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Adolescent, and their parents, attitudes towards graduated driver licensing and subsequent risky driving and crashes in young adulthood

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ABSTRACT

Problem: Although Graduated Driver Licensing Systems (GDLS) have helped reduce young driver crash rates, they remain significantly over-represented in crash statistics. To be effective GDLS rely heavily on support for the legislation by those directly involved; parents to enforce the restrictions and adolescents to comply. There is some evidence that practices regarding GDLS restrictions influence adolescent driving outcomes in the early stage of licensure. However there has been no examination undertaken on the influence of parent and adolescent attitudes toward GDLS on adolescents' driving behavior and crash experiences as they move into their young adult years. The aim of this research was to examine these relationships. *Method:* This investigation was based on a longitudinal study of a birth cohort, and uses data collected when the cohort members were aged 15, 18, and 21 years. At age 15 both adolescent and their parent attitudes toward GDLS were measured. At age 18 adolescent GDLS attitudes were measured again. The association between these measures and self-reported risky driving behavior and crash involvement at age 21 were examined. *Results:* Negative attitudes toward the learner supervisor restriction for males, and negative attitudes toward a GDLS for females were strongly associated with risky driving and crash involvement as young adults. *Impact on industry:* Targeting interventions to improve adolescents and parents understanding of the reasons for graduated licensing and the specific restrictions may improve attitudes and views and thereby contribute to a reduction in risky driving behaviors and crash risk among young adults.

1. Introduction

In response to the high motor-vehicle crash rate among young drivers in New Zealand, a Graduated Driver Licensing System (GDLS) was introduced in 1987 (Ministry of Transport, 1987). The key elements of the GDLS are: a six month learner license stage of supervised driving; a restricted license stage of 18 months that allows unsupervised driving except at night-time (10 p.m.-5 a.m.) or with young passengers in the car; a full license stage with no restrictions. Further details of the New Zealand GDLS have been described elsewhere (Begg & Stephenson, 2003).

Since its inception, the GDLS has contributed to a substantial reduction in young driver traffic crashes and related injuries in New Zealand. An early evaluation by Langley, Wagenaar, and Begg (1996) concluded that the introduction of the GDLS accounted for at least a 7% reduction in traffic-related hospital admissions among young people aged 15–19 years (Langley et al., 1996). Begg and others found that GDLS restrictions, especially the night time restriction, had contributed to a significant reduction in fatal and serious crashes involving young drivers (Begg & Stephenson, 2003; Begg, Stephenson, Alsop, & Langley, 2001). In recent years a variety of GDLS programs have been implemented in several countries. A Cochrane review of 13 studies from four countries (United States, Canada, New Zealand, and Australia) found that crash rates for young drivers decreased by between 26-41% during the first year of driving (Hartling et al., 2004). Despite this, young drivers are still significantly over-represented in the motor-vehicle crash statistics in most OECD countries (International Road Traffic Accident Database, 2010).

Research that has examined attitudes toward graduated licensing systems indicates that although the majority of adolescents and parents have favorable attitudes toward the GDLS and the restrictions, there are some who do not favor the laws (Begg, Langley, Reeder, & Chalmers, 1995; Goodwin & Foss, 2004; McCartt, Leaf, Farmer, Ferguson, & Williams, 2001; Waller, Olk, & Shope, 2000; Williams & Chaudhary, 2008; Williams, Ferguson, Leaf, & Preusser, 1998; Williams, Nelson, & Leaf, 2002). To be effective GDLS rely heavily on support for the legislation by those directly involved; parents to enforce the restrictions and adolescents to comply. In a cross-sectional survey Hartos and colleagues found that adolescents who reported lenient parental restrictions toward carrying friends as passengers were four times more likely to have a traffic violation and seven times more likely to have had a crash, compared to adolescents whose parents were not so lenient (Hartos, Eitel, Haynie, & Simons-Morton, 2000). Hartos and

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colleagues also examined risky driving behaviors one year after licensure and found those young drivers who reported fewer parental limits on driving in the first months of licensure had increased risky driving behaviors one year later (Hartos, Eitel, & Simons-Morton, 2001).

As discussed, there is some evidence that practices regarding GDLS restrictions influence adolescent driving outcomes in the early stage of licensure. However, there has been no examination undertaken on the influence of attitudes toward GDLS on adolescents driving behavior and crash experiences as they move into their young adult years. It is feasible that those parents who do not support the overall GDLS, or specific restrictions, will be less likely to enforce them, and adolescents with low support for the laws will be less likely to comply. Understanding this relationship may help identify areas to target in young driver intervention programs aimed at improving knowledge and attitudes toward GDLS, and which may subsequently improve the safety of young drivers. The Dunedin longitudinal study of a birth cohort (Silva & Stanton, 1996) provides an opportunity to examine these relationships and thereby help fill this knowledge gap.

The aim of this study was to examine adolescents and their parents' attitudes toward the graduated driver licensing system in the early stages of adolescent licensure in relation to risky driving and crashes as young adults.

2. Method

This research was part of an ongoing longitudinal study, the Dunedin Multidisciplinary Health and Development Study (DMHDS), which has followed the health, development and behavior of a cohort (n = 1,037) born at the only obstetric hospital in Dunedin between 1st April 1972 and 31st March 1973. Further details about the cohort and the study are described elsewhere (Silva & Stanton, 1996).

Injury prevention research has been one of the major components of the DMHDS, and since early adolescence road safety has been a focus of the injury interviews. Included in this present investigation were the adolescents interviewed at ages 15, 18, and 21 years, who were licensed under the graduated driver license system, and whose parent completed a brief parent questionnaire at the time of the age 15 interview (n = 732: 360 females and 372 males). The measures used in this study were all self-report and have been used previously in studies of this cohort.

2.1. Explanatory factors

2.1.1. Parent GDLS attitudes when adolescent aged 15 years

The parent GDLS questions were part of a mail out questionnaire completed mainly by mothers (91%; Reeder, Alsop, Begg, Nada-Raja, & McLaren, 1998). Parents were asked about the *inconvenience* on the family transport arrangements for each of the GDLS restrictions: (a) learner license condition requiring a supervisor in the vehicle at all times, (b) restricted license condition requiring a supervisor between 10 p.m. and 5 a.m. (night time restriction), and (c) restricted license condition requiring a supervisor when there are passengers in the vehicle (passenger restriction). Response options were 'not at all,' 'a little,' or 'a lot.' For each question responses of 'a lot' were coded as '*inconvenient,*' all other responses were coded as '*not inconvenient.*' To measure overall attitude to the GDLS parents were asked whether they 'support or oppose these changes to the law?' 'Oppose' or 'strongly oppose' responses were coded as '*oppose GDLS*'; all other responses were coded as '*support GDLS*'.

2.1.2. Adolescent GDLS attitudes at 15 years and 18 years

At the age 15 and age 18 assessments study members were asked about their attitudes toward the GDLS restrictions (Begg et al., 1995). At age 15 years, prior to experience with the newly introduced GDLS, study members reported how much they thought each of the conditions would affect them. At age 18, after experience with the conditions, study members reported how much each condition did affect them. The conditions were: (a) learner supervisor restriction, (b) night time restriction, (c) passenger restriction, and (d) not being able to drive after drinking any alcohol (alcohol restriction). For each restriction 'a lot' responses were coded as '*affected a lot*' and 'not at all' and 'a little' were coded as '*not affected.*' Overall attitude to the GDLS was assessed at the age 15 and age 18 assessments. Study members were asked whether they 'agree or disagree with these restrictions on young drivers?' 'Disagree' or 'strongly disagree' responses were coded as '*disagree with GDLS*,' and 'agree' or 'strongly agree' responses were coded as '*agree with GDLS*'.

2.2. Outcome measures

2.2.1. Risky driving at 21 years

At age 21, study members who had driven in the last month were asked about three high risk driving practices: speeding, alcohol-impaired driving, and not wearing a seatbelt (Begg & Langley, 2001; Gulliver & Begg, 2007). *Risky drivers* were those who had engaged in any of the following behaviors 'fairly often' or 'often' driving faster than 120kph on the open road (speed limit is 100kph); 'never' or 'sometimes' wearing a seatbelt as a driver; or in the previous month driven a car after drinking perhaps too much to be able to drive safely. All others were classified as *not-risky drivers*.

2.2.2. Crashes from 18–21 years

At age 21 study members were asked to report their crash involvement as a driver since their previous interview at age 18. Study members classified as *crash involved drivers* were those who reported being the driver in at least one crash that was on a public road and involved vehicle damage and/or injury. Validation studies of the accuracy of self report have found high agreement between self-reported crashes and police reported crashes (Begg, Langley, & Williams, 1999; Boufous, Ivers, Senserrick, Stevenson, Norton, & Williamson, 2010).

2.3. Driving exposure

At age 21 a measure of traffic exposure was obtained by asking study members how far they usually drove in a typical week (Gulliver & Begg, 2007). For those who had driven in the last month, response options ranged from 1 (1–10 km/week) to 5 (greater than 200 km/week). Distance travelled was categorized into low (1–50 km /week), medium (51–200 km/week), or high (greater than 200 km/week).

2.4. Statistical analysis

2.4.1. Univariate analysis

Unadjusted odds ratios were calculated using logistic regression, to examine the association between each explanatory variable and each outcome variable (risky driving; crash involvement). Driving exposure was treated as a potential confounder and included in all the models. Explanatory variables significant at $p \leq 0.05$ were entered into group specific multivariate logistic regression models.

2.4.2. Group specific analysis

Multivariate logistic regression analyses were conducted to determine the independent association between each explanatory measure within each group (parent GDLS attitudes; adolescent GDLS attitudes at age 15; adolescent GDLS attitudes at age 18) with each outcome variable.

2.4.3. Final model

All explanatory variables that remained significant at $p \leq 0.05$ in the adjusted group specific multivariate models were entered into a final multivariate logistic regression model for each outcome variable.