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Harnessing Science, Tech and Innovation to Combat Distracted Driving

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Distracted Driving as an Nationwide Epidemic

The number of people injured from cellphone use while driving increased from 24,000 injuries in 2010 to 33,000 in 2014 (NHSTA 2014). Since federal data rely on police reports at the time of injury, the total number of crashes due to involving cellphone use is likely vastly underestimated (National Safety Council). This harmful behavior continues to occur despite the fact that 97% know this behavior is dangerous (AT&T 2012), and texting while driving is illegal in all but 4 states. Drivers under the age of 20 represent the largest proportion of drivers who were distracted by cellphone use. The risk of crashes in teen drivers was 3 to 8 fold higher if the driver was dialing or texting their cellphone (Klauer et al 2014), an effect similar to having a blood alcohol concentration of 0.1 (above the legal limit of 0.08) (Leung et al 2012).

Legal bans, public awareness campaigns, pledges to curb cellphone use while driving have had little effect on curbing the epidemic (Cheng & Meer 2012). Policy's limited impact on distracted driving is a result of its inability to address underlying impulsivity (Hayashi 2015) that causes drivers to continue to engage in this behavior, despite knowing it is against their best interests (Delgado 2016).

Innovative Potential Nudge & Behavioral Economic Strategies

Just as the Federal Aviation Administration has policies requiring the use of an "Airplane Mode" while flying, smartphone manufacturers could be required to provide a "Car Mode" that silences notifications and restricts handheld use while driving, such as Apple's Do Not Disturb While Driving setting. Preliminary studies suggest that activating these settings to come on automatically with the ability to "opt-out" reduces cell phone use while driving compared to

remembering to having to turn on these settings with each drive (Delgado 2017).

"Distracted driving is a national epidemic that is vastly underreported. Activities that cause distracted driving – such as handheld cellphone use – are illegal in many states, yet it still happens every day."

Kit Delgado, MD, MS

As a solution to this issue, the use of "behavioral economics" and public policy "nudges" have gained traction as a way to influence good choices in a predictable way without limiting freedom, often by leveraging cognitive flaws in decision making. A "nudge" uses our understanding of these flaws to subtly steer people toward making healthier choices, without anyone feeling forced into a decision. Instead, positive reinforcement and indirect suggestions influence behavior and decision making among individuals.

Recent studies conducted with intelligent speed adaptation (ISA) equipment, which provides drivers with real-time alerts of when the posted-speed limit thresholds are being exceeded, have shown that providing financial incentives reduces speeding behavior above and beyond real-time feedback (Reagan 2013, Lahrman 2012). To our knowledge, financial incentives have not been tested for reducing cellphone use while driving.

A promising policy nudge for smartphone manufacturers is to make the default phone setting of a "Car Mode" to come on automatically instead of having to opt-in to the setting. Furthermore, smartphone manufactures should allow 3rd party app designers to detect whether the Car Mode setting

is activated to come on automatically to create apps that encourage the sustained adoption of this setting. Other nudges aimed at decreasing distracted driving can focus on providing monetary and social incentives based on observed phone use from apps that measure driving and phone use behavior while driving. Many apps have been developed using the rich set of sensors on the smartphone to monitor and provide feedback on driving behaviors such as hard breaking, speeding, and now phone use while driving.

Testing Behavioral Economics

Through the combination of psychology and economics, behavioral economics provides insight into why individuals make judgment errors and irrational decisions. Behavioral economic principles can be used by different sectors to help understand the underlying processes of seemingly irrational decisions. The use of interventions derived from these behavioral economic principles, such as “nudges”, can be used to reinforce better decisions.

Implementation and Next Steps

Kit Delgado, MD, MS, Catherine McDonald, PhD, RN, Scott Halpern, MD, PhD, Kevin Volpp, MD, PhD, Flaura Winston, MD, PhD and other researchers across the Penn Injury Science Center, the Children’s Hospital of Philadelphia, and the Center for Behavioral Economics are collaborating with industry partners on research with technology and auto-insurance industries to translate behavioral economic interventions to reduce distracted driving from cell phone use. Current studies are funded by the Federal Highway Administration, the Centers for Disease Control, the National Institutes of Health, and others. Results are critical in improving safe driving behaviors and health outcomes. Furthermore, apps improved by the collected data, specifically those concerning automobile-related databases and user interfaces, would be significantly more user-friendly and effective.

Citations

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Applying behavioral economics principles across sectors

Researchers

Conducting iterative studies to find best behavioral economic strategies for behavior change regarding phone use while driving and disseminate research for public policy

Insurance Firms

Usage-based insurance (UBI) uses in-vehicle devices and/or smartphone apps to measure driving behavior directly and then enables auto-insurance companies to charge premiums accordingly, enabling discounts of up to 30-40%. UBI is at a tipping point and poised for rapid growth in the U.S. with approximately 70% of all auto insurance carriers are expected to use telematics UBI by 2020 (Center for Insurance Policy Research, 2016). This will likely drive accelerated innovation in the use of real-time behavior change strategies to reduce cell phone use.

Technology Firms, TrueMotion

Enhance driving app algorithms

