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Psychological Foundations of Inattentive Driving

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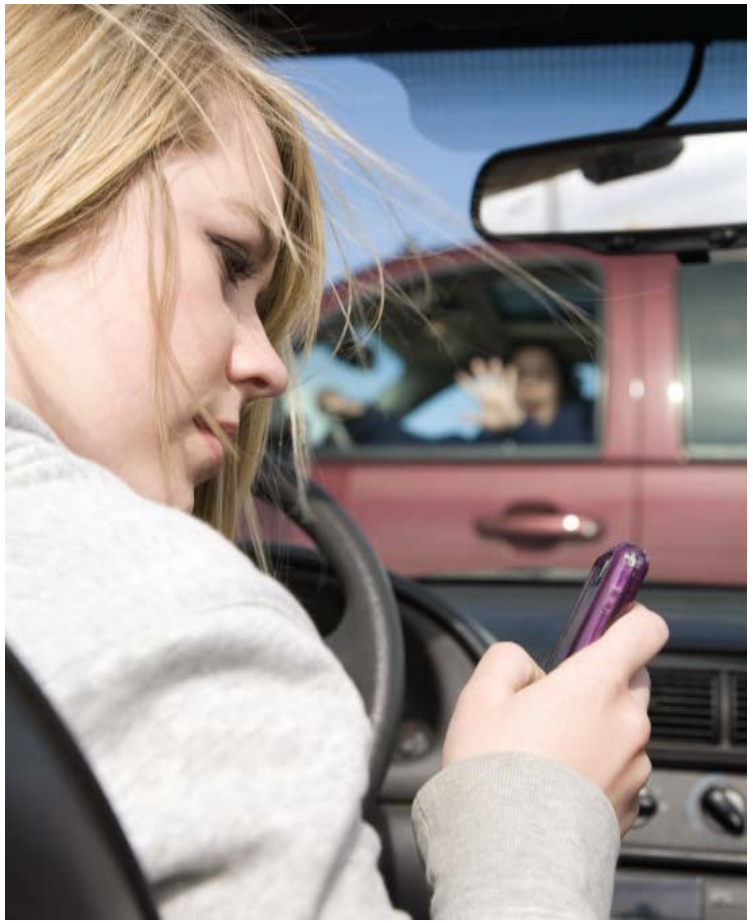
Inattentive Driving

Inattention While Driving Safety Problem

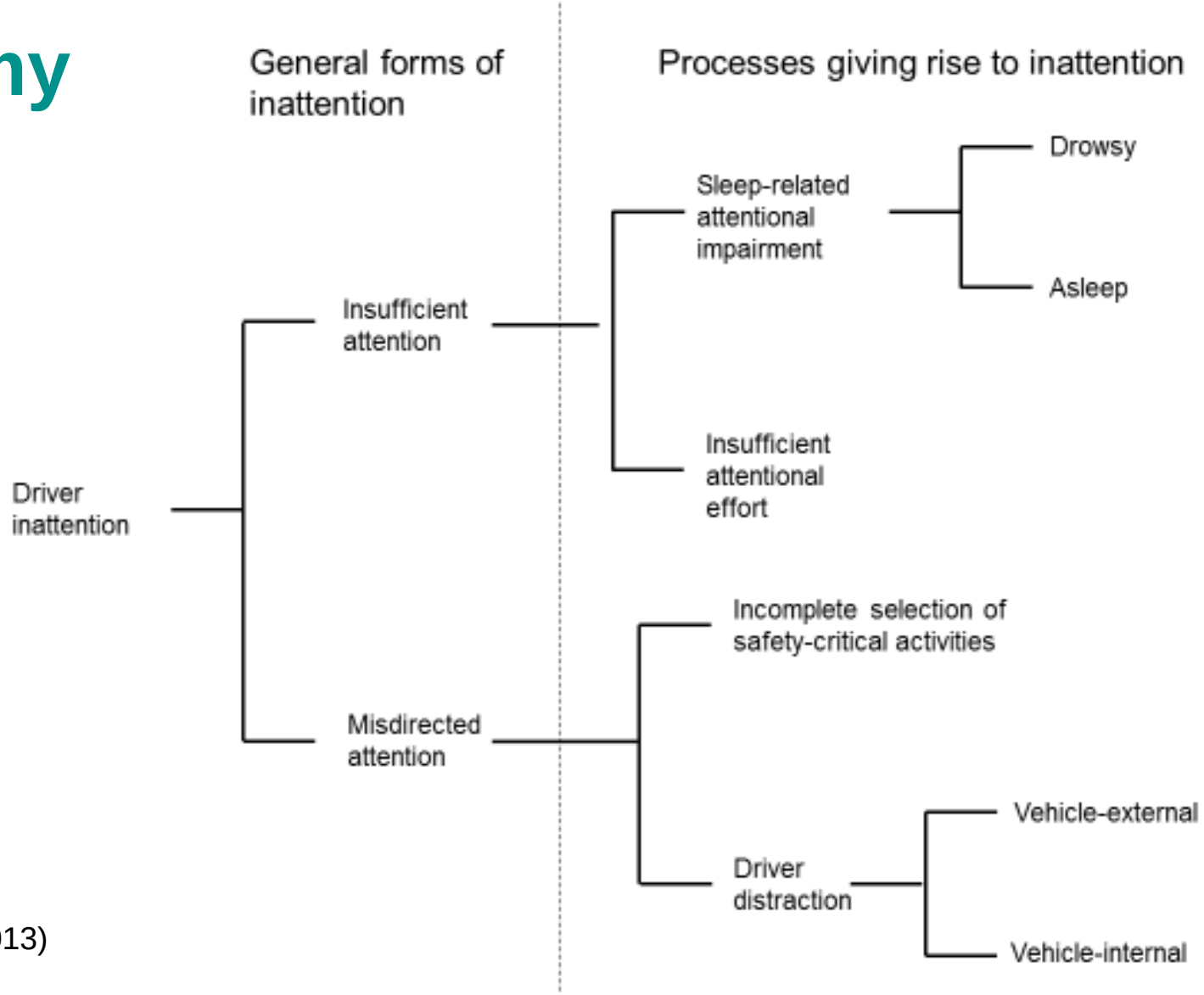
- Distraction-affected Crashes
  - Resulted in 3,166 fatalities in 2017 (DOT HS 812 700)
    - 9% of fatal crashes that year
  - Resulted in an estimated 391,000 people injured in 2015 (DOT HS 812 381)
    - 16% of injury crashes that year
    - Latest injury data available

https://www.nhtsa.gov/risky-driving/distracted-driving



Inattention Taxonomy

- Inattention is more than distraction
- US-EU-Japan Trilateral Working Group developed a taxonomy



Engström, J., Monk, C., Hanowski, R.J., et. al (2013)

Types of Driver Distraction

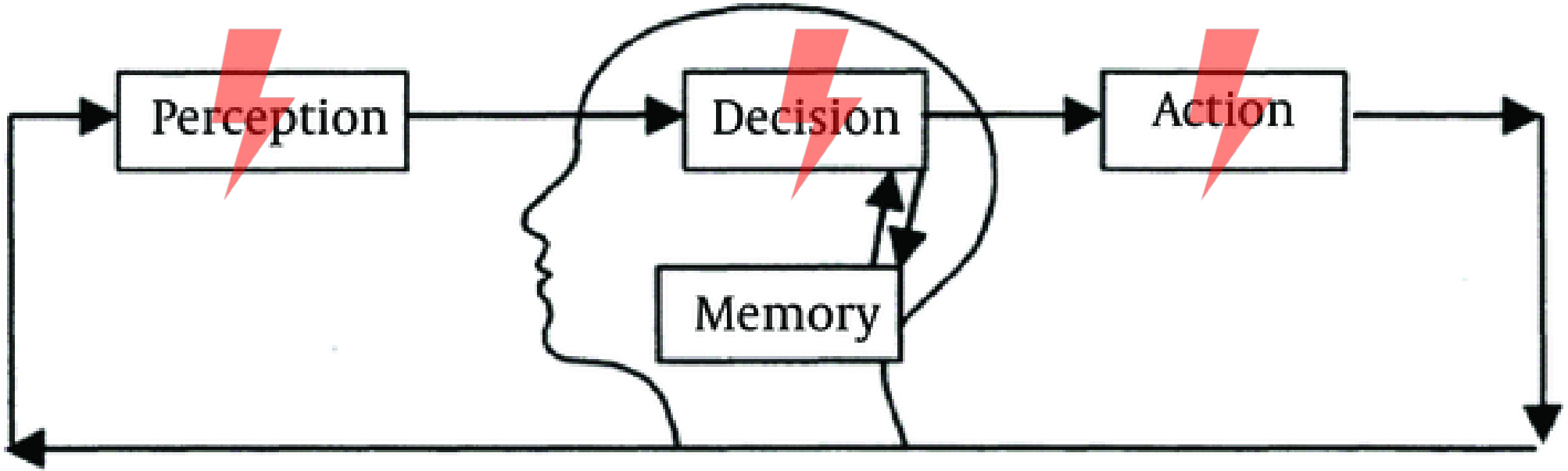
Visual

Manual

Cognitive

NHTSA broadly defines driver distraction as ***anything*** that can take visual, manual or cognitive resources away from the task of driving.

Human Information Processing Model



Perceptual Load

- High perceptual load causes slowed processing or misses
- Associated with inattention blindness

- Observable

Cognitive Load

- Interference without significant perceptual load
- Conversations, lost in thought, mind-wandering, etc.
- “Eyes-on-road” distraction

- Not observable

Action Interference

- Hands-off the wheel
- Body movements causing disruption to steering or pedal application

- Observable
- Often linked with visual distraction

Where the Effects May Occur

Michon's (1985) Hierarchy of Driving

Data Discrepancy!

VS

Why the Discrepancy?

- Simulators show consistent effects of cognitive distraction on reaction time and response selection
- Naturalistic driving studies rarely show increased risks from cognitive distraction tasks

It's all about the BASE…LINE!

Baseline eyes-on-road with no secondary task proportion is about 80%

Fitch et al. (2013) DOT HS 811 757

Thank You!

Questions?