



Meta-Analysis of Graduated Driver Licensing Laws: Effectiveness of Specific Program Components

Introduction

Graduated driver licensing (GDL) programs in the United States do not represent a single homogeneous intervention; rather, they contain different combinations and variations of program components. Programs vary by the duration of each stage of the GDL process, age restrictions imposed at each stage, nighttime and passenger restrictions, and supervised driving requirements. While research has suggested GDL is effective at reducing young driver crashes, results are not as clear about which specific program component variations are associated with the largest crash reductions.

Studies on the effectiveness of GDL implementations have produced a substantial amount of data and analysis results. NHTSA used these data to conduct a meta-analysis in which the results of existing research were pooled to look for effects revealed by their combined power. As part of the meta-analysis process, researchers first screened studies of GDL programs for relevance and quality. Researchers then coded separate rate ratio effect sizes from the 14 selected studies to estimate the impact of overall GDL programs and variations of program components (referred to as GDL component “calibrations” from here forward) on 15, 16, 17, 18, 19, and 20 year-olds’ total, injury, and fatal crash outcomes.

The full technical report explains the meta-analysis methodology more completely together with all of the study results. This Traffic Tech focuses on the effectiveness of GDL component calibrations for reducing per capita crash rates for 16- and 17-year-olds when at least two effect sizes were available for a given analysis.

Results

Researchers first examined the impacts of each GDL component by analyzing changes in per capita crash rates when a GDL program containing a particular component calibration was implemented. These results must be interpreted with caution because they do not represent direct comparisons of component calibrations; rather they represent the impact of overall GDL programs that contained a particular component calibration. As such, the results are confounded by the simultaneous implementation of other GDL components within a jurisdiction. Only statistically significant changes in crash rates ($p < .05$) are presented here.

Learner entry age

15 years old:

- 16-year-old crash rates 20 percent lower
- 17-year-old crash rates 10 percent lower

15½ years old:

- 16-year-old crash rates 24 percent lower

16 years old:

- 16-year-old crash rates 18 percent lower

Learner permit holding period

6 months:

- 16-year-old crash rates 12 percent lower

12 months:

- 16-year-old crash rates 40 percent lower
- 17-year-old crash rates 23 percent lower

Supervised driving hours

40 hours:

- 16-year-old crash rates 21 percent lower

50 hours:

- 16-year-old crash rates 15 percent lower

Intermediate license entry age

16 years old:

- 16-year-old crash rates 22 percent lower

16¼ years old:

- 16-year-old crash rates 24 percent lower

Nighttime driving restriction

Midnight start time

- 16-year-old crash rates 19 percent lower

Passenger driving restriction

One teen passenger for 6 months or longer:

- 16-year-old crash rates 24 percent lower

No teen passengers for 6 months or longer

- 16-year-old crash rates 14 percent lower

Unrestricted licensure age

17 years old:

- 16-year-old crash rates 15 percent lower

18 years old:

- 16-year-old crash rates 22 percent lower
- 17-year-old crash rates 8 percent lower

Contingent advancement (clean driving record)

With contingent advancement:

- 16-year-old crash rates 21 percent lower
- 17-year-old crash rates 15 percent lower

Additional analyses examined effect sizes from a limited number of studies providing data for specific component calibrations. Of the effect sizes coded from the source studies, 64 represented the specific effects of individual GDL components rather than the effects of GDL programs as a whole. For most component calibrations, however, there were only a small number of effect sizes. The following results cover those component calibrations with the largest number of effect sizes available.

Learner Permit Holding Period. In studies of learner permit holding periods (i.e., 3 months, between 3 and 6 months, and 6 months), none of the learner permit holding period calibrations were reliably associated with a change in crashes for either 16- or 17-year-olds.

Nighttime Driving Restriction. Among the age groups with two or more effect sizes for a particular nighttime restriction start time, interpretation is limited because of small sample sizes. The results, however, suggest that for 16-, 17-, and 18-year-olds, nighttime restrictions with 12 a.m. start times were not reliably associated with reduced nighttime crashes ($p > .05$).

Passenger Driving Restriction. Among the calibrations with two or more independent effect sizes, passenger restrictions allowing no more than one teen passenger for at least 6 months were reliably associated with a 20 percent reduction in fatal crashes for 16-year-olds in which a passenger was present ($p < .05$). Restrictions allowing one teen passenger were also associated with a 6 percent decrease in passenger-present crashes for 18-year-olds ($p < .05$).

Limitations

The study made a great effort to include only rigorous evaluations based on high quality data. This resulted in the exclusion of numerous studies. Studies rated as “moderate” quality were included because there was an insufficient number of “high” quality studies to conduct a proper analysis. Excluding the moderate rating studies would have severely reduced the number of available effect sizes for analysis and restricted the ability to generalize the findings. Even with the inclusion of the moderate rating studies, the numbers of effect sizes for the specific component calibrations were limited. This limited the ability of the researchers to reach definitive conclusions regarding the effectiveness of specific GDL component calibrations. The analyses of the impacts of

overall GDL programs do indicate that some component calibrations are potentially more effective than others, but these results are confounded by the simultaneous implementation of multiple GDL components which likely interacted to produce the observed results. Isolating the effects of any single GDL component will continue to be a problem for research in the area because few, if any, GDL programs include only a single provision or phase in provisions over time.

In addition, the study used age-specific rather than GDL stage-specific effect sizes. Among 18- and 19-year-olds, the effect sizes reflect the driving of a mixed population consisting of some people licensed under the GDL programs as well as people licensed at ages not subject to the GDL programs.

Conclusion

One of the primary goals of this meta-analysis was to determine the specific GDL components and calibrations of those components associated with the largest crash reductions. Unfortunately, there were insufficient data to do so in most cases. Although the exact effectiveness of specific component calibrations could not be determined, the analysis did not indicate that any component was necessarily counterproductive for the GDL target audience of 16- and 17-year-olds. Thus, a reasonable strategy for any State considering passage of a GDL law might involve:

- enumerating the full range of program components applicable to that State;
- determining which could be reasonably operationalized given available resources and support from key agencies and organizations; and
- adopting as comprehensive an approach as possible.

How to Order

For a copy of *Meta-Analysis of Graduated Driver Licensing Laws* (55 pages plus appendices), (DOT HS 812 211) prepared by Dunlap and Associates, Inc., write to the Office of Behavioral Safety Research, NHTSA, NTI-130, 1200 New Jersey Avenue SE., Washington, DC 20590, send a fax to 202-366-7394, or download from www.nhtsa.gov. Mary T. Byrd was the NHTSA Task Order Manager for this project.

Suggested APA format citation for this document:

Dunlap and Associates. (2015, November). *Meta-analysis of graduated driver licensing laws: Effectiveness of specific program components* (Traffic Safety Facts Traffic Tech. Report No. DOT HS 812 212). Washington, DC: National Highway Traffic Safety Administration.



U.S. Department of Transportation
**National Highway Traffic Safety
Administration**

1200 New Jersey Avenue SE., NTI-132
Washington, DC 20590

TRAFFIC TECH is a publication to disseminate information about traffic safety programs, including evaluations, innovative programs, and new publications. Feel free to copy it as you wish. If you would like to be added to an e-mail list, contact TrafficTech@dot.gov.