



How perceptions influence young drivers' intentions to participate in gamified schemes

Christopher L. Ambrey^{a,*}, Barbara T.H. Yen^{b,c}

^a Institute for Social Science Research, The University of Queensland, Australia

^b School of Engineering and Built Environment, Griffith University, Australia

^c Cities Research Institute, Griffith University, Australia



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ABSTRACT

This study investigates how perceptions may influence young drivers' intentions to participate in a gamified scheme designed to encourage safer driving behaviours. In doing so, this study offers useful insights into how to design effective and appealing gamified interventions for young drivers. Specifically, the study analyses responses from a survey of young drivers in Queensland, Australia. In all, the key results indicate to researchers and practitioners seeking to implement gamified schemes that they should remain cognisant of satisfying an individual's perceptions of ease-of-use. Further, affecting behavioural intentions, distinct from attitudes, is crucial to an individual's adoption of a gamified scheme. Finally, while the findings reinforce the role of 'practical' decision making; they also reveal, that an absence of 'fun' or 'joy' can play a role in decision making. These findings indicate that nurturing joy and happiness is a worthy, useful and admirable endeavour for transport planners, economists and policy makers. It is a research agenda pertinent to the realisation of behavioural changes and to the promotion of societal welfare more broadly.

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1. Introduction

It is well known that young drivers are over-represented in the incidence of road crashes around the world. In this regard, Australia is no different. In 2014, 20.2% of people who died in road crashes were aged 17–25 and yet represented only 12.4% of the total population (Department of Infrastructure and Regional Development, 2015). Further, policy responses directed at changing specific aspects of road crashes do not always appear to work (Dekker, Cilliers, & Hofmeyr, 2011) and more success has been achieved using a response which draws on a systems-based perspective that explores the multiple factors and circumstances of crashes, including crash prevention (Scott-Parker, Goode, & Salmon, 2015).

A recent concept to emerge which offers the potential to support accident prevention through behaviour change interventions is gamification. Gamification is defined as the "...use of game design elements in non-game contexts." (Deterding, Dixon, Khaled, & Nacke, 2011, p. 1). Gamification involves using elements of games such as competition, teamwork, tactics and rewards for situations not traditionally associated with games. Gamification has been implemented in many fields including in traffic and transport. In traffic and transport gamification has started to emerge as a tool for the promotion of safe driving behaviours. However, there remains a need for further research which extends on the earlier research efforts of traffic and transport scholars and practitioners (Schroeter, Oxtoby, & Johnson, 2014).

* Corresponding author at: Institute for Social Science Research, Long Pocket Precinct, The University of Queensland, Queensland 4068, Australia.
E-mail address: c.ambrey@uq.edu.au (C.L. Ambrey).

Distinct from these earlier studies, this study investigates how perceptions may influence young drivers' intentions to participate in a gamified scheme designed to encourage safer driving behaviours. To this end, this study undertakes a state-wide survey of young drivers in Queensland, Australia. The responses elicited from this survey will be analysed to help to shed light on the factors that may influence young drivers' intention to participate in a gamified scheme. To the extent of the knowledge of the authors, no study has yet to explore this. Further, aside from providing a distinct contribution to the existing stock of knowledge this study also provides policy makers and practitioners with valuable information which may help to improve the efficacy of gamified interventions among young drivers.

The remaining sections of this paper are structured as follows. Section 2 provides a brief overview of the relevant literature. Section 3 details the study area, survey design and data used in the analysis. The research methodology and the specific multinomial logit model are then described. Section 4 reports the model estimates. Finally, Sections 5–7 discuss these results and concludes, noting the limitations of the study and opportunities for further research.

2. Literature review

In the context of young driver safety, the key question is what measures may be taken to encourage young drivers to demonstrate safer driving behaviours? Young driver safety has long been a significant concern (Bridie Scott-Parker, 2015). Also, despite a number of policy initiatives (e.g. the Keys2Drive program (Department of Infrastructure and Regional Development, 2016), Drive Smart (Transport Accident Commission, 2014) and Drive in New Zealand (New Zealand Transport Agency, 2018)) young drivers remain over-represented in road crashes (Bridie Scott-Parker, 2015; Scott-Parker et al., 2015). For a review of earlier evaluations (cf. Austroads, 2015).

Moreover, it should be noted that the issues related to over-representation of young drivers in crash statistics are multifaceted. The road system is a complex, dynamic socio-technical system and young drivers bring an added layer of complexity due to inexperience, risk taking propensity, heightened influence of peers, the likelihood of being in an older, less safe vehicle, *inter alia*. Therefore, graduated driver licensing system (GLS), a staged approach to driver licensing from learner to provisional to full licence, was developed to address these major crash factors with significant effects in many regions, including Australia and US. For example, Queensland, Australia implemented of the GLS was associated with a statistically significant 31% reduction in fatal crashes involving novice drivers with the estimated crash reductions diminishing with reducing crash severity (Scully, Newstead, & Keall, 2014). GLS relies on young drivers' extrinsic motivations, in other words, young drivers' motivation driven by external forces (i.e. young drivers' responsiveness or deterrence due to the prospect of traffic sanctions). The rationale underlying the GLS is utilitarian.

2.1. Theoretical perspectives on societal welfare

The study of young driver safety is situated within a much larger public policy context for which the ultimate aim is the improvement of societal welfare. Implicit in interventions and policy prescriptions in terms of how this is to be achieved is a conceptualisation of societal welfare.

Two dominant perspectives include the Benthamite *hedonistic* perspective and the Aristotelian (and Senian) *eudaimonic* perspective. These two different perspectives overlap yet they can also diverge. Intuitively, this is similar to contradictions underlie economic and public health theorising of active transport behaviours (Ambrey & Bitzios, 2018). The hedonistic perspective on well-being emphasises one's subjective well-being as the product of a person's evaluation of their experienced positive and negative affect, happiness, or satisfaction with life. These are separable constructs with specific meaning among psychologists (Frey & Stutzer, 2002). For this perspective, in line with Bentham, happiness is synonymous with pleasure (Bruni & Porta, 2007).

This study adopts a hedonistic perspective due to: (1) the expected motivations underlying behaviour from economic theory; and (2) the very clear role for overtly hedonistic notions of 'novelty', 'fun' and 'joy' implicated in one's behaviour.

2.1.1. Behavioural implications from economic theory

Implicit in mainstream economic theory is that the volition underlying a person's behavior or choice is determined by a person's pursuit of or maximisation of their *ex ante* utility or happiness (Hands, 2009).¹ This is a person's utility as they comprehend it. It is usually selfish. However, it may also be altruistic, loyal, sadistic or masochistic in nature. Further, this behaviour, among other characteristics, is thought to be forward-looking, consistent over time and to embody judgements of uncertainty (Becker, 1993).

2.1.2. Tibor Scitovsky: Novelty and joy in public policy

This hedonistic perspective is developed further and draws on Tibor Scitovsky's earlier work. In particular, his book *The Joyless Economy* (1976). This work builds on psychological research on understanding motivation and preference formation. Specifically, his work is based on the idea that happiness is derived not only from comfort, but especially from novelty or

¹ While not explored here, these behaviours or choices may have different and almost hidden or unexpected implications for a person's *ex post* experienced utility (Dolan & Kahneman, 2008).

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