

Increasing the Use of Smartphone-Limiting Technology to Combat Distracted Driving

INTRODUCTION

Distraction from smartphones is an important road safety issue and efforts to identify effective countermeasures remain a priority. Most U.S. consumers use either an Android or iOS smartphone device that comes with a feature that can block or limit distractions (referred herein as Do Not Disturb [DND]). Unfortunately, only a small percentage of drivers use this feature while driving and often only on a subset of their driving trips. The current study aimed to (a) understand the barriers to using DND countermeasures for smartphone use while driving and (b) determine the feasibility of overcoming these barriers through educational materials to improve driver awareness and knowledge of DND.

METHODOLOGY

In Part I, the characteristics of drivers who are prone to smartphone use were explored through a literature review of recent scientific findings. The review identified 132 candidate articles, of which 32 were reviewed in depth.

In Part II, an online survey was administered to gather driver perceptions and experiences related to DND app features and to explore some of the factors that impact drivers' willingness to use the features. Three hundred licensed drivers participated in the survey (M = 33.6 years) and were classified by their DND use: current users, non-users, or previous (or former) users. The survey included several different sections: demographic information and driving history; smartphone use, dependence, and use when driving; and DND use. Respondents were also asked about their knowledge and understanding of DND features, social norms related to DND use, barriers that prevent them from using DND (and, conversely, factors that might increase the likelihood they would use them), and situations they believed DND should be automatically enabled.

In Part III, an on-road naturalistic study was undertaken to examine (a) whether training or educational material could improve drivers' awareness and understanding of DND and (b) the effects on subsequent smartphone behaviors while driving. Twenty-six participants (M = 21 years) completed the study. Participants had their personal vehicles instrumented with a data acquisition system for 10 weeks to record their behavior while driving

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(smartphone use was also monitored using the DriveWell Go™ app). Participants drove the first 5 weeks with no intervention. At the 5-week mark, participants received training designed to address misconceptions about DND functionality. Participants were asked to activate DND for the remaining 5 weeks of participation.

RESULTS & IMPLICATIONS

The studies examined in the literature review considered a wide array of factors that characterize drivers who are likely to use their smartphones while driving. While the literature is inconclusive on the role and direction of some factors, driving experience and age show clear relationships to smartphone use. Younger drivers (18–24) and those with less driving experience have increased likelihood of smartphone use while driving. Research also highlights the role of a number of cognitive and behavioral factors, as well as maladaptive phone use.

With respect to Part II, in general, younger users, compared to older users, were more knowledgeable about DND and more likely to report current DND use, but were also more likely to have discontinued use of DND. Moreover, younger previous users of DND were far more likely to believe they can drive safely while messaging than older users, suggesting that they might believe DND is not necessary because they can use their phone safely while driving.

Wanting to use music and navigation apps were the most frequently selected reasons for not using DND, outcomes that underscore an important lack of understanding of DND, which do allow music and navigation use when activated. Sixty percent of previous users reported that they forget to turn on DND and 32% of non-users reported they did not know about the feature. These outcomes suggest that drivers could benefit from training on DND features so they have a more accurate understanding of what actions DND restricts and awareness of the feature itself (e.g., can be turned on to automatically activate when driving is detected).

Most respondents reported they were in favor of automatic DND activation during stressful driving environments, including heavy rain, snow, or traffic. The selection of these environments suggests that drivers

recognize the challenges associated in these situations. Contextual awareness for DND activation as opposed to an all-or-nothing approach may increase usage. Also, improved accuracy in recognizing when a user is not a driver was cited as an important factor that could influence the likelihood of using DND. Control over what apps are restricted and insurance discounts were also identified as factors that would increase DND usage.

For Part III, pre-training knowledge of the DND feature ranged from 50% to 85% accuracy. However, post-training, all participants reported they knew how to use DND, that the feature was readily available on their phones, and that it could be set to automatically activate. However, participant opinions of DND did not change after receiving DND training.

Results also revealed a 41% decrease in the odds of a smartphone task after DND was activated, suggesting that DND was effective in lowering the number of smartphone interactions while driving. Although phone tapping duration decreased post-training for some participants, they were 5% who were more likely to have a tapping event following training. This could be due to the additional steps (and phone taps) needed to disengage DND to unlock their phone (e.g., iPhone users must clear a prompt in order to unlock the phone). Finally, participants were 6% less likely to pick up their phone following DND training, which supports the idea that DND lowers the potential for smartphone interactions while driving.

Collectively, outcomes from this study help to identify important barriers for using DND while driving as well as opportunities to increase the likelihood that drivers will use the feature, including design considerations for future versions of these applications.