

Rethinking How We Train & Assess Young Novice Drivers

Impact of Driver Education on Teen Crashes and Citations

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Thanks to:
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Study Procedure

- ▶ Descriptive epidemiological study examining a census of all teen drivers obtaining the intermediate stage Provisional Operators Permit (POP) in Nebraska during an eight year period from 2003 – 2010.

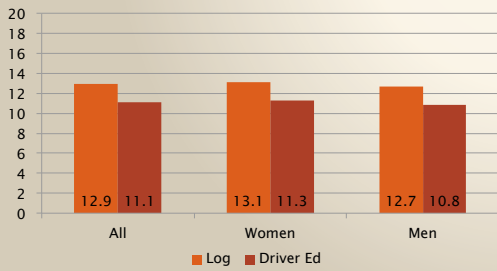
Study Population

- ▶ 80,685 (53.1%) were in the driver education cohort
- ▶ 71,195 (46.9%) were in the certification log cohort.
- ▶ Teens in the driver education cohort were significantly more likely to:
 - be girls (54.6% to 51.7% boys),
 - be White non-Hispanic ethnicity (56.0% to 29.4% non-White),
 - have higher median household income (\$60,344 to \$52,561),
 - reside in an urban area (57.9% to 48.9% rural),
 - be younger on average at the time they obtained their POP (16.15 years to 16.33 years).

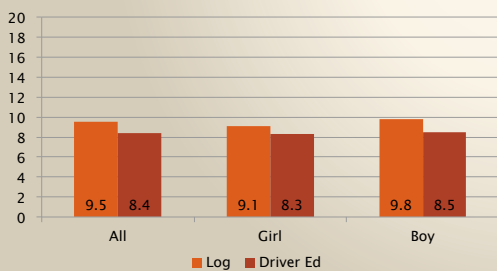
DATA SOURCES

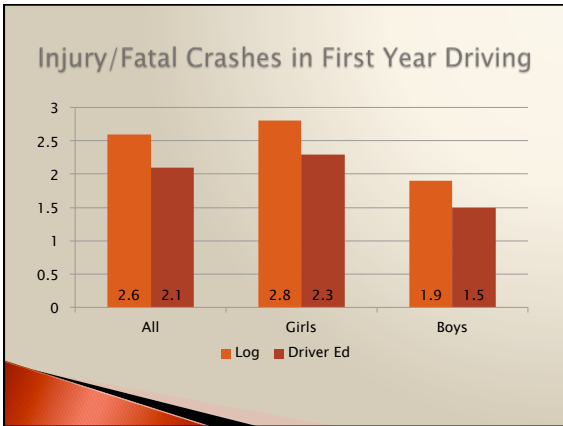
- ▶ Driver information data including demographics and Provisional Operator Permit licensing data and citations for traffic violations were obtained from Nebraska Traffic Records Data maintained by the Nebraska Department of Road and Nebraska Office of Highway Safety.
- ▶ Citation issuance date was used for analysis regardless of when the actual conviction occurred. Only moving violations and secondary violations reflecting risky behaviors (e.g., no seatbelt) were used.
- ▶ Crash data was obtained from the Crash Outcome Data Evaluation System (CODES) maintained by the Nebraska Department of Health and Human Services

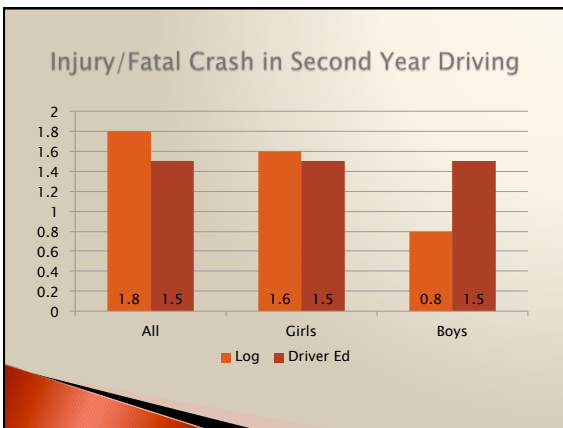
Crashes in First Year Driving



Crashes in Second Year Driving

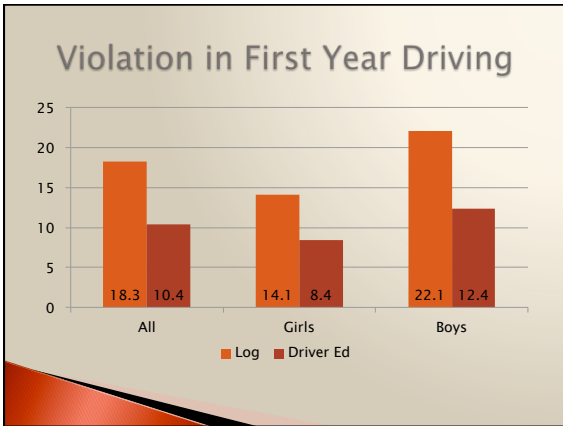


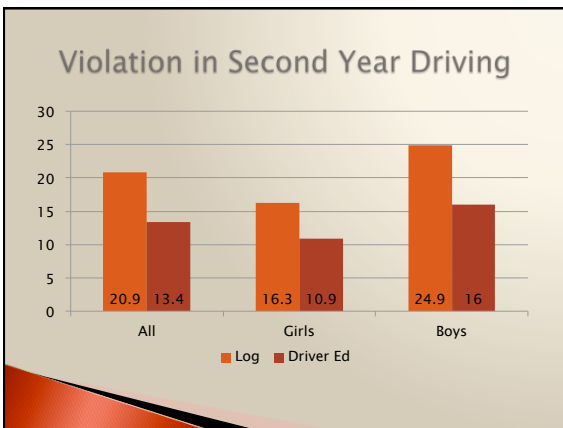


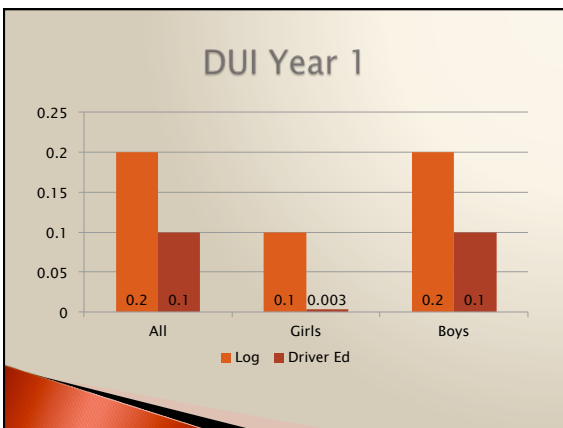


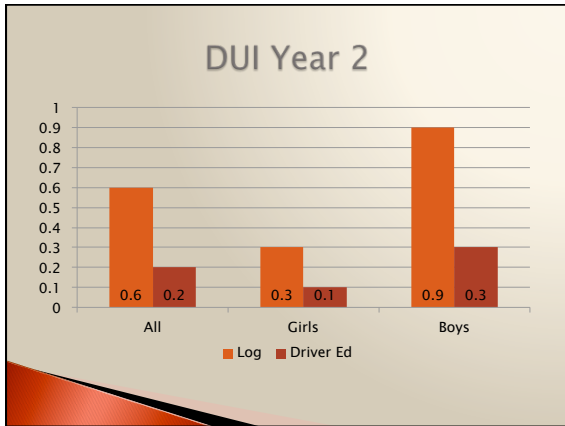
Crash Findings

- ▶ For crashes and injury/fatal crashes significant reductions in prevalence for teens taking driver education compared to teens using the certification log.
- ▶ The impact of driver education was greatest for boys as they had fewer crashes and injury/fatal crashes in both years; girls had fewer injury and fatal crashes in year 1 but not in year 2 of driving.









Violation Findings

- ▶ For total violations and DUI there were significant reductions in prevalence for teens taking driver education log compared to teens using the certification log.
- ▶ The impact of driver education was equivalent for both boys and girls as both had fewer total violations and DUI in both years.

Logistic Regression Analysis

- ▶ Hierarchical logistic regression was conducted to control for potential confounds due to:
 - gender,
 - ethnicity,
 - residence,
 - age at which the POP was obtained,
 - median household income.
- ▶ Control variables were entered in Step 1
- ▶ Log or driver education group was entered in Step 2.

Logistic Regression Analysis

- ▶ During Year 1:
 - Relative to other predictors, teens in the certification log cohort had the second highest odds of a crash (1.22) and highest odds of an injury/fatal crash (1.24).
 - Teens in the certification log cohort had higher odds of a DUI (1.63) and relative to other predictors, the highest odds of a violation (1.74).
- ▶ During Year 2:
 - Relative to other predictors, teens in the certification log cohort had the second highest odds of a crash (1.14) or injury/fatal crash (1.19).
 - Relative to other predictors, teens in the certification log cohort had the second highest odds of a DUI (2.05) and second highest odds of a violation (1.59).

Conclusions

- ▶ If those teens using the certification log had instead taken driver education, there would have been a per year average of:
 - ▶ 157 fewer crashes and 45 fewer injury or fatal crashes in the first year of driving.
 - ▶ 94 fewer crashes and 26 fewer injury or fatal crashes in the second year of driving.

Conclusions

- ▶ If those teens using the certification log had instead taken driver education, there would have been a per year average of:
 - ▶ 707 fewer violations and 5 fewer DUI violations in the first year of driving.
 - ▶ 659 fewer violations and 34 fewer DUI violations in the second year of driving.

Study Two Research Question

Does the difference in traffic crashes and violations between driver education and the certification log identified in the first two years of driving continue beyond the second year?

Survival Analysis

- ▶ For 8-year trend analysis, survival analysis was conducted.
- ▶ Survival time was measured from obtaining POP with endpoints as the year of first occurrence of crash or traffic violation.
 - **Survival rate is the probability of no crash or violation since POP.**
 - **Hazard rate is the probability a crash or violation occurring in the next year.**

Study Population

- ▶ For 8-year trend analysis, teens obtaining their POP in 2003 and 2004 were combined.
- ▶ Total sample of 31,393.

Study Population

Table 1. Characterization of the Teen Drivers in the 8-years group

Variables	Labels	Frequency	Percent
Gender	Male	16208	51.6
	Female	15185	48.4
Race	White	28439	90.6
	Other	2954	9.4
Urbanicity	Urban	15327	48.8
	Rural	16066	51.2
Method	Log	15976	50.9
	Exam	15417	49.1
Left	No	28354	90.3
	Yes	3039	9.7
Left* Accident	Left * Accidents	866	28
	Left* No Accident	2173	72
Left* Citation	Left* Citations	1530	51
	Left*No Citation	1509	49

Figure 1. Kaplan-Meier Cumulative Survival Functions for Crashes

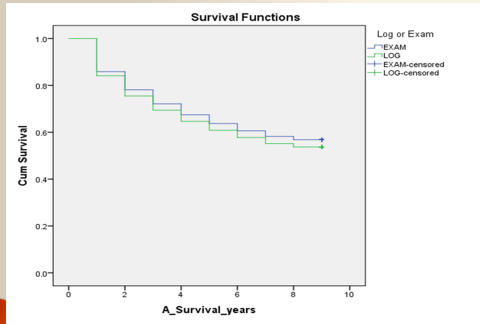


Figure 2. Kaplan-Meier Hazard Functions for Crashes

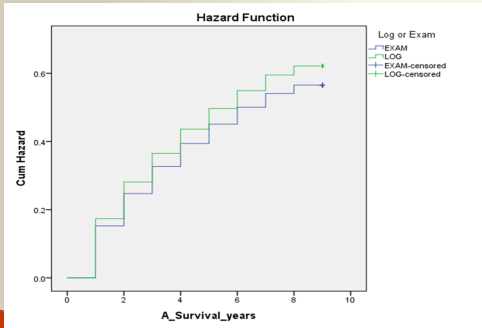


Figure 3. Kaplan-Meier Cumulative Survival Functions for Violations

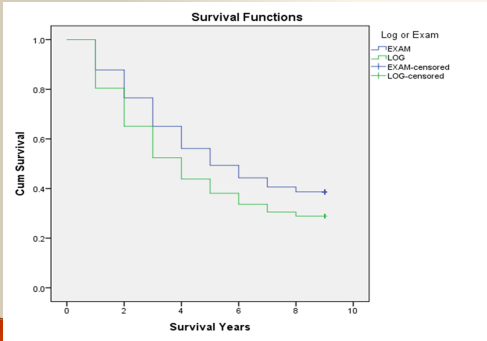
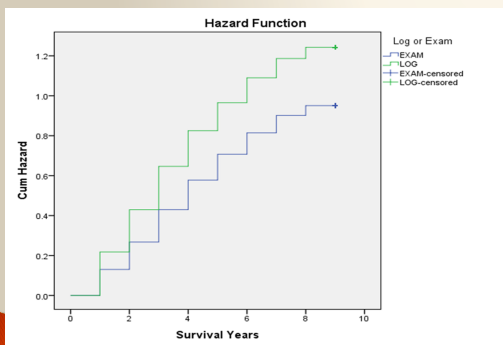


Figure 4. Kaplan-Meier Hazard Functions for Violations



Survival Analysis

- ▶ For the Driver Education cohort from 2003-2004:
- ▶ Higher “survival” at each year through 8 years for crashes.
- ▶ Lower probability of future crashes at each year through 8 years (Hazard).

Survival Analysis

- ▶ For the Driver Education cohort from 2003-2004:
- ▶ **Higher “survival” for violations through 5 years then somewhat lower survival in years 6 and 7 with equivalent survival in year 8.**
- ▶ **Lower probability of future violations all years (Hazard).**

Final Conclusions

- ▶ Across multiple studies looking at impacts in different ways,
- ▶ Teens taking driver education have lower prevalence of crashes, violations, injury/fatal crashes, and DUI.
- ▶ This lower prevalence continues for at least 8 years.
- ▶ Coupled with other recent studies with similar findings, results support promotion of driver education as a strategy to reduce teen crashes and violations.

Acknowledgement

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Contact for Further Information

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Further Information:

Shell, D. F., Newman, I. M., Cordova-Cazar, A. L., & Heese, J. M. (2015).
Driver education and teen crashes and traffic violations in the first two years of
driving in a graduated licensing system. *Accident Analysis & Prevention, 82*,
45-52.
