



Pre-licensed driving experience and car crash involvement during the learner and restricted, licence stages of graduated driver licensing: Findings from the New Zealand Drivers Study



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ABSTRACT

Objective: The aim of this study was to determine whether pre-licence driving experiences, that is driving before beginning the licensing process, increased or decreased crash risk as a car driver, during the learner or the restricted licence stages of the graduated driver licensing system (GDLS).

Method: Study participants were 15–24 year old members of the New Zealand Drivers Study (NZDS) – a prospective cohort study of newly licensed car drivers. The interview stages of the NZDS are linked to, the three licensing stages of the GDLS: learner, restricted and full. Baseline demographic (age, ethnicity, residential location, deprivation), personality (impulsivity, sensation seeking, aggression) and, behavioural data, (including pre-licensed driving behaviour), were obtained at the learner licence interview. Data on distance driven and crashes that occurred at the learner licence and restricted licence stages, were reported at the restricted and full licence interviews, respectively. Crash data were also obtained from police traffic crash report files and this was combined with the self-reported crash data. The analysis of the learner licence stage crashes, when only supervised driving is allowed, was based on the participants who had passed the restricted licence test and undertaken the NZDS, restricted licence interview ($n=2358$). The analysis of the restricted licence stage crashes, when unsupervised driving is first allowed, was based on those who had passed the full licence test and completed the full licence interview ($n=1428$).

Results: After controlling for a range of demographic, personality, behavioural variables and distance driven, Poisson regression showed that the only pre-licence driving behaviour that showed a consistent relationship with subsequent crashes was on-road car driving which was associated with an increased risk of being the driver in a car crash during the learner licence period.

Conclusion: This research showed that pre-licensed driving did not reduce crash risk among learner or restricted licensed drivers, and in some cases (such as on-road car driving) may have increased risk. Young people should be discouraged from the illegal behaviour of driving a car on-road before licensing.

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1. Introduction

The over-representation of young drivers in motor vehicle crashes is a serious public health problem world-wide (Organisation for Economic Co-Operation and Development, 2006). The two main factors that contribute to this elevated crash risk are immaturity and driving inexperience (Huang and Winston, 2011; Williams, 2006; Williams et al., 2012). Immaturity is often

addressed by imposing a mandatory minimum driver licensing age, which is typically between 16 and 18 years (Australian Government, 2012; Department for Transport, 2012; European Commission, 2012; Insurance Institute for Highway Safety, 2012). Addressing the problem of driving inexperience is more challenging because to gain experience the learner driver must be exposed to the traffic environment, and this has to occur at the time when they are at greatest risk of being involved in a traffic crash, that is in the first few months of unsupervised driving (Begg and Langley, 2009; Lewis-Evans, 2010; Mayhew et al., 2003). In some countries, such as New Zealand (NZ), Australia and North America, graduated driver licensing systems (GDLS) have been introduced to allow the learner

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driver to gain initial driving experience in relatively safe conditions (Williams and Shults, 2010). In NZ, the GDLS has three licensing stages: learner, restricted, and full. A learner licence can be gained at 15 years of age¹ by passing a computer-based multi-choice test, and applies for a minimum of six months during which time the learner driver must be supervised by an experienced driver. A restricted licence requires passing a practical on-road driving test, and allows unsupervised driving, except between 10 pm and 5 am, and when carrying passengers. The restricted licence applies for 18 months although this can be reduced to 12 months by completing an approved course (either Defensive Driving or Street Talk) (New Zealand Transport Agency, 2012). A full privilege licence, with no GDLS conditions, requires passing a second practical driving test.

In NZ, as well as elsewhere, young drivers have been shown to have low crash rates during the supervised learner licence period but this changes quite dramatically once unsupervised driving is allowed, with the first few months of unsupervised driving being the time when crash risk is at its highest (Lewis-Evans, 2010; Mayhew et al., 2003; McCartt et al., 2003; Williams, 2003). In an effort to lessen this risk some jurisdictions are extending the learner licence period and requiring a minimum number of hours of supervised driving before unsupervised driving is allowed. The minimum number of hours varies considerably by jurisdiction from around 30 h in several US states (Williams et al., 2012) to 120 h in Victoria, Australia (Vicroads, 2012). In NZ the number of hours of supervised driving practice at the learner licence stage is not mandated but in 2011 changes were made to the licensing system to make the restricted licence test more difficult. This change was intended to encourage 120 h of supervised driving practice (Ministry of Transport, 2011).

Some young people gain their initial driving experience by driving on-road before they get a car drivers licence. This has been reported in several countries (Begg et al., 2012; Elliott et al., 2008; McDowell et al., 2009; Senserrick et al., 2010). In NZ, it is illegal to drive on a public road before licensing (even if supervised by an experienced driver) yet around 50% of the participants in a large study of newly licensed car drivers (New Zealand Drivers Study, NZDS) reported having done this (Begg et al., 2012). In Australia, in the DRIVE study, (which, like the NZDS, is a prospective cohort study of young drivers), the prevalence of pre-licence driving was 25% (Senserrick et al., 2010). However, crash involvement was not examined in either of these published studies so it is not known if on-road driving before licensing had any effect on crash risk once licensed driving had commenced.

Most published studies that have investigated pre-licence driving behaviour among young people have examined factors associated with traffic crashes in relation to the licence status of the drivers involved (Hanna et al., 2010; Hasselberg and Laflamme, 2009; Lam, 2003) or personal and behavioural factors, including crashes, associated with pre-licence driving behaviour (Elliott et al., 2008). None of these studies have examined pre-licence driving and then followed-up the drivers to determine whether pre-licence driving influenced their crash risk, once they were licensed. The one exception to this was a longitudinal study of young drivers in Western Australia (WA) which followed young newly licensed drivers through the first years of licensed driving. One of the key findings from this study was that young drivers who drove daily or weekly before passing their licence test (i.e. gaining their L-plates) were 75–100% more likely to be involved in a crash in the first 12 months as a probationary (P-plate) driver, when unsupervised driving was first allowed, than those who never drove before gaining their L-plates (Stevenson et al., 2001). As the authors note, however,

¹ The minimum licence age increased to 16 years in 2011 but was 15 years when the NZDS cohort was recruited.

driving exposure during the P-plate crash period was not included in the multivariate analysis, a factor that may have influenced their results.

In NZ, there is a belief that young people who have grown up in a rural area, and had the opportunity to drive vehicles around farm paddocks and on farm roads, are experienced (and presumably safer) drivers when they begin licensing, than their urban counterparts who have not had this experience. This argument is often put forward by the rural sector during discussions on minimum driver licence age, and has been used to try and stop the licence age from being raised (Begg and Langley, 2009). There is no direct evidence in NZ to support, or refute, this argument. It seems rather unlikely that this belief would only apply in New Zealand, but to our knowledge no one has examined pre-licensing off-road driving experience among young people so it is unknown what effect may have on crash risk among newly licensed drivers.

The aim of the present study was to examine the relationship between both on-road and off-road pre-licensed driving experience reported by newly learner licensed car drivers, and the traffic crashes experienced as a driver during the learner licence stage, when only supervised driving is allowed, and the restricted licence stage, when unsupervised driving is first allowed. Motorcycle use was also included because it has been suggested, without any supporting evidence, that riding a motorcycle would be good preparation for young people about to start driving a car (Begg and Langley, 2009). In particular, we sought to determine the independent effects for each transport mode (car on-road and off-road, motorcycle on-road and off-road) in relation to a traffic crash as a car driver while on a learner licence, and while on a restricted licence, after controlling for a range of potential confounding socio-demographic, personality, and behavioural factors, including distance driven as a learner licensed driver and as a restricted licensed driver.

2. Method

2.1. New Zealand drivers study (NZDS)

NZDS is a prospective cohort study of 3992 newly licensed car drivers in New Zealand. Fig. 1 shows the stages of the NZDS and how they are linked to the stages of the NZ graduated driver licensing system. The cohort was recruited, and the learner licence (baseline) questionnaire was completed, very soon after passing their learner licence test. This took place between 1st February 2006 and 31st January 2008, at various locations throughout New Zealand. Details of the recruitment procedures have been reported previously (Begg et al., 2012; Begg et al., 2009a,b; Langley et al., 2012a). The NZDS restricted licence (first follow-up) and full licence (second follow-up) telephone interviews took place very soon after the study participants passed the respective licence tests.

2.2. Data

2.2.1. Data extraction

The present analysis used data from the learner (baseline), restricted, and full licence interviews. Data from the restricted licence interviews were extracted on 17 September, 2010 at which time 71% of participants had progressed to a restricted licence, 88% of them completed the NZDS restricted licence (first follow-up) interview. Data from the full licence interviews were extracted on 30 May 2011 at which time 40% of the full cohort had progressed to a full licence, and 93% of them completed the full licence (second follow-up) interview. For the present study our primary interest was young drivers so only those aged 15–24 years at learner licence (93% of the total cohort) were included ($n=2358$ completed the

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