Correlates of Motor Vehicle Screen Use: Moving Screen Use versus Stopped Screen Use

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Abstract

Literature on texting and driving generally makes no distinction between moving (while actively driving) and stopped (e.g., while at a red light) texting. The purpose of this study was to analyze differences in regards to moving and stopped motor vehicle screen use (MVSU). Specifically, we examined mean differences in occurrence rates and attitudes towards the two MVSU behaviors and whether known correlates of texting and driving relate differently to moving versus stopped MVSU. Data for this study was obtained from 236 adults recruited through a participant pool of a Southeastern mid-sized college, social media and Amazon's MTurk. Results suggest that while individuals view moving and stopped MVSU as conceptually different behaviors with different evaluations of driving self-efficacy, perceived risk, and overall levels of behavior frequency. Correlates generally relate similarly to both moving and stopped MVSU with few significant differences.

Introduction

Screen use while driving, a common form of distracted driving, has become a severe issue in modern life, with 70% of drivers using their phone at least sometimes while operating their vehicle, with that percentage reaching as high as 93% among college populations in some studies (Benson et al., 2015). An estimated 3,328 deaths and 421,000 injuries were a result of distracted driving in 2012 in the United States, making it one of the most dangerous distracted driving behaviors (Wang, 2016). Inattention or diverted attention by drivers accounts for as little as 2% (in Great Britain) and as large as 37% (in Spain) of motor vehicle injuries (Benson et al., 2015). Driving under the influence remains the leading cause of motor vehicle accidents, however, distracted driving by cell phone use is growing (Benson et al., 2015). Some studies suggest that cell phone use while driving is more dangerous than other forms of distracted driving, such as eating or reaching for something in the car (Pope et al., 2016).

Predictors and Correlates of Motor Vehicle Screen Use (MVSU)

Much of the research in the field has focused on younger drivers and their tendencies to use a cell phone while driving; 52% of U.S. drivers using cell phones were between the ages of 15-29 (Wang, 2016). While 71% of young drivers have sent a text while driving and 78% have read a text message while driving (Wang, 2016), cell phone use among older drivers is common as well, with 56% of 30-64 year olds reporting using a phone while driving and 66% of them admitting to using a phone while at a red light in the United States (Engelberg et al., 2015). Broadly in the United States, middle-aged drivers are found to engage in cell phone use while driving at similar rates to younger drivers, which is more than that of older drivers (Engelberg et al. 2015; Pope et al., 2016). In regards to gender differences in distracted driving, results are mixed. Some studies report no significant gender differences (Benson et al., 2015; Suhr & Dula,

2016), while others report some significant differences among gender, suggesting there may be some effect of gender on distracted driving but that more research is needed (Cordellieri et al., 2015).

A variety of individual differences have been linked to texting and driving in prior studies. People who usually engage in cell phone use to alleviate boredom in their everyday life were found to be more likely to text and drive (Seiler, 2015). General risky driving is also positively correlated with cell phone use while driving (Suhr & Dula, 2016) and many studies of motor vehicle screen use (MVSU) include it in their questions. While driving history is a common piece of questionnaires about texting and driving (Nelson et al., 2009; Rusu et al., 2016; Suhr & Dula, 2016), it is often not addressed in analysis. However, greater driving frequency was linked to more driving violations (Rusu et al., 2016).

Risk perception, driving self-efficacy, and message importance also impact frequency of motor vehicle screen use (MVSU). Drivers who perceive cell phone use while driving as riskier engage less in the behavior (Nelson et al., 2009; Prat et al., 2015; Shi et al., 2015). However, the importance of the message also weighs heavily into decisions to use cell phones while at the wheel; the more important a message is, the more drivers will initiate and answer calls and text while driving, even if such behavior is considered risky (Nelson et al., 2009). Furthermore, driving self-efficacy and self-perceived ability to compensate for the distraction caused by cell phone use predicts more texting while driving (Prat et al., 2015; Wang, 2016).

Values and beliefs about the immorality of texting while driving also relate to actual and intended cell phone use while at the wheel. Individuals typically hold negative attitudes toward texting and driving, agree that most people would disapprove of texting and driving, and agree that it is a morally wrong behavior (Benson et al., 2016; Nemme &White, 2010; Prat et al.,

2015). However, there are also variations in these beliefs, which predict motor vehicle screen use. Wang (2016) examined the extent to which drivers viewed cell phone use while driving as a reflection of moral values (serving a value expressive function). They found that that those who viewed cell phone use while driving to indicate an individuals' values and moral status also had more negative attitudes towards the behavior and less intentions to engage in it. Wang (2016) also found that anticipatory guilt about texting (expectations that one will feel guilty if they perform or refrain from an action) significantly predicted whether passengers would ask a driver to stop texting and driving. As guilt is a moral emotion that often stems from recognition of personal responsibility for negative outcomes (Tangney et al., 2007), Wang's (2016) study indicates that the extent to which individuals view texting while driving as a moral issue may predict their attitudes towards and engagement in the behavior. That is, the more an individual believes that MVSU is a moral issue, and thus that refraining from it makes them more moral, the less they may engage in MVSU.

Stopped versus Moving MVSU

Most studies on texting and driving neglect to make a distinction between texting while the vehicle is moving and texting while stopped, for example at a stoplight. Engelberg (2015) examined this difference, however, and found that more individuals engaged in red light texting than texting while the car was in motion. Given the sparseness research in this area, little is known about attitudes towards or correlates of cell phone use when a car is stopped versus in motion. There are multiple reasons this is potentially an important distinction to examine. The actual and perceived risk is most likely very different in these situations. The potential for hurting oneself or others is decreased when the driver who is texting is not moving his or her vehicle, the risk of a crash is minimized to being hit by another driver, the amount of damage to

the vehicle is minimized, and the liability is reduced for the stopped driver. This means that drivers may view cell phone use while the car is in motion as more of a moral issue (or value expressive behavior) than cell phone use while the car is temporarily stopped, potentially leading to different attitudes towards the behavior and motivations for engaging or refraining in it.

In addition, the reasons why people engage in texting while moving or stopped may be different. Seiler (2015) found that those who use their phone while bored are more likely to text and drive, but his study did not differentiate texting when the car is in motion from when it is stopped. As there is much less stimulus at a red light, it is possible that boredom-related cell use is more related to stopped than moving MVSU. The perceived importance of communication has also been shown to influence individuals' decisions to engage in cell phone use (Nelson et al., 2015, Shi et al., 2015). Shi et al. (2015) found that drivers were more likely to engage in MVSU when they viewed the call matter as more important, although they attempted to call rather than text in an effort to mitigate risk. It is possible that the perceived importance of communication will relate even more strongly to stopped MVSU than moving MVSU, as individuals attempt to balance a need to engage in important communication with an effort to mitigate some of the risk of MVSU. These distinctions could help policy makers target campaigns based on individual's motivations and texting patterns.

While texting while at a red light is less dangerous than texting while moving, it may be problematic in that it serves a "gateway" function, increasing the likelihood that an individual will text while moving in the future. Gateway behaviors are generally discussed within the context of drug use, when legal drugs are used prior to escalation to use of illicit drugs (Kandel, 2002). It is possible that the phenomenon of gateway behaviors could also be applicable to other forms of law breaking, moral transgressions, and/or risky behaviors. For instance, an increased

frequency of drug use can change a person's perspective of drug use from a prudential one to a personal one, meaning that as drug use increases, individuals tend to see the behavior as more within their personal realm of control, outside of societal regulation, and as less of a morally wrong behavior (Nucci, 1991), encouraging more and more extreme drug use. If a similar pattern holds true for other risky behaviors, stopped MVSU could be a gateway behavior to moving MVSU. This may be particularly relevant because of the large variation in state laws regarding screen use while operating a motor vehicle. Some states, for instance South Carolina and Tennessee, explicitly exclude stopped screen use from what is considered illegal screen use while driving (SC Code 2016; Tenn. Code Ann 2010). Other states, for example Rhode Island and New York, include clauses specifically making texting illegal both when the vehicle is in motion and when it is stopped at a red light (R.I. Gen. Law 2012; N.Y. U.C.C. 2010). Still other states, like Kentucky or Utah, use broad terms that that make no distinction between stopped versus moving motor vehicle screen use, leaving it up to individual interpretation (Ky. Rev. Stat. Ann. 2011; Utah Code 2014). If drivers view the moving and stopped MVSU differently, but live in a state where there is no legal distinction, they may more easily break the law to text at a light (because the law does not match their beliefs about the wrongness of the behavior), which in turn may open the gateway process to more serious (i.e., moving) MVSU violations.

Current Study

Studying individuals' engagement in and conceptions of motor vehicle screen use when vehicles are stopped versus moving is important in order to better tailor interventions, laws, and advertisements designed to discourage the behavior. Intervention or campaign strategies may need to be tailored to suit each type of behavior and the types of individuals who are likely to engage in one, the other, or both. Furthermore, examining correlations between these two screen

use behaviors and differences in their correlations with known predictors of moving motor vehicle screen use (anticipatory guilt, value expressive function, boredom, etc.) can help to determine how engagement in these two behaviors are related.

The present study is an exploratory study to examine if behaviors related to texting and driving in the broader sense, according to previous studies, are related in a similar fashion to both driving and stopped texting. We made the following hypotheses.

Hypothesis 1: Based on Engelberg (2015) and common knowledge regarding the risks of moving versus stopped motor vehicle screen use, we expected that engagement in motor vehicle screen use would be higher, attitudes would be more accepting, and perceived risks would be lower when for stopped compared to moving MVSU.

Hypothesis 2: In line with a gateway hypothesis (Kandel, 2002) and similar communicative functions of the two behaviors, we expected to see a positive correlation between moving and stopped motor vehicle screen use.

Hypothesis 3: As using a cell phone while stopped is less likely to result in a crash, we expected that individuals would feel greater ability to use phones while stopped than in motion, but that feelings of ability and risky driving behaviors more generally would be less related to stopped than moving motor vehicle screen use.

Hypothesis 4: We expected that boredom-related cell usage would more strongly predict stopped than moving motor vehicle screen use.

Methods

Participants

Participants were 236 adults recruited through postings on Facebook, the participant pool of a Southeastern mid-sized college, and Amazon's MTurk. The vast majority of participants

(98.3%) were from the United States, with participants residing in 31 U.S. states (63.5% in Florida). Four participants were from outside of the United States (Canada, Mexico, Nicaragua, and the United Kingdom). Analyses run on data sets including and excluding these international participants showed no meaningful changes, so all participants were retained in this study to maximize analytic power. The institutional review board of the authors' home institution approved this study and a waiver of documentation of consent was obtained. Therefore, participants read an informational letter and then completed questionnaires online using the Qualtrics survey platform as part of a larger intervention looking at a texting and driving behavior.

Participants were recruited through a combination of a university subject pool (SONA; N = 45), Amazon MTurk (N = 60), and social media advertisements or class announcements (N = 131). Individuals recruited through SONA received extra credit in their college courses, those completing the study through Amazon MTurk were monetarily compensated ($3 for a 40-minute survey), and those recruited through social media were not compensated. Participant ages ranged from 17 to 73, with a mean age of 35 and a standard deviation of 14.17. The majority (70.8%) of participants were female. The racial breakdown of participants is as follows (note percentages may add up to more than 100%, as participants could check multiple boxes, as they applied): 84.3% White or Caucasian, 8.1% Hispanic or Latino, 6.4% African American, 3.8% Asian or Pacific Islander, 0.4% Arab or Middle Eastern, 1.3% other. Total household income ranged from under $25,000 a year to over $150,000; the majority of participants (66.9%) made less than $74,999 a year. All participants were required to have a valid driver's license and to have driven in the prior week in order to be eligible to participate in the study. Most (86.9%) of participants owned their own car, while the rest either rented or shared a car. Participants varied in miles

driven per week, ranging from less than 50 to more than 400, with the majority (66.5%) driving 100 miles or less per week.

Measures

Demographics. Demographic information was collected about all participants, including race, ethnicity, gender, and socioeconomic status. Questions about driving frequency, car ownership, and history of crashes and moving violations were also asked. Driver location was determined from the IP address of the individual as recorded by Qualtrics.

MVSU frequency. Two items were used to assess the frequency with which participants engage in motor vehicle screen use. Motor vehicle screen use was defined for participants as "screen use on wireless devices, such as smart phones, while driving." Participants were informed that "this includes behaviors such as texting, tweeting, or writing an e-mail; reading a text message, tweet, or email; scrolling through social media; reading an online article; playing an online game; changing music volume or selection; and taking a photo. It does *not* include talking on a phone or viewing a GPS map, but does include looking up new directions on a GPS while driving." After reading the definition of motor vehicle screen use, participants were asked how frequently in the last week had they engaged in motor vehicle screen use with passengers and without passengers in the car. These two questions separately asked in terms of driving a "temporarily stopped motor vehicle (e.g., at a red light)" and a "moving motor vehicle." Participants responded on a seven-point scale ranging from 1 (never) to 7 (more than once, every time I drive). Reliability was acceptable for moving MVSU, $\alpha = .84$, and stopped MVSU, $\alpha = .82$.

MVSU acceptability. Participants evaluated "the acceptability of screen use on a wireless device while driving…" a "temporarily stopped (e.g. at a red light)" and a "moving"

motor vehicle. Reponses were rated on a 1 (not wrong at all) to 5 (extremely wrong) scale. These items were assessed separately as single items for moving and stopped screen use.

Value expressive function. The extent to which MVSU behavior serves a value expressive function for participants (reflects underlying moral values or the morality of the individual) was assessed using a four-item scale from Wang (2016). Example items include "*refraining from engaging in screen use on a wireless device while driving shows that I am a good person*" and "*refraining from engaging in screen use on a wireless device while driving shows that I am a law-abiding individual."* These questions were separately applied to moving and stopped motor vehicle screen use. Each item was rated from 1 (strongly disagree) to 7 (strongly agree). Reliability was acceptable for moving MVSU $\alpha = .86$ and stopped MVSU $\alpha = .93$.

MVSU self-efficacy. Motor vehicle screen use self-efficacy was measured using a single item from Benson et al. (2015): "*I am confident that I could engage in screen use on a wireless device while driving.*" This item was rated for moving and stopped motor vehicle screen separately. Responses were measured on a seven-point scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Risky driving. Risky driving behaviors were assessed using Dula's Dangerous Driving Scale (Suhr & Dula, 2016). This scale consisted of 28 items rated on a five-point scale ranging from 1 (never) to 5 (always). Items included "*I make rude gestures (e.g., giving 'the finger'; yelling curse words) toward drivers who annoy me*" and "*I will drive when I am drunk."* Reliability was good, $\alpha = .89$.

Boredom-related cell phone use. Boredom-related cell phone use was measured using a single item from Seiler (2015): "*When I am bored, I use my cell phone to entertain myself.*" The rating scale was adapted to range from 1 (never) to 5 (always), instead of the original yes or no.

Inappropriate cell phone use. Participants' engagement in three different inappropriate cell phone behaviors was measured using items from Seiler (2015). The first item ("*How often are you a passenger in a car where the driver uses their phone while driving?"*) and second item (*"How often do you send or receive text messages to exchange information quietly when you are in a setting where you can't make a voice call, like a meeting or a movie?"*) were measured on a scale from 1 (never) to 5 (always). The third item, "*Have you ever sent nudes/sexted?*" was measured dichotomously (yes or no). Consistent with Seiler (2015) these items were treated individually and not aggregated into a scale.

Anticipated guilt. Anticipated guilt was measured on a 9-item scale adapted from Wang (2016). Wang's (2016) original 3-item scale assessed individuals' expected feelings of guilt upon failing as a passenger to ask a driver to stop texting. The current scale applied the original three question stems ("I would feel guilty if…", "I would apologize if…", "I would feel I'm in the wrong for…") to three aspects of motor vehicle screen use: generally engaging in the behavior, injuring someone else as a result, and injuring oneself as a result. The resulting nine items were separately assessed for motor vehicle screen use in a moving vehicle and in a temporarily stopped vehicle. For instance, one question might read "*I would feel guilty if I engaged in screen use on a wireless device while driving a moving motor vehicle.*" Items were rated on a scale from 1 (strongly disagree) to 7 (strongly agree). Reliability was high for moving MVSU, $\alpha = .88$, and stopped MVSU, $\alpha = .96$.

Riskiness of MVSU. Participants' evaluations of the risk of a motor vehicle crash as a result of MVSU was assessed using six items drawn from Prat et al. (2015) and Falk (2010.) These items assessed the frequency and seriousness of risk consideration. One item assessed the perceived likelihood of a crash: "*What do you think the likelihood is that you would get into an accident while engaging in screen use on a wireless device while driving a motor vehicle,*" two items assessed the perceived likelihood of injury from a crash, *"If you got in an accident while engaging in screen use on a wireless device how likely do you think it would be that… you would get seriously injured or killed?" and "…you would seriously injure or kill someone else?"* and three items assessed the frequency with which participants normally consider each of those risks, e.g., "*How often do you think about the possibility that you would get into an accident while engaging in screen use on a wireless device while driving a motor vehicle?"* Questions asking about the likelihood of a crash/injury were measured on a seven-point scale ranging from 1 (not very likely) to 7 (very likely). Questions asking about the frequency of thoughts were measured on a five-point scale ranging from 1 (never) to 5 (often). These six questions were asked twice, once each regarding moving and temporarily stopped motor vehicle screen use. Reliability was acceptable for moving MVSU, $\alpha = .86$, and stopped MVSU, $\alpha = .86$.

Risky health behavior. Risky health behavior was measured using the 10-item Risky Behavior scale from Weber et al. (2002). Participants were asked to indicate the likelihood that they would engage in 10 different risky behaviors, including "*smoking a pack of cigarettes per day*" and "*taking a medical drug that has a high likelihood of negative side effects*." All questions were rated on a five-point scale from 1 (extremely unlikely) to 5 (extremely likely). Reliability approached acceptability, $\alpha = .64$.

Results

Mean Differences

Frequency of MVSU. A paired *t*-test was run on overall frequency of engaging in moving motor vehicle screen use versus stopped motor vehicle screen use. Participants engaged in more MVSU when temporarily stopped ($M = 3.13$, $SD = 1.56$, indicating an average of using screens occasionally in the past week) than when moving ($M = 2.01$, $SD = 1.26$; representing an average of using screens once or twice in the past week), $t(235) = -15.37$, $p < .001$. Moving and stopped MVSU frequency were highly correlated, $r(234) = .71$, $p < .001$. Overall, 48.1% of participants indicated engaging in MVSU at least once in a while when moving and 76.1% of participants indicated doing so while stopped. Table 1 depicts the distribution of MVSU behaviors for stopped and moving conditions.

Level of acceptability. A paired *t*-test was run on acceptability MVSU while moving versus stopped, with higher scores indicating less acceptance of the behavior. Participants rated moving MVSU as less acceptable ($M = 4.21$, $SD = .94$) than when stopped ($M = 2.37$, $SD = 1.25$), $t(218) = 22.16$, $p < .001$. Acceptance of stopped and moving MVSU was moderately correlated, $r(217) = .40$, $p < .001$.

Anticipated guilt. A paired *t*-test was run on anticipated guilt regarding moving and stopped MVSU. Participants anticipated feeling more guilt from engaging in moving MVSU ($M = 5.58$, $SD = 1.58$) than stopped MVSU ($M = 3.14$, $SD = 2.08$), $t(212) = 17.70$, $p < .001$. Anticipated guilt was moderately correlated for stopped and moving MVSU, $r(211) = .42$, $p < .001$.

MVSU self-efficacy. A paired *t*-test was run on self-efficacy for both moving and stopped MVSU. Participants had more confidence in their abilities to engage in stopped ($M =$

5.34, *SD* = 1.68) than moving MVSU (*M* = 2.72, *SD* = 1.80), *t*(235) = -23.78, *p* < .001. Self-efficacy was strongly correlated for moving and stopped MVSU, *r*(234) = .52, *p* < .001.

Riskiness of MVSU. A paired *t*-test was run on perceived riskiness of MVSU while moving versus stopped. Participants perceived moving MVSU as more risky (*M* = 3.92, *SD* = 1.25) than stopped MVSU (*M* = 2.40, *SD* = 1.14), *t*(222) = 18.54, *p* < .001. Riskiness was moderately correlated for moving and stopped MVSU, *r*(221) = .49, *p* < .001.

Value expressive function. A paired *t*-test was run on the value expressive function of stopped versus moving MVSU (the extent to which people feel that such behavior reflects their moral values or moral identity). Participants perceived refraining from moving MVSU was more reflective of moral values (*M* = 5.77, *SD* = 1.20) than refraining from stopped MVSU (*M* = 5.04, *SD* = 1.57), *t*(211) = 7.40, *p* < .001. The extent to which people viewed stopped and moving MVSU as serving a value expressive function was moderately correlated, *r*(210) = .49, *p* < .001.

Correlates

Correlations were run between moving and stopped MVSU and potentially related behaviors (correlates). For each correlate, the strength of the correlation was compared for moving versus stopped MVSU using a Hotelling's t/Steiger's Z test.

Risky driving. Risky driving was weakly correlated with both moving MVSU, *r*(234) = .197, *p* < .01, and stopped MVSU, *r*(234) = .230, *p* < .001. Counter to hypotheses, there was no significant difference in the strength of these correlations, *z* = -.68, *p* = .505.

Risky health behavior. Risky health behaviors were not significantly correlated with moving MVSU, *r*(234) = .102, *p* = .116 and were positively, weakly correlated with stopped MVSU, *r*(234) = .146, *p* = .025. There was, however, no significant difference between the two correlations, *z* = -.86, *p* = .376

Boredom-related cell phone use. Boredom-related cell phone use was moderately, positively correlated with moving MVSU, $r(234) = .338$, $p < .001$ and stopped MVSU, $r(234) = .366$, $p < .001$. Counter to hypotheses, there was no significant difference between the two correlations, $z = -.60$, $p = .546$.

Inappropriate cell phone behaviors. Being a passenger in a car with a driver who is engaged in screen use was moderately, positively correlated to moving MVSU, $r(234) = .236$, $p < .001$ and stopped MVSU, $r(234) = .268$, $p < .001$. There was no significant difference between the two correlations, $z = -.66$, $p = .507$.

Texting at inappropriate times (in meetings, during movies, etc.) was strongly, positively correlated to moving MVSU, $r(234) = .405$, $p < .001$ and stopped MVSU, $r(234) = .528$, $p < .001$. There was a significant difference between these two correlations, such that texting at inappropriate times was more strongly correlated with stopped than moving MVSU, $z = -2.84$, $p < .01$.

Engagement in sexting was moderately, negatively correlated to moving MVSU, $r(234) = -.353$, $p < .001$ and stopped MVSU, $r(234) = -.333$, $p < .001$. There was no significant difference between these two correlations, $z = -.42$, $p = .668$.

Discussion

Prior research regarding screen use while driving has seldom investigated the distinction between moving MVSU and stopped MVSU. Despite this lack of attention, these two behaviors are conceptually very different. It's significantly more dangerous to engage in screen use behaviors while operating a moving vehicle than a stopped one to both the driver and the other drivers on the road. The amount of effort and skill the two MVSU behaviors entail vastly differ as well. There is a significant lack of stimulus for drivers at red lights, making reaching for a

phone more of an appealing behavior than it may be while the car is in motion. Felt-efficacy to manage required tasks associated with driving and screen use may also be considerably higher when drivers are stopped than when in motion. The present study is the first to our knowledge to examine differences in individuals' attitudes towards and correlates of stopped versus moving motor vehicle screen use and as such makes an important contribution to the field's understanding of this phenomenon.

Mean Differences and Correlations Between Stopped and Moving MVSU

Consistent with Engelberg et al. (2015), our results show that drivers engage in stopped motor vehicle screen use more than they engage in moving motor vehicle screen use. As expected, drivers additionally found stopped motor vehicle screen use more acceptable and were much more confident in their abilities to successfully engage in stopped screen use than moving screen use. Drivers anticipated feeling more guilt from engaging in moving MVSU than stopped MVSU and drivers perceived moving MVSU to be the riskier behavior. Additionally, drivers believed moving MVSU was more reflective of an individuals' moral standing than stopped MVSU. Overall, these results are consistent with our expectations and indicate that drivers do in fact view moving and stopped screen use as inherently different behaviors, with stopped motor vehicle screen use seen as significantly more acceptable and less risky. These differences may underscore why drivers engage more in stopped than moving motor vehicle screen use.

Despite the abundance of mean level differences in evaluations and behaviors related to stopped versus moving motor vehicle screen use, the two behaviors were very strongly correlated with one another. This means that people who engage more in stopped motor vehicle screen use also engage more in moving motor vehicle screen use, despite conceptualizing the behavior and it's risks very differently. This correlation indicates that there may be a gateway process that

occurs between the two behaviors, such that individuals first engage in more acceptable forms of MVSU and then branch out to riskier MVSU behaviors. Further research on the gateway process related to motor vehicle screen use would need to employ a longitudinal design to see if individuals' initial levels of stopped MVSU (the less risky form) predict increases in moving MVSU (the riskier from) over time, to determine if a gateway process does indeed exist for these behaviors.

Correlates of Stopped and Moving MVSU

Another potential reason for the high correlations between the two types of motor vehicle screen use behaviors is that all the same factors that predict moving motor vehicle screen use appear to equally predict stopped motor vehicle screen use. All but one of the correlates that were previously shown in research to be positively related to motor vehicle screen use (risky driving, risky health, boredom-related cell use, being in a car with a driver who is texting, texting sexting) were also correlated at equal levels with stopped screen use. This is counter to our hypotheses and seems somewhat at odds with participants viewing moving and stopped motor vehicle screen use as inherently different behaviors and engaging in them at different rates. Although these correlates are mathematically required to be somewhat similarly correlated with both moving and stopped screen use due to the two forms of MVSU being highly correlated with one another, there may also be more conceptual explanations. For one, these correlates may influence people to engage in moving screen use first, and then those individuals decide that since they are already engaging in a risky form of screen use, they may as well do the less risky form as well. This would be in essence the opposite of the originally discussed gateway process and could also be examined through longitudinal work. Another explanation could be that an unmeasured variable (e.g., a personality trait) acts as a third variable, increasing screen use in

moving and stopped conditions as well as higher levels of the observed correlates. Nelson et al., 2009, found previously that the importance of a message will influence driver's decision to engage in cell use while driving, so it is possible that the importance of the messages while driving overrides the other predictors of these behaviors.

Texting at inappropriate times was positively correlated with both screen use behaviors, but had a stronger correlation with stopped than moving motor vehicle screen use. A possible reason for this could be that being at a stoplight has more similarities to the situations given as examples in the question about texting at inappropriate times (i.e., in a meeting) than does active driving. For instance, the "text-inappropriate" situations and being stopped while driving may entail more similar levels of boredom or lack of stimulation than active driving. Likewise, the level of effort needed to multitask may be more similar in the "text-inappropriate" situations and when stopped at a light, than while driving.

Sexting was anticipated to be positively correlated to MVSU, but was actually negatively correlated in this study, although at similar levels across both types of screen use. Compared to Seiler (2015), who showed a positive correlation between sexting and MVSU, the present study had more female participants (70.8% in this study compared to 56.5%). Our sample also tended to be a bit younger with a mean age of 35 years in this sample (range: 17-73) compared to a mean age of 51 years (range: 18-73) in Seiler's (2015). These demographic differences potentially explain the divergent findings. Conceptually speaking, sexting is a much riskier and intimate behavior than the other items assessing inappropriate cell use, which may explain why texting at an inappropriate time may correlate differently from sexting.

Limitations and Future Directions

There are a few limitations regarding this study. Firstly, all information was collected via self-report data, lending to the possibility of false reporting of behaviors either intentionally by the participant to seem like a better person or driver or unintentionally by not accurately remembering driving behaviors. However, Taubman et al. (2016), found that a strong positive association between observed risky driving behaviors and self-report behaviors, indicating that self-report data is a valid form of information collection for driving behaviors, even for illegal or negatively viewed ones.

A second potential limitation deals with the wording of the question related to driving self-efficacy. In this study, participants were asked the following question: "*I am confident that I could engage in screen use on a wireless device while driving."* Although drawn from existing literature on MVSU, this question could have different interpretations. Some individuals may read this as asking about their ability to engage in screen use and drive their vehicle at all, while others may interpret the question to asking whether they believe they could engage in such behavior safely. These two interpretations of the question could yield varying answers from drivers, although both would be expected to be higher in stopped than moving MVSU situations. Future work should more specifically examine whether drivers believed they could engage stopped versus moving MVSU behavior *safely*.

Another potential limitation is the location of our participants. The majority of participants (63.5%) were from Florida, but there were a total of 31 states represented, as well as 4 participants from outside of the United States. This distribution presents two separate problems. One problem is with the wide range of states included in the participant pool. While such variety makes the sample more broadly representative, states often vary in their rules and

laws regarding texting and driving. These differences may provide participants with different mental frameworks for approaching the questions regarding acceptability of motor vehicle screen use. A second problem with this demographic is that the majority of the sample were from Florida, with data collected at a time when motor vehicle screen use was only a second-degree offense (meaning that you could not be pulled over and ticketed solely for engaging in such behavior). This leads to a possible issue with generalizing findings to the rest of the United States and to international populations, where MVSU may be more directly illegal. However, these findings provide a good start for understanding differences between individual's conceptions of moving versus stopped MVSU.

This study also included a disproportionate number of female participants. This could potentially be a limitation as women may have a different perspective on motor screen use behaviors than men and some correlates (such as sexting) may differ across gender lines. Research to date is mixed on the impact of gender on motor vehicle screen use. Some research indicates no gender differences in motor vehicle screen use behaviors (Benson et al., 2015; Suhr & Dula, 2016), while others do indicate significant differences in screen use behaviors and attitudes between genders (Cordellieri et al., 2015). We did not look at any gender differences in this study, but this would be a fruitful direction for future research. This study is also predominately white. Varying racial groups could have differing views on motor vehicle screen use, though no research exists on racial differences to date.

This study had a somewhat older demographic than most studies focused on texting while driving or other motor vehicle screen use behaviors. This may be both a limitation and an advantage unique to this study. Middle aged adults text and drive at a similar frequency as younger adults (Engelberg et al. 2015, Pope et al., 2016), so it may be helpful to include older

adults than the average college sample to get a full picture of those who frequently engage in motor vehicle screen use. However, there may also be attitudinal differences between older and younger drivers in their views of motor vehicle screen use and reasons for it. This could be another avenue for potential future research.

Finally, the frequency of motor vehicle screen use in our sample may be somewhat lower than that reported in prior research. Prior research has found about 70% of younger adults admit to texting while driving (Benson et al., 2015) and 56% of older adults admit to using a phone while driving and 66% while at a stop light (Engelberg et al., 2015). In contrast, only 48% of our participants admitted to engaging in motor vehicle screen use while moving. However, 77% of our sample admitted to engaging in stopped motor vehicle screen use. Thus our sample may be similar or significantly lower than prior studies in their MVSU behavior depending on whether participants in prior research included stopped motor vehicle screen use in the numbers they reported.

With the distinction between moving and stopped screen having received so little attention to date, many avenues of future research are open. An important first step would be to examine gender, racial, and age differences in the frequency, correlates, and attitudes towards stopped versus moving motor vehicle screen use. Another potential avenue for future research would be to qualitatively analyze the justifications for why drivers believe moving and stopped motor screen use is either a wrong or acceptable behavior to engage in. These responses may provide better insight into why participants view the behaviors differently but correlates are similar. A larger scale study to include a balanced participant pool from all 50 states could be done to see if the present study's findings hold true for the greater United States population, as

opposed to a heavily Florida influenced sample. Studies in other countries may also further generalizable findings in regards to the distinction of moving versus stopped screen use.

It may be interesting to investigate whether there is a smaller group of individuals who engage in stopped motor vehicle use exclusively or almost exclusively. If this subset does indeed exist, it would be interesting to investigate if they held the same attitudes towards motor vehicle screen use as do the rest of individuals who engage in motor vehicle screen use. Additionally, the known correlates of texting and driving may differ between this subset and those who engage in both stopped and moving screen use. Another potential future direction is to look at the extent of differences between moving and stopped screen use among participants. If participants varied in the degree to which their levels of moving versus stopped MVSU differed (e.g. some having large differences between the two forms, while others have smaller differences in the frequency) it may be important to examine which factors predict this difference.

Despite its limitations, this study was the first to examine driver's attitudes regarding stopped versus moving MVSU and the potential differences in the correlates of such behaviors. We showed that drivers conceptualize these two forms of MVSU differently but that correlates are surprisingly similar. These findings highlight the need for a more nuanced examination of the reasons individuals may choose to engage in MVSU and how stopped and moving MVSU are related. Future findings may create a basis for individualized intervention campaigns for each type as researchers and policy-makers attempt to curtail these dangerous behaviors.

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Table 1

Distribution of MVSU Frequency for Stopped and Moving Conditions

Frequency	Moving MVSU	Stopped MVSU
Never	51.9%	23.5%
Once or twice	22.05%	20.55%
Occasionally	11.25%	15.5%
Sometimes	8.05%	15.45%
Often	3.2%	14.2%
Almost always	1.9%	6.6%
Always	1.7%	4.2%

Note. Percentages within a column may add up to slightly above 100% due to rounding.