The Effect of Distracted Driving on Reaction Time

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Abstract

This study focused on distracted driving, its dangers, and how it affected the reaction times of 118 college students while in simulated conditions with distractions. The two measures consisted of (1) reacting to an image on the screen in a timely manner and (2) replicating measure 1, but responding to the stimulus out loud. Results show that non-distracted drivers have a quicker response time than those in the distracted measure.

Intro

Driving may seem like a generally simple task, but with distractions, multiple things to look out for, and proper operation of a vehicle it turns out to be much more difficult than it might appear. Distracted driving is a large cause of many motor vehicle crashes. Previous research studied the level of error between distracted drivers, both novice and experienced (Klauer et al. 2014). This study focused more on the aspects of distracted driving, regardless of experience under two different conditions. The first condition measured reaction time with no distractions. The second was the same reaction test, with the inclusion of distraction questions. Both tests also accounted for accuracy (producing the correct response to the stimuli) of the reactions as well. Our initial hypothesis was that reaction times would be quickest during the non-distracted testing and longer during the distracted testing. Our second hypothesis was that there would be higher accuracy of responses in the non-distracted tests and lower accuracy of responses in the distracted tests.

Method

Participants contained 118 college students enrolled in the class ‘Research Methods of Psychology’ and took roughly around 20-30 minutes for each person. In this experiment, the

participant is told to determine whether the car is supposed to be “Go” or “Halt” based on the brake lights being on or off on the car in front of them. If the brake lights were off, then you would press the ‘G’ key to go. If the brake lights were on, then you would press the ‘H’ key to halt. There were two conditions: In the first condition you are being distracted with around 17-22 various questions that you are asked to answer out loud, while still trying to determine whether to go or to halt on 40 different images of the brake lights. The second condition is where you purely just focus on the lights of the car in front of you and determine whether to go or to halt with another set of 40 different images of the brake lights. You have a slight break in between both conditions. The goal was to respond as quickly and accurately as possible because your reaction time and response were being measured. However, there was a 2-second delay between pushing a key on the keyboard and seeing the next image. After completing both conditions of the experiment, the participant is told that in each condition, there were 20 images with the brake lights on and 20 images with the brake lights off. The participant is also told that the reaction time was measured in milliseconds and is then shown their results of their reaction time and how accurate their response was.

Results

During this study, the data from the 118 participants from the Distracted and Non-Distracted groups was observed over the course of 40 trials. The results showed that there was no significant difference between the reaction times and percentage correct for Distracted and Non-Distracted drivers. The results examined show that the 40 trials average reaction time (in milliseconds) for Non-Distracted trials (M = 832.53 , SD = 336.62, N = 118) was faster than the reaction time for the 40 trials of the Distracted drivers (M = 1219.24, SD = 336.62, N = 118). The results from Non-Distracted drivers are shown to have a greater percentage of assessments

correct (*M* = 96.36%, *SD* = 6.57, *N* = 118), than Distracted drivers (*M* = 95.61%, *SD* = 9.11, *N* = 118). As shown in the data, the 118 participants examined were shown to have a shorter reaction time and a high percentage of correct assessments while not distracted.

Discussion

The data shown in the experiment supports the hypothesis that distracted driving results in decreased reaction times. One issue that may have affected the final results was potential confusion from participants, especially during the experiment. There were no practice trials given to ensure the participant understood the test in full, and thus could have contributed a higher average reaction time in the process. When it comes to distracted driving, it's not just cell phones that divert attention away; many of the functions in the car itself are slowly becoming virtual via a central control screen, and are worth studying to see how distracting they are to driving in comparison to a cellular device. Real-world applications using a vehicle in safe testing conditions could also be performed to further study distracted driving as a whole. It would also be worth further studying the relationship between delayed reaction times and the risk of crashing, as driving while doing a secondary task has also been indicated to increase the risk of crashing (Klauer et al. 2014). Overall, while more testing can be done to continue investigating distracted driving, the data collected supports that distracted driving noticeably worsens reaction times compared to non-distracted driving.

References

Klauer, S. G., Guo, F., Simons-Morton, B. G., Ouimet, M. C., Lee, S. E., & Dingus, T. A. (2014). Distracted driving and risk of road crashes among novice and experienced drivers. *The New England Journal of Medicine*, *370*(1), 54–59.