



Do we really need to use our smartphones while driving?



Oren Musicant^{a,b,*}, Tsippy Lotan^c, Gila Albert^a

^a The Ran Naor Research Foundation, 22 Hanagar St., Hod Hasharon 45240, Israel

^b Ariel University, Ariel 40700, Israel

^c Or Yarok, 22 Hanagar St., Hod Hasharon 45240, Israel

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ABSTRACT

Smartphone usage while driving, a prominent type of driver distraction, has become a major concern in the area of road safety. Answers to an internet survey by 757 Israeli drivers who own smartphones were analyzed with focus on two main purposes: (1) to gain insights regarding patterns of smartphone usage while driving and its motivation, (2) to probe drivers' views on the perceived risk and the need to use smartphones while driving, as well as their willingness to use blocking apps that limit such usages. Phone calls and texting were found to be the most common usages while driving, hence, both were chosen to be further analyzed. 73% ($N=551$) of the respondents make phone calls while driving and almost half of them may be considered frequent callers as they admit to do it intensively while driving. As for texting, 35% of the respondents ($N=256$) text while driving and a quarter of them do so frequently. While phone calls were perceived to compromise safety by 34% of the users, texting was perceived to compromise safety by 84% of the users. However, we found that drivers place limitations on themselves as more than 70% avoid texting when they think they need to devote attention to driving. A logistic regression model indicates that perceived need and perceived safety are significant factors associated with being a frequent smartphone phone calls user, but only perceived need significantly predicts being a frequent texting user. Approximately half of all the respondents are willing to try an app which blocks smartphone usage while driving. The willingness to use such technology was found to be related primarily to perceived need. Less significant factors are work-related usage and perceived safety. Frequency of usage was not found to affect this willingness, indicating that it should not be a factor in designing and implementing interventions to limit smartphone usage while driving.

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1. Introduction

Smartphone usage, is a major concern in the road safety literature, and is likely to remain a key issue as smartphone usage continues its global rise. By the end of 2011 there were 5.9 billion mobile phones subscribers worldwide (ITU, 2011), and 432.1 million smartphones were sold just in the second quarter of 2013 (IDC, 2013). In the United States, an annual survey found a progressive rise in the percentage of drivers reporting to access the internet while driving, from 13% in 2009 to 26% in 2014. Introduction of new features to smartphones encourages usages other than calling and texting. Hence, in 2014, 18% of drivers reported on responding

to emails, and 20% on reading social media networks while driving (State Farm, 2014).

The penetration rate of smartphones in Israel, where this study was conducted, is among the highest in the world. According to a global survey "Our Mobile Planet" conducted by Google in partnership with Ipsos MediaCT (Ipsos MediaCT, 2014), the 2013 data shows that in Israel the penetration rate and daily use of the smartphone is among the highest in the world. According to the same survey, 93% of smartphone holders also use their device "on the road". In Israel, texting while driving is illegal, and so is hand-held performance of phone calls. In a phone usage survey ($N=700$) conducted in Israel (Tomer-Fishman, 2010) it was found that 81% reported not sending a text message in the past seven days, 48% avoided reading an incoming message, 13% read messages immediately, and 39% waited to attend to reading while the vehicle was stopped (for example, at a traffic light). In terms of phone calls, it was found that 44% of the sample reported making them while driving and 19% reported on doing it frequently. Furthermore, 28% of phone calling users reported that they initiated calls and not just

* Corresponding author at: The Ran Naor Research Foundation, 22 Hanagar St., Hod Hasharon 45240, Israel.

E-mail addresses: musicant.oren@gmail.com (O. Musicant), tsippy@oryarok.org.il (T. Lotan), gilaa@oryarok.org.il (G. Albert).

responded to incoming calls. When asked about the reasons for talking on the phone, 41% of the callers mentioned work-related reasons, 21% did it to make up for lost time and 20% answered the phone in order to meet certain needs such as emergencies and daily arrangements.

Public surveys are a common tool to capture reflections of public behavior and opinion. For example, the SARTRE (Social Attitudes to Road Traffic Risk in Europe) project is an extensive periodic survey conducted in twenty European countries in order to elicit knowledge of road traffic laws and attitudes toward issues such as alcohol, drugs, phone use while driving, speeding, and the use of advanced driver assistance systems. In Israel, according to the latest SARTRE (SARTRE, 2012), more than 60% of drivers never use a hand-held phone, while about 15% reported to do it at least sometimes. In this respect, Israelis exhibit safer behavior compared to the 33.4% found across 20 surveyed countries reporting the use of hand-held phones while driving. The average of 33.4% includes Sweden, the only country in the survey in which driving with hand held phones is legal. According to SARTRE, in most countries, including Israel, making phone calls while driving is perceived as less risky than other behaviors, such as driving under the influence of alcohol, drugs and fatigue. Hand-held usage has less support (63%) for increased penalties compared to drinking and driving (84%) and helmet use (78%), but more support for increased penalties than for speeding offenses (52%). In addition, talking on the phone while driving is sometimes used as a countermeasure for handling fatigue (stated by 22% of the drivers). It should be noted here that the SARTRE report did not specify the type of usage of hand-held phones (phone calls, navigation, texting, etc.).

Many recent studies indicated that actions involving usage of smartphones and smartphone applications (apps) while driving increase the risk of a crash (Asbridge et al., 2013; Caird et al., 2014). The risks are associated not only with manual handling of the phone (Drews et al., 2009), but also with the cognitive attention diverted from the primary task of driving (Haque and Washington, 2014).

As for texting, Fitch et al. (2013) reported that texting brings diverting eyes off the road much more than other activities (for example: about 23 s compared to 8 s for dialing). Yager (2013) reported that response time of drivers who send text message double, even in the presence of voice interface. A recent meta-analysis study combined estimates from 28 (mostly simulator) studies about the effect of texting (reading, typing or both) on various performance measures such as: reaction times, lane discipline (the authors used the term “lateral control”), gaze based indices and collisions occurrences. The aggregation of the results indicated that across a majority of behaviors there was increased risk with varying levels of effects (Caird et al., 2014).

As for phone calls, several studies found limited evidence of their impact on driving safety. A naturalistic driving study (Klauer et al., 2006) reported that while the odds ratio (OR) for a dialing task to predict involvement in crashes and near crashes was 2.79 (95% confidence interval (CI): 1.6–4.87), the OR for talking/listening to a hand-held phone was not significantly different from 1 (1.29, CI: 0.93–1.8). In a later naturalistic study (Klauer et al., 2014) the contribution of several secondary tasks to the occurrence of crashes was evaluated in two samples: young drivers and experienced drivers. For both samples it was found that dialing increased crash risk (young drivers, OR: 8.32, CI: 2.83–24.42, experienced drivers, OR: 2.49; CI: 1.38–4.54), while talking on the phone had insignificant impact. For other tasks such as eating, looking at roadside objects and reaching for an object other than the cellphone, a significantly higher than one OR values were estimated for the young drivers sample but not for the experienced drivers. These results indicate that experience on how (or when) to do these tasks can mitigate risk. Pertaining to phone calls, the literature yielded mixed results. Some studies indicated that during phone conversations,

compared to in-car passenger conversations, driving performance is affected in terms of approach speeds, reaction times, and avoidance of road and traffic hazards (Charlton, 2009). Other studies indicated that conversing on the phone while driving does deteriorate performance such as attention and peripheral detection, but not significantly more than conversing with a passenger (Amado and Ulupinar, 2005; Ferlazzo et al., 2008).

In summary, the literature clearly indicates an increased risk associated with texting activities. The results for phone calls are less strong; though the dialing action is usually considered as risky, the conversation itself, while controlling for other confounding factors, is probably less problematic from a safety point of view.

In light of the miscellaneous results about the safety implications of phone calls, a public deliberation has emerged recently in Israel regarding the focus and messages of government policy and actions (e.g., education, enforcement) toward smartphone usage. In this debate, the Israeli Road Safety Authority has adopted a view which concentrates on texting (Sheinin, 2013) and accordingly, promoted a public campaign to discourage drivers from texting while driving, deploying the slogan: “Words Can Kill”. The campaign also recommends that drivers install texting blocking apps, indicating the potential of smartphone’s technology itself for reducing driver distraction and, consequently, improving road safety, as well as encouraging drivers to impose self-restrictions on usage.

Considering these aspects it has become important to understand the current patterns and attitudes toward smartphone usage while driving in Israel and the differences in patterns and attitudes regarding types of usage. Accordingly, the purpose of this study was twofold: (1) to gain insights regarding patterns of various smartphone usage while driving and its motivation, and (2) to probe drivers’ view on the perceived risk and the need to use smartphones while driving, as well as their willingness to use blocking apps which limit these usages.

The paper is organized as follows: Section 2 describes the methodology with focus on main items of the survey, Section 3 presents the results and the analysis of the findings. Finally, Section 4 provides summary, insights and discussion.

2. Methodology

575 active drivers (drive a car at least twice a week) who own smartphones participated in an internet survey about smartphone usage while driving. Smartphone was defined as a cell phone with advanced capabilities, with no specific reference to internet connection. The survey was managed through one of the largest internet panels in Israel which include tens of thousands subscribers. The sample included 57% males and 43% females. 3% were 18–20 years old, 8% were 21–30 years old, 12% were 31–40 years old, 19% were 41–50 years old and 58% were above 50. 18% of the respondents did not have any hands-free device for calls (e.g., cradle, Bluetooth). Note that we cannot estimate the extent to which our sample is representative since figures about age and gender distribution among drivers that meet the study screening criteria (smartphone ownership and car usage of at least twice a week) are not available in the Israeli Bureau of Statistics. However, our analysis shows that age and gender are not significant indicators for main smartphone usage patterns investigated in this study. We therefore conclude that bias (if exists) in the sample pertaining to age and gender distribution, does not significantly (statistically wise) affect our results and derived conclusions.

The survey included various questions concerning patterns and attitudes of smartphone usage in general and in particular while driving. First, respondents were asked to list all smartphones’ features they use in general, not just while driving. Then, per each feature (e.g. phone call, texting, news & content), several questions

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