

Young driver perceived risk and risky driving: Applied theoretical approach to the Fatal Five

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Abstract

Prominent determinants (e.g., age, gender, personality) of young driver (17-25years) engagement in risky driving (the “Fatal 5”) are enduring and difficult to change. Therefore, continued research is required to examine psychological variables that can be adapted within young drivers to aid targeted driver interventions to take action to reduce risky driving engagement. Protection motivation theory (PMT), specifically coping and threat appraisal elements, potentially provides additional understanding of young driver decision making in risky driving. Drivers ($N = 601$, 457 females, aged 17-25 years, $M = 20.03$, $SD = 2.33$) holding an Australian driver’s license (P1, P2, or Open) anonymously completed a 143-item online survey to measure: 1) PMT for the Fatal 5, 2) perceived risk of driving related behaviours, and 3) the Behaviour of Young Novice Drivers Scale. Using structural equation modelling, the proposed path model of PMT on perceived risk and reported driving engagement showed that perceived risk and coping appraisal were the strongest predictors of reported risky driving engagement. This adaptation of PMT is a novel contribution to the literature as the model helps us to understand what contributes to young driver engagement in risky driving (maladaptive pathway). It also explains why young novice drivers may choose not to engage in risky driving (adaptive pathway). Applications and further implications of the model will be discussed.

Introduction

Determinants of what makes a young driver engage in risky driving have been researched extensively in the road safety and traffic psychology literature. Researching this issue is important as young drivers (aged 16-25 years) are over-represented in national road related death tolls and injuries worldwide (Scott-Parker, Watson, King, & Hyde, 2015; World Health Organization, 2014). Research has identified that this may be due to young drivers’ lack of experience and their engagement in risky driving behaviours (e.g., Scott-Parker, Watson, King, & Hyde, 2012a). Many predictors of young driver engagement in risky driving behaviours, such as speeding and drink driving, have been found including: age, gender, and personality variables (e.g., sensation seeking, Cestac, Paran, & Delhomme, 2011; aggression, Constantinou et al., 2011). However, these types of determinants are enduring, being difficult or unable to be changed within young drivers. Therefore, continued research on psychological variables that can be adapted within young drivers is required to help driver inventions that target young drivers’ engagement in risky driving behaviours.

Preventing and reducing motor vehicle crashes (MVCs) involving drivers of all age groups is important for governments, policy makers, and researchers. The focus on young drivers arises from the factors discussed above that increase young drivers’ MVC involvement risk. Therefore research on young drivers’ risk perception and reported engagement in risky driving is vital to understanding how and why young drivers choose whether to engage in risky driving behaviours. A social cognitive model, protection motivation theory (PMT) has two primary cognitive mediating processes in decision making – threat appraisal, and coping appraisal (Floyd, Prentice-Dunn, & Rogers, 2000; Rogers, 1975, 1983). Threat appraisal has

three components: *severity*, *vulnerability*, and *rewards*. Severity and vulnerability operate to increase protective motivation; however, these factors are influenced by the possible rewarding advantages of performing the maladaptive health behaviour (in this case, risky driving), which will decrease threat appraisal's overall protective motivation towards the behaviour. Coping appraisal also has three components: *response efficacy*, *self-efficacy*, and *response costs*. Higher effectiveness and confidence in performing adaptive behaviours increases protective motivation, unless the last component, the response costs experienced by performing the adaptive behaviour, are too great, which decreases coping appraisal's overall protective motivation towards the behaviour (Armitage & Conner, 2000). Within traffic psychology PMT has been successfully applied in exploring drunk driving (Cismaru, Lawack, & Markewich, 2009; Greening & Stoppelbein, 2000; Murgraff, White, & Phillips, 1999), and effectiveness of anti-speeding messages (Glendon & Walker, 2013).

PMT can be used to represent a driver's judgement of the probability of a harmful event happening to them (e.g., an MVC – resulting from dangerous driving behaviours). The probability that a driver will perform a protective, rather than a maladaptive behaviour, will be greater if the driver identifies with a stronger response efficacy, has a higher self-efficacy, and perceives fewer costs in performing the adaptive behaviour. Engaging in maladaptive driving behaviours is more likely if the driver has positive views about the rewards associated with the behaviour, and perceives low vulnerability and severity of the behaviour (Floyd et al., 2000). From these components as independent factors, higher coping appraisal and higher threat appraisal would be predicted to decrease a driver's engagement in risky driving behaviours.

The aim of this study was to test an application of PMT on young driver decision making, including their perceived risk, and reported engagement in risky driving behaviours. It was predicted that the PMT model would provide a basis for exploring young and inexperienced drivers' threat and coping appraisals in respect of risky driving behaviours (e.g., the Fatal 5) that may result in MVCs. Specifically, it was hypothesised that higher coping appraisal and higher driver perceived risk would decrease reported risky driving engagement. Higher threat appraisal was predicted to increase driver perceived risk, and to decrease reported risky driving engagement.

Method

Participants

Participants ($N = 601$, 457 females, aged 17-25 years, $M = 20.03$, $SD = 2.33$) held an Australian driver's license (P1, P2, or Open), and drove a car regularly (excluding moped, motorbike, truck, bus, van, etc.). One-hundred-and-seventy-six (29.3%) held a Provisional 1 (P1) license, 231 (38.4%) a Provisional 2 (P2) license, and 194 (32.3%) held an open license. Survey participants reported driving for a mean of 211.68 km ($SD = 176.44$) a week.

Measures

Participants anonymously completed a 143-item online survey. In addition to demographic items (e.g., age, sex, license type), scales measured perceived risk, reported risky driving engagement, and protection motivation components. Perceived risk focused on cognitive aspects of risk perception, aversion to risk taking (perceived danger) for the driving behaviour (e.g., drink driving, speeding), and perception of the likelihood of an MVC occurring to the participant (30 items, $\alpha = .91$).

From Scott-Parker et al.'s (2012b) revised Behaviour of Young Novice Drivers Scale (BYNDS 36 items, $\alpha = .90$), the transient violations (12 items, $\alpha = .89$), and fixed violations (6 items, $\alpha = .80$) subscales were used to measure reported risky driving engagement (total 18 items, $\alpha = .88$).

A PMT driver scale was created based on previous research (e.g., Greening & Stoppelbein, 2000; Murgraff et al., 1999) where items were designed to measure threat appraisal and coping appraisal in two subscales. Each subscale contained three facets – severity, vulnerability, and rewards items formed the threat appraisal subscale, while response efficacy, self-efficacy, and response costs items formed the coping appraisal subscale. An initial 90 items were reduced through confirmatory factor analysis to identify the best item pool that represented the Fatal 5 driving behaviours within the PMT framework. This resulted in a final 30-item measure ($\alpha = .83$).

Procedure

The online survey was created using the Lime Survey tool. The hyperlink to the online survey was advertised using Griffith University's e-news-sheet Volunteer for Important Research Projects and the School of Applied Psychology subject pool. The survey was available online for three months. Drivers aged 17 to 25 who held an Australian driver's license were invited to participate.

Results

After the measurement model confirmed the created scales, a path analysis was conducted using the final versions of the measured variables. Results supported the hypothesised model with fit statistics for the path model being, $\chi^2 = .02(1)$, $p = .904$, CMIN/df = .02, AGFI = 1.000, CFI = 1.000, RMSEA = .00 CIs = .00-.05, indicating a good data fit for the hypothesised model. In fact, threat appraisal completely mediated coping appraisal's direct effect to driver perceived risk, $\beta = -.39$, $t = -10.20$, $p < .001$, to zero. Coping appraisal operated indirectly through threat appraisal on driver perceived risk. Figure 1 shows the final recursive model.

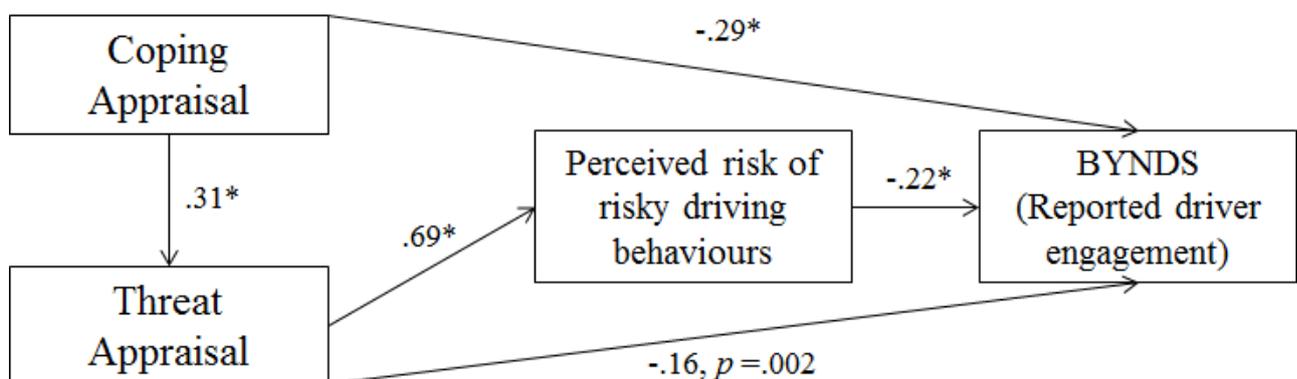


Figure 1. Path diagram showing effects of PMT variables on driver perceived risk and reported engagement in risky driving behaviours ($N = 601$). Note: * $p < .001$.

Discussion

The results supported both hypotheses. From the beta weights shown in Figure 1, it can be concluded that coping appraisal, threat appraisal, and driver perceived risk directly influenced

reported engagement in risky driving behaviours (measured by the BYNDS subscales). The direction and significance of the regression coefficients indicated that higher coping appraisal, which was the strongest predictor, threat appraisal, and driver perceived risk decreased reported risky driving engagement. This indicated that higher responsiveness to driver vulnerability and severity of the risky driving behaviours, and higher perceived response efficacy and self-efficacy in applying the adaptive behavioural response, decreased respondents' reported engagement in risky driving behaviours. While response costs and rewards associated with the risky driving behaviours did not significantly decrease protection motivation, their influence cannot be dismissed and further research on the individual components of coping and threat appraisal need to be further examined. This is an important highlight as the six components of coping and threat appraisal might be expected to improve predictions about the decision process of young drivers who choose to engage in risky driving behaviours, and those who do not.

The fully mediated effect of coping appraisal on driver perceived risk indicated that coping appraisal had no unique effect on driver perceived risk, as the relationship was non-significant once threat appraisal was accounted for. This effect is to be expected, given that threat first needs to be perceived before coping mechanisms are activated. The highest beta weight was for the relationship between threat appraisal and driver perceived risk, which was expected due to some shared variance between these two variables, both being created from similar constructs (threat appraisal's vulnerability and severity; driver perceived risk aversion and likelihood of negative consequences).

As preliminary results have found that PMT variables can influence young drivers' reported perceived risk and risky driving engagement, further research could usefully be conducted using PMT variables to examine the adaptive and maladaptive pathways in risky driving decision making. Our results indicate that when developing and evaluating young driver interventions, focus is also required on factors that contribute to young drivers engaging in non-risky behaviours, as well as factors that aid decision making processes that lead to not choosing to engage in risky driving behaviours. From this, it is clear that PMT could help in further understanding the young driver decision making process in respect of engaging in risky driving behaviours as a developing application in road safety.

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