Roadside Evaluation of Distracted Driving: Driver Limitations in Recognizing Traffic Light Transitions (REDD – LIGHT)

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Purpose: Distracted driving is a global epidemic and is responsible for thousands of injuries every year. As most injuries occur at or near intersections, the purpose of the REDD – LIGHT study was to examine the prevalence of distracted driving at traffic lights. Our secondary goals were to determine the specific distractions and their effect on reactions to traffic light transition.

Methods: Drivers stopped at a red traffic light were observed covertly for distracted driving behaviors. We separated the observational variables into demographic variables (age, sex), driving distractions (in-vehicle, outer-vehicle, and mobile phones), and reaction to traffic light transition (delayed vs not delayed). We considered a driver delayed if they failed to proceed for more than 2 seconds when the light transitioned to green or when the vehicle fell behind another proceeding vehicle by a full car-length. Following the National Highway Traffic Safety Association observation protocol, mobile phone distractions were grouped into three subcategories: talking on a handheld device, talking using a visible headset on, and visibly manipulating a handheld device. We performed regression analyses to determine associations on demographics, distracted driving, and delayed driver reactions.

Results: Out of the 1008 drivers we observed, 608 (60.3%) were distracted while stopped at the red light. In-vehicle distractions (44.8%) were most prevalent, and distractions involving mobile phones were seen in 75 drivers (7.4%). We recorded 126 drivers (12.5%) as delayed at the light transition, 111 (88.1%) of whom were distracted. Drivers between 30 and 50 years old were more likely to be distracted (odds ratio [OR] = 1.3, P = 0.050). There were seven specific distractions significantly associated with a delayed reaction (talking on or manipulating a handheld device, in-vehicle devices [air-conditioning controls, navigation], eating / drinking, reaching, nonspecific and specific outer-vehicle distractions). Mobile phone distractions had the highest risk for a delay at the traffic light (talking while holding a phone [OR = 8.2, P = 0.043] and manipulating a handheld phone [OR = 2.9, P = 0.002]). Delayed reactions were not associated with talking to a passenger and talking on a hands-free device.

Conclusion: Distracted driving is exceedingly prevalent, as the majority of drivers stopped at traffic lights engaged in distracting behaviors. One in eight drivers had delayed reactions, and 88% of them were distracted. This demonstrates how distractions negatively affect drivers› situational awareness. The fact that we observed drivers at a single red light along their trip further emphasizes the gravity of these numbers. These data can be applied toward driver education, action plans, and policy development aimed at injury prevention due to distracted driving.