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Distractions N' Driving: video game simulation educates young drivers on the dangers of texting while driving

Haneen Saqer[a,1*], Ewart de Visser[a], Jonathan Strohl[a], and Raja Parasuraman[a]
[a]*Psychology Department, George Mason University, 4400 University Drive, MS 3F5, Fairfax, VA, United States*

Abstract. The proliferation of portable communication and entertainment devices has introduced new dangers to the driving environment, particularly for young and inexperienced drivers. Graduate students from George Mason University illustrate a powerful, practical, and cost-effective program that has been successful in educating these drivers on the dangers of texting while driving, which can easily be adapted and implemented in other communities.

Keywords: Distracted driving, education, human factors, outreach, texting

1. Introduction

With the proliferation of handheld technological devices in recent years, almost every teenager owns a smart phone, a portable music player, or a navigation system. In fact, many devices now have the ability to perform all these functions. While these devices are seen as vital to our communication and entertainment habits, their portability makes them particularly dangerous when used by drivers. According to the National Highway Traffic Safety Administration (NHTSA), in 2009 1 in 5 injury crashes in the United States involved distracted driving [2]. Even more troubling is the fact that teenagers have the highest proportion of distracted drivers and in fatal accidents involving teenagers, 16% were reported to be distracted while driving [2]. One distraction of particular concern is that of texting. Texting is a preferred mode of communication for young mobile phone users because of the ability to send texts inconspicuously during class or family outings. Some *texters* are so versed with the practice that they can send text messages without looking at the phone keypad. This ease and familiarity leads inexperienced drivers to believe that they will be able to continue to text even when they begin driving. This misconception undermines perceptions of the dangers presented by distractions and can lead to overconfidence. Texting is also particularly dangerous because the task introduces three kinds of distraction: cognitive, visual, and physical. Cognitive resources are necessary to read the messages and think of responses, visual attention is required to read the messages and see the keys when responding, and the phone must be held with the hand while manually entering keystrokes. These three kinds of distractions create a "perfect storm," whereby the risk of crash is significantly increased.

2. Practice innovation

To educate young (unlicensed or inexperienced) drivers on the dangers of distracted driving, a group of graduate students from George Mason University (Fairfax, VA, USA), set-up a demonstration that was part of the first annual US Science and Engineering Festival. The festival, meant to highlight science careers, was attended by over 500,000 parents and children. The demonstration included a PlayStation®2 video game console equipped with a Genius Twin Vibration Feedback Racing Wheel and Foot Pedals (Figure 1). Both the video game system and controls

*Corresponding author. E-mail: hsaqer@gmu.edu or visit www.distractionsndriving.com.

can be purchased online for a combined cost of less than $200.

Fig 1. Foot pedals and steering wheel used as materials.

Video output was displayed on a projector so that audience members could observe the participants' driving behavior. Participants were instructed to drive one lap of a test course on the *Gran Turismo 4* game without distraction and, upon successful competition, drive the course a second time while sending and receiving text messages from a mobile telephone. To successfully complete the test course, drivers were required to follow a lead police car through the many twists and turns of the track without significant lane deviations. The game ended with an evaluation of either a pass or fail of the test track. Invariably, performance of the drivers while distracted suffered from their baseline performance, much to the surprise of the participants and the audience members. A retired National Highway Traffic Safety Administration Human Factors Division Chief was in the audience at the time and through his volunteer capacity with the Fairfax County Police Department suggested that the graduate students present the demonstration to local area high schools.

3. Findings

Since the initial demonstration at the festival, the Distractions N' Driving team has been invited to numerous high schools to present their program and has received media attention from the Human Factors and Ergonomics Society, as well as local television and radio stations [1,3]. At the first high school, approximately 600 students attended the demonstration (Figure 2). During the presentation, teams of students participated, whereby one student drove the simulator while a friend was prompted to send texts during the second course. Projecting the video output onto a large screen onstage allowed the audience members to participate. On-lookers were instructed to count driver lane deviations, keep track of the number of times the driver looked away from the screen, and estimate the distance between the driver and the lead car. Each driving simulation lasted approximately five minutes, allowing several teams of students to partake in the demonstration (Figure 3).

Fig. 2. Approximately 600 high school students attend the first field demonstration.

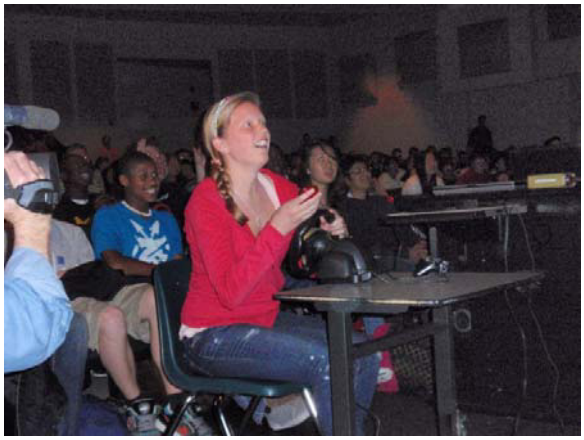

Fig. 3. A student unsuccessfully attempts to text while driving a simulated driving course.

In addition to the driving simulation, the graduate students precede the demonstration with a 25-minute presentation on the study of human factors, current driving research findings, and examples of inattentional blindness. Following the successful high school demonstrations, the graduate students were invited to two Fairfax County Courthouse Licensing Ceremonies (Figure 4) where judges distribute provi-

sional driver's licenses to the guardians of new drivers. At these ceremonies, the Distractions N' Driving team was granted the opportunity to present their simulation to new license recipients. These inexperienced drivers navigated the course while receiving text messages from their parent or guardian to simulate future real situations.

Through continued outreach efforts, the Distractions N' Driving team hopes to evaluate the effectiveness of their program by analyzing traffic data and self-report attitude and behavior questionnaire responses of drivers that attend the demonstrations. Expansion efforts are also underway with national and regional organizations (e.g., the Human Factors and Ergonomics Society and AAA – Tidewater Region).

Fig. 4. The Distractions N' Driving team at the Fairfax County Courthouse.

In the future, the team also hopes to administer pledges to students whereby they commit to not text while driving, implement safe driving habits, and speak up when others text and drive. In fact, the name of the program, Distractions N' Driving, was selected because the initials (DND) also mean "Do Not Disturb." Students taking the pledges will be provided decals with the DND logo (Figure 5) symbolizing their support.

Fig. 5. The Distractions N' Driving logo – synomous with Do Not Distrub [while driving].

4. Discussion

Increasing consumer awareness of public safety concerns can take many years of concerted efforts before behavioral changes are observed. Often times, the behavioral changes are most evident in generations that were exposed to the awareness campaigns as small children. For example, twenty years ago, many organizations worked to educate drivers on the dangers of driving while intoxicated or without proper seat restraints. Today, these dangers are engrained in our society and evident in laws and cultural norms. It may take many years for programs demonstrating the dangers of distracted driving to have the same impact, but it is critical to continue these efforts on our young and future drivers. The Distractions N' Driving program illustrates a powerful, practical, and cost-effective option that many graduate programs and companies can implement in their local communities to increase awareness on the dangers of texting while driving.

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