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Dear National Distracted Driving Coalition:

In support of the National Distracted Driving Coalition's (NDDC) vision of accelerating national efforts to implement short-and long-term interventions that will eliminate distracted driving (DD) fatalities, the Insurance Institute for Highway Safety (IIHS) has agreed to develop, conduct, and analyze results from a nationally representative survey of drivers established from the Health Belief Model and focused on identifying: 1) what will encourage termination of distracted driving behaviors and 2) the barriers preventing behavior change. In preparation for survey development, the IIHS performed this literature review to summarize what other studies on distracted driving have found, which primarily focus on distraction due to phone use. This literature review is not exhaustive but should sufficiently guide instrument development to ensure that we can gain novel information from this effort.

Distracted Driver Typography:

Distraction-prone drivers make up an estimated 42% of the United States driving population (Schroeder et al., 2018). Drivers who are more likely to self-report driving while distracted are characteristically: younger than age 44, more affluent and educated, and have a history of receiving traffic citations and crash involvement (AAA Foundation for Traffic Safety, 2020; Ehsani et al., 2015; Hill et al., 2015; Schroeder et al., 2018; Stavrinos et al., 2020; Vanlaar et al., 2021). Those who engage in phone use while driving report a high self-efficacy of their ability to use their phone and drive and have more confidence in their abilities to do so than of others (AAA Foundation for Traffic Safety, 2020; Hill et al., 2015; Sanbonmatsu et al., 2016; Shevlin & Goodwin, 2019). Subjective norms (those who think the people close to them approve), moral norms (drivers do not think the behavior is immoral), attachment to one's phone, low perceived threats of distracted driving to personal safety, and history of distracted driving are predictive of future engagement (Shevlin & Goodwin, 2019; Shoots-Reinhard et al., 2021; Stavrinos et

al., 2020; Weller et al., 2013). Those who report frequent phone use while driving tend to spend greater

proportions of their drives engaging with their phones (Sanbonmatsu et al., 2016).

Prevalence of Distracted Driving Behaviors and Justification:

Distracted driving is widespread in the United States, with extensive variation in the prevalence of

distraction subcategories (i.e., texting, app use, phone calls, eating, external distractions, other people). However,

phone-related distractions account for most distracted driving behaviors (AAA Foundation for Traffic Safety, 2020;

Cambridge Mobile Telematics, 2017; Ehsani et al., 2015; Hill et al., 2015; Sanbonmatsu et al., 2016; Schroeder et

al., 2018). Studies including only teens and younger adults report a much larger prevalence of reading or typing a

text message than studies representative of the entire driving population. This holds when participants are asked

about behavior engagement in the last 30 days (teens and young adults: 65-84%; general population: 30-39%) or

ever (teens and young adults: 91%; general population: 25%) (AAA Foundation for Traffic Safety, 2020; Ehsani et

al., 2015; Hill et al., 2015; Schroeder et al., 2018; Shevlin & Goodwin, 2019). Distraction occurs on all road types

and at varying speeds (Cambridge Mobile Telematics, 2020). A study of college students found 50% of participants

reported sending texts while driving on the freeway, 60% while in stop-and-go traffic, and 87% at traffic lights (Hill

et al., 2015).

Because distracted driving is difficult to measure, estimates on the impact distracted driving has on crash

outcomes fluctuate depending on study methodology and is likely substantially underestimated (Cambridge

Mobile Telematics, 2020). An observational study using dash-cam footage found 68% of crashes involved some

form of observable distraction (Dingus et al., 2016). However, the National Highway Traffic Safety Administration's

(NHTSA) National Center for Statistics and Analysis (2020) attributed just 9% of all crash-related fatalities to

distraction. In a survey of U.S. drivers, 6.8% reported they were more likely to drive distracted during the COVID-19

pandemic compared with before, although most reported no change and 1 in 5 reported less (Vanlaar et al., 2021).

Difficulties in measuring the behavior and the subsequent underestimation of the crashes and injuries resulting

from distraction likely contribute to some drivers having low risk perceptions (Cambridge Mobile Telematics, 2020;

Shoots-Reinhard et al., 2021).

Drivers reported keeping their phone in their pocket or purse most (44%), followed by in a cup holder or

tray (25%), then on the passenger seat (8%) (Schroeder et al., 2018). Among the general population, the most

common reasons for answering a phone call while driving are: who is calling (36%), how important the call is

(17.2%) and if the call is work-related (14.4%); while common reasons for making a call are: the importance of the

call (27.8%), being in need of directions or other information (13.4%) and if the call is work-related (13%)

(Schroeder et al., 2018). Similarly, respondents most often cited the importance of the message (43%) or if the

message was work or personal (9% each) for why they send texts while driving (Schroeder et al., 2018). The most

common reasons for using an app while driving are: to get directions or other information (21%), for music or

entertainment (12%), and out of boredom (11%) (Schroeder et al., 2018). Bad weather, bumper-to-bumper traffic,

and fast-moving traffic are the primary driving situations drivers won't talk, text, or use phone apps (Schroeder et

al., 2018).

Perceptions of Safety:

Despite many drivers self-reporting engagement in distracted driving behavior, an overwhelming majority

of drivers consider the behavior unsafe (AAA Foundation for Traffic Safety, 2020; Schroeder et al., 2018). This

implies a clear disconnect between beliefs surrounding the behavior and behavior engagement; many agree the

behavior is unsafe yet continue to do so (AAA Foundation for Traffic Safety, 2020; Sanbonmatsu et al., 2016). High

self-efficacy characteristic of drivers who engage in distracted driving is likely driving this disconnect (AAA

Foundation for Traffic Safety, 2020; Hill et al., 2015; Sanbonmatsu et al., 2016; Shevlin & Goodwin, 2019). Drivers

consider talking on the phone, especially when done through the vehicle's voice system, as less dangerous than

distracted driving activities requiring phone manipulation (i.e. reading or sending a text message or email) (AAA

Foundation for Traffic Safety, 2020; Hill et al., 2015).

Most drivers (66% of distraction-averse; 64% of distraction-prone) feel a driver can safely take their eyes

off the road for 0-2 seconds, however, a greater proportion of distraction-prone drivers say 3-6 seconds is safe

(32%) than distraction-averse drivers (26%) (Schroeder et al., 2018). This is troubling considering a driver would

travel the length of a football field in 5 seconds at 55 mph (National Highway Traffic Safety Administration, 2021).

Drivers are largely unaware of how distraction impacts their driving; a staggering 52.6%, 52.5%, and 31.3% of

drivers feel there is no difference in their driving when they talk, use apps, and text, respectively, while driving,

(Schroeder et al., 2018). This suggests a strong need for educational messaging surrounding the true dangers of

distracted driving and the impact driving distraction can have.

Messaging and Intervention Strategies

Various countermeasures have been deployed to combat the distracted-driving problem. Support for

distraction reduction tends to be higher among those who perceive a greater risk (Shoots-Reinhard et al., 2021).

One method has been through the enactment of legislation banning texting or hand-held phone use while driving.

Though the prevalence of distracted driving behavior based on self-reported data and observational studies is

widespread, most of the population favors legislation to combat the behavior (AAA Foundation for Traffic Safety,

2020; Sanbonmatsu et al., 2016; Schroeder et al., 2018; Shoots-Reinhard et al., 2021). This is promising as drivers

are more likely to comply with laws they support (Tapp et al., 2015)

Although support for legislation exists, perceptions of enforcement appear low and declining. In 2015,

56% of participants in NHTSA's national survey felt it was likely that a driver would be ticketed for sending text

messages or emails while driving, but AAA Foundation for Traffic Safety's 2019 Traffic Safety Culture Index found

only 42.7% of participants felt the same behavior would result in a driver being ticketed (AAA Foundation for

Traffic Safety, 2020; Schroeder et al., 2018). Just 3.6% of NHTSA's study population reported ever being stopped by

police for using their phones while driving (Schroeder et al., 2018), which is likely in part due to the difficulty in

detection and subsequently enforcement. Studies exploring long-term effects of legislation show mixed results

(Cambridge Mobile Telematics, 2020; McCartt et al., 2010) but high-visibility enforcement campaigns in

Connecticut, New York, California, and Delaware proved effective at reducing hand-held cell phone use and texting while driving, suggesting perceptions of tough enforcement among the public is crucial to reducing the behaviors (Cosgrove et al., 2011; Schick et al., 2014). This supports the theory that the greatest reduction in unwanted behavior comes from the greatest certainty of being caught rather than the harshest penalty (Gershowitz, 2011). This argues against penalties as stiff as driving under the influence of alcohol or other drugs as some have suggested if the laws aren't being enforced.

In addition to legislative tactics, educational campaigns and organizational strategies to encourage desired behaviors have been implemented. Studies on the effectiveness of these campaigns found messages should be positive-, permissive- (i.e., "help you drive without using your phone), and gain-framed (i.e., discounts and rewards) and avoid the use of restrictive and loss-framed messaging (i.e., "prevent you from using your phone") as the former is much more effective at producing desired behavioral changes than the latter (Cambridge Mobile Telematics, 2020; Delgado et al., 2018; Gallagher & Updegraff, 2012; Shoots-Reinhard et al., 2021). Furthermore, insurance company strategies that inform of discounts by saying "charging good drivers less" outperform negatively framed messages like "charging bad drivers more" (Shoots-Reinhard et al., 2021).

Campaigns should carefully consider the intended audience and the mechanisms of current behavior to effectively prompt change. For example, when asking teens if they were willing to give up distracted driving behaviors and under what conditions, they were overwhelmingly willing or somewhat willing to give up reading texts (90%), sending texts (95%), and social media (99%) while driving and most felt gain-framed financial incentives would be very effective at reducing the behavior (75%) (Delgado et al., 2018). However, they were less willing to give up navigation and music apps (Delgado et al., 2018). This points to the benefit of using the power of freedom of choice as a driver of behavior change by targeting the behaviors people are not willing to give up and suggesting different risk-mitigation strategies, like encouraging the use of hands-free technologies or pre-programming directions (Shoots-Reinhard et al., 2021).

A few studies have focused on message content and NHTSA's survey asked participants about what type of messaging they've seen and where. About half responded TV advertisements or public service announcements, and about a third indicated billboards (Schroeder et al., 2018). When asked about the content of messaging, the four most common were related to drinking and driving or driving without a seatbelt, with the "It Can Wait" campaign rounding out the top five and only half saying they heard the slogan in the last 30 days (Schroeder et al., 2018). This suggests traffic safety messages reach the general population but highlights a need to increase distracted driving focused messaging. This survey was not designed to ask if these messages were effective at changing the participants behavior, which is needed. Researchers studied the interest in distracted driving related videos uploaded to YouTube as measured by view counts and found there is high interest in viewership (Gjorgjievski et al., 2020) indicating the internet may be an effective medium for dispersing such messaging. These researchers argue the need for portraying outcomes more representative of distraction related motor vehicle collisions like orthopedic injuries resulting in long-term disability rather than death, which is a far less common consequence but portrayed nearly twice as much (Gjorgjievski et al., 2020). An educational strategy which communicates more realistic outcomes may reach those who think distracted driving poses trivial risk (Shoots-Reinhard et al., 2021), but be careful to not exaggerate or misrepresent true risks posed as suggested by Gjorgjievski et al. (2020), which can be counterproductive (Shoots-Reinhard et al., 2021).

Technology-based interventions are a newer form of intervention showing great promise - but many require fine tuning to live up to their full potential. Although a study of the current feature of automatic Do Not Disturb While Driving, where a smart phone will automatically enter that Do Not Disturb status upon vehicle Bluetooth connection proved to be ineffective (Reagan & Cicchino, 2020), questions about increased use if the user had to opt out vs opt in loom. Telematics apps, which track driving behaviors and provide feedback to the driver, have been proposed to affect long-term behavior change with frequent users showing long-term improvement in driving behavior, particularly when insurance companies encourage use in exchange for incentives (Cambridge Mobile Telematics, 2020). Minnesota teens who used applications blocking phone usage made

significantly fewer calls and texts per mile traveled compared with teens in the study who didn't use the

application (Creaser et al., 2015). A study of South Australian corporate fleet drivers testing cellphone blocking

technology found drivers felt the technology was effective at preventing phone use while driving but user

acceptance was low due to product unreliability complaints (Pointe et al., 2016). These technologies cannot be

effective if they're not used, which points to a potential participation bias – those who are willing to use the app

may be safer drivers to begin with.

It is important to understand both the oppositions of telematics or cellphone blocking app use and what

would encourage use so program developers can tailor their programs to their intended audience, thus maximizing

effectiveness. For example, teens strongly opposed the use of apps that allowed for parental monitoring (Delgado

et al., 2018) and Australian drivers favored apps that blocked text and internet browsing functions but allowed for

continued use of GPS, Bluetooth, and music-playing capabilities (Oveido-Trespalacios et al., 2019). Because most

teens said gain-framed financial incentives (75%), group-based financial incentives (58%), and insurance discounts

(53%) would be "very effective" at reducing texting and driving (Delgado et al., 2018) and because the use of

technology to monitor behavior and deliver financial incentives has been effective at changing various other

health-based behaviors (Kurti et al., 2016), developers might consider how they could incorporate financial gains

with their product to enhance use. We will set to identify who is and who is not willing to use these sorts of

technologies and why.

Gaps Identified and Recommendations

This process has allowed for identification of shortcomings in prior research and effective behavioral

intervention strategies to guide future efforts. Taking a thoughtful and organized systems approach has the

potential to be most effective because not just one strategy can effect change on this scale. We know there is

public support for laws targeting distracted driving behavior and high-visibility campaigns have been successful,

but we don't clearly know if people would stop the behavior if they felt the risk of law enforcement apprehension

was higher in general. We will ask this, and if the data suggest that a higher perceived risk of law enforcement

penalty can reduce the behavior, the NDDC should encourage law enforcement stakeholders to consider amplified

efforts to target the behavior. This could serve as one component of a dynamic systems approach.

Traffic safety PSAs can be another aspect of the systems approach. However, research suggests that

distracted driving messages don't get as much airtime as other traffic safety topics and those that do exist portray

outcomes that drivers consider unrealistic. PSAs that target distracted driving behavior should consider the high

prevalence of the behaviors with the reality that many of the people who self-report the behavior have not been in

a severe crash which has resulted in a fatality, as many of the messages suggest. It is vital that these targeted

strategies communicate the genuine risks of distracted driving, as overblown or exaggerated messaging can cause

resentment towards the message and result in even more of the undesired behavior. We will aim to better

understand if PSAs resonate with the public and encourage behavior change.

Many underestimate the risks of distracted driving and how their driving behavior changes while

overestimating their abilities to drive distracted and the time they can safely take their eyes off the road.

Educational campaigns designed to target the norms, peer and social networks, and risk perceptions of those who

view the risk to be low and the behavior as socially acceptable may produce desired results. Prior research has

suggested using the mechanism driving support for stopping with benefits for use to encourage better behavior,

like suggesting the use of voice systems or waiting until stopped at traffic light to look for information, reply to a

text message, or change music. With the value that U.S. citizens place on personal freedoms, particularly in the

current political and social climate, it is logical that policies describing "bans" are unpopular. To move the needle,

we need to encourage drivers make the right choices while highlighting the choice is theirs to make.

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Sincerely,

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