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Multiple facets of overconfidence: Implications for driving safety

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ABSTRACT

This study sought to advance understanding of overconfidence in driving, and its relationship to safety-relevant individual difference factors. We compared the traditional, general above average affect (AAE) in driving ability with an assessment of AAE in relation to compensation for impairments, such as intoxication, fatigue and distraction. General driving and driving impairment AAEs were found to be distinct with unique relationships to illusory control, driver stress, and self-reported unsafe driver behaviors (errors, violations, lapses). Illusory control was associated with driving impairment AAE but not with general driving AAE. Both AAEs were negatively related to dislike of driving but related differently to other criteria. Risk factors related to self-estimation (violations, thrill-seeking) were distinct from factors related to competence relative to peers (aggression). Men scored more highly than women did on both AAEs. Trivia and driving calibration tasks were used to discriminate three aspects of a recent Bayesian belief updating model of overconfidence: overestimation, overplacement (AAE), and overprecision. Findings indicated that overplacement in the calibration tasks was related to AAE, its conceptual equivalent. There was a significant gender difference in overplacement but no gender difference in overprecision. The unique relationships between various types and facets of overconfidence, and driving-relevant individual differences, support the need for tailoring safety interventions to drivers of differing psychological characteristics.

1. Introduction

Overconfidence may have important implications for driving safety. One particularly well documented form of overconfidence is the belief that one possesses greater competence than one's peers do: a phenomenon described as the above average effect (AAE: Alicke & Govorlin, 2005) or in some cases optimism bias (e.g. White, Eiser, & Harris, 2004). In driving, most people believe they are safer and more skilled than the average driver is (Matthews & Moran, 1986). Svenson (1981) found, for example, that more than 50% of respondents placed themselves in the 81st percentile or higher when asked how safely they drove relative to their peers. This belief leads people to underestimate risk, and may contribute to risky behaviors such as speeding and accidents (Horswill & McKenna, 1999; Matthews & Moran, 1986). Further, without a thorough understanding of the role of overconfidence in driver safety, interventions to improve driving safety can prove ineffective (Walton & McKeown, 2001).

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Overconfidence in driving safety usually addresses driving skill in a general sense. In addition to driving skill however, safety is influenced by a variety of potential impairments and voluntarily chosen risks such as alcohol and drug use, fatigue, distraction, and unsafe driving practices. Overconfidence in handling impairments may also impact safety. Studies on cell-phone use while driving, for example, have called attention to the consequences of distraction (Schlehofer et al., 2010; Strayer, Drews, & Johnston, 2003; White et al., 2004). Schlehofer et al. (2010) found that belief in the ability to compensate for cell phone impairment was associated with more frequent cell phone use despite knowledge that such use is unsafe while driving. Nonetheless, research has concentrated less on overconfidence in compensating for impairment than it has on overconfidence in general driving ability.

Like AAE, perception of control is an important shaper of risk perception and behavior. Perceived control is often considered a desirable personal quality; it relates to heightened self-efficacy, which may enhance performance both directly and through goal adjustment (Bandura & Wood, 1989). In the driving context though, Horswill and McKenna (1999) suggested that, despite the task-focused coping strategy that self-efficacy fosters, a drawback might be overconfidence in ability and a heightened propensity to take risks while driving. Illusion of personal control may be especially prone to produce AAE, i.e., the belief that one is less likely than other drivers to be in an accident, leading to risk taking behavior (Horswill & McKenna, 1999).

Langer (1975) defined illusory control as the expectation of a higher personal success probability than an objective analysis would warrant (p. 311). McKenna (1993) refined this definition stipulating that illusion of control refer not to a general expectancy of positive outcome, but to expectancy of positive outcome as a consequence of personal control. Illusory control encompasses both (1) the false belief that one possesses the skills necessary to accomplish a desired outcome through control, and (2) the false belief that skills one does actually possess influence outcomes, when they do not. Langer (1975) suggested that an illusion of control is likely in situations governed by chance in which factors linked to skill execution remain, such as choice. For example, new drivers who undergo skill training may have an inflated sense of their ability to handle a challenging driving situation because they fail to consider the controllability of the situation, even though they have acquired considerable driving skills (Gregersen, 1996).

Illusory control may be especially strongly related to impairment AAE because drivers possess control over their exposure to risks such as intoxication and distraction. González-Iglesias, Gómez-Fraguela, and Luengo (2014) pointed out that in Ajzen's (1991) theory of planned behavior control beliefs may influence the decision to drive while potentially impaired. Their study showed that a scale tapping perceived control over drinking behavior ("self-efficacy in avoiding a DUI") predicted greater likelihood of driving drunk. However, it could be argued that illusory control may be less relevant to impairment AAE than to general AAE, if impairment-related bias is affected by specific beliefs about the dangers of seemingly minor sources of impairment. For example, if drivers believe that imbibing a couple of drinks or talking on the phone has no impact on driving then their control beliefs may not be relevant to the context.

The extent of correlation between general- and impairment-related biases is also open to differing predictions. Positive association is expected to the extent that these biases represent common underlying personal qualities, such as elevated perceptions of personal driving skill, illusory control, and high self-efficacy in relation to skill execution in challenging situations. However, the two biases might dissociate if beliefs about potential impairments are distinct from attitudes toward driving in general. For example, González-Iglesias et al. (2014) found that general driving self-efficacy was unrelated to self-efficacy/control beliefs associated with drunk driving. Only the latter was associated with drunk driving behavior. Dissociations between biases are relevant to safety programs. In general, interventions that reduce overconfidence and encourage more realistic appraisals of personal vulnerability may enhance safety (Lesch & Hancock, 2004; Näätänen & Summala, 1974; White et al., 2004). However, if impairment AAE reflects different underlying beliefs to those underlying general AAE, then reducing general overconfidence may not be effective in motivating drivers to avoid driving while impaired.

There remain two fairly neglected issues with which any intervention hoping to diminish the undesirable consequences of overconfidence must contend. First, advances in decision-making suggest that overconfidence is multifaceted (Moore & Healy, 2008); the impact of overconfidence on safety may be more complex than previously thought. Second, overconfidence has been linked to individual difference factors such as gender (Lesch & Hancock, 2004) and driver stress vulnerability (Dorn & Matthews, 1995). It is unclear how much AAE and other facets of overconfidence contribute to individual differences in risky driving behaviors. We will examine the significance of these two issues next.

1.1. Aspects of overconfidence

Overconfidence research has often focused on self-evaluation relative to peers (AAE: e.g. Svenson, 1981) and self-evaluation relative to objectively measured performance (e.g., Lesch & Hancock, 2004). These two forms of overconfidence are typically treated as manifestations of the same underlying construct (Moore & Healy, 2008). However, Moore and Healy have separated overconfidence into three components: overestimation, overplacement, and overprecision. Overestimation refers to the belief that one is more skilled than objective measures would indicate. Overplacement, commonly referred to as AAE or optimism bias, refers to the belief that one is more competent or at lower risk than one's peers. Overprecision refers to overconfidence in the accuracy of one's belief and is usually identified through interval estimates (e.g., Hansson, Juslin, & Winman, 2008; Hilton, Régner, Cabantous, Charalambides, & Vautier, 2011). Understanding overprecision is important for driving safety to the extent that drivers estimate safety margins. Summala (1996) pointed out that drivers may use these margins to maintain zero risk of crashing. For example, a driver might believe that the margin of safe speed on a par-