

Cell Phone Conversation while Driving

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INTRODUCTION

This article presents an in-depth review of studies on the conversational aspect of cell-phone use while operating a motor vehicle. Here, a cell phone refers to any mobile device used to answer and initiate calls as well to send and receive texts, which includes smartphones (e.g., iPhone, Blackberry). Conversation denotes any length of talking on a cell phone. Driving indicates operating any type of motor vehicle on the road, including stopping at a red light.

Engaging in a cell phone conversation while operating a vehicle has become a public safety concern and a social problem. Research has indicated that talking on a cell phone while operating a vehicle produces a four-fold increase in the risk of involvement in a collision compared to when not talking on a cell phone (McEvoy et al., 2005). Studies report that the risks of using hands-free cell phones can be as great as using hand-held ones, because regardless of the phone type cell-phone use while driving decreases people's driving performance and increases the likelihood of involvement in an accident (Amado & Ulupinar, 2005; Caird, Willness, Steel, & Scialfa, 2008; Collet, Guillot, & Petit, 2010a, 2010b; Dragutinovic & Twisk 2005; Hendrick & Switzer, 2007; Ishigami & Klein, 2009; McEvoy et al., 2005; Törnros & Bolling, 2005; Zhao et al., 2013). This means that using either a hands-free or a hand-held cell phone can cause drivers failing to notice pedestrians or other vehicles in their vicinity, or missing traffic signals and lanes, resulting in traffic collisions (Nurullah, Thomas, & Vakilian, 2013).

OVERVIEW

While cell phones have been around for the last several decades, the mass adoption and usage of this device is particularly evident in the last two decades. In 1987, Dr. Anthony C. Stein of Safety Research Associates, Inc., and Zareh Parseghian and Richard Wade Allen of Systems Technology, Inc. conducted one of the earliest studies on the safety implications of hand-held cell phones using a driving simulator (Stein, Parseghian, & Allen, 1987). During the early 1990s, several studies were conducted showing that talking on a cell phone poses safety risks in driving situations compared to when not using a cell phone (Alm & Nilsson, 1994; Brookhuis De Vries, & De Waard, 1991; Fairclough, Ashby, Ross, & Parkes, 1991; McKnight & McKnight, 1993). Epidemiological studies on the effects of cell phone use on traffic collisions and injuries started to emerge during the latter half of the 1990s. Violanti and Marshall (1996), for instance, found that talking on cell phones while driving for more than 50 minutes per month was associated with 5.59 times greater risk of a traffic accident. One of the most cited studies in this genre is Redelmeier and Tibshirani's (1997) study, which I have discussed in detail in a subsequent paragraph. From the early 2000s, research on cell-phone use while driving has skyrocketed with studies by scholars such as Dr. David L. Strayer and colleagues at the University of Utah (e.g., Strayer & Johnston, 2001; Strayer, Drews, & Johnston, 2003).

Research has indicated that talking on a cell phone while driving poses a safety threat to people

both in the vehicle and on the road. This is because cell phone conversations take considerable cognitive, visual, and physical demands on the person involved in this task. The use of cell phones takes one's attention away from the road and creates deterioration in driving performance, even in hands-free mode (Just, Keller, & Cynkar, 2008). However, studies have also shown that people engage in risky driving behavior, even after being cognizant of the dangers associated with using cell phones in driving conditions (Ivers et al., 2009; Nelson, Atchley, & Little, 2009; Nurullah et al., 2013; White, Hyde, Walsh, & Watson, 2010).

CURRENT SCIENTIFIC KNOWLEDGE IN CELL PHONE USE WHILE DRIVING

In this article, I identify five leading researchers who, together with their colleagues, conduct empirical investigations on the effects of talking on a cell phone while operating a vehicle. These researchers are: Dr. Anne T. McCartt at the Insurance Institute for Highway Safety, Dr. Katherine M. White at the Queensland University of Technology, Dr. David L. Strayer at the University of Utah, Dr. Anne Bolling at the Swedish National Road and Transport Research Institute, and Dr. Paul Atchley at the University of Kansas. Their representative research areas are outlined below.

Anne T. McCartt (McCartt, Kidd, & Teoh, 2014; McCartt et al., 2010; McCartt & Hellinga, 2007; McCartt, Hellinga, & Bratiman, 2006) conducts research in the areas of distracted driving, alcohol-impaired driving, driver safety, young drivers, airbag effectiveness, and occupant restraints. Katherine M. White (White et al., 2010; Nemme & White, 2010; Walsh & White, 2007; Walsh & White, 2006; Walsh et al., 2008; Walsh et al., 2007) investigates road safety, speeding, driver distraction, road-user behavior, and risk factors for cell-phone use while driving. David L. Strayer (Strayer, Drews, & Crouch, 2006; Strayer, Drews, & Johnston, 2003; Strayer & Johnston,

2001; Drews, Pasupathi, & Strayer, 2008) often uses driving simulator in a laboratory setting and examines cell-phone induced driver distraction, the effect of multi-tasking on driving performance, and attitudes of young drivers towards cell-phone use. Anne Bolling's (Törnros & Bolling, 2006; Törnros & Bolling, 2005) research is in the area of road safety, driver performance in a simulator, effects of cell-phone conversation on mental workload, and hand-held versus hands-free phones. Finally, Paul Atchley (Atchley, Atwood, & Boulton, 2011; Dressel & Atchley, 2008; Nelson et al., 2009) conducts studies on distracted driving, texting among young drivers, and perception of risk in answering and initiating a cell-phone call while driving. In the following, I discuss the findings from existing literature classified into six thematic areas.

The Dangers Associated with Cell Phone Use while Driving

Researchers agree that the use of cell phones while operating a motor vehicle can potentially result in traffic collisions (Collet et al., 2010a, 2010b; McCartt et al., 2006; Zhao et al., 2013). Both experimental and naturalistic studies found that talking on a cell phone increases the risk of collision by more than 30 percent (Wilson & Stimpson, 2010). Redelmeier and Tibshirani (1997) studied 699 drivers in Toronto who had cell phones and who were involved in traffic accidents to determine if they were using their phones at the time of collisions. By analyzing drivers' detailed billing records during the past week and cell-phone calls made on the day of the collision, Redelmeier and Tibshirani (1997) discovered that a driver had 4.3 times higher risks of involvement in a collision while using a cell phone than when not using a cell phone. McEvoy et al. (2005) followed similar methodology used in Redelmeier and Tibshirani's (1997) study with a sample of 456 drivers in Australia. McEvoy et al. (2005) found that drivers who used a cell phone up to 10 minutes before the collision had 4.1 times

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