

Teen Driver Errors
Leading to Motor Vehicle Crashes

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1,781 fatally injured teens behind the wheel.

56% were not wearing their seatbelt.

Neither were 65% of their fatally injured peer passengers.

Crashes: A Linked Chain of Cause-Effect Events
Accident Cause Analysis (Perchonak)

Primary Causal Chain → Underlying cause

Und. Cause	Prevention Effort
Inexperience	Graduated Driver Licensing (GDL) restrictions, driver education
Immaturity/age	↑ GDL minimum age requirements
Alcohol	Zero tolerance policies, education

Linked cause-effect events

Proximate cause

?

Identified Proximate *Factors*

- Peer passengers
- Nighttime driving
- Risky driving behaviors
- In-car distraction

Previous Studies of Proximate Risk Factors
Methodological Limitations

Approach	Limitation
Study of a single factor	• Hard to identify relative contribution of factors
Cross-sectional surveys	• Precludes causal inferences
National crash databases	• Post-crash focus • Reliance on police reports

National Motor Vehicle Crash Causation Survey (NMVCCS)

- Conducted by NHTSA
- July 2005 - Dec 2007
- Nationally representative sample of 5,470 crashes
- Goal: Inform crash avoidance technologies

Specific Research Objectives

- Determine most common proximate reasons for serious teen crashes
- Examine relative frequency of specific "critical" teen driver errors
  - Gender-specific relative frequencies

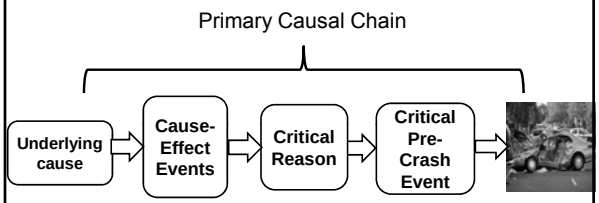
NMVCCS Methodology
Eligibility Criteria

- 6 am – midnight
- Injury or property damage
- EMS responded
- 1+ "case vehicles" towed
- Police and at least 1 case vehicle on-site

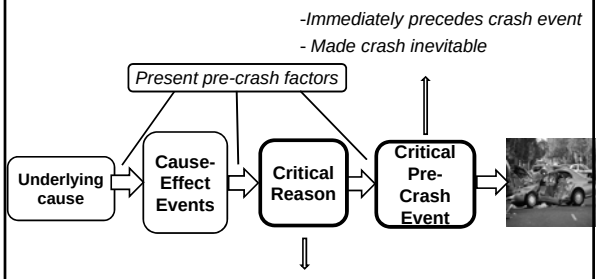
Data Collection at Crash Scene

- Researchers dispatched to scene of selected crashes
- Surveys and photographs of scene and vehicles
- Interviews: police, crash participants, drivers or proxy, witnesses

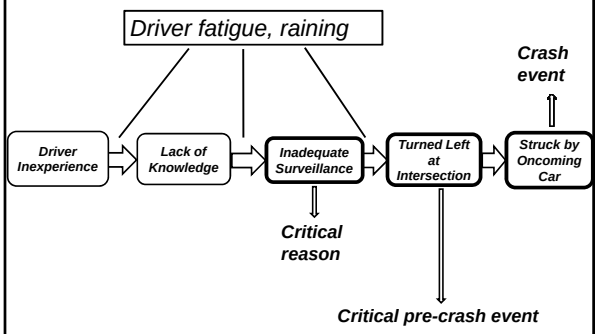
NMVCCS Methodology



NMVCCS Methodology



NMVCCS Methodology: Example



Major Categories of Driver Error

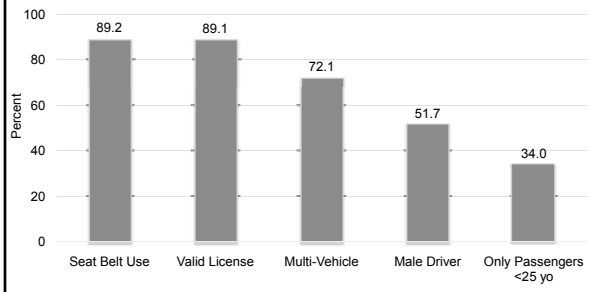
- **Recognition errors**: Inadequate surveillance, inattention, internal and external distraction
- **Decision errors**: Driving too fast for conditions, aggressive driving behavior
- **Performance errors**: Poor directional control, overcompensation, panicking
- **Non-performance errors**: Physical impairments, sleep, driver not functioning

Statistical Analysis

- Crashes involving passenger vehicle driven by 15-18 year old
- Unweighted frequencies
- Weighted prevalences representative of similar types of US crashes
- Prevalence ratios and 95% CI

Teen Drivers in Serious Crashes Characteristics

822 teen drivers (weighted n=335,667)



Critical Reasons and Teen Driver Errors Prevalences

Driver error: Critical reason for **95.6%** of serious teen crashes

Teen driver error: **79.3%** of crashes with a critical driver error (**75.8%** of all crashes)

Likelihood of teen driver critical error: No difference by age, vehicle type, gender, license status, or presence of passengers

Specific Critical Teen Driver Errors Relative Frequency

246,535 serious crashes with a teen driver error

Major Categories of Teen Driver Critical Errors	Total Wght %	Males Wght %	Females Wght %
Recognition	**46.3**	**47.5**	**44.9**
Decision	**40.1**	**39.9**	**40.3**
Performance	**8.0**	**8.9**	**7.0**
Non-Performance	**2.9**	**2.1**	**3.9**
Other/Unknown	**2.7**	**1.7**	**4.0**

Specific Teen Driver Critical Errors Relative Frequency

Specific Teen Driver Critical Errors	Total Wght %	Males Wght %	Females Wght %
Total Recognition	46.3	47.5	44.9
Inadequate Surveillance	21.3	17.3	26.0
Internal Distraction	13.9	19.5	7.4
External Distraction	6.0	8.7	2.8
Inattention	2.0	0.8	3.4
Total Decision	40.1	39.9	40.3
Too Fast for Conditions/ to Respond to Others	13.3	11.4	15.6
Too Fast for Curve	7.4	8.4	6.3
False Assumption of Other's Action	3.9	4.6	3.1
Aggressive Driving Behavior	2.6	3.2	2.0

Conclusions

- Critical teen driver errors in 3 of 4 teen-involved serious crashes
- 60% of all errors:
  - Inadequate surveillance
  - Distraction
  - Driving too fast for conditions

  Nearly half of all teen-involved serious crashes
- Aggressive driving-related, inattention, and drowsy driving critical errors rare

Main NMVCCS Limitations

- No comparison group
- Excludes crashes 12 a.m. – 6 a.m.
- Subjectivity in assignment of critical reason

Implications for Teen Crash Prevention

- Informs intervention development
- Focus on ***promoting*** safe driving skills as well as ***preventing*** "problem" behaviors
- Dispels myth that most teen crashes due to recklessness or thrill-seeking

NMVCCS
Future Opportunities

Data available on:

- **Crash** (Police Accident Report, narrative summary)
- **Vehicle** (Event Data Recorder, crush profile, on-board electronic equipment, tires)
- **Atmospheric Conditions**
- **Traffic/Roadway** (traffic control devices, road configuration)
- **Person** (driver, occupant, nonmotorist)

For more information on NMVCCS: http://www-nrd.nhtsa.dot.gov/Pubs/811059.PDF

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