Measuring Changes in Teenage Driver Crash Characteristics During the Early Months of Driving

Saving lives through research and education
Motor vehicle crashes are the leading cause of death for teenagers in the United States.

In 2009, 3,466 teenagers (ages 13-19) were killed in motor vehicle crashes.

Teen driver crash rates are substantially higher than those of adults, due to a combination of **inexperience** and **impulsivity/immaturity** characteristic of adolescence.

Studies have not found evidence that driver education in its current form reduces teen crash rates.

- Graduated Driver Licensing (GDL) laws have been credited with saving lives, but have not eliminated the major initial spike in crash risk.
The Problem

• Crash rates increase **12 times** when teens first begin to drive unsupervised, and teens are **50 percent more likely to crash** in their first month of driving than they are after getting a year of experience.

• Despite these risks, teen driver crash rates **decline sharply** during the first 6-18 months of driving:
  - Specific reasons for this decline are not well understood.
  - While little can be done to address immaturity and other adolescent traits, there is hope that **more practice and better instruction** could reduce inexperience-related crashes and speed up the learning curve even more.
Figure 1. Young driver crashes by months licensed in North Carolina, Nova Scotia and Victoria.
Key Questions

• How and why do young novice driver behaviors change during the first few years of driving?

• What specifically are teens learning during these early years of driving that accounts for the crash rate decline?
  • Conversely, what are teens not learning quickly enough and what is preventing the crash rate from declining more rapidly?

• Which crash types or characteristics, if any, decrease differently from the overall crash rate?
  • If some do deviate from the overall pattern, what might this suggest about teen learning, behavior, and opportunities for improving safety?
The Study

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Method

• Identified all 16- & 17-year-olds who obtained a North Carolina intermediate license between 1/1/98 and 12/31/08 (N=629,144)

• Searched North Carolina crash data from 1/1/01 to 12/31/08 for crashes involving the above persons
  • Selected for analysis those crashes that occurred within 36 months of driver getting intermediate license (N=256,975)

• Driver licensing files used to determine how long drivers had been licensed at the time of their crash
Method (cont.)

• Analyses reported are largely visual and exclusively descriptive

• Major focus on creating easily-interpretable charts showing the trend in individual crash characteristics during the first 36 months of unsupervised driving
  • Distribution of each crash type/characteristic was standardized (max value = 1) to facilitate visual comparisons between the trajectories of each
Results

Left- and right-turn crashes (thick red lines) decline more quickly than do overall young novice driver crashes (dashed black lines) suggesting relatively rapid improvement in judgment and vehicle handling skills required to execute such maneuvers.
Results (cont.)

Rollovers, run-off-road-right crashes, and hitting a fixed object/parked vehicle all decline more quickly than overall teen crashes; this rapid decline that fits a learning curve suggests these, too, often resulted from a lack of skill/understanding that was quickly corrected with experience.
Crashes resulting from inattention, failure to yield, and driving too fast for conditions also exhibit a pattern consistent with learning and decline more quickly than overall teen crashes.
Results (cont.)

Crashes involving *collisions with an animal* actually *increase* during the first 36 months of driving, serving as a reminder that *exposure* plays an important role (teens may, for example, increasingly drive at times when deer are more prevalent.) Alcohol-related crashes also go up.
Results (cont.)

Not all crash characteristics exhibit patterns consistent with learning, suggesting **teen dispositions/trait**s (such as difficulty controlling impulsiveness) do play a role. This may explain why crashes involving certain factors decline more slowly than do overall crashes.

a. Failed to reduce speed (0.2)

i. Following too close (0.02)
Discussion & Conclusions

• High initial crash rates following intermediate licensure indicate parents can do more during the permit stage to prepare teens to drive unsupervised, such as
  ▪ Ensuring teens get lots of practice making left- and right-turns, and entering roadways from driveways/ parking lots
  ▪ Insisting teens get practice driving in a variety of weather, lighting, and road conditions

• However, it is also possible that teens simply need to learn things like self-control and self-reliance behind the wheel, which may be much more difficult to learn under supervision
• Crash types that decline relatively slowly and don’t fit a learning curve – such as those involving following too closely and failing to slow down – suggest certain levels of immaturity and impulsiveness do play a role in teen crashes.

• However, the patterns identified in this study seem to suggest that experience-based learning, rather than age-related maturation, is the more important factor in the large decline seen in teen driver crashes.

• Given the strong influence that exposure has on crash risk, the fact that teens tend to drive more as they get older and experience a rapid decline in crashes during this period is remarkable – but more can be done!
For more information visit
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