Contents lists available at ScienceDirect

Journal of Transport & Health

An intervention encouraging planned self-regulation and goal setting in drivers across the lifespan: Testing an extended theory of planned behaviour

Holly Gwyther, Carol Holland *

Psychology, School of Life and Health Sciences, Aston University, Birmingham B4 7ET, UK

ARTICLE INFO

ABSTRACT

Previous work has demonstrated that planning behaviours may be more adaptive than avoidance strategies in driving self-regulation, but ways of encouraging planning have not been investigated. The efficacy of an extended theory of planned behaviour (TPB) plus implementation intention based intervention to promote planning self-regulation in drivers across the lifespan was tested. An age stratified group of participants ($N=81$, aged 18–83 years) was randomly assigned to an experimental or control condition. The intervention prompted specific goal setting with action planning and barrier identification. Goal setting was carried out using an agreed behavioural contract. Baseline and follow-up measures of TPB variables, self-reported, driving self-regulation behaviours (avoidance and planning) and mobility goal achievements were collected using postal questionnaires. Like many previous efforts to change planned behaviour by changing its predictors using models of planned behaviour such as the TPB, results showed that the intervention did not significantly change any of the model components. However, more than 90% of participants achieved their primary driving goal, and self-regulation planning as measured on a self-regulation inventory was marginally improved. The study demonstrates the role of pre-decisional, or motivational components as contrasted with post-decisional goal enactment, and offers promise for the role of self-regulation planning and implementation intentions in assisting drivers in achieving their mobility goals and promoting safer driving across the lifespan, even in the context of unchanging beliefs such as perceived risk or driver anxiety.

1. Introduction

The current generation of older adults has certain expectations about their lives and mobility. They anticipate that they will remain active, independent and mobile for as long as possible (Holland, 2001) and in today's society, that generally means reliance on a car. A travel survey by the UK Department for Transport (2010) stated that 68% of trips made by people aged over 70 were by car, either as a driver or passenger. Sustained driving in older age has implications for quality of life (Oxley and Whelan, 2008), greater social engagement (Marottoli et al., 2000), reduced likelihood of significant depression (Marottoli, et al., 1997) and depressive symptoms (Fonda and Herzog, 2001) and even, in some cases, greater life expectancy (Marottoli et al., 2000; Ragland, et al., 2005). Maintaining safe driving in older adults is therefore a priority. Nevertheless, given four million drivers aged over 70 on UK roads (RAC Foundation, 2013) and similar increases in other developed countries, this dilemma for policy makers and older drivers themselves indicates a need for research on how to balance potential safety risks of age-related functional change with mobility needs of individuals. One potential approach is the use of self-regulation. Berry (2011) proposed that a system of 'nudging' drivers into voluntary 'self-regulation' could be 'the only viable option for producing safer, older drivers without undermining mobility and well-being' (Berry, 2011, p. 8). This study examines the utility of an extended theory of planned behaviour (Ajzen, 1985) intervention in promoting self-regulation and changes in driver coping strategies.

Self-regulation is a strategy used by drivers to improve feelings of safety and wellbeing. Traditionally, it has been conceptualised as driving avoidance, specifically in difficult or challenging circumstances, often in response to skill attenuation or age-related physical and functional decline (Baldock et al., 2006; Ball et al., 1998; Hakamies-Blomqvist and Wahlström, 1998). However, the value of driving avoidance has been questioned,

* Corresponding author. Tel: +44 121 204 4063.
  E-mail addresses: gwythehe@aston.ac.uk (H. Gwyther), c.holland1@aston.ac.uk (C. Holland).

in terms of constraining everyday behaviour and independent mobility and disregarding an older adult's goals and motivations for driving (Gwyther and Holland, 2014). Molnar et al. (2013) examined self-regulatory practices in older adults taking into account motivations behind driving avoidance in certain circumstances. They determined that reasons for driving avoidance were often more closely related to lifestyle or preferences than self-regulation per se. Further, avoidance is only one strategy amongst a range of self-regulatory behavioural countermeasures, including pre-journey route planning and trial runs, pre-arranging rest stops, making vehicle adaptations (Molnar et al., 2009) and presence of a 'co-pilot' (e.g. Shua-Haim et al., 1999; Vrkljan & Millar Polgar, 2007; Gwyther and Holland, 2014).

Planning behaviours have not been as widely researched as avoidance strategies in terms of driving self-regulation, but previous research (Gwyther and Holland, in preparation) suggests they may be more successful in terms of managing risk and feelings of vulnerability in driving. In addition, they offer a means of ensuring that older drivers' motivations and goals for driving (Hatakka et al., 2002) are addressed, ensuring safe independent mobility. While there will always be a place for sensible, risk-related avoidance, this research aims to promote planning behaviours (e.g. route planning, planning to drive with a co-pilot, sharing driving) using a theory of planned behaviour (TPB) (Ajzen, 1985) plus implementation intention based intervention (Gollwitzer, 1993).

1.1. Previous Interventions with older adults

A number of campaigns have been established with the intention of improving mobility in older drivers. Generally, these focus on refresher training with advice on risk reduction, hazard perception and legislation. Evaluated examples include '55 Alive-Mature' in the USA (Bedard et al., 2005; Nasvadi, 2007), 'Wiser driver' in Australia (Strain, 2003) and 'Knowledge Enhances Your Safety' (KEYS) in the USA (Owsley et al., 2003, 2004; Stalvey and Owsley, 2003). They also promote driving reduction/avoidance strategies and planning for driving cessation. However, with exception of the KEYS programme, which was devised for drivers with visual limitations, they lack a structured theoretical basis.

Evaluations of these programmes have demonstrated significant improvements in driving behaviour, specifically road knowledge (e.g. '55 Alive-Mature' Bedard et al., 2005), driving skills and confidence (e.g. 'Wiser Driver' Strain, 2003), self-reported alertness and health awareness relating to visual impairments (e.g. '55 Alive-Mature' Nasvadi, 2007). Less success has been found in terms of reducing crash risk (Owsley et al., 2004) or promoting self-regulation.

Nasvadi (2007) demonstrated, using a retrospective cohort design, that although 75% had changed some aspect of their driving after attending, only 9% of women and 4.2% of men said they had increased avoidance strategies as a result of the '55 Alive-Mature' course. Strain (2003) evaluated behavioural changes three months after the 'Wiser Driver' course; 80% of participants had altered their self-reported habits, but only 16% had changed the way they 'recognised, avoided or developed strategies to manage difficult driving conditions…'(p. 4). However, 7% had improved trip planning strategies. The findings from these studies suggest that educational programmes are an effective means of altering driving behaviour or promoting planning, but are less successful when promoting driving avoidance.

Although avoidance self-regulation has been widely advocated as a means of producing safer drivers, the evidence linking it with risk reduction is mixed. Baldock et al. (2006) and De Raedt and Ponjaert-Kristoffersen (2000) determined a positive effect of compensation tactics on collisions; Owsley et al. (2004) found no effect of self-regulation on crash rate in the KEYS study prospectively, while Ball et al. (1998) and Charlton et al. (2003) noted that drivers who avoided certain situations were more likely to have been crash involved retrospectively. These variations may be due to differences in confidence or function, or confounds with health status or gender. Charlton et al. (2003) found that half of their drivers lacked confidence in a given situation, and Hennessy (1995) found that older avoidant drivers with reduced vision or processing speeds had a higher number of at-fault crashes than drivers with good visual fields or speed of processing. Similarly, Ball et al. (1998) found that generally, the most crash involved drivers reported the highest levels of driving avoidance, but these drivers were also the ones with the most severe impairments. These drivers may be struggling to function generally and so their avoidance strategies are insufficient to ameliorate their risk, or ameliorate it enough, or conversely, their avoidance may be placing them into a category of very low mileage, occasional drivers whose skill is attenuating (Langford et al. 2006). Thus, function and confidence may be confounding the relationship between avoidance self-regulation and risk reduction. This evidence clearly highlights a need for support for older drivers to plan their self-regulation appropriately, especially in the context of impairment, but also for less confident younger drivers, given that previous research has demonstrated a U-shaped age curve for self-regulation with younger *and* older drivers showing more self-regulation than experienced middle-aged drivers, in a manner related to confidence (Gwyther and Holland, 2012).

Another reason that promoting avoidance behaviour is not entirely successful or related to safer driving may be that promoting driving avoidance fails to acknowledge older drivers' goals and motivations for driving (Hatakka et al., 2002), i.e. to maintain day-to-day mobility and independence. Simply asking people to stop or reduce driving may be distressing (Coughlin et al., 2004) and could lead to inappropriate restrictions. The over-regulation (as a result of avoidance without planning in line with goals) is not an optimal solution in terms of a driver's health and quality of life, resulting in some of the negative health and social effects associated with driving cessation (e.g. Oxley and Whelan, 2008). A more positive and appropriate intervention might involve changing avoidance strategies that are responses to loss of function, low confidence or perceived risk, to alternative strategies of planned behaviour. For example, for someone who feels at risk driving in poor light to avoid that situation is sensible but may restrict their access to certain activities or locations, but if that same person planned their self-regulation to move those activities to daylight hours, or to use a better lit route then the self-regulation occurs, but the restriction does not. Taking these findings into consideration, the present intervention uses an extended theory of planned behaviour (Ajzen, 1985) model to predict planned self-regulation behaviours, including both older and younger drivers, with an implementation intention strategy to promote enacting of planned behaviours.

1.2. Theory of planned behaviour

One of the best established social-cognition models (Ajzen, 2011; Godin et al., 2005) is the theory of planned behaviour (TPB: Ajzen, 1991). This model has been applied extensively to health (e.g. exercise, dieting, binge drinking) and non-health related behaviours (e.g. travel choices and driving behaviour). Meta-analytic reviews (Armitage and Conner, 2001; Cheung and Chan, 2000; Rivis and Sheeran, 2003; Schulze and Wittmann, 2003) provide empirical support for its capacity to predict a high proportion of the variance in behavioural intention; as such, it is a useful theory on which to base interventions.

Developing effective interventions depends upon identification of suitable psychological constructs for modification. Despite a growing literature on mobility in older age, driving cessation and self-regulation, recommendations for interventions targeting specific TPB