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A prospective study of relationships between propositions about risk and driver speeding

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ABSTRACT

Risk propositions are specific and modifiable hypotheses that people hold about the outcomes of risk-taking behavior. According to fuzzy trace theory (FTT), risk propositions arise from the subjective and idiosyncratic interpretations that people make about the meaning of risk information, and form the primary basis of decision-making. A community sample of 255 drivers was interviewed at baseline (T1), 6 weeks after baseline (T2) and 14 weeks after baseline (T3). We tested whether propositions about speeding-related risk at time 1 (T1) would predict speeding at time 3 (T3), controlling perceptions of speeding-related danger and other speeding-related variables (the perceived possibility of being caught and the enjoyment and excitement to be gained from speeding) measured at time 2 (T2). We also tested whether relationships between T1 propositions and T3 speeding would be mediated by T2 perceptions of danger. T1 propositions predicted T3 speeding independently of the control variables, and we also found evidence consistent with mediation by T2 danger. In line with FTT, risk propositions were not scaleable as a single dimension, but generally predicted speeding as independent entities. Taken together these findings support the view that drivers perceive speeding risk as a series of potentially modifiable propositions which may have item-specific influences on speeding behavior.

1. Introduction

Worldwide, road traffic crashes kill about 1.2 million people annually, are the primary cause of deaths of 19–25 year olds, and by 2030 are projected to be the fifth largest overall cause of death (World Health Organization, 2009). Speeding is a prominent risk factor for injurious traffic crashes (Aartz and van Schagen, 2006). In many jurisdictions, the greatest opportunities for speed-related crash reduction involve persuading drivers to regulate their own speeding behavior.

Risk perception theories are based on the idea that people become motivated to change risk-taking behaviors when they perceive risk to be high (Weinstein, 1993). These theories underpin many health interventions (Reniscow et al., 2002), including anti-speeding campaigns (Rundmo and Iversen, 2004). Support for risk perception theories comes from research showing prospective links between risk perceptions and self-protective behavior (e.g., Brewer et al., 2007). Risk perceptions have also been linked to speeding (e.g., Brown and Cotton, 2003; Machin and Sankey, 2008; McKenna and Horswill, 2006), although cross-sectional study designs often limit interpretation of these findings (Weinstein, 2007).

Risk perceptions have traditionally been operationalized as subjective estimates of the likelihood and severity of negative consequences related to unhealthy or unsafe behavior (Weinstein, 1993), although behavior seems to be better predicted by measures that that involve a mix of cognitive and emotional components (Weinstein et al., 2007), including perceptions of vulnerability (Weinstein et al., 2007), dread or worry (Slovic and Peters, 2006) and, in the case of road safety, danger (Brown and Cotton, 2003; Groeger and Chapman, 1996). The use of these measures assumes that individuals' risk representations are best conceptualized as estimates that they make over a small number of normative dimensions. Fuzzy trace theory (FTT) (Reyna, 2004; Reyna and Brainerd, 1991; Rivers et al., 2008) takes another approach. Risk representations are seen as qualitative and idiosyncratic propositions, or hypotheses, that people hold about the outcomes of risk behavior. For example, a person who experiences a rare and unexpected negative event may conclude that 'even very small risks sometimes happen', and behave in accordance with this proposition (Rivers et al., 2008). Thus, decision-making is influenced, less by an estimate made on a quantitative scale, than by the subjective meanings that people draw from their encounters with risk-related stimuli. This has obvious implications for the conduct of health and safety campaigns that target risk perception processes. If specific

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