



Motivations for Speeding—Additional Data Analysis

Speeding-related crashes are a serious problem in the United States. While speeding is dangerously common, it is also a complicated behavior that varies by driver and situation. Given the high toll in speeding-related injuries and lives lost, and the high economic costs associated with such crashes, speeding is a safety issue that continues to demand a great deal of attention.

The Motivations for Speeding Study

NHTSA's naturalistic driving study, *Motivations for Speeding* (Richard et al., 2013), examined motivations and situations conducive to speeding behavior. The study collected data from 88 drivers in Seattle, Washington, and 76 drivers in College Station, Texas, over a 3- to 4-week period to record how fast they drove on different roadways. Personal inventories were also collected from drivers to measure demographic, personality, attitudinal, and risk-taking behaviors.

Speeding was operationally defined as driving 10 mph or more above the posted speed limit. Free-flow episodes (FFE), defined as driving speeds at or above 5 mph below the posted speed limit, were used as a proxy for opportunity to speed. The units of analysis (UA) in the original study were 30-second driving epochs. The additional analyses conducted for this study used time-series data to redefine the UA for speeding in terms of continuous speeding episodes (SEs).

Types of Speeding

A cluster analysis was conducted using variables that measured the magnitude, duration, variability, and form or shape of the SEs. The cluster analysis revealed five types of speeding behavior:

Speeding at Speed Zone Transitions: These SEs included both speeding up and slowing down. They typically had short durations, a high maximum speed, and occurred on lower-speed roadways. In these cases, the roadway environment in the slower segment may be similar enough to the higher-speed segment that it supports faster driving.

Incidental Speeding: This was the most common type of speeding. It involved low-exceedance, short-duration episodes that more likely represented the upper bound normal speed maintenance behavior, as opposed to a separate speeding behavior.

Casual Speeding: This was another relatively common type of speeding. Although it was similar to Incidental Speeding, it involved speeds that were high enough that drivers were likely to be aware that they were speeding. However, the durations were relatively brief, therefore drivers may not have persisted in this type of speeding for long (e.g., it could have included passing behavior).

Cruising Speeding: The defining characteristic of this type of speeding was the relatively long duration. While the longer duration increased a driver's exposure to safety risk, this type of speeding was more likely to occur on controlled-access, high-speed roads, which reduced the likelihood of unexpected hazards. Another notable aspect of this speeding was that only a subset of drivers engaged in this type of speeding. Specifically, the subset of drivers that had the highest prevalence of Cruising Speeding (i.e., 8-25% of their trips) was limited to 10 drivers in Seattle and 3 in Texas, representing all demographic groups.

Aggressive Speeding: This type of speeding was characterized by relatively high speed exceedance, moderate duration, and a high level of speed variability. This cluster only occurred in Seattle and it generally encompassed riskier aspects of speeding than the other clusters. Similar to the Cruising Speeding type, the subset of drivers that had the highest prevalence of Aggressive Speeding (i.e., 15-50% of their trips) was limited to 10 Seattle drivers, representing all demographic groups.

These types of speeding were remarkably consistent across drivers and locations in the study.

Types of Speeding Drivers

A cluster analysis was conducted using the individual drivers' speeding profiles. In Texas, there were too few SEs to conduct this analysis; however, there were sufficient SEs for Seattle drivers. The analysis identified four speeding driver types, described below. Figure 1 shows the frequency of speeding type by driver type.

Deliberate Speeders: Drivers in this group averaged a higher proportion of Casual and Aggressive SEs, but lower levels of Incidental SEs than other groups. Individuals in this group also had substantially more SEs than those in other groups.

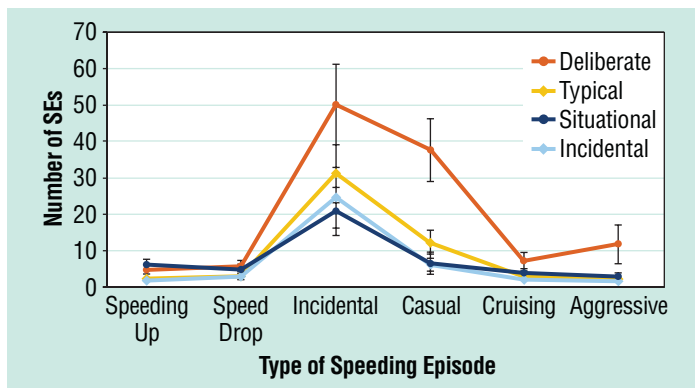
In general, these drivers tended to engage in the more aggressive and deliberate types of speeding, substantially more than other driver types. Deliberate speeders also reported engaging in risky driving behaviors more frequently than others, and they had the most favorable attitudes toward speeding.

Typical Speeders: The distribution of SEs within this group basically matched the distribution across all drivers. The Typical driver type was also comprised of the largest number of drivers, and Casual Speeding was relatively more common in this group. Individuals in this driver type category also occupied a middle range in terms of average speeding profiles and frequency of SEs.

Situational Speeders: This driver type was challenging to label. This type was distinct in that these drivers had a much higher proportion of the speeding-up type of speeding in transition zones than other driver types, and they engaged in minimal amounts of Aggressive Speeding and Cruising Speeding. Overall, this group only engaged in a little more speeding than the Unintentional Driver Type, but they did not share the same favorable views regarding not speeding.

Unintentional Speeders: This group was comprised primarily of drivers that engaged mostly in Incidental Speeding and some Casual Speeding, but almost none of the other types of speeding. These drivers also had attitudes and beliefs that were the most favorable toward not speeding. While this group may have represented non-speeders, most of them still drove at sufficiently high speeds to exceed the speeding threshold on many occasions.

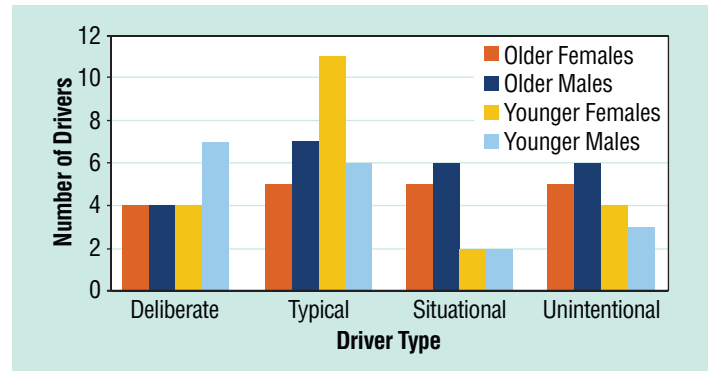
Figure 1. Average Frequency of Different Types of Speeding Episodes (SEs) by Driver Types in Seattle



When examining driver type by demographic group (see Figure 2), the most salient pattern appeared to be that each driver type included drivers from all demographic

categories; however, there were differences across driver types. In particular, young males were more prevalent in the Deliberate Speeder category, whereas young females were more prevalent in the Typical Speeder category. Both the Situational Speeder and Incidental Speeder types were comprised of a greater proportion of older drivers.

Figure 2. Driver Types by Demographic Group in Seattle (based on cluster membership)



Conclusions

This project was successful in identifying five types of speeding behavior and four types of speeding drivers. There is converging evidence that Deliberate Speeders represent a distinct driver type. They speed much more frequently and they tend to engage in the more aggressive and deliberate types of speeding substantially more often than other drivers. The Deliberate Speeders also reported engaging in risky driving behaviors more frequently and had the most favorable attitudes toward speeding. Their behaviors and attitudes are outside of the norm. Changing their behavior may have disproportionately large benefits in terms of reducing speeding-related crashes.

References

Richard, C., Campbell, J., Lichty, M., Brown, J., Chrysler, S., Lee, J., Boyle, L., & Reagle, G. (2013). *Motivations for speeding, volume II: Findings report*. (DOT HS 811 818). Washington, DC: National Highway Traffic Safety Administration.

How to Order

To order the *Motivations for Speeding—Additional Data Analysis*, prepared by Battelle Memorial Institute, write to the Office of Behavioral Safety Research, NHTSA, NTI-130, 1200 New Jersey Avenue SE., Washington, DC 20590, fax 202-366-7394, or download from www.nhtsa.gov.

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