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Possession Attachment Predicts Cell Phone Use While Driving

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Objective: Distracted driving has become an important public health concern. However, little is known about the predictors of this health-risking behavior. One overlooked risk factor for distracted driving is the perceived attachment that one feels toward his or her phone. Prior research has suggested that individuals develop bonds toward objects, and qualitative research suggests that the bond between young drivers and their phones can be strong. It follows that individuals who perceive a strong attachment to their phone would be more likely to use it, even when driving. **Method:** In a nationally representative sample of young drivers (17–28 years), participants ($n = 1,006$) completed a survey about driving behaviors and phone use. Risk perception surrounding cell phone use while driving and perceived attachment to one's phone were assessed by administering factor-analytically derived scales that were created as part of a larger project. **Results:** Attachment toward one's phone predicted the proportion of trips in which a participant reported using their cell phone while driving, beyond that accounted for by risk perception and overall phone use. Further, attachment predicted self-reported distracted driving behaviors, such as the use of social media while driving. **Conclusions:** Attachment to one's phone may be an important but overlooked risk factor for the engagement of potentially health-risking driving behaviors. Understanding that phone attachment may adversely affect driving behaviors has the potential to inform prevention and intervention efforts designed to reduce distracted driving behaviors, especially in young drivers.

Keywords: possession attachment, risk perception, distracted driving, cell phone use while driving, individual differences

Cell phone use while driving (CPUWD) is a public-health concern that has gained significant media attention in recent years. According to the National Highway Traffic Safety Administration (NHTSA, 2010), 995 fatalities and 24,000 injuries were believed to be caused by cell phone use as the source of distraction. Despite the well-documented negative effects that CPUWD has on driving ability, a large number of people report engaging in this behavior (Braitman & McCartt, 2010). Given the questionable effectiveness of laws designed to restrict use (Foss, Goodwin, McCartt, & Hellinga, 2009; Rajalin, Summala, Poytsi, Anteroinen, & Porter, 2005), understanding the psychological variables that are associated with CPUWD can help to identify individuals who may engage in this behavior. In turn, these insights may lead to more effective risk-communication efforts designed to increase traffic

safety. However, the majority of research on this topic has focused on crash rates or basic cognitive processes such as attention or multitasking (e.g., Lee & Strayer, 2004). In contrast, less emphasis has been placed on the degree to which individual differences are associated with CPUWD. Research adopting this approach largely has focused either on attitudes such as perceived acceptance of CPUWD, perceived risks, negative outcome expectancies, or traits that are typically associated with antisocial behavior such as trait hostility and tolerance for deviance (e.g., Hafetz, Jacobsohn, García-España, Curry, & Winston, 2010; Patil, Shope, Raghunathan, & Bingham, 2006; White, Eiser, & Harris, 2004).

One overlooked variable that may predict CPUWD is the degree of perceived attachment one feels to his or her phone. In Bowlby's (1969/1982) original conceptualization, he proposed that an attachment behavioral system acts as a homeostatic control system in which a child tries to maintain a "set goal" of proximity maintenance with his or her primary caregiver. Theory and research suggest that people may also develop attachments to their possessions, a phenomenon present early in life (Belk, 1988; Lehman, Arnold, & Reeves, 1995). Research has demonstrated that people place greater subjective value on objects they own, especially ones that are perceived to be irreplaceable (Grayson & Shulman, 2000). However, one may only need to merely be in ownership of an object to feel an affinity toward it (Beggan, 1992). For instance, researchers have robustly shown an *endowment effect*, in which individuals overvalue even mundane items that are bestowed upon

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them by an experimenter (Thaler, 1980). Beyond aggregate-level effects, evidence suggests considerable differences in the degree to which individuals become attached to possessions (Park, MacInnis, & Priester, 2007). Further, Kogut and Kogut (2011) found that interpersonal attachment anxiety (Hazan & Shaver, 1987), an attachment dimension associated with worries of abandonment or loss in one's close relationships, was associated with higher selling prices of endowed objects. This finding provides preliminary evidence that individuals may experience some degree of "separation anxiety" with regard to possessions in ways that may be similar to what individuals feel toward close others. It also suggests that attachment to objects is affect-laden, much like attachment within the context of close relationships.

Because of its ability to easily connect one to their social network, cell phone use in particular may be susceptible to similar attachment dynamics. One survey found that 25% of individuals reported that they would rather lose their wallet than their phone, and 75% said they never leave their home without their phone (Synovate, 2009), suggesting considerable cell phone attachment. Further, proximity maintenance to the phone may be especially important for young drivers. For instance, Walsh, White, and Young (2009) reported that 16- to 24-year-olds have a strong sense of connection to their phones. These participants expressed that the cell phone enhanced feelings of belonging with others. This sentiment is also echoed in Geser's (2006) qualitative analysis of teens, which observed that the phone represents a way to be connected with social networks and gain autonomy from parents.

The current research extends these ideas by quantifying this reported attachment as an individual difference variable, and subsequently tests its association with CPUWD in young drivers 17–28 years old. Young drivers might be especially apt to engage in CPUWD for several reasons. First, adolescence and emerging adulthood in general has been characterized as a period of increased risk-taking (e.g., Reyna & Farley, 2006). For instance, teens are more likely to take traffic risks such as shorter following distances and speeding (Laapotti, Keskinen, Hatakka, & Katila, 2001). Second, adolescents and young adults are typically considered to be early adopters of technology and may be more likely to use distractible technology than older adults while driving (Lee, 2007). Third, teens and emerging adults may be poorly calibrated between perceptions of their driving ability and their actual performance, leading to overconfidence in their abilities to negotiate unexpected road hazards (Matthews & Moran, 1986). Therefore, better understanding of how young drivers approach potentially dangerous behaviors is integral for best communicating risk information and developing interventions designed to curtail CPUWD.

CPUWD may be considered within the context of psychological risk–return frameworks that predict the propensity to take a risk is (a) inversely associated with the perceived risks of engaging in the activity and (b) positively associated with the activity's expected benefits (e.g., Weber, Blais, & Betz, 2002). Risk–return models demonstrate a divergence between psychological risk representations (i.e., inverse correlations between risk and benefit) and risk–benefit associations in the real world, which are often positively correlated (Slovic, 2010).

Affect-as-information models of decision making can help to explain why this divergence occurs (e.g., Loewenstein, Weber, Hsee, & Welch, 2001). It is believed that psychological evaluations of risks are guided by an *affect heuristic*, wherein risk

judgments are directed by feelings (Finucane, Alhakami, Slovic, & Johnson, 2000). Specifically, the degree to which people inversely associate an endeavor's perceived expected benefits and riskiness is based on their like or dislike of it. Put differently, the greater affinity one feels toward an activity, the fewer risks or dangers they perceive, and the more expected benefits they expect as a result of engaging in it.

The affect heuristic also suggests a potential association between possession attachment and risky behaviors. Similar to perceived expected benefits or positive outcome expectancies, perceived attachment toward one's phone is imbued with affect, which may impact risk perceptions and behavior. However, attachment can also be distinguished from positive outcome expectancies or perceived benefits, because attachment need not be tied to direct expectations of a future positive outcome. For instance, Mikulincer, Hirschberger, Nachmias, and Gillath (2001) found that subjects rated neutral stimuli as being more positive after receiving a prime representing attachment security (e.g., mother and child picture). Likewise, possession attachment was expected to be associated with positive feelings toward CPUWD. This positivity should be inversely related to perceived risks, and positively associated with CPUWD.

In the current study, greater perceived attachment to cell phones was predicted to be inversely associated with perceived risks and positively correlated with both (a) the proportion of CPUWD trips, both for talking and texting, and (b) distracted driving behaviors such as accessing the Internet while driving. Moreover, it was predicted that perceived attachment would moderate the relationship between age and CPUWD. Although past research has suggested that older drivers engage in less CPUWD than younger cohorts, it was predicted that older drivers who perceive greater attachment to their phones will show an elevated degree of CPUWD.

Method

Participants

A nationally representative sample of young drivers (17–28 years) was recruited through Knowledge Networks (n.d.). The median age of the final sample was 23 years. Of the participants who completed the study, 12.7% of participants did not possess a high school diploma, 16% had a high school diploma or equivalent, 44.1% were either currently in college or received an associate degree, 22.1% received a bachelor's degree, and 5.1% received an advanced college degree. In this sample, 78.1% of participants were Caucasian, 5.9% African American, 7.4% Hispanic, and 8.7% either "Other, Non-Hispanic" or "2+ races, Non-Hispanic."

Procedure

Participants who were randomly selected to take part in the survey received a notification email from Knowledge Networks informing them that the survey was available for them to take. In the email, participants were provided with a hyperlink that directed them to the questionnaire. As shown, Figure 1 illustrates how the study sample ($n = 1,006$) was derived from the initial eligible population. Cooperation rate of this study was 46.1%. Individuals

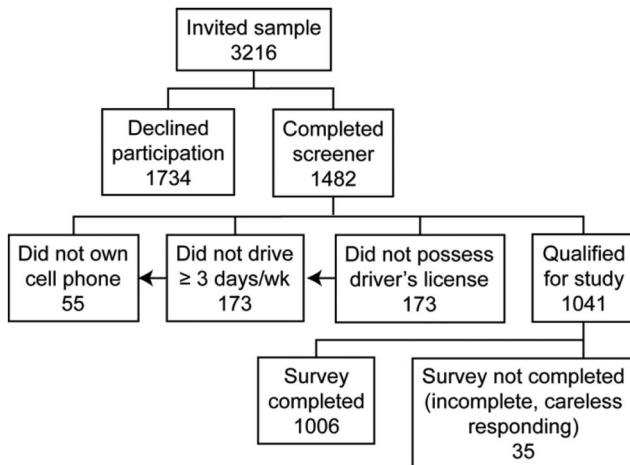


Figure 1. Derivation of study sample.

were eligible to participate if they (a) were aged 17–28 years, (b) possessed a valid U. S. driver's license, (c) drove at least three times per week, and (d) owned a cell phone. One thousand, forty-one participants qualified for this study (70% qualification rate). Based on formulas suggested by Callegaro and DiSogra (2008), the cumulative response rate (4.5%) was derived by multiplying the household recruitment rate (19%), the household profile rate¹ (51.2%), and the survey completion rate (46.1%).

As a result of their participation in Knowledge Networks' ongoing survey panel, respondents earned points to enter raffles for cash and other prizes. The questionnaires and procedures were all approved by the Human Subjects Officer at Decision Research. Participants read the informed consent online and consented to participate prior to receiving survey items. Individuals under 18 years of age had parental permission to participate in the study.

Participants were informed that they would be asked questions about their driving behaviors and their attitudes about driving. Participants first completed items regarding overall driving frequency, cell phone use, and behaviors related to distracted driving. Then, as part of a larger project (Weller, Dieckmann, Mauro, & Slovic, 2010), participants were asked to respond to items concerning attitudes toward distracted driving. The study took approximately 15–20 minutes to complete (Median duration = 15 minutes).

Measures

Driving behaviors. Participants first completed items regarding personal driving habits and behaviors. Specifically, participants were asked to rate the proportion of trips in which they used a cell phone while driving a car, both texting and talking (the response scale for these variables was *never, fewer than 1/2 of trips, about 1/2 of trips, most trips, all trips*).

Perceived attachment to phones. Participants completed a five-item scale developed to measure perceived attachment to one's phone (e.g., "I would feel lost if I didn't have a cell phone"; Weller et al., 2010). Participants responded to items on a five-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), Cronbach's alpha = .81, mean interitem $r = .45$.

Risk perception. A 16-item scale assessed drivers' CPUWD risk perceptions (Appendix A; Weller et al., 2010). Participants responded to items on a five-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores on this measure reflected more negative risk attitudes toward CPUWD, Cronbach's alpha = .91, mean interitem $r = .38$.

Statistical Analyses

Poststratification sample weights were generated by Knowledge Networks not only to account for oversampling and nonresponse rates in panel membership, but also as a function of study design. Accordingly, the reported descriptive statistics are sample-weighted.² Correlational analyses were initially conducted (Pearson product-moment, unless otherwise specified) between the variables of interest. Next, a series of logistic and ordinal regression analyses were conducted that regressed CPUWD behaviors on psychological attachment, risk attitude, overall phone usage, and age. Interaction terms for Age \times Perceived Attachment and Age \times Risk Perception were also included. Variables were centered before creating interaction terms. Missing data for the perceived attachment and risk perception items were addressed with a bootstrapping-based imputation algorithm (Little & Rubin, 2002) that is enabled by the Amelia package in R (version 2.8.1; other analyses used IBM SPSS Statistics 19.0 and Mplus Version 6.12). The imputation algorithm was run five times resulting in five separate data sets. The observed data in each of the data sets are identical, but the imputed values for the missing data vary and reflect our uncertainty about the true values for the missing data. By analyzing each of the data sets, we can increase our confidence that the results are not a result of the idiosyncratic nature of a single imputation run. All analyses were conducted on these five datasets, yielding substantively identical results. For simplicity, only the results from the first imputed dataset are presented here.

Results

Descriptive Statistics

On average, participants drove daily for a mean of 9.66 hours per week ($SD = 11.05$), $Mdn = 7$. Participants reported spending a median of 30 minutes per day talking on their phones. Participants reported receiving and sending multiple text messages per day, $Mdn = 15$.

Overall, 89.8% stated they have called someone while they were driving, and 63.0% reported sending a text message while driving ($n = 974$). Overall, 33.7% stated they talked on their cell phones on at least half of their trips, and 21.5% reported reading or writing text messages on at least half of their trips. Further, of those participants who had Internet service on their cell phone ($n = 697$), 16.8% reported accessing Web sites such as Facebook while

¹ The household profile rate is computed as an average of the cohort profile rates for all households in the study sample. Although the average number of profiled panel members per household is usually greater than one, a household is considered "profiled" when at least one member completes a profile survey.

² For a detailed explanation of how sample weights were derived, see Weller et al. (2010).

driving at least once. For participants who had the capability to access software applications, or “apps,” ($n = 646$), 22.4% reported using one while driving.

Endorsement rates for the attachment items are shown in Table 1. Overall, 62.3% of respondents reported they would feel uncomfortable if they didn’t have their phone with them for a long period of time, 56.5% would feel detached from their friends without their phone, 58.4% would feel “lost” if they didn’t have their phone, and 56.1% reported a feeling of momentary distress upon discovering they’d left their phone at home. Comparing phone attachment to other objects, 9.6% of respondents reported they would rather lose their wallet than their phone. Furthermore, 40.3% report they often check their phone for texts or messages even if they did not hear it ring or vibrate. For the composite perceived attachment scale, $M = 3.23$, $SD = 0.92$.

For CPUWD-Talking, older participants (aged 23–28 years) reported CPUWD on at least half of their driving trips, more than younger participants (aged 17–22 years), $\chi^2(1) = 4.41$, $p = .03$. Of individuals between the ages of 23 and 28 years, 38.1% reported CPUWD-Talking at least half of their driving trips, and 42.5% of these individuals reported CPUWD-Talking on all or most trips. For participants aged 17–22 years, 26.7% reported CPUWD-Talking on at least half of their trips and approximately 43.2% of these individuals reported talking on all or most trips.

For CPUWD-Texting, younger participants were more likely than older participants to send or receive text messages while driving on at least half of their trips, $\chi^2(1) = 7.16$, $p = .01$. Approximately 26.2% of 17–22 year-olds reported CPUWD on at least half their trips; of these individuals, 56.0% reported doing so on all or most trips. In contrast, 17.8% of 23–28 year-olds reported CPUWD on half of their trips, and 51.0% of these individuals did on all or most trips.

Possible gender differences in CPUWD were also explored. For CPUWD-Talking, 34.6% of men talked on their phones while driving on at least half of their trips, compared with 32.7% of women, $\chi^2(1) = 0.44$, $p = .51$. Similarly, a parallel analysis for CPUWD-Texting also revealed no significant gender effects, $\chi^2(1) = 0.21$, $p = .64$. Gender was not further examined in this study.

Associations Between Variables of Interest

The intercorrelations between self-reported driving behavior, risk perception, and perceived attachment are displayed in Table 2. As expected, perceived attachment was inversely associated with

Table 2
Intercorrelations Between Study Variables

	1	2	3	4	5	6
1. Talking while driving	—					
2. Texting while driving	.51	—				
3. Phone use talking (min/day)	.34	.18	—			
4. Phone use texting (texts/day)	.08	.38	.15	—		
5. Perceived Attachment	.19	.26	.19	.21	—	
6. Risk Perception	-.40	-.39	-.17	-.19	-.17	—

Note. $n = 974$ –1,006. All values $p < .01$.

risk perception ($r = -.17$, $p < .001$), and lower risk perception and greater perceived attachment were associated with a greater proportion of CPUWD trips for both talking ($r = -.40$, $p < .0001$ and $.19$, $p < .001$, respectively) and texting ($r = -.39$ and $.26$, $p < .001$, respectively). Participants’ age was inversely associated with perceived attachment ($r = -.16$, $p < .001$) but was not associated with differences in risk perceptions ($r = -.03$). Both the number of days driven and the number of hours driven per day were modestly inversely associated with risk perceptions, $r = -.12$, and $-.11$, $p < .01$, respectively; however, these variables were not associated with perceived attachment, $r = .06$ and $.01$, respectively.

The self-reported proportion of CPUWD trips (separate models for talking and texting) was then regressed on age, risk perception, perceived attachment, and overall frequency of cell phone use per day (talking in minutes), as well as the interaction for Age \times Perceived Attachment and Age \times Risk Perception. The frequency of phone use variables were square-root-transformed to reduce positive skewness before entering them into regression models.

As shown in Table 3, phone usage habits, holding other variables constant, significantly accounted for variance in the proportion of CPUWD-Talking trips. Moreover, lower risk perceptions predicted a greater proportion of trips in which the individual talked on a phone while driving. Finally, greater perceived attachment to one’s cell phone accounted for unique variance in the proportion of trips of CPUWD-Talking, beyond that accounted for by risk perceptions and overall use. The interaction terms did not reach significance.

The results were similar for a parallel analysis predicting the proportion of CPUWD-Texting trips. Again, holding other variables constant, one’s overall frequency of texting significantly

Table 1
Endorsement Rates for Perceived Attachment Items

	Strongly agree	Somewhat agree	Neutral (neither agree nor disagree)	Somewhat disagree	Strongly disagree
1. I would feel uncomfortable if I didn’t have my phone with me for a long period of time	31.7	30.6	17.6	10.1	10.0
2. I would feel lost if I didn’t have a cell phone	26.3	32.1	19.7	14.1	7.8
3. I would feel detached from my friends if I didn’t have a cell phone	22.6	33.9	16.7	14.9	12.0
4. I feel momentarily distressed if I realize that I am without my phone while I am out and about	18.8	37.3	20.3	13.6	10.0
5. I would rather lose my wallet than my phone	2.4	7.2	21.9	24.0	44.5

Note. $n = 1,006$. Values represent percent endorsement for each response category. Percentages in this table are weighted.

Table 3
Ordinal Regression Analyses Predicting Proportion of CPUWD Trips

	Stand. B	Std. error	Unst. B	Std. error	R ²
Talking while driving					.32
Age	0.18**	0.03	0.11	0.02	
Perceived Attachment	0.15**	0.03	0.36	0.07	
Risk Perception	-0.35**	0.03	-1.11	0.10	
Usage	0.27**	0.03	0.17	0.02	
Age × Attachment	0.05	0.03	0.03	0.02	
Age × Risk	0.01	0.03	0.01	0.03	
Texting while driving					.31
Age	0.09**	0.03	0.06	0.02	
Perceived Attachment	0.19**	0.03	0.46	0.07	
Risk Perception	-0.28**	0.03	-0.89	0.10	
Usage	0.34**	0.03	0.16	0.02	
Age × Attachment	0.09**	0.03	0.06	0.02	
Age × Risk	0.09**	0.03	0.08	0.03	

Note. *n* = 974–1,006. R² values denotes Nagelkerke Pseudo R² estimate.
** *p* < .01.

predicted CPUWD-Texting. Risk perception and perceived attachment to one’s cell phone accounted for unique variance in CPUWD-Texting. Specifically, individuals who reported fewer perceived risks and those who felt greater attachment to their phones were more likely to report a greater proportion of CPUWD-Texting trips. The results also revealed significant Age × Perceived Attachment (see Figure 2) and Age × Risk Perception interactions (see Figure 3). Although, overall, there were age-related declines in CPUWD-Texting, older drivers who reported greater attachment were more prone to CPUWD-Texting than older drivers who reported lower perceived attachment. Similarly, greater risk perceptions were associated with avoidance of CPUWD-Texting trips at an earlier age.

Finally, two logistic regression models tested how the psychological constructs were associated with (a) viewing Web sites on a cell phone while driving (e.g., Facebook, Myspace, etc.) and (b) using an app while driving. In each model, age, perceived attachment, risk perception, interaction effects, and overall phone usage entered as predictors. Overall phone usage is a composite variable derived by standardizing the transformed talking and texting overall usage variables, then calculating a mean score for each indi-

vidual. As shown in Table 4, perceived attachment predicted the likelihood that a driver used an app or the Internet while driving, holding overall use and risk perception constant. Interaction effects were not significant.

Discussion

The results of this study highlight three main points regarding how risk perceptions and perceived possession attachment may be associated with CPUWD. First, although variables such as the driver’s age and overall phone usage predicted CPUWD, greater risk perceptions were associated with lower incidences of self-reported CPUWD, both for talking on the phone and texting. Second, holding demographic variables and risk perceptions constant, the current study illustrates how perceived attachment to one’s cell phone may be a significant risk factor for increased CPUWD. Specifically, perceived attachment predicted the reported proportion of CPUWD trips, as well as behaviors such as using social media while driving. Finally, the current study also found evidence that risk perceptions and perceived attachment moderated age-related differences in CPUWD-Texting.

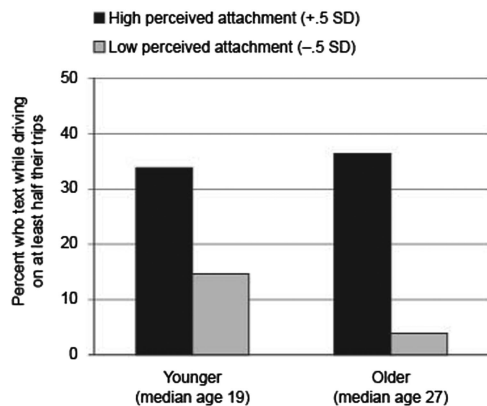


Figure 2. Proportion of respondents reporting CPUWD-Texting on at least half their trips as a function of age and perceived attachment.

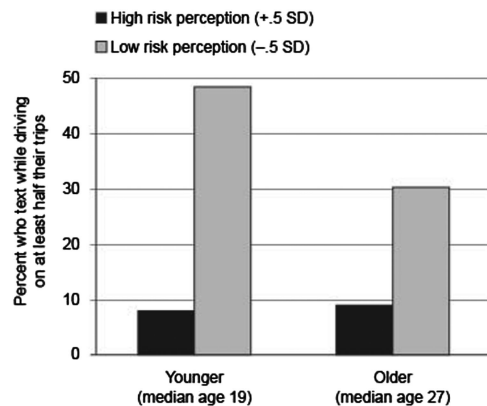


Figure 3. Proportion of respondents reporting CPUWD-Texting on at least half their trips as a function of age and risk perception.

Table 4
Logistic Regression Analyses Predicting Distracted Driving Behavior

	Std. B	Std. error	Unstd. B	Std. error	R ²
Have you ever checked a Web site while driving? (0 = No, 1 = Yes)					.20
Age	-0.15**	0.06	0.09	0.04	
Perceived Attachment	0.16**	0.06	0.37	0.14	
Risk Perception	-0.25**	0.06	-0.74	0.17	
Overall Use	0.21**	0.05	0.54	0.13	
Age × Perceived Attachment	-0.06	0.06	0.04	0.05	
Age × Risk Perception	-0.06	0.06	0.05	0.05	
Have you ever used software "app" while driving (0 = No, 1 = Yes)					.19
Age	-0.27**	0.06	0.16	0.04	
Perceived Attachment	0.25**	0.05	0.55	0.13	
Risk Perception	-0.08	0.05	-0.23	0.15	
Overall Use	0.22**	0.05	0.57	0.13	
Age × Attachment	0.00	0.06	0.00	0.04	
Age × Risk	-0.06	0.05	0.05	0.04	

Note. $n = 697$ for the question, "Have you ever checked a website while driving?" $n = 646$ for the question "Have you ever used a software 'app' while driving?" R^2 value denotes Nagelkerke Pseudo R^2 estimate. In this sample, 16.8% ($n = 117$) and 22.6% ($n = 226$) of respondents answered "Yes" to checking a website while driving or using an "app," respectively.

** $p < .01$.

Consistent with past research, individuals who perceived fewer risks involved with CPUWD were more likely to use their phones on a greater proportion of trips than were individuals who possessed greater risk perceptions. These findings are consistent with psychological risk-return models that predict that the likelihood that one will engage in a risky activity will decrease as risk perceptions increase (e.g., Hanoch, Johnson, & Wilke, 2006; Weber et al., 2002). This pattern may be attributable in part to the use of an affect heuristic, in which people base risk attitudes on how they feel about an activity or hazard, and involves a tradeoff between positive and negative emotional information. The current findings reinforce past traffic safety research. For example, Nelson, Atchley, and Little (2009) found that perceived riskiness was directly associated with both answering and initiating a call while driving. Similarly, Hafetz et al. (2010) found that young drivers who perceived greater advantages associated with abstention of CPUWD reported using their phone while driving less frequently than those who saw fewer advantages in abstaining. Additionally, Walsh, White, Hyde, and Watson (2008) found evidence that risk perceptions were predictive of behavioral intentions toward CPUWD-Texting.

Past research has suggested that affective influences can lead to biases in judgment and decision making, especially related to judgments of risk (Loewenstein et al., 2001). Because possession attachment is proposed to be an affect-laden construct, it follows that individual differences in possession attachment may influence risk evaluation. Indeed, a majority of individuals reported such an affective connection to their phones. Perceived attachment was related to a greater proportion of CPUWD trips both for talking and texting, as well as lower risk perceptions. More broadly, research has observed an association between interpersonal attachment anxiety and risk behaviors such as reckless driving and health-risking sexual behavior (Feeney, Peterson, Gallois, & Terry, 2000; Taubman & Mikulincer, 2007). The current study adds to these findings and suggests that possession attachment also

has the potential to be associated with increased risk-taking behaviors. Although limited research exists regarding possession attachment and risk-taking, one study (Billig, 2006) reported that Jewish settlers in an area of Gaza affected by hostilities who felt greater "place" attachment (i.e., to their homes and the area that they live) perceived lower risks about living in the area: these individuals tended to remain in the hostile region longer. Future research should test the role of possession attachment in other domains, as well as explicate the common and distinct underlying mechanisms of interpersonal and possession attachment and their subsequent influence on risk behavior.

A great deal of media attention has focused on CPUWD in young drivers. Coupling (a) young drivers' propensity to communicate via text messaging and (b) the increased distractibility required to send and receive texts may be especially dangerous for drivers with limited experience. Younger drivers were also more likely to check the Internet or use an app while driving than older adults, suggesting greater risk-taking. Research has suggested that teens and emerging adults are more likely to engage in risk-taking behaviors than adults, including risky driving behaviors (Reyna & Farley, 2006). Taken together, young drivers may be most likely to engage in distracted driving behaviors and therefore most likely to suffer the potential negative consequences associated with these behaviors. The results highlight that although older drivers (who were still relatively young) were more likely to report talking on a hand-held device while driving, young drivers reported CPUWD-Texting on a greater proportion of trips.

Two interaction effects further suggest the power of affective influences on risk behavior. First, greater perceived attachment attenuated age-related declines in CPUWD-Texting. Age-related declines in CPUWD-Texting were only present for those who reported greater perceived attachment. Similarly, individuals who reported low risk perceptions demonstrated typical age-related declines in risk behaviors, yet still engaged in CPUWD at much higher rates than those reporting greater perceived risks. In con-

trast, those reporting greater risk perceptions rarely engaged in CPUWD-Texting, regardless of age. According to mental model approaches of risk perception, individuals with richer, more elaborated mental representations of risks associated with an activity are more likely to act judiciously than those with less-established mental models (e.g., Bruine de Bruin, Downs, & Fischhoff, 2007). These richer representations may facilitate more reflexive decisions about avoiding risk (Reyna & Farley, 2006). The current findings would suggest that early development of these mental models may help to reduce CPUWD. Although the current results are silent regarding underlying cognitive and developmental processes, it would be fruitful for future research to examine these issues in greater depth.

This research has the potential to help shape intervention and public service campaigns especially for young drivers. For instance, public service campaigns could aim to address both distracted driving risks and psychological mechanisms that may influence use. McKenna (2007) argues that a key method to improving safety culture is to direct education efforts toward increasing the perceived legitimacy of traffic safety. One way to increase perceived legitimacy may be to reinforce the fact that distracted driving affects everyone on the road, not just the driver, which may be effective in increasing social responsibility norms which may, in turn, increase adherence to laws restricting CPUWD and support for traffic safety policy changes. However, the current results suggest that cell phone attachment may attenuate the perceived legitimacy of interventions designed to reduce distracted driving. Programs that address and counteract this attachment, while concurrently reinforcing the potential risks associated with CPUWD within the context of social norms campaigns (McNeely & Gifford, 2007), may serve to more effectively communicate the potential dangers of CPUWD.

As phones become more technologically advanced and economically affordable, individuals will likely use them for more purposes than are even used today. In turn, attachment may also become greater and more widespread—making perceived attachment a formidable obstacle to overcome. Research is needed to test methods to counteract phone-attachment effects. One study attempted to reduce interpersonal attachment anxiety by attempting to down-regulate attachment-related anxiety by secure attachment schemas (Taubman & Mikulincer, 2007). Contrary to their predictions, however, this manipulation only served to increase risky behaviors. Other methods for the reduction of attachment-related anxiety may be possible. For instance, Feldman, Greeson, Renna, and Robbins-Monteith (2011) found that greater mindfulness (Kabat-Zinn, 2005) was associated with lower incidence of texting while driving. While the Feldman et al. study did not specifically address attachment per se, they found that lower trait mindfulness was associated with less adaptive emotional regulation strategies which, in turn, led to greater CPUWD-Texting. It is possible that increasing mindfulness could reduce CPUWD by down-regulating emotional influences of attachment effects.

Although this study has shed light on several psychological factors that may influence distracted driving behavior, two limitations must be acknowledged. First, the study's design cannot speak to whether past behaviors have influenced risk perceptions. Research in the health behavior change literature has suggested that prior behaviors may exert influence on current and future risk perceptions and behavioral intentions (Weinstein, 2007). Given

that this study was not longitudinal, it is possible that the perception-behavior correlations would be somewhat biased by the effects of prior behavior on perceptions. Prospective studies that control for past behavior may help attenuate such a potential bias, as would prospective studies that investigate how distracted driving risk perception would relate to future cell phone use in teenagers who have not yet begun to drive without parental supervision. Moreover, experiments designed to test attachment effects would complement the results of the current study.

Second, although the current risk perception measure assesses the content of risk representations, it was not designed as a measure of one's perceptions of personal risk (i.e., "How dangerous it is for me [personally] to text while driving?") related to CPUWD. It is possible that personal estimates of CPUWD may diverge from more global risk perceptions. For instance, research has found that people may find it difficult to fully comprehend cumulative risk, the concept that the likelihood of harm occurring increases the more the activity is repeated (e.g., Svenson, 1984). Individuals use cell phones to communicate nearly every day, likely without consciously considering any health risks, or even the level of distraction one experiences while on a telephone. Thus, individuals become accustomed to the lack of negative consequences associated with an activity and believe it to be less of a threat (White et al., 2004).

The mobile phone has undoubtedly changed the way individuals communicate with others, and it has become a gateway to their personal and professional lives. In fact, advertisements for mobile phone carriers and manufacturers commonly portray the cell phone as a reflection, even an extension, of the self. As technology provides our phones with greater functionality, attachment to one's phone may only increase. Understanding how such attachment influences our risk judgments has the potential to inform intervention efforts designed to curtail use of distractible technology when one is behind the wheel.

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Appendix

CPUWD Risk-Perception Scale Items

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1. Texting while driving limits a person's ability to control one's car
 2. Texting while driving takes a person's eyes off the road for too long
 3. Using a cell phone while driving affects everyone on the road, not just the person using it
 4. Driving next to someone who is talking on a cell phone makes me more cautious
 5. Talking on a cell phone while driving is dangerous
 6. Using a cell phone while driving reduces a person's ability to mentally focus on the road
 7. Using a cell phone while driving sometimes becomes too distracting
 8. Using a cell phone while driving and driving when drunk (your blood alcohol level is a little bit over the legal limit) similarly affects your ability to concentrate on the road
 9. A person talking on a cell phone is as likely to cause a traffic accident as a drunk driver (a driver whose blood alcohol level is a little bit over the legal limit)
 10. Compared with drunk driving (your blood alcohol level is a little bit over the legal limit), talking on your phone while driving similarly affects your reflexes
 11. People who use cell phones while driving are likely to cause an accident
 12. People who use cell phones while driving are acting irresponsibly
 13. Talking on a phone while driving is no different than talking to another passenger
 14. Most of the time, dialing a phone number or reading a text message while driving doesn't take my eyes off the road for a long enough period of time to really matter
 15. When I see someone driving and talking on a cell phone, I don't think anything of it
 16. An accident caused by using a cell phone while driving is less likely to cause major damage to one's car, compared with other causes of traffic accidents
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