



Peer passenger effects in a dual-process framework

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Driving: complex & goal-oriented

Different tasks

- Parallel
- Switching
- E.g., shifting, steering, changing lanes, ...

In a dynamic environment

With risk of distraction

- Phone
- Passenger
- ...

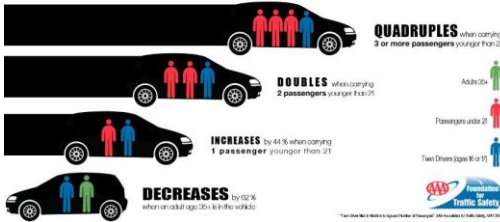


Peer passengers

Teen Drivers Risk Death with Young Passengers

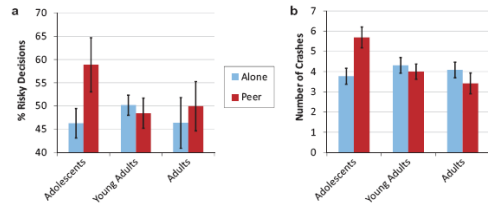
A 16- or 17-year-old driver's **RISK OF BEING KILLED IN A CRASH** increases when there are young passengers in the vehicle.

Compared to driving without any passengers, **THE RISK:**



Beyond distraction, to risky driving

For instance, Chein et al. (2010)



Beyond distraction, to protective effects



Engström et al. (2008)

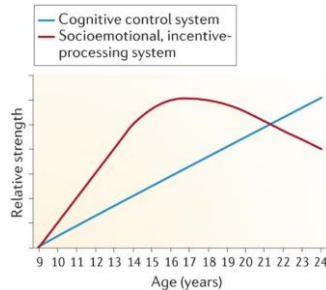
3 age groups (18-24, 25-64, >65)

Overall protective effect: crash risk higher alone, regardless of age

But weakest effect youngest male drivers (18-24 years)



Dual process theory



Period of heightened vulnerability to risk-taking. Source: Steinberg 2014.



Dual processes

Cognitive control system → develops later

Thinking brain - neocortex
Emotional brain - limbic system
Survival brain - basic / reptilian brain

Figure 1. Key areas of the brain (Image © 2014 Soteris).

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Cognitive control

Cognitive control functions (CCFs) enable to flexibly perform goal-directed actions

E.g., inhibition and working memory (WM)

Working Memory
Focuses Attention
Operates over a few seconds
Temporary Storage
Manipulates information

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Dual processes

Social-emotional system → develops earlier

Thinking brain - neocortex
Emotional brain - limbic system
Survival brain - basic / reptilian brain

Figure 1. Key areas of the brain (Image © 2014 Soteris).

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Peer passengers in a dual process theory

Ross et al. (2016)

Risk-increasing → violations (e.g., speed)



Especially for those with low inhibitory control

Protective

Peers as additional risk detectors? (e.g., hazards)

AND/OR



Decrease in lateral lane position variability → **Distraction**

Recommendations

Education & policy initiatives should address teenage passenger influences, for instance:

- Peer passenger restrictions (~GDL)
- Raising awareness
- Cognitive control and peer passenger training

