

- At the end of the session participants will:
  - Understand the dangers of distracted driving.
  - Gain a basic understanding of some tools available for performing a driving evaluation.
  - Have a cursory knowledge of the driving literature especially as it relates to distracted driving.

Introduction

- Many people use their automobiles every day to drive to work, to school, take their children different places, and for many other reasons.
- Most do not stop to consider that driving is a complicated task that requires many different performance skills, client factors, and performance patterns.
- Some of these abilities include but are not limited to executive mental functions, specific motor functions, and sensory functions.

Introduction (cont.)

- According to the National Highway Traffic Safety Administration (NHTSA, 2017) in 2015 there, were 3,477 people killed and 391,000 injured in motor vehicle accidents involving distracted drivers.
- Distracted driving can be defined as any activity that shifts your attention from driving such as eating, drinking, talking on the phone, changing the radio, and texting (NHTSA, 2017).
- Texting, which may be the most disturbing of these distractions, requires a person to divert their eyes from the road for 5 seconds (NHTSA, 2017). In those 5 seconds at 70 mph, a vehicle can travel approximately 515 feet which is about 103 feet per second.

Distracted driving

- Driving distraction occurs when the attention demand by the roadway is greater than the attention devoted to it (Lee et al. 2008).
- Large proportions of drivers admit to engaging in distracting activities such as talking with passengers, using a mobile phone, eating or drinking, smoking, and reading maps (Stutts et al. 2001, 2005).

Distracted driving

- KAEWKEN, U (2012) Driving Distraction Effects on Reaction Time in Simulated Driving

	Baseline	Texting	Calling	Eating	Navigation
Reaction time	0.77	1.37	1.18	1.16	1.43
Increased distance		62	42	40	68

Driving under the influence

- Car and Driver Magazine Study: Rigging a car with a red light to alert drivers when to brake, the magazine tested how long it takes to hit the brake when sober, when legally drunk at .08, when reading an e-mail, and when sending a text. The results:
- · Unimpaired: .54 seconds to brake
- · Legally drunk: add 4 feet
- · Reading: add 36 feet
- · Texting: add 70 feet

Driving under the influence

- Hindmarch, I., Subhan, Z., & Stoker, M. J. (1983). Comparison of the effects of zimeldine, amitriptyline and placebo on brake reaction time. *IRCS Medical Science: Psychology & Psychiatry, 11*(5-6), 532-533.
- Examined the effects of 2 antidepressants, zimeldine (200 mg) and amitriptyline (50 mg), and placebo on the braking reaction time and psychomotor performance of 9 females (aged 30–45 yrs). Results indicate that amitriptyline significantly slowed brake reaction times and also impaired performance on the tracking task, while zimeldine did not affect performance

Driving under the influence

- **Cannabis and its effects on driving skills**
- PercyBondallaz,BernardFavrat,HaïthemChtioui,EleonoraFornari,PhilippeMaeder, ChristianGiroud (2016)

- Results presented in this review show a cannabis-induced impairment of actual driving performance by increasing lane weaving and mean distance headway to the preceding vehicle.
- Acute and long-term dose-dependent impairments of specific cognitive functions and psychomotor abilities were also noted, extending beyond a few weeks after the cessation of use.

Driving under the influence

- **The acute and residual effects of escalating, analgesic-range doses of ketamine on driving performance: A simulator study (2018)**
- Ketamine induces neurobehavioural effects which make it incompatible with driving.
- Compared to blood alcohol concentrations, impairment was equivalent to BAC >0.05%.
- Driving under the influence of ketamine has potential implications for road safety.

Texting and driving

- According to Overton, T. L., Rives, T. E., Hecht, C., Shafi, S., & Gandhi, R. (2015) impairment from cell phone use can be as significant as impairments associated with intoxication.
- According to the National Safety Council, more than 100,000 crashes that resulted in injury or death involved texting drivers (2015).
- The National Highway Traffic Safety Administration found that texting drivers are twenty-three times more likely to be in an accident than those drivers that are not texting and driving (2006).

Texting and driving

- Hayashi, Y., Rivera, E., Modico, J., Foreman, A., & Whirth, O. (2017) conducted a study to examine social factors that lead people to text while driving.
- The findings suggest that people engage in mobile multiplexing (communication using two or more media on the mobile) while driving
- The study concluded that men are more likely than women are to text while driving; white people were more like to text while driving than non-white people were, and as age increases, the likelihood of texting while driving decreases.

Texting and driving

- Sellers, S. (2015) performed a study to compare two populations of drivers: those who frequently, infrequently text while driving, and the extent to which they differed in self-reported measures of executive function and impulsivity.
- The sample consisted of college students that were similar in gender, age, years of education, and years driving.
- The results showed that the group of students who frequently text while driving had significantly lower levels of executive function and higher levels of self-reported impulsivity.
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Driving assessment

Analysis of occupational performance

- Performance Skills
  - Motor and praxis skills
  - Sensory-perceptual skills
  - Cognitive skills
  - Emotional regulation skills
  - Communication and social skills

Motor and praxis skills

- UE function
  - ROM
  - Strength
  - Coordination
- Ambulation and Transfer Status
  - Ability to get in and out of the vehicle.
  - Type of assistive device the person uses for mobility outside of driving

Sensory-perceptual skills

- Vision
- Sensation
- Hearing
- Proprioception

Vision

- Visual acuity
  - Snellen chart
- Useful field of view (UFOV)
  - Divided attention
  - Selective attention
  - Processing speed
- Classen, S., Witter, D., Lanford, D., Okun,M., Rodriguez, R., Romrell, J., Malaty, I., & H., Fernandez. (2011).
- Usefulness of Screening Tools for Predicting Driving Performance in People With Parkinson's Disease.

Low Vision

- Elgin, J., McGwin, G., Wood, J., Vaphiades, M., Braswell, R., DeCarlo, D., Kline, L., and Owsley, C. (2010).

- Evaluation of On-Road Driving in People With Hemianopia and Quadrantanopia.

Cognitive skills

- Memory
- Problem solving
- Planning
- Sequencing

Cognitive Skills (cont.)

- Dawson, J., Uc, E., Anderson, S., Johnson, A., & Rizzo, M., (2010).
- Neuropsychological Predictors of Driving Errors in Older Adults.

Cognitive Skills (cont.)

- Hunt, L., Brown, A., & Gilman, G. (2010).
- Drivers With Dementia and Outcomes of Becoming Lost While Driving.

Gold standard

- A behind the wheel assessment is the gold standard for driving assessment.
- Driving simulators can be a safe alternative for research and preparing drivers to return to the road.

Emotional regulation & Communication and social skills

- Relaxation
- Controlling anger (road rage)
- Being able to interact appropriately with other drivers

- Sansone, R. & Sansone, L. (2010).
- Road Rage: What's Driving It?

Behind the Wheel Assessment

- Decision making and route planning
- Lane changes
- Spacing
- Visual scanning
- Highway/Interstate driving as appropriate

Simulator Sickness

- Simulator Sickness
  - Simulator sickness can be described as physical discomfort experienced when "driving" a simulated vehicle that is caused by incompatible signals from visual, auditory, and motion systems.
  - SS affects the driver in the absence of true motion and shares many of the same symptoms as motion sickness which may include pallor, restlessness, and cold sweat and can progress to nausea, excessive salivating and, finally, vomiting.
  - SS occurs when a person is exposed to moving visual scenes while the body remains in a relatively fixed state.
  - The classic sensory conflict explanation, suggests that SS is triggered when the brain interprets sensory messages regarding movement as inharmonious.
  - Classen, S., Bewernitz, M., & Shechtman, O.

Current Study

- Female drivers between the ages of 16-24 tend to be the group most likely to text and drive (NHTSA, 2017).
- Currently there are not specific data available for Hispanic female drivers.
- The purpose of this study is to determine the particular types of errors committed by Hispanic female drivers' while operating a driving simulator and texting.
- Errors for this study may include accidents, lane violations, and traffic violations.

Current Study (cont.)

- The first specific aim is to determine the particular types of errors committed by Hispanic female drivers' while operating a driving simulator and texting. Errors may include accidents, lane violations, and traffic violations.
- The second specific aim is determine the percentage of female drivers that admit to texting and driving.
- The third specific aim is to use the outcome data to develop an education program for local high schools about the dangers of distracted driving.

Procedures

- Subjects were asked to complete a three minute driving simulation task while responding to text messages sent by a research assistant. The driving simulation software tracks various metrics such as total number of off road accidents, total number of collisions, total number of speed exceedances, total number of centerline crossings, and total number of road edge excursions.

Data from pilot study n=8

- Total number of off road accidents 6
- Total number of collisions 7
- Total number of speed exceedances 7
- Total number of centerline crossings 4
- Total number of road edge excursions 16

Thank you