
White Rose Research Online

eprints@whiterose.ac.uk
https://eprints.whiterose.ac.uk
Universities of Leeds, Sheffield and York

Deposited via The University of Sheffield.

White Rose Research Online URL for this paper:
https://eprints.whiterose.ac.uk/id/eprint/246375/

Version: Accepted Version

Article:
Lazuras, L., Poulter, D., Ypsilanti, A. et al. (2026) Mobile phone use while driving: the role of driving self-regulation. Transportation Research Part F: Traffic Psychology and Behaviour, 123. 103834. ISSN: 1369-8478

https://doi.org/10.1016/j.trf.2026.103834

© 2026 The Authors. Except as otherwise noted, this author-accepted version of a journal article published in Transportation Research Part F: Traffic Psychology and Behaviour is made available via the University of Sheffield Research Publications and Copyright Policy under the terms of the Creative Commons Attribution 4.0 International License (CC-BY 4.0), which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited. To view a copy of this licence, visit http://creativecommons.org/licenses/by/4.0/

Reuse
This article is distributed under the terms of the Creative Commons Attribution (CC BY) licence. This licence allows you to distribute, remix, tweak, and build upon the work, even commercially, as long as you credit the authors for the original work. More information and the full terms of the licence here: https://creativecommons.org/licenses/

Takedown
If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing eprints@whiterose.ac.uk including the URL of the record and the reason for the withdrawal request.





Abstract

Driving-specific self-regulation has been associated with risky driving behaviour. The present research examined, for the first time, the relationship of driving-specific self-regulation with mobile phone use while driving across two survey-based studies in the United Kingdom. Study 1 ($N = 296$) showed that driving-specific self-regulation was significantly associated with both texting and calling while driving, over and above the effects of other predictors. Domain-general self-regulation was indirectly associated with texting while driving, through driving-specific self-regulation. Study 2 ($N = 309$) showed that driving-specific self-regulation was negatively associated with mind wandering while driving. Mind wandering was positively related to both calling and texting while driving, but this relationship was moderated by driving-specific self-regulation. The association of mind wandering and texting was weaker for higher levels of driving-specific self-regulation (B= -.127, $p = .019$). Driving-specific self-regulation presents a theoretically relevant construct for the study of behaviours that contribute to distracted driving, such as mobile phone use.

Keywords: mobile phone use; driving; self-regulation; mind wandering.

Mobile Phone Use while Driving: The Role of Driving Self-Regulation

Road traffic crashes remain a global public health concern, accounting for 1.35 million deaths and more than 50 million serious injuries annually across the globe, being the leading cause of death for children and young people aged 5-29 years and the 12th leading cause of death globally across age groups (WHO, 2023). The target to reduce fatalities associated with road traffic crashes by 50% was not met by the United Nations' Decade of Action for Road Safety 2011-2020 and remains one of the priorities in the context of the global Sustainable Development Goals (SDGs). Road user behaviour is a key component for improving road safety and reducing road traffic fatalities, and driver inattention presents a significant risk factor for crash risk and actual crash involvement (Wundersitz, 2019). Distracted driving is a common cause of driver inattention and negatively impacts drivers' information processing capacity and attendant road safety practices (Jazayeri et al., 2021). While the harmful effects of mobile phone use on driving performance are well documented, less is known about the psychological and attentional correlates of mobile phone use while driving. Identifying key factors can inform the development of interventions designed to reduce distracted driving.

Using a mobile phone while driving, either for making calls or texting, is one form of driver distraction which has been associated with crash involvement in different studies (Dingus et al., 2016; Gariazzo et al., 2018; Jazayeri et al., 2021). Atwood et al. (2018) demonstrated that severe crash rate (e.g., involving airbag deployment and injury) increased by 8.32% for every additional text per hour of driving. Young drivers aged 20-29 years, who are overrepresented in road traffic fatalities and serious injuries, are more likely to engage in mobile phone use while driving (Lam, 2002; Zatezalo et al., 2018). Road traffic legislation is advocated as an effective deterrent to mobile phone use while driving, especially when strongly enforced (Olsson et al., 2020). However, road traffic legislation represents an external influence which does not take into consideration individual-level factors that may

predict behaviour. A complementary non-legislative approach would be to implement behaviour change interventions (Tirla et al., 2024). For such interventions to be effective in reducing mobile phone use while driving, one must first examine drivers' own beliefs and behaviour and identify relevant behaviour change targets.

Self-Regulation & Mobile Phone Use While Driving

Theories that integrate individual differences (e.g., personality traits) and driving safety attitudes and related beliefs (e.g., Ulleberg & Rundmo, 2003) have been widely studied to predict different risky driving outcomes across age groups (Lucidi et al., 2014; Lucidi et al., 2019), countries (Dotse & Rowe, 2025), and type of motorists (Lucidi et al., 2019; Mallia et al., 2015). Recent work has specifically focused on the role of self-regulatory processes and driving safety attitudes, suggesting that these factors can mediate the effects of more impulsive traits and self-control failure on risky driving outcomes. Lazuras et al. (2019) showed that impulsivity and normlessness (i.e., tendency to defy social norms, rules, and regulations) were indirectly associated with risky driving outcomes in young drivers. This association was modelled to operate via driving safety attitudes and trait self-regulation – our overall capacity to regulate our thoughts, emotions, and behaviour and pursue long-term goals while foregoing short-term rewards, goal-incongruent temptations, or distractions (Werner & Milyavskaya, 2019). Similarly, a study among young Iranian drivers showed the normlessness and sensation seeking were indirectly associated with driving violations, via driving-specific self-regulation, and impulsivity was indirectly associated with driving errors through driving safety attitudes (Memarian et al., 2023). Driving-specific self-regulation represents a context-specific measure of self-regulation that is associated with both individual differences in crash risk (e.g., driving anger) as well as in risky driving behavioural outcomes (e.g., driving violations, errors and lapses), over and above the effects of well-established predictors of these outcomes (Lazuras et al., 2022).

Self-regulatory processes are highly relevant for the study of mobile phone use while driving (Cordellieri et al., 2022). Panek et al. (2015) showed that texting while driving was associated with lower levels of trait self-control and of "*acting with awareness*", a facet of trait mindfulness that reflects how aware people are of their actions. These findings indicate that texting behaviour can occur habitually without necessarily requiring high levels of conscious awareness and self-control. Furthermore, Moore and Brown (2019) showed that higher scores in trait self-regulation were associated with lower scores in self-reported texting while driving (r = -.15), but in the multivariate model the effect of trait self-regulation on texting was mediated by habitual texting, the tendency to text habitually, without paying attention. It is theoretically plausible that driving-specific self-regulation (i.e., the capacity to self-regulate one's driving behaviour) would be negatively associated with mobile phone use while driving, over and above the effects of trait self-regulation. Previous research has already shown that driving self-regulation predicts risky driving outcomes after accounting for the effects of trait, domain-general, self-regulation (see Lazuras et al., 2022).

Mind Wandering, Self-Regulation, & Mobile Phone Use

Mind-wandering is the tendency to mentally disengage from the task at hand either spontaneously or intentionally and engage in task-unrelated thoughts, thereby indicating executive control shifting and failure to maintain focused attention on the primary task (Randall et al., 2014). Although there is ongoing debate about whether mind wandering reflects executive control failure, research has shown that, during demanding tasks, more frequent mind-wandering is associated with lower working memory capacity – a key component of executive control and self-regulation (see Hoffman et al., 2012) – and subsequent error proneness (Kane & McVay, 2012; Kawagoe, 2022). Additionally, higher levels of mind wandering have been associated with lower levels of trait self-regulation (Deng et al., 2019; Isacescu et al., 2017). Driving is a complex and demanding task requiring

focused attention and research has already shown that mind-wandering is associated with crash risk (e.g., Galéra et al., 2012) and a range of different aberrant driving behaviours such as traffic rule violations, drunk driving, speeding, shorter headway distance, slower reaction times, in both survey-based research and driving simulation studies (Albert et al., 2018; Qu et al., 2015; Yanko & Spalek, 2014). Burdett et al. (2016) further showed that a driving-specific measure of mind wandering (i.e., frequency by which people mind wander while driving in different contexts and situations) was associated with cognitive failure and risky driving outcomes, such as lapses and violations. Mind-wandering is also associated with mobile phone addiction (Zhang et al., 2024) and has been found to explain the association of mobile phone addiction with cognitive failure (Li et al., 2025), but no study has yet examined whether mind-wandering is associated with mobile phone use while driving, although such an association is theoretically plausible. Questions also remain about the relationships between driving-specific self-regulation and mind wandering.

The Current Study

The detrimental effects of mobile phone use on driving performance are well-established. While there is evidence that mobile phone use can be associated with trait self-regulation (Moore & Brown, 2019; Panek et al., 2015), no study has examined the role of driving-specific self-regulation. Driving-specific self-regulation, as measured by the Driving Self-Regulation Questionnaire (DSRQ-16; Lazuras et al., 2022), is a tailored measure of self-regulated driving that is associated with risky driving behaviour such as violations, errors and lapses – and driving safety attitudes. It has also been found to correlate with non-driving psychological factors that are known to increase crash risk, such as lower levels of executive functions, maladaptive emotion regulation, high trait impulsivity, and lower levels of trait self-regulation (Lazuras et al., 2022; Memarian et al., 2023). Additionally, there is limited research on the effects of mind-wandering on mobile phone use while driving, although

research has already shown that mind wandering is associated with both risky driving tendencies and crash risk (Albert et al., 2018; Yanko & Spalek, 2014) and with mobile phone use addiction (Li et al., 2024). Even more so, no study has investigated the additive and synergistic effects of driving-specific self-regulation (Lazuras et al., 2022) and driving-specific mind wandering (Burdett et al., 2016) on mobile phone use while driving. Taken together, these constitute a clear gap in the literature: driving-specific self-regulation has not yet been examined as a predictor of mobile phone use while driving, and neither its additive nor its interactive role alongside driving-specific mind wandering has been investigated.

It is theoretically plausible that driving-specific self-regulation can be negatively related to mobile phone use while driving. Driving self-regulation may also enable drivers to inhibit the temptation to check or respond to their phones in the moment, and by supporting the maintenance of driving safety goals in context, thereby keeping attentional resources directed toward the primary driving task. Mind wandering, by contrast, is likely to increase susceptibility to mobile phone use while driving through attentional disengagement from the driving task: when attention drifts from driving, the cognitive and motivational barriers to habitual phone checking or texting are weakened, making engagement with the phone more likely. This reasoning is further supported by the domain specificity principle (Ajzen, 1991; Tsukayama et al., 2012), which holds that domain-specific measures are stronger predictors of context-specific outcomes than domain-general trait measures (see Geurts et al., 2023). Consistent with this principle, and with prior evidence that driving-specific self-regulation predicts risky driving outcomes over and above trait self-regulation (Lazuras et al., 2022), we propose a hierarchical model in which trait self-regulation represents a distal correlate of mobile phone use while driving, operating through its contextualised, driving-specific expression. That is, individuals with higher trait self-regulation are expected to exhibit higher

driving-specific self-regulation, which in turn more directly governs engagement in distracting in-context behaviours such as texting while driving.

By reporting the findings from two empirical studies, the present research examines, for the first time, the associations between contextualised driving-specific measures of self-regulation and mind-wandering and mobile phone use while driving, after controlling for the effects of other variables that are known to predict risky driving and crash risk, namely trait self-regulation and emotion regulation, and driving safety attitudes. Previous studies on driving-specific self-regulation focused on risky driving outcomes, such as driving violations, lapses, and errors (Lazuras et al., 2022; Memarian et al., 2023). The present research extended these findings by examining the role of driving-specific self-regulation on behaviours that contribute to distracted driving: mobile phone use while driving. Although calling and texting while driving share common antecedents, research suggests texting may be more strongly linked to self-regulatory processes, given evidence that it is associated with lower self-control and tends to occur habitually and without full conscious awareness (Moore & Brown, 2019; Panek et al., 2015).

Study 1 tested whether driving-specific self-regulation predicts mobile phone use while driving over and above established predictors, including trait self-regulation and emotion regulation, and examined whether driving-specific self-regulation mediates the relationship between trait self-regulation and texting while driving. Study 2 extended these findings by incorporating driving-specific mind wandering as an additional predictor, examining both the additive effects of driving-specific self-regulation and mind wandering on mobile phone use, and the moderating role of driving-specific self-regulation in the association between mind wandering and mobile phone use while driving. Accordingly, for Study 1 the following hypotheses were formed:

H1: Higher levels of driving self-regulation will be associated with higher levels of trait self-regulation.

H2: Higher levels of driving self-regulation will be associated with lower frequency of mobile phone use while driving, after controlling for the effects of other correlates.

H3: Driving-specific self-regulation will mediate the association between trait self-regulation and mobile phone use while driving.

Study 1

Methods

Participants

Three hundred and thirty English-speaking participants were recruited via the online research participation platform Prolific (https://www.prolific.com/), between March and October 2020. Prolific is widely used in social science research, and studies have shown that it returns higher quality participant responses compared to other online platforms (Douglas et al., 2023). Participants received an average of £6.80 for completing the survey, consistent with the fee policy of Prolific at the time of data collection. A priori power size calculations with G*Power (Faul et al., 2009) was conducted, using a small effect size (f^2=0.1) based on previous studies, α = 0.05 and power = 0.95, and indicated that a sample of 226 participants was needed for the study. To be eligible for participation, participants had to be adults (aged ≥ 18 years) and having a valid UK driving license at the time of data collection. Furthermore, to ensure that participants were meaningfully engaged in the survey an attention checker item was embedded in the survey requiring them to select a specific response option (i.e., "*if you are paying attention to the survey, please select "somewhat disagree" from the responses provided*"). Twenty-nine participants (8.7% of the total sample) did not select the correct answer to the attention checker item, and their responses were removed. Five participants did

not complete all the measures, leaving a final sample of $N = 296$. The mean age of the participants in the final sample was 28.96 years ($SD = 13.29$) and the majority of them (67.2%, $n = 199$) were females. Mean weekly mileage was 73.72 miles (SE mean = 5.84; Median = 40.00), and 76.4% had passed their driving test between 2011 and 2020.

Measures

Demographic and background variables included participants' age and weekly mileage driven, and closed questions on participants' gender (male, female, other), driving test date (dates ranged from before 1980 to 2020).

Mobile phone use while driving was assessed with a 4-item measure reported by White et al. (2010). The measure assessed how often respondents used their mobile phones while driving to answer or make calls (two items), and to read or send text messages (two items). Responses were recorded on a 7-point scale, from 1 = more than once a day, to 7 = never, and were summated to compute a total score. Higher scores reflected less engagement with mobile phone use while driving. Internal consistency reliability was high for the calling (Cronbach's $\alpha = 0.90$; $r = .82$, $p < .001$) and texting (Cronbach's $\alpha = 0.85$; $r = .76$, $p < .001$) dimensions.

Trait (domain-general) self-regulation was assessed with the Brief Self-Control Scale (BSCS; Tangney et al., 2004), a 13-item self-report measure of trait self-regulation which includes questions about both successful exercise of self-regulation (e.g., "*I am good at resisting temptation*") and self-regulation failure (e.g., "*I have hard time breaking bad habits*"). Responses were recorded on a 5-point continuous scale, from 1 = not at all, to 5 = very much. After reverse-scoring items reflecting self-regulation failure, a sum score was computed and higher scores indicated higher levels of self-regulation. Internal consistency reliability was high (Cronbach's $\alpha = 0.84$).

Emotion regulation was assessed with the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003), a 10-item self-reported measure assessing two core emotion regulation strategies: suppressing emotional expression (e.g., "*I keep my emotions to myself*") and cognitive reappraisal (e.g., "*I control my emotions by changing the way I think about the situation I'm in*"). Responses were recorded on a 7-point Likert scale, from 1 = strongly disagree to 7 = strongly agree, and a mean score was computed, with higher scores reflecting higher use of each emotion regulation strategy. Internal consistency reliability was high for both expressive suppression (Cronbach's $\alpha = 0.78$) and cognitive reappraisal (Cronbach's $\alpha = 0.86$).

Attitudes to driving safety were assessed with the 16-item questionnaire by Iversen (2004). This measure includes statements reflecting attitudes towards different aspects of driving including both risky (e.g., violating traffic rules, endorsing speeding) and safety practices (e.g., conforming to traffic rules). Responses were recorded on a 5-point Likert scale, from 1 = strongly disagree to 5 = strongly agree. After reverse scoring risky driving attitude items a mean score was computed, and higher scores reflected more positive attitudes to driving safety. Internal consistency reliability was high (Cronbach's $\alpha = 0.84$).

Driving-specific self-regulation was measured with the DSRQ-16 measure (see Lazuras et al., 2022; Memarian et al., 2023), a 16-item assessing either self-regulation successful enactment (e.g., "*I never allow myself to lose control when I'm driving*") or failure (e.g., "*I get easily distracted by my thoughts when I'm driving*") while driving. Responses were recorded on a 5-point Likert scale, from 1 = strongly disagree to 5 = strongly agree. After reverse scoring successful self-regulation enactment scores, a sum score is computed with higher scores reflecting lower levels of driving self-regulation. Internal consistency reliability was high (Cronbach's $\alpha = 0.86$)

Design/Procedure

A cross-sectional survey-based design was used. The online survey was developed in Qualtrics (https://www.qualtrics.com/en-gb/). Participants received an average of £6.80 for completing the survey, consistent with the fee policy of Prolific to date. The study adhered to the Code of Human Research Ethics of the British Psychological Society and was approved by the Internal Review Board of Sheffield Hallam University (Ref no: ER67222383).

Data analysis

Statistical analysis was conducted with IBM SPSS version 27.0 for Windows. Descriptive statistics were used to indicate the frequency of mobile phone use while driving (Appendix A). Pearson correlations were used to assess the bivariate associations between demographic factors (i.e., age, gender, and weekly mileage), trait self-regulation, emotion regulation, driving safety attitudes, driving-specific self-regulation, and calling and texting. The multivariate associations between these variables were further assessed with two hierarchical linear regression models for different outcome variables: calling (Model 1) and texting (Model 2). Each regression model was completed in three steps, with background factors (age, gender, and weekly mileage) included in Step 1; trait self-regulation, emotion regulation, driving safety attitudes included in Step 2; and driving-specific self-regulation included in Step 3. Lastly, we used regression-based mediation modelling (Hayes, 2022) to assess the indirect effect of trait self-regulation on mobile phone use outcomes, via driving-specific self-regulation. Mediation results are reported following current methodological standards (Rockwood & Hayes, 2020), including the indirect effect estimate and standard error (ab path), bias-corrected and accelerated (BCa) 95% bootstrap confidence intervals based on 1000 resamples, and the a and b path coefficients.

Results

Correlates of Mobile Phone Use while Driving: Bivariate Associations

The correlations, as well as mean and standard deviation scores, between the measures of the study are summarised in Table 1. Calling and texting were positively correlated ($r = .37$, $p < .001$). The observed effect size justifies analysing these two facets of mobile phone use separately in subsequent multivariate analysis. Lending support to the idea that driving-specific self-regulation can be a protective factor against driver distractibility, lower driving-specific self-regulation was significantly associated with higher levels of calling ($r = -.23$, $p < .001$) and texting ($r = -.34$, $p < .001$) while driving. A negative sign is observed because higher scores in driving-specific self-regulation reflects lower levels of this construct, and lower scores in texting/calling reflect higher frequency of these behaviours.

Multivariate Associations & Mediation Modelling

Model 1 explained 14.3% (Adjusted R^2) of the variance in making/receiving calls while driving, $R^2 = 0.167$, F (8, 280) = 6.99, $p < .001$, with low risk for collinearity (tolerance >.675, VIF < 1.48). The multivariate effect size was $f^2 = 0.20$. The addition of predictors in Step 2 significantly increased the explained variance ($\Delta R^2 = 5.9\%$, $p < .001$), and Step 3 produced a further significant increase ($\Delta R^2 = 2.7\%$, $p = .003$). At the last step of the analysis, calling while driving was associated with higher weekly mileage ($\beta = -.270$, $p < .001$), higher levels of expressive suppression ($\beta = .127$, $p = .028$), and lower levels of driving-specific self-regulation ($\beta = -.201$, $p = .003$). The association between riskier driving attitudes and calling while driving was significant ($\beta = .180$, $p = .003$) in Step 2, but turned non-significant ($\beta = .114$, $p = .075$) when controlling for driving-specific self-regulation.

Model 2 significantly predicted 24.2% (Adjusted R^2) of the variance in texting while driving, $R^2 = 0.263$, F (8, 280) = 12.50, $p < .001$, $f^2 = 0.35$. Collinearity was not evidenced

(tolerance >.675, VIF < 1.48). Step 2 significantly increased the explained variance (ΔR^2 = 20.1%, $p < .001$), followed by a further significant increase at Step 3 (ΔR^2 = 2.5%, $p = .002$). At the last step of the analysis, texting while driving was significantly associated with higher weekly mileage ($\beta = -.163$, $p = .002$), self-identifying as female ($\beta = -.126$, $p = .022$), lower scores in driving safety attitudes ($\beta = .323$, $p < .001$), and lower levels of driving-specific self-regulation ($\beta = -.192$, $p = .002$). The association between texting and (lower levels in) trait self-regulation was significant ($\beta = .125$, $p = .030$) in Step 2 but turned non-significant when driving-specific self-regulation was controlled for. The results from the regression analyses are summarised in Tables 2-3.

Regression-based mediation modelling indicated a significant indirect association between trait self-regulation and texting while driving through driving-specific self-regulation (Figure 1). The indirect association was significant, $ab = .040$, $SE = .011$, 95% BCa CI (.024, .069), based on 1000 bootstrap resamples. Higher trait self-regulation was associated with higher driving-specific self-regulation ($a = -.507$, $SE = .059$, $t = -8.65$, $p < .001$). Driving-specific self-regulation was also associated with less frequent texting while driving ($b = -.080$, $SE = .016$, $t = -5.07$, $p < .001$). The direct association between trait self-regulation on texting while driving was non-significant after driving-specific self-regulation was included in the model ($c' = .034$, $SE = .018$, $t = 1.94$, $p = .053$). No additional covariates were included because the analysis focused on this specific indirect association.

The multivariate association between trait self-regulation and calling while driving was non-significant, so their indirect association was not assessed.

Figure 1. *Indirect Association of Trait Self-Regulation with Texting while Driving.*

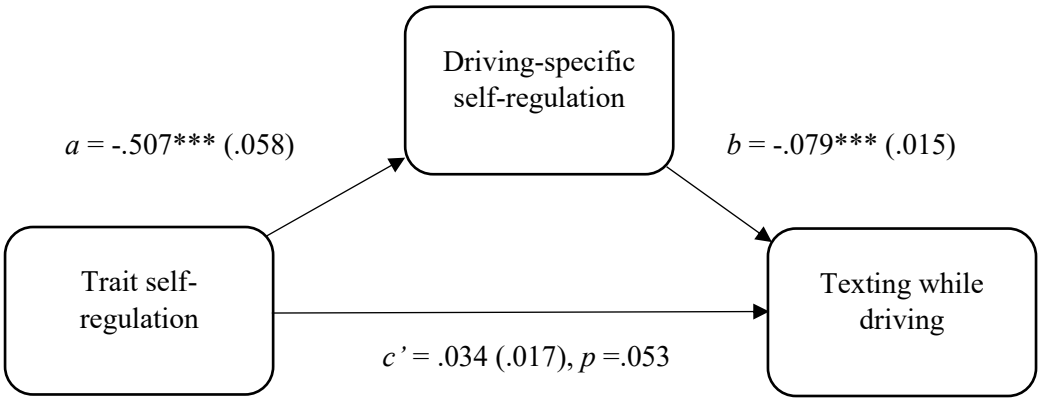


Table 1. *Zero-order Correlations between the Variables of the Study*

	1	2	3	4	5	6	7	8	9	10
1. Mobile phone use – Calling	-	.37***	.18***	-.02	.06	.13*	-.23***	.07	-.03	-.25***
2. Mobile phone use – Texting		-	.40***	.13*	.06	.26***	-.34***	.09	-.03	-.15*
3. Driving safety attitudes			-	.17**	-.09	.32***	-.46***	.17**	.21***	-.07
4. Cognitive reappraisal				-	.04	.29***	-.24***	.07	.09	.07
5. Expressive suppression					-	.00	.07	-.13*	-.25***	.15*
6. Trait self-regulation						-	-.45***	.12*	.03	.02
7. Driving-specific self-regulation							-	-.13*	-.13*	.04
8. Age								-	.05	-.00
9. Gender									-	-.13*
10. Weekly mileage										-
M	11.49	12.68	3.79	4.74	3.73	40.38	31.51	28.96	-	73.72
SD	3.17	2.39	0.58	1.07	1.27	8.43	9.52	13.29	-	5.84[†]
Cronbach's α	0.90	0.85	0.84	0.86	0.78	0.84	0.86	-	-	-

Note: *$p < .05$; **$p < .005$; ***$p < .001$; [†]standard error of the mean is reported.

Table 2. *Multivariate Analysis of Self-Regulation Effects on Calling while Driving*

	Regression coefficients		95% CI for *B*		R^2
Step 1	*B*	*β*	Lower	Upper	8%
Age	.020	.083	-.007	.046	
Gender	-.475	-.070	-1.245	.295	
Weekly mileage	-.009	-.274***	-.012	-.005	
Step 2					13.9%
Age	.015	.062	-.012	.041	
Gender	-.498	-.073	-1.288	.292	
Weekly mileage	-.009	-.277***	-.012	-.005	
Cognitive reappraisal	-.243	-.082	-.587	.100	
Expressive suppression	.295	.119*	.010	.580	
Trait self-regulation	.037	.098	-.008	.082	
Driving safety attitudes	.978	.180**	.328	1.628	
Step 3					16.7%
Age	.014	.057	-.013	.040	

Gender	-.511	-.075	-1.289	.268
Weekly mileage	-.009	-.270***	-.012	-.005
Cognitive reappraisal	-.295	-.099	-.635	.046
Expressive suppression	.315	.127*	.034	.597
Trait self-regulation	.013	.034	-.034	.060
Driving safety attitudes	.619	.114	-.063	1.301
Driving-specific self-regulation	-.068	-.201**	-.112	-.024

Note: *$p < .05$; **$p < .005$; ***$p < .001$.

Table 3. *Multivariate Analysis of Self-Regulation Effects on Texting while Driving*

	Step 1		95% CI for *B*		R^2
Step 1	*B*	*β*	Lower	Upper	3.7%
Age	.018	.102	-.002	.039	
Gender	-.307	-.060	-.904	.290	
Weekly mileage	-.004	-.165*	-.007	-.001	
Step 2					23.9%
Age	.006	.033	-.013	.025	
Gender	-.641	-.125*	-1.204	-.078	
Weekly mileage	-.004	-.169**	-.007	-.002	
Cognitive reappraisal	.105	.047	-.140	.350	
Expressive suppression	.176	.094	-.027	.380	
Trait self-regulation	.036	.125*	.003	.068	
Driving safety attitudes	1.590	.386***	1.127	2.053	
Step 3					26.3%

Age	.005	.029	-.013	.024
Gender	-.650	-.126*	-1.205	-.096
Weekly mileage	-.004	-.163**	-.006	-.001
Cognitive reappraisal	.068	.030	-.175	.310
Expressive suppression	.191	.101	-.010	.392
Trait self-regulation	.018	.063	-.016	.052
Driving safety attitudes	1.331	.323***	.845	1.817
Driving-specific self-regulation	-.049	-.192**	-.081	-.018

Note: *$p < .05$; **$p < .005$; ***$p < .001$.

Study 1 Discussion

Study 1 findings broadly supported our hypotheses. In line with the first hypothesis, higher levels of driving-specific self-regulation corresponded to higher levels of trait self-regulation, and the effect size observed in the present study (r = -.45) is similar to those observed in previous research (rs ~ .52 to .56; Lazuras et al., 2022; Memarian et al., 2023). In support of the second hypothesis, driving-specific self-regulation was significantly associated with mobile phone use while driving over and above the effects of other measures of regulatory capacities such as trait self-regulation and emotion regulation. Specifically, adding driving-specific self-regulation in the multivariate models significantly increased predicted variance in the criterion variable by 2.5% for calling and 2.6% for texting. Previous studies (Lazuras et al., 2022; Memarian et al., 2023) showed that driving-specific self-regulation was associated with risky driving behaviour, such as traffic violations and driving lapses and errors.

Study 1 extends past research by showing that driving-specific self-regulation is also implicated in behaviours that contribute to driver distractibility as measured by use of a phone while driving. Furthermore, the present study extends the finding that mobile phone use when driving is associated with trait self-regulation (Moore & Brown, 2019) by showing that lower levels of both trait and driving specific-self-regulation are positively associated with higher frequency of texting while driving in the zero-order correlations. In the multivariate models, trait self-regulation was not associated with making/receiving calls, but it was significantly associated with texting while driving. Moreover, the association between trait self-regulation and texting while driving was mediated by driving-specific self-regulation. This suggests that context-specific self-regulatory capacity is more relevant for controlling mobile phone use while driving than domain-general trait self-regulation, and

highlights the importance of using contextualised, driving-specific measures in studies of aberrant driving behaviour.

Study 2

Study 2 extends past research on mind wandering and risky driving (e.g., Albert et al., 2018; Burdett et al., 2016; Yanko & Spalek, 2014) by investigating the effects of driving-specific mind wandering and self-regulation on mobile phone use while driving, after controlling for the effects of well-established predictors of driving behaviour, such as driving safety attitudes. Furthermore, given the evidence that driving-specific self-regulation has a protective effect against aberrant driving behaviours (see Lazuras et al., 2019; Lazuras et al., 2022), then it should attenuate the relationship between mind wandering and mobile phone use while driving. Accordingly, the following hypotheses were developed for Study 2:

H1: Driving-specific self-regulation will be negatively associated with driving-specific mind wandering (i.e., higher levels of driving self-regulation corresponding to lower levels of mind wandering while driving).

H2: Mobile phone use while driving will be associated (negatively) with driving-specific self-regulation and (positively) with driving-specific mind wandering, after controlling for other correlates.

H3: Driving-specific self-regulation will moderate the association between driving-specific mind wandering and mobile phone use while driving, so that at higher levels of driving self-regulation mobile phone use will be weakly associated with mind wandering while driving.

Methods

Participants

Overall, 328 English-speaking participants were recruited via the online research participation platform Prolific during May 2025. The required sample size was informed by an a priori power calculation. On the basis of Study 1 results, the effect sizes were estimated to be moderate to large ($f^2 \sim 0.20$ to 0.35) for the relationship between driving-specific self-regulation and calling, and driving-specific self-regulation and texting. The calculation indicated that a sample size of $n = 157$ would provide strong power (95%) with $\alpha = .01$. The same eligibility criteria as used in Study 1 were applied (i.e., aged ≥ 18 years and having a valid UK driving license). Nineteen participants (5.7% of the total sample) failed the attention checker test item (i.e., "*if you are paying attention to the survey, please select "somewhat disagree" from the responses provided*") and their data were excluded, leaving a final sample of 309 participants. Their mean age was 43.81 years (*SD* = 12.65), 58.9% self-identified as males, and mean weekly mileage was 205.09 miles (SE mean = 37.74; Median = 100.00).

Measures

The same measures as used in Study 1 assessed demographic and background variables, driving-specific self-regulation (DSRQ16, Lazuras et al., 2022), and driving safety attitudes (Iversen, 2004). The emotion regulation questionnaire was not included in Study 2. Its inclusion in Study 1 was theoretically motivated by prior research identifying emotion regulation as a correlate of risky driving (Lazuras et al., 2019; Lazuras et al., 2022), and was necessary to establish the incremental validity of driving-specific self-regulation over and above all regulatory capacities identified in that literature when applied, for the first time, to mobile phone use while driving. In Study 2, emotion regulation was not a focal variable and

was omitted to limit participant burden given the addition of the 14-item mind wandering scale. Moreover, in Study 2 we reverse scored the negative items in DSRQ16, so a higher total score reflected higher levels of driving specific self-regulation. We did this to help with interpretation of results across the two studies, as the directionality of the observed associations between driving self-regulation and mobile phone use while driving will be aligned.

Mobile phone use while driving was assessed with the same measure as in Study 1 (White et al., 2010) but we simplified the 7-point response options (from 1 = more than once a day, to 7 = never) to reflect frequency of using a mobile phone while driving on a 5-point continuous scale, from 0 = never to 4 = almost always. The same scaling approach was used in previous research on self-regulation and mobile phone use while driving (see Moore & Brown, 2019; Panek et al., 2015). A mean score was computed and higher scores reflected more frequent mobile phone use. Internal consistency reliability was high for the calling (Cronbach's $\alpha = 0.93$; $r = .88$, $p < .001$) and texting (Cronbach's $\alpha = 0.86$; $r = .76$, $p < .001$) dimensions.

Mind wandering while driving was assessed with Burdett et al.'s (2016) 14-item measure of the tendency to mind wander during different driving situations (e.g., "w*hen I am diving tired, for example at the end of a busy day*") and contexts (e.g., "*on a country route that I have never driven before*"). Responses were recorded on a 6-point scale, from 0 = never to 5 = all of the time. A mean score was computed with higher scores indicating greater tendency to mind wander while driving. Internal consistency reliability was high (Cronbach's $\alpha = 0.94$)

Design/Procedure

The same design and data collection procedure was used as Study 1. Ethics approval was granted by the Internal Review Board of Sheffield Hallam University (Ref no: ER67222383, amendment for additional study approved 14/05/2024).

Data analysis

Statistical analysis was conducted with IBM SPSS version 27.0 for Windows. Descriptive statistics were used to indicate the frequency of mobile phone use while driving (Appendix B). Correlation analysis with Pearson's *r* and hierarchical multiple regression modelling were used to respectively assess the bivariate associations between demographic factors (i.e., age, gender, and weekly mileage), driving safety attitudes, mind wandering while driving, driving-specific self-regulation, and calling and texting while driving. The multivariate associations between these variables were further assessed with two hierarchical linear regression models respectively predicting calling (Model 1) and texting (Model 2) while driving. Each regression model was completed in three steps, with background factors included in Step 1; mind wandering while driving and driving safety attitudes included in Step 2; and driving-specific self-regulation included in Step 3. Moderated linear regression was also used with PROCESS macro v5.0 for SPSS (Hayes, 2022) to assess the moderating effect of driving-specific self-regulation on the relationship between mind wandering and mobile phone use outcomes (i.e., calling and texting).

Results

Correlates of Mobile Phone Use while Driving: Bivariate Associations

The correlations, mean and standard deviation scores for the variables used in the study are shown in Table 4. Higher levels of driving-specific self-regulation were significantly associated with lower frequency of calling ($r = -.25$, $p < .001$) and texting ($r = -.37$, $p < .001$)

while driving. Similar effect sizes were also observed for the associations of mind wandering while driving with calling (r = .28, p < .001) and texting (r = .37, p < .001).

Multivariate Associations

Model 1 significantly predicted 14.9% (Adjusted R^2) of the variance in making/receiving calls while driving, R^2 = .166, F (6, 301) = 9.96, p <.001, f^2 = 0.19, with low risk for collinearity (tolerance >.575, VIF < 1.73). The addition of predictors in Step 2 significantly increased the explained variance (ΔR^2 = 5.8%, p < .001), but Step 3 did not produce a significant increase (ΔR^2 = 0.008, p = .08). At the last step of the analysis, calling while driving was associated with younger age (β = -.249, p < .001) and higher scores in mind wandering (β = .143, p = .026). A non-significant effect was observed for driving-specific self-regulation (β = -.119, p = .087).

Model 2 significantly predicted 24.3% (Adjusted R^2) of the variance in texting while driving, R^2 = .258, F (6, 301) = 17.46, p <.001, f^2 = 0.34. Collinearity was not evidenced (tolerance >.575, VIF < 1.73). Step 2 significantly increased the explained variance (ΔR^2 = 12.2%, p < .001), followed by a further significant increase at Step 3 (ΔR^2 = 2.4%, p = .002). At the last step of the analysis, younger drivers (β = -.169, p = .001), male drivers (β = -.133, p = .008), higher weekly mileage (β = .150, p = .003), greater mind wandering (β = .191, p = .002), and lower levels of driving-specific self-regulation (β = -.205, p = .002) were all significantly associated with a higher frequency of texting while driving. The results from the regression analyses are summarised in Tables 5 and 6.

Moderated Regression Analysis

The predictor and moderator variables (mind wandering and driving-specific self-regulation) were mean-centred, and an interaction term (mind wandering × driving-specific self-regulation) was computed. Moderation was tested with Model 1 of the PROCESS macro

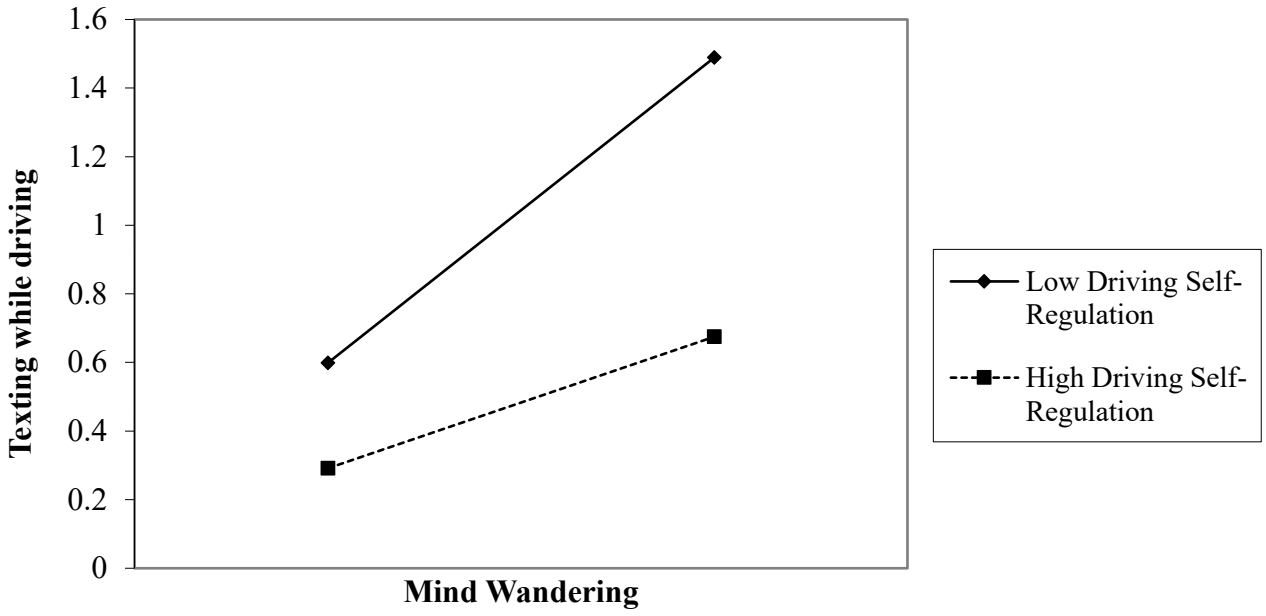
SPSS version 5.0 (Hayes, 2022), and two models were run for each outcome. The first included mind wandering, driving-specific self-regulation, and their interaction term, and is reported as the primary analysis. The second added the covariates used in the hierarchical regression models reported above (age, gender, weekly mileage, and driving safety attitudes), to establish whether the interaction held once these variables were taken into account. Conditional effects were estimated at the 16th, 50th, and 84th percentiles of driving-specific self-regulation, and 95% confidence intervals were used.

The model was statistically significant, R^2 = 19.9%, $F(3, 305) = 25.25$, $p < .001$, and the results showed that driving-specific self-regulation significantly moderated the relationship between mind wandering and texting while driving (B = -.127, *SE* = .054, *p* = .019, ΔR^2-change = .015, *p* = .02), indicating a weaker relationship between mind wandering and texting while driving when driving-specific self-regulation was high. Mind wandering was positively associated with texting while driving when driving-specific self-regulation was at low (B = .442, *SE* = .094, p < .001), medium (B = .309, *SE* = .082, *p* < .001), and high (B = .197, *SE* = .099, *p* = .048) levels, although the effect was marginally significant at higher levels of self-regulation (see Figure 2).

In the adjusted model, accounting for the effects of covariates (age, gender, weekly mileage, and driving safety attitudes), the interaction was statistically significant and improved compared to the unadjusted model R^2 = 27.48%, $F(7, 300) = 16.23$, $p < .001$ (B = -.138, *SE* = .052, *p* = .009, ΔR^2-change = .017, *p* = .009. Age (B = -.017, *p* = .001), gender (B = -.379, *p* = .004), and weekly mileage (B = .0003, *p* = .004) were each associated with texting while driving in this model, while driving safety attitudes were not (B = .199, *p* = .079). Mind wandering was positively associated with texting while driving when driving-specific self-regulation was at low (*B* = .376, *SE* = .092, *p* < .001) and medium levels (*B* = .230, *SE* = .080, *p* = .004), but not when it was high (*B* = .114, *SE* = .095, *p* = .234).

Driving-specific self-regulation did not moderate the association between mind wandering and calling while driving (B = -.059, *SE* = .087, $p > .05$), in both the unadjusted model, $R^2 = 9.8\%$, $F(3, 305) = 11.08$, $p < .001$ (ΔR^2-change = .001, $p = .496$), and the adjusted model which included covariates, $R^2 = 16.7\%$, $F(7, 300) = 8.62$, $p < .001$ (B = -.069, *SE* = .086, $p = .428$, ΔR^2-change = .002, $p = .428$). In the adjusted model, age was the only variable associated with calling while driving (B = -.040, $p < .001$), and the association with driving-specific self-regulation was no longer significant (B = -.212, $p = .151$).

498 **Figure 2.** *Interaction of Mind Wandering while Driving with Driving Self-Regulation.*



499

500

501

Table 4. *Zero-order Correlations between the Variables of the Study*

	1	2	3	4	5	6	7	8	9
1. Mobile phone use total	-	.92***	.80***	.22***	.36***	-.34***	-.31***	-.10	.17**
2. Mobile phone use – Calling		-	.51***	.17**	.28***	-.25***	-.29***	-.07	.10
3. Mobile phone use – Texting			-	.24***	.37***	-.37***	-.25***	-.13*	.21***
4. Driving safety attitudes				-	.31***	-.51***	-.01	.00	.02
5. Mind wandering while driving					-	-.54***	-.21***	.01	.12*
6. Driving-specific self-regulation						-	.10	-.02	-.09
7. Age							-	.02	-.09
8. Gender								-	-.00
9. Weekly mileage									-
M	2.66	2.91	2.41	2.06	2.49	65.26	43.81	-	205.09
SD	0.73	1.01	0.66	0.68	0.89	9.49	12.65	-	37.74[†]
Cronbach's α	0.78	0.90	0.85	0.84	0.86	0.78	0.84	-	-

Note: *$p < .05$; **$p < .005$; ***$p < .001$; [†]standard error of the mean is reported instead of standard deviation.

506 Table 5. *Multivariate Analysis of Driving-Specific Self-Regulation and Mind Wandering Effects on Calling while Driving*

	Step 1		95% CI for *B*		Adjusted R^2
Step 1	*B*	*β*	Lower	Upper	9.9%
Age	-.047	-.290***	-.064	-.029	
Gender	-.246	-.060	-.689	.197	
Weekly mileage	.000	.078	.000	.001	
Step 2					15.7%
Age	-.040	-.250***	-.057	-.023	
Gender	-.268	-.065	-.698	.162	
Weekly mileage	.000	.055	.000	.000	
Driving safety attitudes	.309	.104	-.016	.634	
Mind wandering while driving	.439	.192***	.181	.697	
Step 3					16.6%
Age	-.040	-.249***	-.057	-.023	
Gender	-.276	-.067	-.704	.153	

Weekly mileage	.000	.052	.000	.000
Driving safety attitudes	.173	.059	-.186	.533
Mind wandering while driving	.327	.143*	.040	.615
Driving-specific self-regulation	-.026	-.119	-.055	.004

Note: *$p < .05$; **$p < .005$; ***$p < .001$.

508 Table 6. *Multivariate Analysis of Driving-Specific Self-Regulation and Mind Wandering Effects on Texting while Driving*

	Step 1		95% CI for *B*		Adjusted R^2
Step 1	*B*	*β*	Lower	Upper	11.2%
Age	-.024	-.228***	-.035	-.013	
Gender	-.331	-.122*	-.619	-.043	
Weekly mileage	.000	.188***	.000	.001	
Step 2					23.4%
Age	-.018	-.171***	-.029	-.007	
Gender	-.351	-.130*	-.620	-.083	
Weekly mileage	.000	.156**	.000	.001	
Driving safety attitudes	.298	.154**	.095	.501	
Mind wandering while driving	.412	.275***	.251	.573	
Step 3					25.8%
Age	-.018	-.169***	-.028	-.007	
Gender	-.361	-.133*	-.625	-.096	

Weekly mileage	.000	.150**	.000	.000
Driving safety attitudes	.145	.075	-.077	.367
Mind wandering while driving	.286	.191**	.108	.463
Driving-specific self-regulation	-.029	-.205**	-.047	-.011

Note: *$p < .05$; **$p < .005$; ***$p < .001$.

Study 2 Discussion

The results from Study 2 supported all three hypotheses concerning the associations between driving-specific mind wandering, self-regulation, and mobile phone use. Specifically, a strong effect size was observed for the zero-order correlation between driving-specific self-regulation and mind wandering (r = -.54), which is similar to the effect sizes reported in previous mind wandering research outside the context of driving (rs ~ -.46 to -.49; Deng et al., 2019; Isacescu et al., 2017). Although the observed correlation between driving-specific self-regulation and mind wandering was strong (r = -.54), the two constructs are conceptually distinct: mind wandering refers to an attentional phenomenon reflecting task-disengagement, whereas driving-specific self-regulation refers to a control process reflecting the active capacity to regulate driving behaviour (Lazuras et al., 2022; Randall et al., 2014). The acceptable collinearity diagnostics (tolerance > .575, VIF < 1.74) further confirm that both constructs contributed independently to the prediction of mobile phone use while driving. To the best of the authors' knowledge, this is the first study to report associations between contextualised, driving-specific measures of both self-regulation and mind wandering.

Additionally, as hypothesised, calling and texting while driving were both associated with driving-specific self-regulation and mind wandering in the expected direction in the bivariate analysis. In the multivariate models, both driving-specific self-regulation and mind wandering were associated with texting, but only driving-specific mind wandering was associated with calling. These findings are consistent with previous research about the association between mind-wandering and mobile phone use while driving, although it is the first time a driving-specific mind wandering scale has been used in this context. Also, the present findings offer novel insights about the associations between texting, self-regulation, and mind wandering: mind wandering was less strongly related to texting while driving when

driving-specific self-regulation was high, an effect observed even after controlling for covariates, such as age, gender, weekly mileage, and driving safety attitudes.

General Discussion

Taken together, the present findings have important theoretical implications. Firstly, driving-specific self-regulation presents a relevant theoretical construct for the study of distracted driving behaviours, such as mobile phone use while driving. Moreover, the observed effects of driving-specific self-regulation on mind wandering lend support to dual process and resource allocation theories that relate mind wandering to self-regulation failure (Randall et al., 2014). Previous research showed that drivers tend to engage in mind wandering more often when the driving context is familiar and undemanding (e.g., driving on a familiar route; Burdett et al., 2016; Burdett et al., 2018). This does not imply mind wandering while driving is a safe practice. Charlton and Starkey (2013) demonstrated that drivers who reported higher levels of driving without awareness because of route familiarity were more likely to display inattention blindness: failing to notice changes in the route (e.g., changes in road signs and buildings). Our results demonstrate that higher levels of driving-specific self-regulation, as measured by the DSRQ-16, are negatively associated with mind wandering while driving.

The present findings indicate that mind wandering is associated with mobile phone use especially when driving-specific self-regulation is low. It is possible that this effect can be, at least partly, attributed to individual differences in executive control and metacognitive processes. As Deng et al. (2019) proposed, mind wandering and self-regulation represent the opposite ends of a continuum. Supporting evidence comes from research showing that core components of executive functions, such as working memory capacity (WMC), are associated with mind wandering (lower WMC levels associated with higher levels of mind wandering; Kane & McVay, 2012). From this perspective, distracted driving (e.g., mind

wandering and mobile phone use while driving) and aberrant driving behaviour (e.g., traffic violations and driving errors) can be manifestations of executive control failures. Memarian et al. (2023) provided supporting evidence for this argument, showing that executive function deficits were associated with lower levels of driving-specific self-regulation and higher levels in driving violations and errors.

Across both studies, a systematic pattern emerged in which self-regulatory predictors were more consistently associated with texting than with calling while driving. In Study 1, trait self-regulation significantly predicted texting but not calling, and mediation via driving-specific self-regulation was significant only for texting. In Study 2, driving-specific self-regulation significantly predicted texting but not calling in the multivariate model, and the moderating effect of driving-specific self-regulation was significant only for texting. This pattern is theoretically meaningful and consistent with evidence that texting while driving is more strongly linked to self-regulatory processes than calling, given its greater association with habitual behaviour and reduced conscious awareness (Moore & Brown, 2019; Panek et al., 2015). It is plausible that calling while driving is more reactive and situationally driven, whereas composing or reading a text message involves more deliberate cognitive engagement, rendering it more susceptible to self-regulatory influences.

The present research is not free of limitations. Firstly, the cross-sectional design is inherently limited and we cannot safely draw causal inferences, because third variables unaccounted for in the present study may partly explain the association between predictors and outcome variables. Secondly, mobile phone use while driving was self-reported and referred to past behaviour, which can be subject to response bias (e.g., social desirability or self-deception). Relatedly, common method variance presents another limitation, which could be mitigated by using objective measures of mobile phone use while driving. Thirdly, the measure used to assess driving-specific mind wandering (Burdett et al., 2016) did not

distinguish between deliberate and spontaneous mind wandering (see Tinella et al., 2022), although this presents an inherent limitation of the specific measure. Another limitation was the observed differences in demographic characteristics (age and gender) and weekly mileage driven between the two studies. Although both gender and age were controlled for in the multivariate analyses, having more female drivers in Study 1, and older drivers in Study 2 may limit the generalisability of the findings, as engagement in distracted driving behaviours and associated psychological factors may differ across genders and age groups. In addition, weekly mileage in Study 1 was almost 1/3 of the mileage reported in Study 2, which could reflect differences in driving behaviour during (Study 1) and after (Study 2) the COVID pandemic. Moreover, Study 2 did not control for route familiarity which has been associated with increased mind wandering and inattentive driving in past research (e.g., Charlton & Starkey, 2013). Future research may assess whether drivers tend to use their phones more while driving in demanding vs. undemanding routes. Notwithstanding these limitations, the present research presented novel findings and avenues for future research regarding the interplay between driving-specific self-regulation, mind wandering, and distracted driving behaviour, such as mobile phone use while driving. Another strength is the identification of driving-specific self-regulation as a potential target for interventions against distracted driving and associated crash risk.

With regards to implications for practice, the present findings indicate that driving-specific self-regulation represents a key target for behaviour change interventions aiming at reducing distracted driving. In particular, given the systematic pattern observed across both studies, interventions targeting driving-specific self-regulation are likely to be most effective for reducing texting while driving; interventions targeting calling may need to engage additional mechanisms. The mediation effect observed in Study 1 suggests that such interventions can be more effective by targeting contextualised, driving-specific self-

regulation. Accordingly, the moderation effect observed in Study 2 suggests that targeting driving-specific self-regulation can attenuate the relationship between mind-wandering and texting while driving, thereby addressing the attentional and behavioural component involved in distracted driving.

References

Atwood, J., Guo, F., Fitch, G., & Dingus, T. A. (2018). The driver-level crash risk associated with daily cellphone use and cellphone use while driving. *Accident Analysis & Prevention*, *119*, 149-154.

Burdett, B. R., Charlton, S. G., & Starkey, N. J. (2016). Not all minds wander equally: The influence of traits, states and road environment factors on self-reported mind wandering during everyday driving. *Accident Analysis & Prevention*, *95*, 1-7.

Burdett, B. R., Charlton, S. G., & Starkey, N. J. (2018). Inside the commuting driver's wandering mind. *Transportation Research Part F: Traffic Psychology and Behaviour*, *57*, 59-74.

Charlton, S. G., & Starkey, N. J. (2013). Driving on familiar roads: Automaticity and inattention blindness. *Transportation Research Part F: Traffic Psychology and Behaviour*, *19*, 121-133.

Cordellieri, P., Lausi, G., Fraschetti, A., Mari, E., Burrai, J., Quaglieri, A., Paoli, E., & Giannini, A. M. (2022). Young drivers 'on the phone: Personality traits, driving attitudes, beliefs, and risk perception on using mobile phone while driving. *Psychological Studies*, *67*(4), 459-467.

Deng, Y., Zhang, B., Zheng, X., Liu, Y., Wang, X., & Zhou, C. (2019). The role of mindfulness and self-control in the relationship between mind-wandering and metacognition. *Personality and Individual Differences*, *141*, 51-56.

Dingus, T. A., Guo, F., Lee, S., Antin, J. F., Perez, M., Buchanan-King, M., & Hankey, J. (2016). Driver crash risk factors and prevalence evaluation using naturalistic driving data. *Proceedings of the National Academy of Sciences*, *113*(10), 2636-2641.

Dotse, J. E. K., & Rowe, R. (2025). Applicability of the contextual mediated model to predicting road crashes in Ghana and the United Kingdom. *Transportation Research Part F: Traffic Psychology and Behaviour*, *109*, 635-651.

Douglas, B. D., Ewell, P. J., & Brauer, M. (2023). Data quality in online human-subjects research: Comparisons between MTurk, Prolific, CloudResearch, Qualtrics, and SONA. *PLoS One, 18*(3), e0279720. https://doi.org/10.1371/journal.pone.0279720

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41*(4), 1149–1160.

Galéra, C., Orriols, L., M'Bailara, K., et al. (2012). Mind wandering and driving: responsibility case-control study. *Bmj*, *345*.

Gariazzo, C., Stafoggia, M., Bruzzone, S., Pelliccioni, A., & Forastiere, F. (2018). Association between mobile phone traffic volume and road crash fatalities: A population-based case-crossover study. *Accident Analysis & Prevention*, *115*, 25-33.

Geurts, S. M., Koning, I. M., & Finkenauer, C. (2023). How specific is alcohol-specific self-control? A longitudinal study of the mediating role of alcohol-specific self-control in the relation between general self-control and adolescent alcohol use. *Journal of Prevention*, *44*(5), 501-520.

Hayes, A. F. (2018). Partial, conditional, and moderated moderated mediation: Quantification, inference, and interpretation. *Communication Monographs*, *85*(1), 4-40.

Hayes, A. F. (2022). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (3rd ed.). New York: The Guilford Press.

Hofmann, W., Schmeichel, B. J., & Baddeley, A. D. (2012). Executive functions and self-regulation. *Trends in Cognitive Sciences*, *16*(3), 174-180.

Isacescu, J., Struk, A. A., & Danckert, J. (2017). Cognitive and affective predictors of boredom proneness. *Cognition and Emotion*, *31*(8), 1741-1748.

Jazayeri, A., Martinez, J. R. B., Loeb, H. S., & Yang, C. C. (2021). The impact of driver distraction and secondary tasks with and without other co-occurring driving behaviors on the level of road traffic crashes. *Accident Analysis & Prevention*, *153*, 106010.

Iversen, H. (2004). Risk-taking attitudes and risky driving behaviour. *Transportation Research Part F: Traffic Psychology and Behaviour*, *7*(3), 135-150.

Kane, M. J., & McVay, J. C. (2012). What mind wandering reveals about executive-control abilities and failures. *Current Directions in Psychological Science*, *21*(5), 348-354.

Kawagoe, T. (2022). Executive failure hypothesis explains the trait-level association between motivation and mind wandering. *Scientific Reports*, *12*(1), 5839.

Lam, L. T. (2002). Distractions and the risk of car crash injury: The effect of drivers' age. *Journal of Safety Research*, *33*(3), 411-419.

Lazuras, L., Rowe, R., Ypsilanti, A., Smythe, I., Poulter, D., & Reidy, J. (2022). Driving self-regulation and risky driving outcomes. *Transportation Research Part F: Traffic Psychology and Behaviour*, *91*, 461-471.

Li, J., Lu, A., Ye, L., Chen, G., Ling, H., Chen, W., ... & Ke, X. (2025). Mobile Phone Addiction, Self-Control, Mind Wandering, and Cognitive Failure in Chinese Adolescents: A Network Analysis and a Chain Mediation Model. *Psychology in the Schools, 62,* 1730-1740.

Lucidi, F., Mallia, L., Lazuras, L., & Violani, C. (2014). Personality and attitudes as predictors of risky driving among older drivers. *Accident Analysis & Prevention*, *72*, 318-324.

Lucidi, F., Girelli, L., Chirico, A., Alivernini, F., Cozzolino, M., Violani, C., & Mallia, L. (2019). Personality traits and attitudes toward traffic safety predict risky behavior across young, adult, and older drivers. *Frontiers in Psychology*, *10*, 536.

Lucidi, F., Mallia, L., Giannini, A. M., Sgalla, R., Lazuras, L., Chirico, A., Alivernini, F., Girelli, L., & Violani, C. (2019). Riding the adolescence: Personality subtypes in young moped riders and their association with risky driving attitudes and behaviors. *Frontiers in Psychology*, *10*, 300.

Mallia, L., Lazuras, L., Violani, C., & Lucidi, F. (2015). Crash risk and aberrant driving behaviors among bus drivers: the role of personality and attitudes towards traffic safety. *Accident Analysis & Prevention*, *79*, 145-151.

Memarian, M., Lazuras, L., Rowe, R., & Karimipour, M. (2023). Impulsivity and self-regulation: A dual-process model of risky driving in young drivers in Iran. *Accident Analysis & Prevention*, *187*, 107055.

Olsson, B., Pütz, H., Reitzug, F., & Humphreys, D. K. (2020). Evaluating the impact of penalising the use of mobile phones while driving on road traffic fatalities, serious injuries and mobile phone use: a systematic review. *Injury Prevention*, *26*(4), 378-385.

Panek, E. T., Bayer, J. B., Dal Cin, S., & Campbell, S. W. (2015). Automaticity, mindfulness, and self-control as predictors of dangerous texting behavior. *Mobile Media & Communication*, *3*(3), 383-400.

Qu, W., Ge, Y., Xiong, Y., Carciofo, R., Zhao, W., & Zhang, K. (2015). The relationship between mind wandering and dangerous driving behavior among Chinese drivers. *Safety science*, *78*, 41-48.

Randall, J. G., Oswald, F. L., & Beier, M. E. (2014). Mind-wandering, cognition, and performance: A theory-driven meta-analysis of attention regulation. *Psychological Bulletin*, *140*(6), 1411.

Rockwood, N. J., & Hayes, A. F. (2020). Mediation, moderation, and conditional process analysis: Regression-based approaches for clinical research. In A. G. C. Wright & M. N. Hallquist (Eds.), *The Cambridge handbook of research methods in clinical psychology* (pp. 396–414). Cambridge University Press. https://doi.org/10.1017/9781316995808.037

Tinella, L., Koppel, S., Lopez, A., Caffò, A. O., & Bosco, A. (2022). Associations between personality and driving behavior are mediated by mind-wandering tendency: A cross-national comparison of Australian and Italian drivers. *Transportation Research Part F: Traffic Psychology and Behaviour*, *89*, 265-275.

Tirla, L., Sârbescu, P., & Rusu, A. (2024). Assessing the effectiveness of psychoeducational interventions on driving behavior: A systematic review and meta-analysis. *Accident Analysis & Prevention*, *199*, 107496. https://doi.org/https://doi.org/10.1016/j.aap.2024.107496

Ulleberg, P., & Rundmo, T. (2003). Personality, attitudes and risk perception as predictors of risky driving behaviour among young drivers. *Safety Science*, *41*(5), 427-443.

Watson-Brown, N., Scott-Parker, B., & Senserrick, T. (2019). Association between higher-order driving instruction and risky driving behaviours: Exploring the mediating effects of a self-regulated safety orientation. *Accident Analysis & Prevention*, *131*, 275-283.

Watson-Brown, N., Senserrick, T., Freeman, J., Davey, J., & Scott-Parker, B. (2021). Self-regulation differences across learner and probationary drivers: The impact on risky driving behaviours. *Accident Analysis & Prevention*, *154*, 106064.

Werner, K. M., & Milyavskaya, M. (2019). Motivation and self-regulation: The role of want-to motivation in the processes underlying self-regulation and self-control. *Social and Personality Psychology Compass*, *13*(1), e12425.

Wundersitz, L. (2019). Driver distraction and inattention in fatal and injury crashes: Findings from in-depth road crash data. *Traffic Injury Prevention*, *20*(7), 696-701.

Yanko, M. R., & Spalek, T. M. (2014). Driving with the wandering mind: The effect that mind-wandering has on driving performance. *Human Factors*, *56*(2), 260-269.

Zatezalo, N., Erdogan, M., & Green, R. S. (2018). Road traffic injuries and fatalities among drivers distracted by mobile devices. *Journal of Emergencies, Trauma, and Shock*, *11*(3), 175-182.

Zhang, J., Feng, Q., & Qiu, J. (2024). Frequent absent mindedness and the neural mechanism trapped by mobile phone addiction. *Neuroscience*, *563*, 252-260.

Appendix A. *Self-reported Frequency of Calling and Texting while Driving (Study 1)*

	Never	Once a year	1 or 2 times in 6 months	1 or 2 times a month	1 or 2 times a week	Daily	More than once a day
	% (*n*)	% (*n*)	% (*n*)	% (*n*)	% (*n*)	% (*n*)	% (*n*)
Answer a call	50.2% (148)	6.4% (19)	15.9% (47)	9.5% (28)	12.5% (37)	5.1% (15)	0.3% (1)
Make a call	63.7% (188)	6.4% (19)	9.8% (29)	5.1% (15)	10.2% (30)	4.4% (13)	0.3% (1)
Read a text message	65.1% (192)	9.2% (27)	10.5% (31)	7.1% (21)	5.1% (15)	2.4% (7)	0.7% (2)
Send a text message	82.0% (242)	5.8% (17)	4.4% (13)	4.4% (13)	1.4% (4)	1.4% (4)	0.7% (2)

752 Appendix B. *Self-reported Frequency of Calling and Texting while Driving (Study 2)*

	Never	Rarely	Sometimes	Often	Almost always
	% (*n*)	% (*n*)	% (*n*)	% (*n*)	% (*n*)
Answer a call	42.1% (130)	25.9% (80)	21% (65)	9.4% (29)	1.6% (5)
Make a call	52.4% (162)	23.9% (74)	15.2% (47)	7.1% (22)	1.3% (4)
Read a text message	61.8% (191)	26.5% (82)	10% (30)	1.3% (4)	0.3% (1)
Send a text message	77.0% (238)	16.8% (52)	4.2% (10)	1.6% (5)	0.3% (1)

753

754

755

Appendix C. *Direction of Scoring in the Key Measures Used in Studies 1 and 2*

Variable	**Study 1**	**Study 2**
Mobile phone use: Calling	1 = more than once a day, 7 = never; higher scores = less use	0 = never, 4 = almost always; higher scores = more use
Mobile phone use: Texting	1 = more than once a day, 7 = never; higher scores = less use	0 = never, 4 = almost always; higher scores = more use
Driving-specific self-regulation (DSRQ-16)	Higher scores = lower self-regulation	Higher scores = higher self-regulation (negative items reverse-scored)
Trait self-regulation	Higher scores = higher self-regulation	Not assessed
Mind wandering while driving	Not assessed	Higher scores = more mind wandering
Driving safety attitudes	Higher scores = more positive attitudes	Higher scores = more positive attitudes

Note. Scoring directions should be taken into account when interpreting coefficient signs in the regression models reported for each study. In Study 1, a negative regression coefficient for DSRQ-16 predicting mobile phone use indicates that lower self-regulation (higher DSRQ scores) is associated with more frequent phone use (lower scores on the phone use scale). In Study 2, a negative regression coefficient for DSRQ-16 predicting mobile phone use indicates that higher self-regulation is associated with less frequent phone use, consistent with Study 1 in direction but opposite in sign due to the reversed coding of both variables.

762