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Increased Reaction and Movement Times When Text Messaging during Simulated Driving

Authors : Adriana M. Duquette, Derek P. Bornath

Abstract : Reaction Time (RT) and Movement Time (MT) are important components of everyday life that have an effect on the way in which we move about our environment. These measures become even more crucial when an event can be caused (or avoided) in a fraction of a second, such as the RT and MT required while driving. The purpose of this study was to develop a more simple method of testing RT and MT during simulated driving with or without text messaging, in a university-aged population (n = 170). In the control condition, a randomly-delayed red light stimulus flashed on a computer interface after the participant began pressing the 'gas' pedal on a foot switch mat. Simple RT was defined as the time between the presentation of the light stimulus and the initiation of lifting the foot from the switch mat 'gas' pedal; while MT was defined as the time after the initiation of lifting the foot, to the initiation of depressing the switch mat 'brake' pedal. In the texting condition, upon pressing the 'gas' pedal, a 'text message' appeared on the computer interface in a dialog box that the participant typed on their cell phone while waiting for the light stimulus to turn red. In both conditions, the sequence was repeated 10 times, and an average RT (seconds) and average MT (seconds) were recorded. Condition significantly (p = .000) impacted overall RTs, as the texting condition (0.47 s) took longer than the no-texting (control) condition (0.34 s). Longer MTs were also recorded during the texting condition (0.28 s) than in the control condition (0.23 s), p = .001. Overall increases in Response Time (RT + MT) of 189 ms during the texting condition would equate to an additional 4.2 meters (to react to the stimulus and begin braking) if the participant had been driving an automobile at 80 km per hour. In conclusion, increasing task complexity due to the dual-task demand of text messaging during simulated driving caused significant increases in RT (41%), MT (23%) and Response Time (34%), thus further strengthening the mounting evidence against text messaging while driving.

Keywords : simulated driving, text messaging, reaction time, movement time
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