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The Theory of Planned Behavior (TPB) and Texting While Driving Behavior in College Students

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Abstract

Objective—To examine the role of intent and other Theory of Planned Behavior (TPB) constructs in predicting college students' willingness to texting while driving (TWD).

Methods—This was an, cross-sectional study. Two hundred and forty-three male and female college students enrolled in the 2013–2014 academic year in the College of Health, Human Services & Nursing completed a survey on TWD. Inclusion criteria: All races and ethnicities, 18 years of age, own a cell phone, and drive a car.

Results—Over 70% of the sample (n = 243) reported talking on a cell phone, and sending and receiving text messages “at least a few times” while driving within the past week. However, only 27% reported being stopped by police. Of these, 22% reported being fined. Twenty-six percent reported reading or sending TWD, and having to slam on the brakes to avoid hitting another car or a pedestrian(s) as a result within the past 30 days. In all, 47% of the variance in *intention* to send TWD was accounted for by the full TPB model. Intention, in turn, predicted *willingness* to TWD. Intention also mediated the relationship between perceived behavioral control and willingness to TWD.

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CONFLICT OF INTEREST

Authors have no conflict of interest to report

Conclusion—The role of Attitude was found to be the strongest predictor of intention. In addition, intention was found to mediate the relationship of willingness to TWD on perceived behavioral control. These findings highlight potential factors that could be targeted in behavioral change interventions seeking to prevent TWD.

Keywords

Texting while driving; college students; injury prevention; traffic safety

INTRODUCTION

Distracted driving occurs when a driver engages in an activity unrelated to driving, and diverts his or her attention from the necessary tasks at hand.¹ It is one of the leading causes of road crashes in the U. S.^{2–4} In 2011, 3,350 people died, and approximately 387,000 were injured, as a result of distracted driving.⁵ The use of a mobile phone while driving has been found to be a major distraction and risk factor for death and injury for drivers, passengers, and other road users.^{6–8} Studies have also found that reading and typing text messages while driving (TWD) adversely affects eye movements, stimulus detection, reaction time, number of collisions, habitual aggressive driving, as well as one's perceptions of risk.^{8–11}

Studies also suggest that the U.S. leads the rest of the world when it comes to distracted driving. Among drivers aged 18 – 65, 69% of U. S. drivers have talked on their cell phone while driving in the past 30 days, compared to 21% in the United Kingdom, and 59% in Portugal.¹² Thirty-one percent of U. S. drivers admit to TWD, or sending and receiving email messages, compared to only 15% and 21% in Spain and Germany, respectively. According to the National Highway Traffic Safety Administration (NHTSA), 196 billion texts messages were sent and received in June, 2011, an increase of approximately 50% over June, 2009.⁵

In California, drivers are prohibited from writing, sending, or reading text messages or emails, with fines of \$20 for the first offense, and \$50 for each subsequent event.¹³ Nonetheless, TWD remains common. In a 2013 survey in California, nearly 70% of drivers reported that they had been hit or nearly hit by a driver who was talking or texting on a cell phone.¹⁴

In this study, we examine Theory of Planned Behavior (TPB) constructs in predicting college students' willingness to send and read TWD. According to this theory, human behavior is guided by a) the propensity to engage in the behavior (intention); b) beliefs about the outcome of the behavior, and evaluation of these outcomes (attitude); c) beliefs about the expectations of others (normative belief); d) motivation to comply with these expectations (subjective norm); and e) beliefs about factors that can either facilitate or hinder the performance of the behavior, and the perceived power of these factors (perceived behavioral control).¹⁵ In this theory, an individual's behavior is therefore determined by his or her *intention* to perform the behavior. Intention, in turn, is determined by: a) the person's *attitude* as the extent to which he or she favors performing a behavior; b) *subjective norm* as expectations, that the person perceives those close to him or her would want the behavior performed, and c) *perceived behavioral control*, as the extent to which the person believes

him- or herself able to exert control in performing, or in abstaining from performing, the behavior.¹⁶ TPB has been applied to explain a variety of health behaviors, including exercise behavior¹⁷, smoking¹⁸, drug use¹⁹, STD/HIV prevention behaviors²⁰ and For driving behaviors.^{11,21–23} (See Appendix 1) Notably, the role of past behavior, in addition to accounting for the influence of habitual behavior in intention and behavior, are evident in earlier studies.^{16,24}

Additional Constructs

To further enhance the predictability of the TPB model, others have added *group norm* and *moral norm* constructs. Group norm refers to the context-specific attitudes and behavior of group members in regards to approving or disapproving of certain behavior. It highlights the influence of one's referent group on one's decision-making, as opposed to subjective norm, which implies social pressure from all people who are important to oneself (significant others).²⁵ It has been shown, for example, that group norm along with other main TPB constructs is associated with patterns of mobile phone and sun screen use among young individuals.²²

The construct of moral norm as an extension of TPB has been widely used in studying driving behaviors.^{26–29} These studies, in general, hypothesized that feelings of moral obligation and anticipated regret could have negative effects on individuals' intention to engage in risky riding behavior. We employ the *behavioral willingness* construct from the Prototype/Willingness Model (PWM),³⁰ which may predict behavior, in addition to other TPB constructs.

The “willingness variable” may account for the irrationality of health-risk behaviors in young people. It may also apply to behaviors that are more reactive (non-intentional) in nature, such as pregnancy risk, STD risk,³¹ and drunk driving.³⁰ In this study, this construct aids in examining the extent to which individuals with intended (rational) thinking are willing to engage in the behavior under conducive or facilitated circumstances. If true, this construct may add to the TPB.

Based on the aforementioned literature, we hypothesize that: a) intention to text while driving would be directly influenced by participants' attitude, subjective norm, and perceived behavioral control (PBC), controlling for gender and past behavior; b) participants' willingness to TWD would be directly influenced by intention and perceived behavioral control, after controlling for gender and past behavior, and c) the addition of group norm and moral norm would increase intention and willingness to TWD. Our findings are expected to help identify psychosocial predictors of TWD behavior, which can lead to more effective preventative interventions and education programs.

METHODS

This cross-sectional study involved a sample of 243 male and female college students of different races and ethnicities. Participants were students 18 years of age, and enrolled in the 2013–2014 academic year in the College of Health, Human Services & Nursing at a California State University. Each owned a cell phone, and drove a car. Students who did not

meet these criteria were excluded. The Ethics Committee of the University approved this study.

Study Questionnaire and Measurements

We adapted a self-administered questionnaire from an earlier study by et al²⁸ consisting of 50 composite items, which took approximately 10–15 minutes for each participant to complete.

The study outcome variable was willingness to send and read TWD: Participants were asked to respond to the following using a 7-point Likert scale, ranging from “not at all willing” (=1) to “extremely willing” (=7):

1. “Imagine that in the next week you are driving alone in light traffic conditions. You are stopped at a traffic light and hear the incoming message received tone. Under these conditions, how willing would you be to: a) read the TWD immediately; b) pull over to the side of the road or wait until you have reached your destination to read the text message?”
2. “Imagine that in the next week you are driving alone in light traffic conditions and are stopped at a traffic light. You realize that you are late for an important appointment and need to contact someone to get directions. Under these conditions, how willing would you be to: a) send a text message immediately while driving; b) pull over to the side of the road to send a text message, or not send a text message at all while driving?”

We examined the following TPB-based predictors:

Intention to send and read TWD—Intention was measured through three 7-point Likert scale items with responses ranging from strongly disagree = 1 to strongly agree = 7:¹⁸ (send, $\alpha = .90$; read, $\alpha = .89$).

Attitude towards TWD—This construct was assessed using three 7-point semantic differential items, ranging from 1 to 7.¹⁶ (send, $\alpha = .75$; read, $\alpha = .79$).

Subjective norm—This construct was measured through 7-point Likert scale items with responses ranging from strongly disagree = 1 to strongly agree = 7.¹⁸ (send $\alpha = 0.72$, read $\alpha = 0.79$).

Perceived behavioral control (PBC)—We assessed PBC through two 7-point Likert scale items with responses ranging from strongly disagree = 1 to strongly agree = 7:¹⁸ (Pearson’s correlation send $r(218) = 0.54$, $p < 0.001$; read $r(222) = 0.54$, $p < 0.001$)

Group norm—We assessed this construct using two 7-point Likert scale items with responses ranging from none = 1 to all = 7 (Pearson’s correlation send $r(212) = 0.51$, $p < 0.001$, read $r(212) = 0.52$, $p < 0.001$).

Moral norm—We measured this by using two 7-point Likert scale items with responses ranging from strongly disagree = 1 to strongly agree = 7,¹⁸ (send, $\alpha = .76$; read, $\alpha = .78$).

Past behavior—This construct was measured by asking: “Within the past week, how often did you use your cell phone to send/read TWD ?” The response categories were regrouped as *never* vs. *a few times*, *several times a day*, and *many times a day*. (See Appendix 1 for the complete descriptions of study measures).

Statistical Analysis

All analyses were conducted using IBM Statistical Package for the Social Sciences (SPSS) software, version 20, except for the mediation analysis, which was conducted using Mplus 7.4.³² We used Cronbach’s alpha and Pearson correlation reliability coefficients to identify and assess any correlations between the main study predictors, and reading and sending TWD. Prior to the hierarchical regression, we examined the relationship between independent variables for collinearity. In the first model, we tested the ability of the TPB to predict students’ intention to TWD, using intention as the dependent variable in the regression. In the second model, we used willingness to read and send TWD as the dependent variable. We entered background variables in both regression models, and included TPB variables. Statistical significance was established at $p = 0.05$. In addition, we used hierarchical multiple regressions (HMR) to determine the effect of intention and perceived behavioral control in predicting willingness to send and read TWD. Finally, the indirect relationship between perceived behavioral control on willingness to read and send TWD was assessed using a latent mediation analysis. (See Appendix 1 for the details)

RESULTS

Descriptive Findings (Table 1)

Two hundred and forty three college students ($n = 243$) completed the study survey. The mean age of our sample was 20.9 ± 4.8 , and 86% of the sample drove a car with an automatic transmission. In all, participants reported driving an average of 12 hours each week. Nearly 70% (69,1%) reported using a cell phone to send text messages, and 71% reported using a cell phone to read text message at least a few times within the past week. On average, each participant sent 97 messages, and received 104 messages per day. Only 27% reported being stopped by police for using cell phones while driving. Of these, 22% reported being fined. Almost 26% reported reading or sending TWD within the past 30 days, and then had to slam on the brakes to avoid hitting another car or pedestrian(s) as a result.

Correlation between Mean Scores for Sending and Reading TWD

Table 2 reveals a strong correlation between reading and sending TWD and mean scores for each study variable. The value of r reveals the weakest correlation to be “willingness,” and the strongest “perceived behavioral control.” The mean scores of the variables indicate that participants in the sample had negative attitudes towards sending (1.75) and reading (1.86) TWD, as did their significant others (1.83 and 1.93, respectively). The means of intention scores were 2.51 and 3.52 on a scale of 1–7, which suggests low intention toward sending and reading TWD.

Means for the reference group norm were 3.94 and 4.16, indicating that, on average, participants thought their friends and peers were impartial in sending and reading TWD. However, the means for moral norm were 4.58 and 4.49, suggesting that participants were “neutral” to “somewhat agreed” in regards to the moral aspects of sending and reading TWD, as in feeling that it is wrong, and they felt guilty about doing it. In regards to past behavior, the sample means were 1.28 and 1.30, indicating that on average, participants read and sent TWD “a few times” during past seven days. The sample means for the willingness were 3.89 and 3.95, suggesting that on average these participants were neither willing nor unwilling to send and read TWD. In addition, we found strong bivariate correlations between TPB variables and willingness to *send* and *read* TWD. (See Appendix 1 for the details)

Hierarchical Multiple Regression Analysis Predicting Intention to Send and Read TWD

Table 3 depicts the results of two hierarchical regression analyses to determine the effects of TPB constructs in predicting intention to a) send and b) read TWD. Gender and past behavior were entered into the model in the first step. The standard TPB constructs were then entered in the second step; additional variables were entered in the final model.

The linear combination of gender and past behavior accounted for nearly 8.8% of the variance in intention to *send* TWD. The addition of attitude, subjective norm, and perceived behavioral control accounted for an additional and significant 35.5% of the variance. The subsequent addition of group norm and moral norm accounted for an additional, significant 3.2% of the variance in intention. The hierarchical regression equation showed that gender ($\beta=0.101, p < 0.05$), past behavior ($\beta =0.204, p < 0.001$), attitude ($\beta =0.313, p < 0.001$), subjective norm ($\beta =0.262, p < 0.001$), perceived behavioral control ($\beta =0.208, p < 0.001$), and group norm ($\beta =0.146, p < 0.01$) were significant determinants of intention to *send* TWD, with the final model explaining 47.5% of the variance.

The linear combination of gender and past behavior accounted for a significant 7.4% of the variance in intention to *read* texts while driving. The addition of attitude, subjective norm, and perceived behavioral control accounted for an additional and significant 48.0% of the variance. The subsequent addition of group norm and moral norm did not add significantly to the variance (.09%). The hierarchical regression equation showed that gender ($\beta=0.93, p < 0.05$), past behavior ($\beta =0.113, p < 0.01$), attitude ($\beta =0.216, p < 0.001$), subjective norm ($\beta =0.242, p < 0.001$), and perceived behavioral control ($\beta =0.514, p < 0.001$) were significant determinants of intention to *read* TWD, with the final model explaining 56.3% of the variance.

Hierarchical Regression Analysis in Predicting Willingness to Send and Read TWD

Table 4 illustrates the results of two hierarchical regression analyses to determine the effects of TPB constructs in predicting willingness to send and read TWD. Background factors were entered in the first step. The standard TPB constructs were then entered, followed by TPB constructs not expected to directly influence willingness.

The linear combination of gender and past behavior accounted for a significant 8.0% of the variance in willingness to *send* TWD. The addition of intention and perceived behavioral

control accounted for an additional, significant 19% of the variance. The subsequent addition of attitude, subjective norm, group norm and moral norm accounted for a significant 5.5% of the variance. The hierarchical regression equation showed that gender ($\beta = 0.029$, $P < 0.05$), past behavior ($\beta = 0.140$, $P < 0.05$), intention ($\beta = 0.341$, $P < 0.001$), and moral norm ($\beta = -0.239$, $P < 0.001$) were significant determinants of willingness to *send* TWD, with the final model explaining 32.5% of the variance.

The linear combination of gender and past behavior accounted for a significant 7.6% of the variance in willingness to *read* TWD. The addition of intention and perceived behavioral control accounted for an additional, significant 14.2% of the variance. The subsequent addition of attitude, subjective norm, group norm and moral norm accounted for a significant 10.7% of the variance. The hierarchical regression equation showed that past behavior (beta = 0.129, $P < 0.05$), intention (beta = 0.303, $P < 0.001$), and moral norm (beta = -0.303, $P < 0.001$) were significant determinants of willingness to *read* TWD, with the final model explaining 32.5% of the variance.

Mediation Analysis of Willingness to TWD on Perceived Behavioral Control

To assess the indirect relationship of perceived behavioral control on willingness to TWD, a latent mediation analysis of intention as the mediator of this relationship was tested^{33,34}. All path coefficients were standardized using the variances of the continuous latent variables, as well as the variances of the outcome variables (i.e., STDYX standardization in Mplus).³⁵ The structural model includes the regression paths of intention on attitude, group norm, moral norm, past behavior, and subjective norm; as well as the indirect path of willingness to TWD on perceived behavioral control, mediated by intention. Figure 1. The results suggest that intention mediates the relationship between perceived behavioral control and willingness to TWD. (See Appendix 1 for details)

DISCUSSION

An alarming 70% of college students in our sample had sent and read TWD driving in the last 30 days. Very few reported being pulled over or fined. These findings are consistent with previous work that determined TWD to be a major risk factor, especially among younger drivers.³⁶ This behavior can prove fatal^{37,38} and distracts drivers visually, manually, and cognitively.³⁹ One study of commercial drivers showed that TWD increased the likelihood of a crash by 23 times.⁴⁰

To limit the risk of distracted driving, including texting, several states in the U.S have enacted laws prohibiting the use of hand-held devices. The practice, however, remains common and continues to contribute to high crash rates.³ In one study of young adult drivers in the U.S, 70% reported initiating TWD, while even higher numbers reply to (81%) and read texts (92%) while driving.¹⁰ In a 2013 AT&T national survey of 1011 commuters age 18 and older, 49% admitted to doing so, and 43% consider it a habit.⁴¹ It is important to raise awareness among young adults about the risk of, and reinforce the negative consequences associated with, TWD. AT&T's "It Can Wait" campaign in the U.S.⁴² or "BTW friends would prefer a late TXT to an early death" in Australia are two examples of

such campaigns.²⁸ College campuses may be ideal locations at which to initiate such interventions.

Intention to Send and Read TWD

Findings support our first hypothesis: A large variance in intention to send (35.5%) and read (48.0%) texts was accounted for by attitude, subjective norm, and perceived behavioral control. Although the overall attitude of students and their perceptions of what their significant others believe in regards to both sending and reading TWD was generally negative. However, they still demonstrated intention in sending and reading TWD. Interventions may be tested to determine whether raising college students' awareness of unpredictable road and traffic conditions, and circumstances that require their full attention to avoid road related crashes, will influence their perceptions of risk. Drivers who send texts may perceive road conditions to be safer than those who read and/or replied to a text.¹⁰ Less mindful or attentive drivers are also more likely to text as a means of regulating unpleasant emotions.⁹ Our findings suggest that engaging college students and their referent groups in promoting responsible and mindful driving may alter their perceptions of social pressure toward TWD, such that they may avoid such behavior.

Willingness to Send and Read TWD

Our second hypothesis was partially supported in that intention predicted willingness to TWD, demonstrated in large variances in sending (19.0%) and reading texts (14.2%). Intention also mediated the relationship between perceived behavioral control, and willingness to *send* or *read* TWD. This means that a person's intention to *send* or *read* TWD explains the association between his or her perception of control and willingness to *send* or *read* TWD. The finding that those with high perceptions of control have on average stronger intention to *send* or *read* TWD, which in turn leads to higher ratings of being willing to *send* or *read* TWD (see Figure 1) could be reflective of the volitional nature of mobile phone use.^{25,28} Although "willingness" to TWD is not equivalent to the actual behavior, Gauld and colleagues⁴³ associate willingness with high intention, which is supported in our analysis. We found the correlation between these variables to be statistically significant at .50. Gauld et al., argue that "willing" individuals are more likely to engage in concealed texting, sharing information with others through texting, and using time more effectively. They are also less likely to believe that the amount of traffic would affect their texting behavior.⁴³ Interventions aimed at highlighting the risk involved in TWD would seem to require strategies unique to this "willing" group.¹¹ Further work is needed to assess if influencing individual's risk perception can influence their intention and therefore willingness to TWD.

Social Influence in Sending and Reading TWD

We found that our third hypothesis was only partially supported. We expected that a combination of group norm and moral norm would increase the intention to *send* and *read* TWD. The addition of group norm, but not moral norm, contributed slightly in increasing intention to *send* ($\beta = 0.146, p < 0.0$) but not to *read* TWD. This implies that social identity, rather than personal values, as suggested by previous studies^{28,44,45} influenced TWD decision behavior in this sample of college students. This finding also suggests to motivate

college student to avoid TWD, it may be helpful that their referent group members obtrusively voice their disapproval of TWD.

Moral norm, operationalized as feelings of guilt, doing wrong and acting against one's principles in TWD behavior, was a significant predictor for both willingness to *send* and *read* TWD. This finding implies the students' perceived moral values, and feelings of moral obligation had a negative effect on their willingness to TWD. This also implies that knowing what ethical principles influence college students' willingness to TWD may help in developing educational and campaign measures to avoid this risky behavior. Studies are needed to test if increasing one's confidence and self-efficacy in avoiding TWD will foster a perception of self as one who rejects TWD, and who overcomes perceived barriers in adhering to his or her moral obligations.

Gender and Past Behavior in Reading and Sending TWD

Previous studies indicate that gender and past behavior are significant in regards to willingness in sending and reading TWD.^{9,22,28} We also found that female drivers were significantly more likely than males to demonstrate intention in sending and reading texts while driving. However, as a group, females were more willing to send, and not read texts. This finding suggests that there is an opportunity for gender-specific TWD prevention interventions. Sending and reading TWD in the past also predicted both intention and willingness to send and read texts. This suggests needs to test interventions that aim to attenuate the influence of past TWD behavior on intention and willing to TWD in the future. These interventions may benefit from strategies used to break drivers' unwanted habits such as implementation intention (if-then plans).^{46,47}

Limitations

We were not able to determine causality, as our study design was cross-sectional. Also, data collection was limited to college students enrolled in a large public university in California. More than half of the sample was Hispanic/Latino, and nearly 69% were female. These factors limit the generalizability of our findings. Some participants may also have been reluctant to report possibly embarrassing or socially undesirable behaviors, such as TWD. Moreover, in the questionnaire, it is possible that people are more willing TWD at traffic lights than while they are actively driving and so their response to the scenarios that assesses willingness to TWD while stopped at traffic lights may not be representative of all "while driving" situations. In addition, the past behaviors of sending and reading text messages included in the same question. It is possible that some people may read a text message if they receive one while driving, but not send one.

CONCLUSIONS AND FUTURE DIRECTIONS

Our findings confirm the value of the main constructs in the Theory of Planned Behavior (TPB) in understanding and predicting TWD in our sample of college students. The constructs of TPB appear to predict students' intention to TWD, and intention in turn predicted a significant portion of students' willingness to *send* and *read* TWD. Intention also mediated the relationship between perceived behavioral control and willingness to TWD.

This means that intention to *send* or *read* TWD plays an explanatory role in the association between perceived control and willingness to *send* or *read* TWD. Counterintuitively, those who rate themselves as having higher perceived behavioral control will have on average higher intentions to *send* or *read* TWD, which in turn results in higher willingness to *send* or *read* TWD. In addition, while one's perception of approval from important others predicted rational planning (intention) to TWD, one's moral obligation predicted willingness to engaging in TWD. Our findings indicate that future interventions should consider TPB constructs and its extended construct, especially the role of attitude, moral obligation, and intention in willingness to TWD. Findings can also inform behavioral interventions aimed at raising awareness and perception of risks associated with distracted driving in a new generation of technology-savvy drivers, and discourage risky behaviors such as TWD.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1. Structural latent mediated path model of Willingness on Perceived Behavioral Control
 Note. att= Attitude, gnm= Group Norm, mnm = Moral Norm, pbh = Past Behavior, sbn = Subjective Norm, pbc = Perceived Behavioral Control, int = Intention to Text, wil = Willingness to Text. The * symbol denotes paths that were significantly different from zero, $p < 0.05$.

Table 1

Demographic Characteristics of the Sample

	N/Mean	Percentage/SD
Gender		
Male	75	31.1%
Female	168	68.9%
Age	20.9	4.8
Marital Status		
Married	22	9.1%
Divorced	2	0.8%
Widowed	1	0.4%
Single or never married	204	84.3%
Other	13	5.4%
Years in College		
Freshman	147	60.5%
Sophomore	23	9.5%
Junior	59	24.3%
Senior	10	4.1%
Other	4	1.6%
Employment Status		
Employed/full time	26	10.7%
Employed/part time	82	33.6%
Self-employed	4	1.6%
Unemployed/looking for job	85	34.8%
Unemployed/not looking for job	44	18.0%
Other	3	1.2%
Have children		
Yes	17	7.0%
No	227	93.0%
Race/ethnicity		
White	17	7.0%
Hispanic/Latino	134	54.9%
Black/AA	40	16.4%
Asian/Pacific Islander	38	15.6%
Other	15	6.1%
Type of driver's license		
Restricted	3	1.4%
Temporary	6	2.8%

	N/Mean	Percentage/SD
Permanent	178	84.0%
Other	24	11.3%
Driving related variables		
Type of car		
Automatic	185	86.0%
Manual	30	14.0%
Hours of driving per week	12.1	17.6
Do you own a cell phone?		
Yes	207	99.0%
No	2	1.0%
Multivehicle accident		
Yes	35	10.7%
Yes, but minor injury	6	2.9%
Yes, major injury	3	1.5%
No	175	85.0%
Stopped by police for using cell phone while driving		
No	151	72.9%
Yes	12	5.8%
N/A	44	21.3%
Number of messages send per day	96.5	149.2
Number of messages received per day	104.4	158.8
Number of messages read per day	101.8	163.1
Within the past week, how often did you use your cell phone to TALK to someone while driving?		
Never	64	28.4%
A few time	104	46.2%
Several times	32	14.2%
Many times	25	11.1%
Within the past week, how often did you use your cell phone to SENT text messages while driving?		
Never	69	30.7%
A few time	70	31.1%
Several times	41	18.%
Many times	45	20.0%
Within the past week, how often did you use your cell phone to READ a text messages while driving?		
Never	70	29.0%
A few time	78	32.4%
Several times	44	18.3%

	N/Mean	Percentage/SD
Many times	49	20.3%

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Table 2

Mean and standard deviation in sending and reading texts while driving

Variable	n	r	Send		Read	
			Mean	SD	Mean	SD
Attitude	226	0.78**	1.75	1.15	1.86	1.22
Subjective norm	227	0.92**	1.83	1.16	1.93	1.28
PBC	224	0.98**	4.98	2.05	5.03	2.02
Intention	225	0.82**	2.51	1.60	3.52	1.42
Group norm	213	0.92**	3.94	2.02	4.16	2.02
Moral norm	225	0.96**	4.58	1.63	4.49	1.62
Past behavior	225	0.89**	1.28	1.10	1.30	1.10
Willingness	215	0.67**	3.89	1.62	3.95	1.67

Note: PBC=perceived behavioral control

* $p < 0.05$
* $p < 0.01$
*** $p > 0.001$

Table 3

Multiple regression: intention to send and read texts while driving

Variable	β	R ²	R ²
Sending texts			
Step 1			
Gender	0.101 *	0.088***	0.088
Past behavior	0.204***		
Step 2			
Attitude	0.315***	0.443***	0.355
Subjective norm	0.262***		
PBC	0.208***		
Step 3			
Group norm	0.149 **		
Moral norm	-0.106	0.475***	0.032
Reading texts			
Step 1			
Gender	0.093 *	0.074***	0.074
Past behavior	0.133 **		
Step 2			
Attitude	0.216***	0.554***	0.480
Subjective norm	0.242***		
PBC	0.514***		
Step 3			
Group norm	0.098		
Moral norm	-0.016	0.563***	0.009

Note: Weights provided are those found in final step of the analysis

*
 $p < 0.05$ *
 $p < 0.01$ **
 $p < 0.001$

Table 4

Multiple regression: Willingness to send and read texts while driving

Variable	β	R ²	R ²
Sending texts			
Step 1			
Gender	0.029 *	0.080***	0.080
Past behavior	0.140 *		
Step 2			
Intention	0.341 ***	0.270***	0.190
PBC	0.107		
Step 3			
Attitude	-0.006		
Subjective norm	0.073	0.325***	0.055
Group norm	0.009		
Moral norm	-0.239***		
Reading texts			
Step 1			
Gender	0.031	0.076***	0.076
Past behavior	0.129 *		
Step 2			
Intention	0.303***	0.218***	0.142
PBC	0.035		
Step 3			
Attitude	0.108	0.325***	0.107
Subjective norm	-0.003		
Group norm	0.025		
Moral norm	-0.303***		

Note: Weights provided are those found in final step of the analysis

*
 $p < 0.05$ *
 $p < 0.01$ **
 $p < 0.001$