



Risk Factors for Young Drivers in Fatal Crashes

In 2019 there were 1,603 young drivers (15 to 20 years old) killed and an estimated 205,000 injured in motor vehicle crashes (NCSA, 2021). Young drivers, many of whom are novices, are overrepresented in fatal crashes: In 2019 young drivers made up 7.8% of drivers involved in fatal crashes but only 5.3% of licensed drivers. While graduated driver licensing (GDL) is an effective behavioral countermeasure for teen novice drivers (Venkatraman et al., 2021), most States' GDL provisions do not extend to novices 18 to 20 years old. Further improvements in young driver safety may also require the development of other approaches, like effective training or education for novices. In the current study, the research team conducted quasi-induced exposure analyses to determine the highest risk driving situations for young drivers; this information could be used to refine existing GDL programs or to develop driver education and training.

Methods

The research team examined 5 years of data (2013 to 2017) from the Fatality Analysis Reporting System (FARS) for drivers 16 to 20 years old and a comparison group of 35-year-old drivers involved in multi-vehicle crashes. Drivers younger than 16 were excluded due to small sample sizes. The research team also examined data from the second Strategic Highway Research Program Naturalistic Driving Study (SHRP2 NDS); however, this Traffic Tech highlights results of quasi-induced exposure analyses from the FARS dataset only.

Multi-vehicle crashes selected for analyses involved at least one driver of an age of interest (16 to 20, or 35), fewer than six vehicles in the crash, and only one driver of any age with an identified contributing factor. In total, the analyses included 2,980 drivers involved in 2,801 fatal crashes. To determine an age group's over- or underinvolvement in crashes for the risk factors of interest, the research team calculated crash involvement ratios (CIRs) by dividing the number of drivers with contributing factors in the age group by the number of drivers without contributing factors in the age group. CIRs greater than 1.0 indicated that there were more drivers with contributing factors than without for that age.

CIRs were only calculated when based on a sample of 20 or more drivers. The likelihood of having a contributing factor in a fatal crash for each young driver age was compared to 35-year-old drivers using logistic regression. In the figures

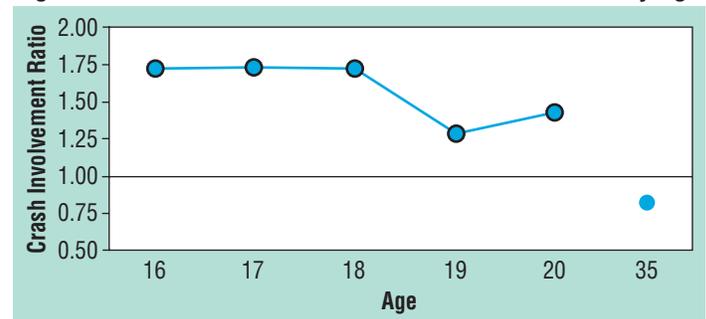
that follow, a CIR that indicates a statistically significantly different likelihood of having a contributing factor in a fatal crash relative to 35-year-old drivers ($p < .05$) is indicated with a black outline around the data point.

This Traffic Tech highlights some of the results from the quasi-induced exposure analyses—specifically, analyses that revealed situations in which (1) young drivers were more likely than drivers age 35 to have contributing factors in fatal crashes for at least one level of a factor of interest, (2) there was visually apparent differentiation between levels of a factor of interest among young drivers, and (3) no data points were missing due to insufficient sample sizes.

Results

Young drivers ($n = 2,502$) were significantly more likely to have contributing factors in fatal crashes than 35-year-old drivers ($n = 478$). Consistent with prior research, young drivers' over-involvement in fatal crashes was higher at younger ages and lower at older ages; however, young drivers remained at increased risk even at ages 19 and 20.

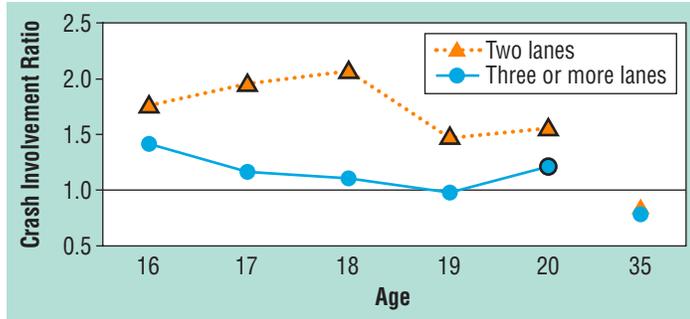
Figure 1. Crash Involvement Ratios for Fatal Crashes by Age



Number of Travel Lanes

Young drivers ($n = 1,711$) were significantly more likely to have contributing factors in fatal crashes on two-lane roadways relative to 35-year-old drivers ($n = 300$). On roadways with three or more lanes, however, young drivers ($n = 755$) were only at greater risk than 35-year-old drivers ($n = 166$) at age 20. (Fatal crashes on one-lane roadways did not meet the minimum sample size.) This result suggests that two-lane roadways—which include two-lane undivided roadways and divided roadways with two lanes traveling in one direction—pose a risk for young drivers.

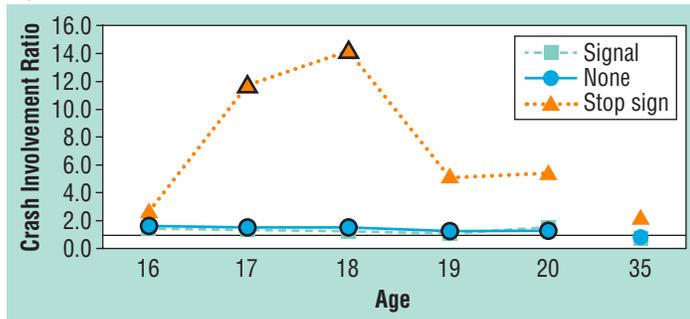
Figure 2. Crash Involvement Ratios for Fatal Crashes by Age and Number of Travel Lanes



Traffic Control

Young drivers ($n = 1,847$) were more likely to have contributing factors in fatal crashes than 35-year-old drivers ($n = 369$) when there was no traffic control in the environment just prior to the crash. When a traffic signal was present, young drivers ($n = 316$) were not at increased risk relative to 35-year-old drivers ($n = 65$). Young drivers appeared to be at greatest risk of having contributing factors in fatal crashes at stop signs ($n = 246$), particularly for drivers 17 and 18 years old compared to 35-year-old drivers ($n = 20$). (Fatal crashes at yield signs did not meet the minimum sample size.)

Figure 3. Crash Involvement Ratios for Fatal Crashes by Age and Traffic Control

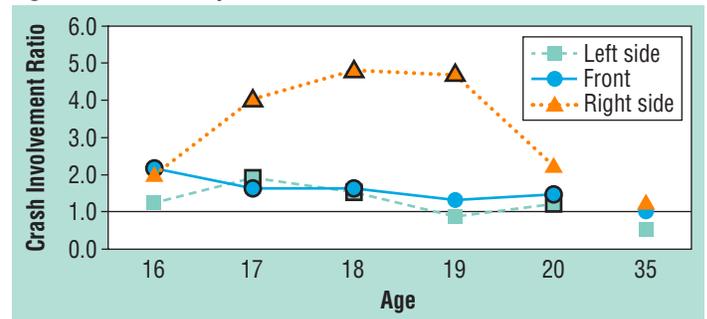


Initial Impact Location

In most cases, young drivers were more likely to have contributing factors in fatal crashes when the initial impact location (area on the driver’s vehicle that resulted in the first instance of injury or damage) was the left side ($n = 375$), front ($n = 1,580$), or right side ($n = 381$) relative to 35-year-old drivers (left side, $n = 60$; front, $n = 324$; right side, $n = 381$). However, young drivers appeared to be at highest risk when fatal crashes involved an initial impact on the right side, particularly for 17- to 19-year-olds. Thus, the kinds of situations that often result in right-side initial impacts—like left turns—may be par-

ticularly risky for young drivers. (Most data points for fatal crashes with rear initial impact did not meet the minimum sample size.)

Figure 4. Crash Involvement Ratios for Fatal Crashes by Age and Initial Impact Location



Conclusion

This Traffic Tech highlights three driving situations that appear to put young drivers at heightened risk of having contributing factors in fatal crashes: two-lane roadways, intersections with stop signs, and situations resulting in right-side impacts like left turns. This information may be useful for developing driver education material aimed at familiarizing young novice drivers with risky scenarios. Parents and driver educators may also use this information to ensure that young novice drivers gain supervised practice in these potentially hazardous situations.

References

National Center for Statistics and Analysis. (2021, June). *Young drivers: 2019 data* (Traffic Safety Facts. Report No. DOT HS 813 130). National Highway Traffic Safety Administration. <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813130>

Venkatraman, V., Richard, C. M., Magee, K., & Johnson, K. (2021, July). *Countermeasures that work: A highway safety countermeasures guide for State Highway Safety Offices*, 10th edition, 2020 (Report No. DOT HS 813 097). National Highway Traffic Safety Administration. <https://rosap.ntl.bts.gov/view/dot/57466>

Download a copy of *Risk Factors for Young Drivers in Fatal and Non-Fatal Crashes* (DOT HS 813 303A) from the National Transportation Library ([https://rosap.ntl.bts.gov/collection_nhtsa_bsr](https://rosap.ntl.bts.gov/collection/nhtsa_bsr)).

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