Effect of Age and Intersections on Motor Vehicle Crashes

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Background

Motor vehicle crashes are a leading cause of death in the United States.

- Younger (16-24 yrs) and Older (65 yrs and above) drivers have the most crashes and fatalities per miles driven.
- Intersections are of some concern for these age groups, especially older drivers.

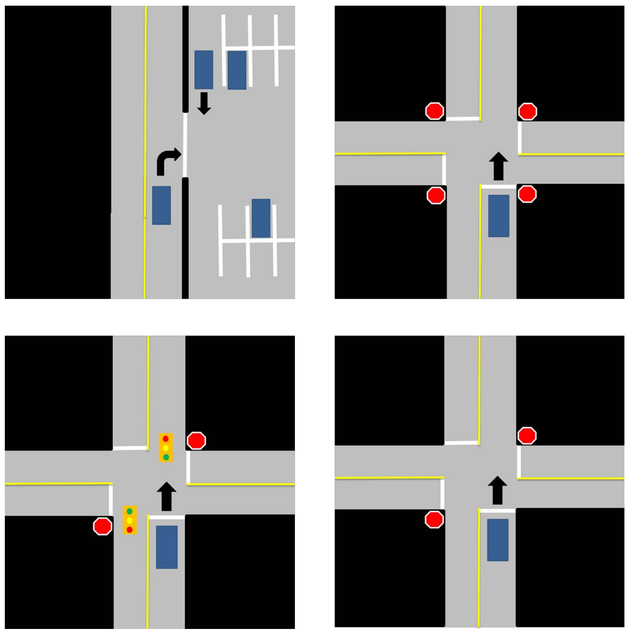

Figure 1. Common intersection types (Top Left: Parking Lot; Top Right: Stop Sign Controlled; Bottom Left: Signal Controlled Bottom Right: Uncontrolled) at which crashes occurred during data collection of the SHRP2 NDS.

- Additionally, previous research has shown that younger drivers take more risks than older drivers, but there is reason to believe that the youngest and newest drivers (drivers age 16-19) take less risks and may more closely resemble the patterns of older drivers.

Goals

1. Identify patterns and compare crashes for younger and older drivers at intersections.
2. Assess and compare maneuver judgments for pre-crash maneuvers for older and younger drivers, in an attempt to identify differences between novice and young drivers.

Methods

Participants

- Data from the Naturalistic Driving Study (NDS) was used for this study.
- Age groups were of the NDS were compiled into 4 distinct groups.
  - Novice: Ages 16-19 years old
  - Young: Ages 20-24 years old
  - Middle: Ages 35-54 years old
  - Elderly: Ages 65-84 years old

NDS data

- The data was aggregated so that events containing more than one crash were not counted more than once.
- Only Minor to Major crashes for which the participant driver was at fault were used for the chi square analyses.

Analyses

- Crashes per 100 thousand kilometers driven were calculated in two different ways 1) for all at fault crashes including low-risk tire strikes and 2) for all at fault crashes excluding low-risk tire strike.

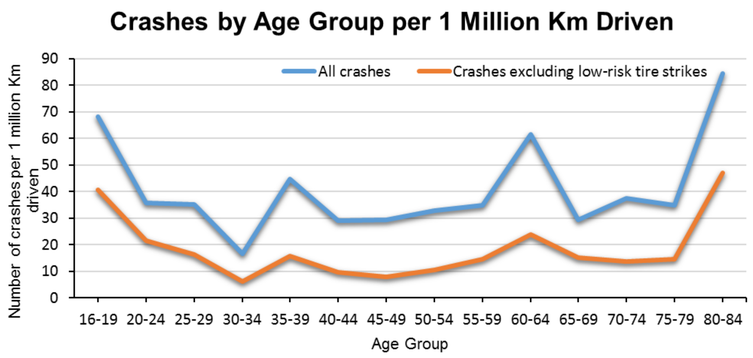

Figure 2. At fault crashes per hundred Km driven during the SHRP2 NDS by age groups.

- Chi squares were calculated for minor to major at fault crashes that occurred at intersections, comparing age group and intersection type, as well as all minor to major at fault crashes, comparing age groups and maneuver judgement.

Results & Discussion

- The Chi square for maneuver judgement and age group was significant. It seems that the percentage of safe and legal maneuvers that resulted in crashes increases with age and there is a higher percentage of unsafe maneuvers overall, for younger and novice drivers than for older drivers.

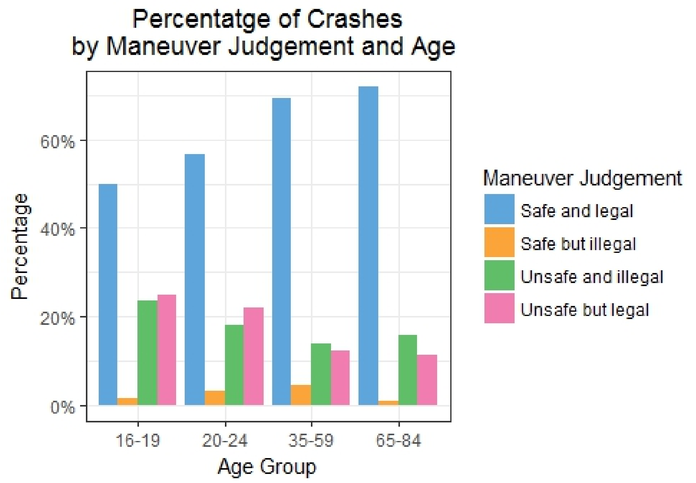

Figure 3. Percentage of crashes in each age group that were considered either safe and legal, safe but illegal, unsafe and illegal, and unsafe but legal.

- The Chi square for Intersection influence was not significant but appears to be trending toward significance.

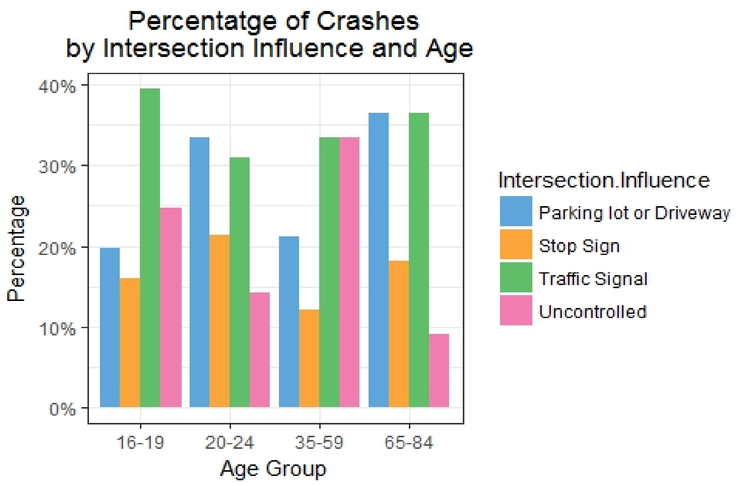

Figure 4. Percentage of crashes for each age group that were influenced by specific types of intersections.

Acknowledgements

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