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Title	Trait mindfulness & self-reported driving behaviour
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Publication date	2019-05-10
Original Citation	Murphy, G. and Matvienko-Sikar, K. (2019) 'Trait mindfulness & self-reported driving behaviour', Personality and Individual Differences, 147, pp. 250-255. doi: 10.1016/j.paid.2019.05.002
Type of publication	Article (peer-reviewed)
Link to publisher's version	https://www.sciencedirect.com/science/article/pii/S0191886919302818 - 10.1016/j.paid.2019.05.002
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Download date	2026-11-16 06:30:28
Item downloaded from	https://hdl.handle.net/10468/8103



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Trait Mindfulness & Self-Reported Driving Behaviour

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Abstract

Trait mindfulness is considered a protective factor for a number of risky health behaviours, yet the relationship between mindfulness and driving behaviours remains underexplored. In the current study, 657 participants completed the Mindful Attention and Awareness Scale, Spielberger State Trait Anxiety Inventory, Manchester Driving Behaviour Questionnaire, Driving Behaviour Survey and Driving Cognitions Questionnaire, as well as questions concerning driving under the influence of drugs or alcohol, phone use when driving and collision history. The findings suggest that trait mindfulness is associated with decreased engagement in problematic driving behaviours including errors, lapses, wilful violations of road rules, aggressive driving and phone use. Mindfulness was also associated with reduced anxious driving behaviours and reduced negative thoughts while driving. Observed effects were relatively small, though for most variables measured, safe driving was more strongly correlated with trait mindfulness than it was with age or driving experience. Overall, this study highlights important mechanisms for future examinations of mindful driving interventions.

Introduction

Mindfulness can be described as "the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment" (Kabat-Zinn, 2003, p 145). Mindfulness is associated with multiple beneficial psychological, physiological and behavioural outcomes including increased life satisfaction and self-esteem, and decreased perceived stress, anxiety and negative affectivity (Brown & Ryan, 2003). Trait mindfulness has also been associated with a range of health behaviours, such as consuming smaller servings of calorie-dense foods (Beshara, Hutchinson, & Wilson, 2013), and reduced alcohol use (Christopher, Ramsey & Antick, 2012) and polydrug use (Dakwar, Mariani & Levin, 2011).

While a number of theoretical and conceptual models of mindfulness have been proposed (e.g. Cebolla et al., 2018), the key components underpinning all mindfulness approaches are self-regulation of attention and adopting an orientation to experience that is characterised by openness and acceptance to all mental, physical and external stimuli that arise in the present moment (Bishop et al., 2004; Keng et al., 2011). According to Bishop et al. (2004) the aim of this orientation to experience is that all stimuli are experienced and acknowledged, with the focus of attention constantly brought back to the present moment. It is argued that mindfulness can result in stability, clarity and self-regulation of attention (Semple, 2010), wherein all stimuli are experienced without any secondary elaborative processing. Worry and rumination that could result from elaborative processing do not therefore occur. This effortful refocusing and redirecting of attention can be considered a form of meta-cognitive awareness (Bishop et al., 2004; Carmody, 2009; Grabovac et al., 2011) and may be contrasted with undirected or mindless attention, (Semple, 2010), which is characterised by distraction and inconsistent focus.

While all individuals are capable of achieving mindful states, it has been suggested that there may be individual differences in the tendency to be mindful. This could have important applied applications in areas such as driving. As noted by Valero-Mora and colleagues (2015), the notion that mindfulness may relate to driving behaviour is appealing, due to the positive nature of the message (utilising an existing ability to improve driving), contrasted with the typically very negative driving safety messages (driving is too complex, drivers get too distracted, etc.). The role of mindfulness in driving behaviour also makes intuitive sense, as the role of situational awareness and selective attention in driving has been well supported (Kass, Cole & Legan, 2008; Murphy & Greene, 2016, 2017) and self-regulation of attention is central to the concept of mindfulness (Bishop et al., 2004). While there is currently limited empirical support for mechanistic pathways between mindfulness and a range of outcomes (Cebolla et al. 2018), this study hypothesises that mindfulness will influence four specific driving behaviours through the two central components of orientation to experience and self-regulation of attention. These outcomes are; driver attention, risky driving behaviour, driver aggression, and driving anxiety and negative thoughts.

1. Driver Attention

Given that a central component of mindfulness is self-regulation of attention, and given the importance of attention in safe driving (Groeger, 2000), it is hypothesised that mindfulness may result in reduced errors, lapses and inattention behind the wheel. Mindfulness training studies have shown improved distractor inhibition (Moore & Malinowski, 2009), improved executive attention (van den Hurk, Giommi, Gielen, Speckens & Barendregt, 2010) and reduced inattentional blindness (Schofield, Creswell & Denson, 2015). In a driving context,

trait mindfulness negatively correlates with self-reported mind-wandering when driving (Burdett, Charlton & Starkey, 2016) and more mindful drivers report fewer near-collisions when they text while driving, suggesting that mindfulness may aid attention regulation when multitasking (Terry & Terry, 2015). In the current study, we will assess the relationship between mindfulness and a broad range of driver attention failures (e.g. failing to notice pedestrians at a pedestrian crossing, reversing into a clearly visible object, getting into the wrong lane when approaching a junction, etc.).

2.Risky Driving Behaviour

It is hypothesised that mindful behaviours are more intentional and mindful people pay greater attention to their behaviours (Chatzisarantis & Hagger, 2007). This is unsurprising as mindfulness fosters more present-focused attention to thoughts, feelings and behaviours; in addition to self-regulation of attention. It has been suggested that mindful individuals' attention to present experiences may strengthen the ability to override counter-intentional habits and thoughts and thus strengthen the intention-behaviour relationship, translating into positive health behaviours (Chatzisarantis & Hagger, 2007). Though limited research has been conducted in the context of driving, one study did find that more mindful individuals chose to text less frequently when driving (Feldman, Greeson, Renna & Robbins-Monteith, 2011). This suggests that trait mindfulness may improve driver safety by reducing risky driving behaviours, such as road-rule violations, drink-driving and phone use when driving, all of which will be assessed in the current study.

3.Driver Aggression

Trait mindfulness has been shown to relate to stress and aggression across a wide variety of settings and populations (Fix & Fix, 2013; Heppner et al., 2008; O'Leary, O'Neil & Dockray, 2016; Matvienko-Sikar & Dockray, 2017). Neuroimaging evidence has suggested a pathway for this effect, demonstrating reduced bilateral amygdala activation and increased prefrontal cortex activation in individuals high in trait mindfulness performing a facial affect-labeling task, suggesting improved regulation of negative stimuli (Creswell, Way, Eisenberger & Lieberman, 2007). There is some evidence that mindfulness interventions can reduce aggressive driving behaviour (Polizzi, 2007; Kazemeini, Ghanbari-e-Hashem-Abadi & Safarzadeh, 2013), and it is hypothesised that mindfulness reduces aggressive driving behaviour through present-focused, non-judgmental attention, improving emotional regulation (Keng et al., 2011).

4. Driving Anxiety & Negative Thoughts

In a similar manner, mindfulness may reduce driving anxiety and negative thoughts through self-regulation of attention, reducing worry and rumination and facilitating a more open approach to dealing with perceived negative stimuli (Keng et al., 2011). Evidence from non-driving contexts demonstrates that trait mindfulness is negatively associated with uncontrollable rumination (Raes & Williams, 2010), social anxiety (Brown & Ryan, 2003), negative thoughts (Frewen, Evans, Maraj, Dozois & Partridge, 2008), and trait anxiety (Walsh et al., 2009). As anxiety is known to exert a negative influence on driving behaviour, including impaired driving ability, excessively-cautious behaviour, hostile behaviours and higher difficulty evaluations (Clapp et al., 2011; Stephens & Groeger, 2009), reducing driving anxiety has the potential to significantly improve other driving outcomes also.

The current study will use self-report data to investigate trait mindfulness in line with these four outcomes, hypothesising that:

1. Higher trait mindfulness will be associated with improved driver attention, with fewer reports of errors and lapses.
2. Higher trait mindfulness will be associated with reduced risky driving behaviours, such as breaking the rules of the road, mobile phone use and drink driving.
3. Those higher in trait mindfulness will report engaging in less aggressive driving.
4. Higher trait mindfulness will be associated with reduced self-reported anxious driving behaviour and negative thoughts when driving.

Method

Participants

Of the 657 participants, 428 (65.1%) were female. Participants' ages ranged from 18 to 73 with an average age of 32.54 years (SD = 13.12). 680 participants completed the survey but 23 were excluded as they failed to answer critical questions or selected the same answer for every item in a matrix. Participants were recruited via staff and student email lists in an Irish university and via social media posts. We aimed to recruit a relatively large sample with a broad range of driving experience and age and so the only requirements were to be over the age of 18 and a driver. Most participants were not professional drivers, with just 46 drivers (7%) reporting driving as part of their work. 609 participants (92.7%) reported having a full driving licence, while the remaining drivers held provisional licences. Drivers had learned to drive on average 13.28 years ago (SD = 11.98). Most participants were frequent drivers, with 56.6% driving more than once a day and 88.6% driving at least once per week.

Measures

Demographics

Participants were asked to record their age, gender, driving experience, driving frequency, and to rate themselves from 0 (worst possible driver) to 10 (best possible driver). Participants reported their engagement in risky driving behaviours (e.g. making phone calls, texting or eating) and how often they drove after consuming alcohol or drugs, or when sleep deprived. Participants were also asked to record how many minor collisions (described as

‘’fender benders’ where no one is seriously injured and there is only minor damage to vehicles) and major collisions (described as more serious incidents where there may be injury, death or major damage to vehicles) that they had been responsible or partly responsible for.

Driving Behaviour Questionnaire

The Manchester Driving Behaviour Questionnaire (DBQ) (Reason et al., 1990) is a scale that measures aberrant driving behaviour on a 6-point Likert scale (1 = Never, 6 = Nearly All the Time). The DBQ is perhaps the most widely-used measure of driving behaviour, but there are many different versions available, each with different factor structures. In the current study we used the 28-item, four-factor version used previously (e.g. Burdett, Charlton & Starkey, 2016). The internal consistency for the overall scale in the current study was .86, with acceptable reliability for all four subscales; Ordinary Violations .73 (6 items, e.g. ‘Overtake a slow driver on the inside’); Aggressive Violations .70 (6 items, e.g. ‘Become angered by a certain type of driver and indicate your hostility by whatever means you can’); Errors .78 (8 items, e.g. ‘Attempt to overtake someone that you had not noticed to be signalling a right turn’); Lapses .70 (8 items, e.g. ‘Attempt to drive away from the traffic lights in third gear’).

Driving Cognitions Questionnaire

The Driving Cognitions Questionnaire (DCQ) is a 20-item scale that asks drivers how frequently certain thoughts occur to them while driving on a 5-point Likert scale ranging

from ‘the thought never occurs’ to ‘the thought always occurs when I am driving’ (Ehlers et al., 2007). The internal consistency for the total scale in the current study was .92, with high reliability for all three subscales; panic-related .86 (e.g. ‘I will tremble and not be able to steer’); accident-related .86 (e.g. ‘I cannot control whether other cars will hit me’); social-concerns .82 (‘I will hold up traffic and people will be angry’).

Driving Behaviour Survey

The Driving Behaviour Survey (DBS) (Clapp et al., 2011) is a 21-item measure of problematic behaviour of anxious drivers. Participants are asked to consider their behaviour during driving situations that make them nervous (e.g. poor weather conditions) and report how frequently they perform certain behaviours (1 = Never, 7 = Always). In the current study the internal consistency of the total scale was .86 with good internal consistency observed in each of the three subscales; Performance Deficits .84 (e.g. ‘I have trouble finding the correct lane’), Exaggerated Safety Behaviour .82 (e.g. ‘I slow down when approaching intersections, even when the light is green’); Aggressive Behaviour .86 (e.g. ‘I honk my horn at the driver who made me nervous’).

State-Trait Anxiety Inventory

The trait anxiety subscale of the State-Trait Anxiety Inventory (STAI) (Spielberger, 1983) was used to measure trait anxiety. Participants rated 20 items such as ‘Some unimportant thoughts run through my mind and bother me’ and ‘I make decisions easily’ on a 4-point

Likert scale (1 = Not at all, 4 = Very much). In the current study the internal consistency was .92.

Mindfulness Attention Awareness Scale

The Mindfulness Attention Awareness Scale (MAAS) is a 15-item self-report measure that assesses the frequency of mindful states on a six-point Likert scale (1 = almost always – 6 = almost never) (Brown & Ryan, 2003). All items are negatively worded, e.g. 'I could be experiencing some emotion and not be conscious of it until some time later'; 'I snack without being aware that I'm eating'. Internal consistency in the current study was .90.

Procedure

Responses were gathered online, with participants first completing the demographics questions, then the STAI, then the MAAS. These were followed by the DBQ, the DCQ and the DBS.

Results

Due to the large sample size and large number of variables, a conservative alpha was adopted ($p < .001$). The relationship between variables was first examined via a series of bivariate correlations (see Table 1). Mindfulness was significantly negatively correlated with every driving subscale except the DBS Anxiety, with coefficients ranging from -.20 to -.41. Mindfulness was significantly positively correlated with age and driving experience. There was no significant relationship between minor or major crashes and mindfulness. It is important to note though that there was a floor effect on reports of crashes, with average rates of 0.59 minor crashes and 0.08 major crashes per person.

There was no difference between males and females in mindfulness, minor crashes or major crashes. Of the driving subscales, males reported higher scores in DBQ ordinary violations $t(428.80) = 4.70$, $p < .001$, $d = .39$ and DBQ aggressive violations $t(407.97) = 2.80$, $p < .001$, $d = .24$ while females reported higher scores in DBQ lapses $t(653) = -5.36$, $p < .001$, $d = .45$ and DBS safety $t(653) = -3.91$, $p < .001$, $d = .32$. All other scales showed no gender differences.

Table 1: Zero-order correlations between trait mindfulness, trait anxiety & self-reported driving-related behaviours.

	Mindfulness	Age	Driving Exp.	Driver Rating	Minor	Major	Trait Anxiety	DBQ Ordinary	DBQ Aggressive	DBQ Errors	DBQ Lapses	DCQ Panic	DCQ Accident	DCQ Social	DBS Anxiety	DBS Safety	DBS Aggressive
Mindfulness																	
Age	.21*																
Driving Exp.	.21*	.91*															
Driver Rating	.13	.02	.09														
Minor Crash	-.07	.31*	.30*	-.09													
Major Crash	-.11	.01	.12	-.06	.08												
Trait Anxiety	-.53*	-.25*	-.26*	-.20*	.03	.09											
DBQ_Ordinary	-.28*	-.16*	-.09	.01	.12	.09	.18*										
DBQ_Aggressive	-.20*	-.06	-.01	.09	.08	.09	.06	.62*									
DBQ_Errors	-.35*	-.04	-.04	-.32*	.16*	.14*	.24*	.46*	.39*								
DBQ_Lapses	-.41*	.01	-.01	-.25*	.17*	.06	.28*	.31*	.24*	.56*							
DCQ_Panic	-.34*	-.14*	-.14*	-.22*	.01	.13	.35*	.22*	.25*	.45*	.37*						
DCQ_Accident	-.34*	-.20*	-.17*	-.20*	.01	.01	.32*	.19*	.19*	.41*	.40*	.66*					
DCQ_Social	-.38*	-.33*	-.33*	-.31*	.03	.05	.44*	.18*	.10	.42*	.41*	.66*	.64*				
DBS Performance	-.41*	-.13	-.13	-.35*	.10	.01	.35*	.29*	.13	.57*	.60*	.48*	.47*	.56*			
DBS_Safety	-.08	.02	-.01	-.14	.01	-.07	.11	-.09	-.09	.09	.21*	.17*	.23*	.25*	.31*		
DBS_Aggressive	-.24*	-.09	-.09	.01	.05	.06	.22*	.33*	.53*	.25*	.24*	.26*	.24*	.22*	.31*	.18*	
Mean (SD)	4.06 (0.86)	32.54 (13.12)	13.28 (11.98)	7.43 (1.16)	0.59 (0.95)	0.08 (0.60)	39.83 (9.78)	5.42 (4.03)	4.33 (3.61)	3.73 (3.26)	6.99 (3.93)	1.65 (2.77)	4.61 (4.18)	3.60 (3.57)	5.40 (4.86)	18.38 (8.13)	6.76 (6.51)

** $p < .001$*

Associations between mindfulness and risky driving behaviours are presented in Table 2. Participants' reports of phone use and eating, drinking or smoking when driving were low, with averages falling between 0 (Never) & 2 (Sometimes). Similarly drink, drug and sleep-deprived driving reports also averaged between 0 (Never) and 1 (Once). There were significant, negative correlations between mindfulness and phone use, drug-driving and sleep-deprived driving, but not driving after consuming alcohol.

Table 2: Zero-order correlations between driving behaviours and mindfulness, age and driving experience.

	Mean (SD)	Mindfulness	Age	Driving Experience
Make or receive phone calls	1.09 (1.12)	-.12*	.01	.05
Read or send text messages	0.90 (.98)	-.19**	-.19**	-.12*
Other phone use	.32 (.72)	-.15**	-.18**	-.14**
Eat, drink, smoke	1.6 (1.15)	-.14*	-.07	-.04
Drive after 1 drink	1.48 (1.53)	.09	.10	.09
Drive after 2 drinks	0.81 (1.32)	-.06	.27**	.31**
Marijuana	0.16 (0.63)	-.06	-.11*	-.07
Cocaine	0.02 (0.19)	-.13*	-.02	.02
Ecstasy	0.02 (0.21)	-.14*	-.04	-.01
Other illegal drug	0.02 (0.17)	.004	-.02	-.01
Sleep deprived	0.52 (0.94)	-.13*	.01	.04

** p <.001 * p <.01

A series of standard multiple regressions were conducted on the driving behaviour sub-scales shown to significantly correlate with mindfulness in Table 1 (DBS Safety was excluded). Driving experience, age and gender are associated with a wide range of driving behaviours (Burdett, Charlton & Starkey, 2016; De Winter & Dodou, 2010) and so were

considered as control variables. Due to strong correlations between age and driving experience (see Table 1) it was impossible to include both variables in the regression models. As the purpose of the analyses was to assess driving behaviour effects, driving experience was selected as the more relevant variable and included in the model (note that a re-analysis using age instead of driving experience did not significantly change any of the findings). There were no other multicolinearity violations. Regression results are presented in Table 3. Mindfulness was a significant predictor in every regression model, with mindfulness emerging as a significant predictor of a range of driving behaviours including rule violations, aggressive driving, errors, lapses of attention, anxious driving and negative thoughts when driving. It is interesting to note that for nine of the ten driving scales, mindfulness explained more variance than gender and driving experience combined. The total amount of variance explained by the models ranged from 5% to 21%.

Table 3: Results from ten x standard regressions examining the relationship between mindfulness and self-reported driving behaviour and cognitions, controlling for gender and driving experience.

		B	SE B	β	t	F	Adj. R^2
DBQ Ordinary Violations	Overall model**					29.08	.12
	Gender**	-1.72	0.32	-0.20	-5.44		
	Driving Experience	-0.01	0.01	-0.02	-0.64		
	Mindfulness**	-1.36	0.18	-0.29	-7.57		
DBQ Aggressive Violations	Overall model**					12.73	.05
	Gender*	-1.02	0.29	-0.13	-3.47		
	Driving Experience	0.02	0.01	0.05	1.24		
	Mindfulness**	-0.89	0.17	-0.21	-5.36		
DBQ Errors	Overall model**					27.66	.11
	Gender	-0.01	0.26	0.00	-0.01		
	Driving Experience	0.01	0.01	0.03	0.77		
	Mindfulness**	-1.31	0.15	-0.35	-9.01		
DBQ Lapses	Overall model**					52.76	.20
	Gender**	1.47	0.29	0.18	5.02		
	Driving Experience	0.02	0.12	0.08	2.06		
	Mindfulness**	-1.84	0.17	-0.41	-11.13		
DBS Performance	Overall model**					44.24	.17
	Gender	0.40	0.36	0.04	1.12		
	Driving Experience	-0.02	0.02	-0.06	-1.55		
	Mindfulness**	-2.19	0.21	-0.40	-10.68		
DBS Aggressive	Overall model**					12.73	.05
	Gender	0.17	0.53	0.01	0.32		
	Driving Experience	-0.02	0.02	-0.04	-1.04		
	Mindfulness**	-1.71	0.30	-0.23	-5.69		
DCQ Panic	Overall model**					26.29	.11
	Gender	0.21	0.21	0.04	0.98		
	Driving Experience	-0.02	0.01	-0.08	-2.06		
	Mindfulness**	-0.96	0.12	-0.30	-7.88		
DCQ Accident	Overall model**					32.04	.13
	Gender	0.41	0.33	0.05	1.25		
	Driving Experience*	-0.04	0.01	-0.11	-2.87		
	Mindfulness**	-1.55	0.19	-0.32	-8.38		
DCQ Social	Overall model**					58.85	.21
	Gender	0.66	0.26	0.09	2.54		
	Driving Experience**	-0.08	0.01	-0.26	-7.30		
	Mindfulness**	-1.31	0.15	-0.32	-8.90		

** p <.001, * p < .01

Discussion

The purpose of this study was to examine the association between trait mindfulness and driving behaviours. While the results largely support our predictions that those higher in mindfulness report engaging in problematic driving behaviours less frequently, the effect sizes are small. The relationship between mindfulness and driving behaviours was assessed in line with our four hypotheses:

1. Driver Attention

Overall, drivers higher in trait mindfulness reported less inattention when driving. Given the centrality of self-regulation of attention in mindfulness theory (Cebolla et al., 2018), it is encouraging that driver lapses were most strongly associated with mindfulness. Driver inattention is detrimental to safe driving (Groeger, 2000) and so perhaps the most promising mindfulness-based driving interventions are those that target driver inattention; however, the current findings should be further investigated using experimental methods due to limitations of self-report data noted below.

2.Risky Driving Behaviour

More mindful drivers reported reduced mobile phone use and fewer ordinary violations such as disregarding speed limits or driving too close to the vehicle in front. This is in line with previous findings of associations between mindfulness and reduced likelihood of engaging in harmful behaviours such as polydrug use (Dakwar, Mariani & Levin, 2011) and harmful drinking (Christopher, Ramsey & Antick, 2012). These findings are in line with

theoretical understandings of the role of mindfulness in the intention-behaviour relationship (Chatzisarantis & Hagger, 2007) and suggest that mindfulness interventions may be helpful in addressing a broader range of risky driving behaviours, such as speeding and non-use of seatbelts.

Mindfulness was not associated with other risky driving behaviours such as driving under the influence of alcohol or drugs, or with reported minor or major collisions. Interpretation of these findings are limited however due to low numbers of participants self-reporting these outcomes. This is not uncommon for crash data, with previous studies finding that approximately 30% of crashes are forgotten each year and even 18% of crashes resulting in injuries are forgotten a year later (Maycock & Lester, 1995).

3.Driver Aggression

More mindful drivers were also less likely to engage in aggressive driving behaviours, as has been observed previously (Burdett, Charlton & Starkey, 2016). In addition, when asked specifically about driving situations that make them nervous (using the Driving Behaviour Survey), more mindful drivers were less likely to report aggressive driving in those situations. This finding underscores the range of potential pathways for mindfulness as a predictor of safe driving; more mindful drivers were less likely to drive aggressively in general, and furthermore, upon encountering negatively-perceived driving situations, mindful drivers were less likely to respond with aggression. This improved emotional regulation may be a result of the present-focused, non-judgemental attention that characterises mindful states (Keng et al., 2011).

4. Driving Anxiety and Negative Thoughts

Mindfulness was associated with reduced anxious driving behaviour and reduced negative thoughts when driving. This is in line with existing mindfulness theory, where it has been suggested that by encouraging active self-regulation of attention mindfulness can reduce rumination and worry (Carmody, 2009; Grabovac et al., 2011). Though the amount of variance explained by mindfulness was again very small, observed associations merit further investigation, particularly as trait mindfulness explained as much or more unique variance for some driving outcomes than gender or driving experience, which are regarded as highly predictive (Cassarino & Murphy, 2018).

Though both the link between mindfulness and reduced anxiety (Walsh et al., 2009) and the negative impact of anxiety on driving behaviours (Stephens & Groeger, 2009) are well supported, this study is the first to explore the relationship between trait mindfulness and anxious driving behaviours and thoughts. The findings suggest that mindfulness interventions may be a promising method of improving anxious driving, by encouraging a non-judgmental awareness of the present moment and limiting rumination and worry (Carmody, 2009).

Limitations and future recommendations

The current study is limited by use of self-report data. For instance, there are obvious difficulties posed by asking participants to report how often they fail to detect something. However, previous studies support correlations between self-reported inattention and driving performance in a simulator (Kass, Beede & Vodanovich, 2010); mindfulness inductions have also demonstrated reductions in inattentional blindness for an unexpected distractor (Schofield, Creswell & Denson, 2015). Similarly, examination of the effect of

mindfulness on crash risk is limited due to the very small number of crashes reported. Future studies could employ prospective designs to record crashes as they occur, rather than relying on retrospective self-report. Use of experimental methods and/or objective indices of driving outcomes would improve future research in the area.

Conclusions

The current study provides a comprehensive overview of the role of mindfulness in the complex and multifaceted task of driving. The findings suggest that trait mindfulness may protect against certain driving behaviours, including deliberate risky behaviours (phone use, speeding), behaviours resulting from inattention (errors and lapses), and anxiety (negative thoughts, overly-cautious driving). Furthermore, safe driving was more strongly correlated with trait mindfulness than age or driving experience in this study. The small but consistently positive effects of trait mindfulness on driving behaviours in our study support the call for further research in this area. In particular, these findings can inform future mindfulness-based interventions to improve driving outcomes.

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