Impact of distracted driving on safety and traffic flow.

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Abstract
Studies have documented a link between distracted driving and diminished safety; however, an association between distracted driving and traffic congestion has not been investigated in depth. The present study examined the behavior of teens and young adults operating a driving simulator while engaged in various distractions (i.e., cell phone, texting, and undistracted) and driving conditions (i.e., free flow, stable flow, and oversaturation). Seventy five participants 16-25 years of age (split into 2 groups: novice drivers and young adults) drove a STISIM simulator three times, each time with one of three randomly presented distractions. Each drive was designed to represent daytime scenery on a 4 lane divided roadway and included three equal roadway portions representing Levels of Service (LOS) A, C, and E as defined in the 2000 Highway Capacity Manual. Participants also completed questionnaires documenting demographics and driving history. Both safety and traffic flow related driving outcomes were considered. A Repeated Measures Multivariate Analysis of Variance was employed to analyze continuous outcome variables and a Generalized Estimate Equation (GEE) Poisson model was used to analyze count variables. Results revealed that, in general more lane deviations and crashes occurred during texting. Distraction (in most cases, text messaging) had a significantly negative impact on traffic flow, such that participants exhibited greater fluctuation in speed, changed lanes significantly fewer times, and took longer to complete the scenario. In turn, more simulated vehicles passed the participant drivers while they were texting or talking on a cell phone than while undistracted. The results indicate that distracted driving, particularly texting, may lead to reduced safety and traffic flow, thus having a negative impact on traffic operations. No significant differences were
detected between age groups, suggesting that all drivers, regardless of age, may drive in a manner that impacts safety and traffic flow negatively when distracted.

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