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A Note from the Editor:

This reprint from the Journal of Safety Research (Vol. 36, No. 2) represents the third annual summary of current research about Graduated Driver Licensing (GDL). These annual reviews began with a special issue of the Journal (Vol. 34, No. 1) that was devoted to the publication of the proceedings of the "Symposium on Graduated Driver Licensing: Documenting the Science of GDL," held in Chatham, Massachusetts, in November 2002. The following year, the Journal (Vol. 35, No.1) published a paper that reviewed the research published during the calendar-year 2003. This paper reviews the research published during 2004.

The Chatham proceedings provided a comprehensive review of the research on the licensing measures that have been put in place to reduce the risk of crash or fatality for teenage drivers. Beginning with the genesis of GDL systems and concluding with a future research agenda, the collective research presented at Chatham makes a compelling case for the adoption or strengthening of GDL laws in each state, and serves as a clarion message to both parents and teens to adopt GDL practices for their families.

Dr. Jim Hedlund and Dr. Richard Compton have once again authored this annual update of the published research. It importantly brings current the research presented at Chatham and provides additional and unassailable evidence that GDL offers significant safety benefits for those who follow its precepts.

We are pleased that the Journal once again provides a forum for the scientific evidence documenting the success of GDL and its contribution to improved highway traffic safety. We look forward to publishing a similar update each year.

This review and publication of the 2004 research evidence was made possible through funding from the Centers for Disease Control, and is just one demonstration of their continuing contributions to teen driver safety.

I hope that the Journal's commitment to this issue will help promote more attention and trigger more discussion to further both the research and the implementation of GDL, and extend its benefits to our teenage drivers and their families.

Mei Li Lin, PhD  
Editor  
Journal of Safety Research



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## Graduated driver licensing research in 2004 and 2005

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### Abstract

This is the second update of research on graduated driver licensing (GDL) and teenage drivers. It briefly summarizes research in progress and research published since the January 2004 update (Hedlund, J. & Compton, R. (2004). Graduated driver licensing research in 2003 and beyond. *Journal of Safety Research* 35 (1), 5–11). Research has been very active, especially on teenage driver risk factors, GDL program evaluations, the role of parents in managing and training their teenage drivers, and driver education. Results have strengthened the case for GDL, for nighttime and passenger restrictions, and for extended supervised driving practice.

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### 1. Introduction

The January 2003 special issue of the *Journal of Safety Research* (JSR) was devoted entirely to graduated driver licensing (GDL). The first 12 papers, which were written for and presented at a GDL Symposium in November 2002, provided a comprehensive review of research on teenage driver issues in general and GDL in particular. The final paper (Hedlund, Shults, & Compton, 2003) used information from these papers to summarize GDL knowledge, information gaps, and research needs as of the time of the symposium. All papers are available on the National Safety Council's website [www.nsc.org/gdlsym/index.htm](http://www.nsc.org/gdlsym/index.htm).

Research on GDL and teenage driver issues has been very active since the symposium and the JSR special issue. Hedlund and Compton (2004) summarized research published since the symposium and work in progress. This paper provides a further update. It summarizes 50 recent published papers and studies and reports on over 30 ongoing and planned studies. It references only studies published in 2003 or 2004 and not cited in any of the January 2003 JSR papers or the 2004 update. It provides contact information for ongoing and planned studies.

The JSR plans to publish similar updates for the next few years, as long as there are substantial new research results to report. Readers are invited to send information on new studies and recent studies not included in this paper, the 2004 update, or any of the January 2003 JSR papers to Jim Hedlund at [jhedlund@sprynet.com](mailto:jhedlund@sprynet.com).

In this review, GDL refers to a three-stage licensing system for beginning drivers consisting of a learner's permit, a provisional license, and a full license. A learner's permit allows driving only while supervised by a fully licensed driver, a provisional license allows unsupervised driving under certain restrictions, and both the learner's permit and the provisional license must be held for a specified minimum period of time. Other restrictions may apply during both the learner's permit and provisional license periods.

### 2. Syntheses and overviews

Senserrick and Haworth (2004) summarize the research literature and the research gaps in several key areas: driving, crash, and injury risk during the learner's permit and provisional periods; driver education and training; GDL systems; and unlicensed driving. They provide 95 references. A more comprehensive summary is in progress. For information, contact Narelle Haworth at [Narelle.Haworth@general.monash.edu.au](mailto:Narelle.Haworth@general.monash.edu.au).

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Engström, Gregerson, Hernetkoski, Keskinen, and Nyberg (2003) summarize the research literature on driving and crash behavior during the first years of licensure; methods used to influence young drivers' attitudes and behavior, with special attention to alcohol, safety belt use, and speeding; high school driver education; and licensing systems. They provide 325 references.

The Organization for Economic Co-operation and Development (OECD) has established a working group on Young Driver Risks and Effective Counter-Measures. The working group will assess the factors that contribute to young driver's crash risk; review countermeasures, including driver education, driver training, and GDL; and document current practices in the OECD countries. The group intends to complete its work in 2005 and publish a final report in 2006. For information, contact Colin Stacey at [Colin.STACEY@oecd.org](mailto:Colin.STACEY@oecd.org).

The Highway Safety Research Center (HSRC) of the University of North Carolina is drafting a guide for states to use in reducing crashes involving young drivers. The guide is part of the series of state guides for implementation of the American Association of State Highway and Transportation Officials (AASHTO) strategic plan. Each guide is a volume in the National Cooperative Highway Research Program (NCHRP) Report 500. The young driver guide should be completed in 2006. For information, contact Rob Foss at [rob\\_foss@unc.edu](mailto:rob_foss@unc.edu).

### 3. The need for GDL: teenage driver risk factors

Risk factor studies include literature surveys, cohort studies, focus groups, telephone surveys, questionnaires, crash data analyses, and theoretical models. They provide additional detail on the influences of general lifestyle and of specific factors such as alcohol on teenage driver crash risk.

#### 3.1. General risk factors

Masten (2004) reviewed and summarized the research on teenage driver risk factors and the countermeasures directed at reducing their high crash risk, with special attention to California. Risk factors include risk perception, overall risky behavior, personality characteristics, gender, immaturity and inexperience, alcohol and drug use, passengers, and nighttime and weekend driving. Countermeasures include driver education and training, provisional licensing, GDL, nighttime restrictions, alcohol limits, and driver improvement programs. He cites over 225 references.

Begg and Langley (2004) investigated factors observed in teenagers (ages 15 and 18) that predicted subsequent persistent risky driving behavior at ages 21 and 26, using data from a longitudinal study of 933 New Zealand youth. Very few females were persistent risky drivers. For males, low constraint (self-control, harm avoidance, and traditionalism), aggressive behavior, and cannabis use predicted risky driving.

Møller (2004) explored the relationships between lifestyle and driving behavior in focus group interviews with 29 young drivers in Denmark. The results suggest that teenagers see driving as a way to attract attention, achieve status, and control a powerful machine as well as provide mobility, and that these factors influence their driving behavior.

Bellavance and colleagues at the Université de Montréal are conducting a literature review of the psychological factors underlying teenage risk-taking, the factors that predict risky behavior, and the methods to evaluate the attitudes and driving behaviors of beginning drivers. They then will survey licensing practices for beginning drivers worldwide, with particular attention to jurisdictions that require a second road test or a hazard perception test for full licensure. They also will explore the use of new technology to monitor the driving performance of new drivers. A report is scheduled for late 2005. For information, contact Francois Bellavance at [francois.bellavance@hec.ca](mailto:francois.bellavance@hec.ca).

#### 3.2. Teenage driver crash risks and attitudes

Mayhew, Singhal, Simpson, and Beirness (2004) examined crashes involving young people aged 15–19 and 20–24 in Canada. Traffic crash fatalities among persons aged 15–19 dropped 68% from 1980 to 2002. However, most of this progress occurred before 1992. In 2001, traffic crashes continued to be the leading cause of death among young people, accounting for 35% of the deaths of persons aged 15–19 and 30% of the deaths of persons aged 20–24.

Beirness, Mayhew, Simpson, and Desmond (2004) summarized results from a telephone survey of 1,221 Canadian drivers. Drivers aged 16–19 reported substantially more risky driving behaviors than drivers aged 45–54: 38% take driving risks just for fun, compared to 12% of older drivers; 90% exceed the speed limit compared to 78%; and 72% speed up to get through a traffic light before it turns red compared to 66%. Drivers aged 16–19 drive less (300 km monthly) than drivers aged 45–54 (1000 km) but receive more traffic tickets: 21% were ticketed in the previous year compared to 10% of the older drivers.

The Liberty Mutual Group and SADD (Students Against Destructive Decisions) surveyed 3,574 teenagers in 41 schools across the United States in May and June 2004 (Liberty Mutual Group and SADD, 2004). Many teenagers reported unsafe actions while driving: 67% speeding, 62% talking on a cell phone, and 33% failing to wear safety belts. High school age teens reported similar unsafe actions by their parents: 48% speeding, 62% talking on a cell phone, and 31% unbelted. Not surprisingly, 59% of teen drivers said that their parents have the most influence on their driving. And, of course, 89% of teen drivers rated themselves as safe drivers.

Laapotti, Kenkinen and Rajalin (2003) used the same questionnaire in 2001 as in 1978 to study how young drivers' traffic attitudes and behaviors changed over this period in Finland. Survey respondents were 18 to 20 years old and had

been licensed for 5 to 18 months. Drivers in 2001 had more driving experience than in 1978 and more believed that they were above average drivers. Young drivers, especially males, had more negative attitudes toward traffic laws and safe driving in 2001 than in 1978. Compared to male drivers in 2001, female drivers drove less, were less confident of their driving skill, committed fewer traffic offenses, and were involved in fewer crashes.

### 3.3. Teenage drivers in crashes

Lin, Huang, Hwang, Wu, and Yen (2004) studied the effect of a motorcycle crash on risk-taking behavior in a prospective study of 4,818 junior college students in Taiwan. Most students were 17 to 19 years old. At the initial assessment, students who had experienced a motorcycle crash had higher risk-taking levels than those who had not. A motorcycle crash during the study period did not significantly change risk-taking behavior.

Preusser and colleagues at the Preusser Research Group (PRG) will interview teenage drivers who crash during the first few months of driving to learn more about the circumstances and causal factors of their crashes. The study, funded by the Insurance Institute for Highway Safety (IIHS), will begin in 2005. For information, contact Susan Ferguson at [sferguson@iihs.org](mailto:sferguson@iihs.org).

### 3.4. Specific risk factors: alcohol and sleep

Hingson, Assailly, and Williams (2004) provide a comprehensive review of the drinking and driving after drinking behavior of youth under age 21 in the United States. They also discuss various interventions to reduce drinking and driving after drinking: family, public school, college, and comprehensive community programs; minimum legal drinking age and zero BAC laws; alcohol pricing; and alcohol sales practices.

Gulliver and Begg (2004) studied factors observed during adolescence that predicted driving after drinking at age 21 in New Zealand. They surveyed over 800 youth at ages 15, 18, and 21. Few females at age 21 reported that they had driven after “perhaps having too much to drink.” For males, aggression, riding with a drinking driver, and previous crash experience in adolescence predicted driving after drinking at age 21.

Assailly (2004) has developed a model of youth decision-making regarding driving after drinking or riding with a drinking driver. He considers decisions at four stages: the first drink, the amount of drinking, driving after drinking, and disregarding the risks of driving after drinking. He discusses preventive actions that can be taken at each stage.

HSRC is completing its study of drowsy driving among teenage drivers, and in particular whether school starting times affect crash rates. For information, contact Rob Foss at [rob\\_foss@unc.edu](mailto:rob_foss@unc.edu).

The University of Massachusetts-Amherst is conducting a study, sponsored by the National Highway Traffic Safety

Administration (NHTSA), to evaluate a PC-based risk awareness training program. It is designed to train novice drivers to recognize potentially risky situations and respond in an appropriate and safe manner. Preliminary work has shown that the training improves recognition of potential risks as measured in a driving simulator. For information, contact Patricia Ellison-Potter at [Patricia.Ellison-Potter@nhtsa.dot.gov](mailto:Patricia.Ellison-Potter@nhtsa.dot.gov).

## 4. Effectiveness of GDL as implemented

Evaluations of GDL programs in British Columbia, California, Michigan, and Utah were published in 2004 and 2005. Evaluations for Georgia, Ontario, and Oregon are in final review and should be released shortly. Evaluations in California, Louisiana, North Carolina, and Québec as well as three nationwide studies are underway. The results confirm the effectiveness of GDL overall. They provide greater evidence for three key GDL components: an extended learner’s permit period, to provide supervised driving practice, and restrictions on nighttime driving and teenage passengers during the provisional period. They suggest that safety belt use requirements may be valuable. They provide some suggestion that GDL may have carryover effects on fully licensed 17-year-old drivers.

### 4.1. British Columbia

British Columbia implemented GDL on August 1, 1998. It begins with a 6-month learner’s permit stage, reduced by 3 months for learners who complete a driver’s education course approved by the Insurance Corporation of British Columbia (ICBC). This is followed by an 18-month novice stage that requires an “N” to be displayed in the vehicle’s window, prohibits alcohol use, and has a lower penalty point threshold. ICBC conducted an extremely thorough evaluation using a cohort study comparing GDL drivers with pre-GDL drivers and a case-control study of novice drivers involved in crashes (Wiggins, 2004). The evaluation found that the crash rate for GDL drivers was 16% lower than for pre-GDL drivers over a 3.4 year follow-up period. The 6-month learner’s permit was the main reason for the reduction. Crash rates were 27% higher for drivers who completed driver education and thus could receive their novice license after only 3 months with a learner’s permit.

On October 6, 2003, British Columbia extended the learner’s permit holding period to 12 months and added passenger restrictions and a crash- and violation-free requirement to the novice stage. These changes, together with new safe driving guides and learner’s and novice driver road tests implemented in 2000, will be evaluated after sufficient data are available. The ICBC report recommended removing the 3-month reduction in the learner’s permit holding period for driver’s education course graduates. The report is available at <http://www.icbc.com>.

#### 4.2. California

In July 1998, California increased the learner's permit holding period from one to 6 months, required 50 hours of supervised practice during the learner's period, and introduced a provisional license with a 12-month nighttime driving restriction (12 a.m. to 5 a.m) and a 6-month restriction on unsupervised driving with passengers under the age of 20. In 2004, two evaluations reported in the 2004 update were published in journal form: Masten and Hagge (2004), from the California Department of Motor Vehicles, and Rice, Peek-Asa, and Kraus (2004), from the Southern California Injury Prevention Research Center. A third evaluation was completed: Cooper, Gillen, and Atkins (2004), from the University of California Institute of Transportation Studies.

While all three studies analyzed data from the same statewide crash file, they reached rather different conclusions. Masten and Hagge (2004) used time series analysis on 4.5 years pre-GDL and 3.5 years post-GDL crash data, controlling for trend, seasonality, and changes in teen driver licensure. They concluded that the 1998 GDL changes produced no overall reductions in injury crashes for 15- to 17-year-old drivers or for 16-year-old drivers. However, the nighttime and passenger restrictions produced modest crash reductions.

Rice et al. (2004) compared per-capita crash rates of 16- and 17-year-old drivers for one pre-GDL year with 2 post-GDL years, using crash rates for drivers aged 25–34 as a control. They found that GDL lowered fatal or severe injury crash rates substantially: 28% overall from 1997 to 2000 and 17% from 1997 to 2001. Reductions were larger during the nighttime driving restriction hours.

Cooper et al. (2004) compared crashes per licensed 16-year-old driver for "equilibrium" pre-GDL and post-GDL periods: far enough from the implementation date to exclude the effects of increased licensure immediately before the law and reduced licensure immediately after. The crash rate for 16-year-old drivers decreased by about 17% from the approximately 21 pre-GDL months (July 1996–March 1998) to the 6 post-GDL months analyzed (November 2000–May 2001). The percentage of crashes occurring during nighttime restriction hours did not change, but the number of teenage passengers of 16-year-old drivers decreased by about 25% (see also Cooper, Atkins, & Gillen, 2005). The report is available from Douglas Cooper at [dcooper@berkeley.edu](mailto:dcooper@berkeley.edu).

In an attempt to reconcile these results, IIHS is sponsoring an additional analysis by PRG. For information, contact Susan Ferguson at [sferguson@iihs.org](mailto:sferguson@iihs.org).

#### 4.3. Georgia

Emory University is evaluating Georgia's GDL program, which has not been evaluated previously though it is one of the oldest and most complete in the United States. The study is assessing whether there are effects extending several years. Preliminary results indicate that there was a significant

decrease in per-capita fatal crash rates for 16- and 17-year-old drivers after GDL was implemented in 1997. The NHTSA-funded study should be released in 2005. For information, contact Paul Tremont at [Paul.Tremont@nhtsa.dot.gov](mailto:Paul.Tremont@nhtsa.dot.gov).

#### 4.4. Michigan

Michigan's 1997 GDL law included a 6-month learner's permit period with at least 50 hours of supervised driving and a 6-month provisional period with a nighttime restriction. Shope and Molnar (2004) at the University of Michigan Transportation Research Institute (UMTRI) updated earlier evaluations of Michigan's 1997 GDL law. Two previous studies by Shope and co-authors found that GDL reduced the per-capita crash risk of 16-year-old drivers by about 25% in 1998 and 1999 compared to 1996. The update found that the reductions persisted at about the same level in 2000 and 2001. For example, the overall crash risk reduction for 16-year-old drivers in 2001 compared to 1996 was 29%. After adjusting for changes in the crash risk of drivers aged 25 and older, to account for other influences on crash rates, the reduction for 16-year-old drivers was 19%.

#### 4.5. North Carolina

The University of North Carolina School of Public Health and HSRC studied the effect of North Carolina's GDL law on hospitalization rates and hospital charges for 16-year-old drivers. Preliminary results suggest that hospitalization rates and charges have decreased similarly to the previously-reported decrease in crash rates. Funded by the Centers for Disease Control and Prevention (CDC) and the State Farm Insurance Company, the study should be released in Spring 2005. For information, contact Lewis Margolis at [lmargoli@email.unc.edu](mailto:lmargoli@email.unc.edu).

#### 4.6. Oregon

Oregon's 2000 GDL law included a 6-month learner's permit period and a 1-year provisional period with passenger and nighttime restrictions. Oregon requires 100 hours of supervised driving, reduced to 50 hours for drivers who complete an approved driver education course. The Center for Applied Research is evaluating the law using driver and crash records and focus groups. Preliminary results suggest that GDL reduced crash and violation rates, especially during the first 6 months of the provisional period. Driver education course graduates appeared to have lower crash and violation rates than non-graduates. The NHTSA-sponsored study should be released in 2005. For information, contact Patricia Ellison-Potter at [Patricia.Ellison-Potter@nhtsa.dot.gov](mailto:Patricia.Ellison-Potter@nhtsa.dot.gov).

#### 4.7. Utah

Utah implemented GDL in three stages: a 30-hour supervised driving requirement during the learner's permit (though with no minimum learner's permit holding period) and a mid-night to 5 a.m. restriction for provisional licensees as of July

1999; a seat belt use requirement for occupants under 17 as of July 2000; and a prohibition against passengers under 21 during the first six months of licensure as of July 2001. Hyde, Cook, Knight, and Olson (2005) evaluated the law's effects on crashes involving 16-year-old drivers using data from 1996 through 2001. The proportion of 16-year-olds who were licensed dropped from about 85% in 1996, before GDL, to about 76% in 2001. Crashes per licensed driver dropped 5% from the pre-GDL period (January 1996–June 1999) to the post-GDL period (July 1999–December 2001). Thus crashes per population dropped about 15%. Nighttime crashes per year dropped 16%, from 141 through June 1999 to 118 afterwards. The nighttime crash rate per licensed driver decreased, but the change was not statistically significant.

#### 4.8. Single-jurisdiction evaluations in progress

Dunware is studying GDL effects in Louisiana using interrupted time series methods with three years pre-GDL and three years post-GDL data. Among other topics, she is considering how driver's education, as part of the GDL program, affects injury and fatality rates. The study should be completed in 2005. For information, contact Gwen Dunware at GDunware@dps.state.la.us.

HSRC is studying North Carolina crash rates per driver at each GDL level, controlling for exposure using both days since licensure and trip estimates from interview data. In addition, HSRC is using time series methods to document long-term GDL effects, in an update of their previous study.

Initial results suggest that the crash rate reductions observed previously for 16-year-old drivers have been sustained and a smaller reduction has been observed for 17-year-old drivers. For information, contact Rob Foss at rob\_foss@unc.edu.

The Traffic Injury Research Foundation (TIRF) has completed an evaluation of the Ontario GDL program's effects on crashes of young passenger vehicle and motorcycle drivers. The study also examined overall support for the GDL program, compliance with its restrictions, and how beginning drivers progress through its stages. The report is under review by the sponsor, the Ontario Ministry of Transportation. For information, contact Barbara Koppe at barbarak@trafficinjuryresearch.com.

The Société de l'Assurance Automobile is completing an evaluation of Québec's 1997 GDL law using three years pre- and three years post-GDL data to examine both short-term and long-term effects. The study should be completed in 2005. For information contact Joanne Bouchard at Joanne.Bouchard@saaq.gouv.qc.ca.

#### 4.9. Multi-jurisdiction evaluations in progress

Williams, Ferguson, and Wells (2005) analyzed United States traffic fatality data from 1993 to 2003, a time during which 46 states and the District of Columbia implemented GDL. The per capita crash rate for 16-year-old drivers decreased 26%

over this period, compared to 11% for 17-year-old drivers, 6% for 18–19-year-old drivers, and 7% for 20–49-year-old drivers. There was a substantial reduction in fatal crashes in which 16-year-old drivers were transporting young passengers but no change in fatal crashes late at night.

Johns Hopkins University, in a NHTSA-sponsored study, is evaluating GDL and its components nationwide using national crash databases. Preliminary results confirm that GDL reduced fatal crash involvement rates for 16-year-old drivers. Each component studied—learner's permit age and length, provisional and full licensure ages, supervised driving requirement, and nighttime and passenger restrictions—appeared to have a positive effect, though some of the effects may be only coincidental. The study should be released in 2005. For information, contact Paul Tremont at Paul.Tremont@nhtsa.dot.gov.

Johns Hopkins has begun a second national evaluation for the AAA Foundation for Traffic Safety (AAAFTS). The study will examine licensing rates and mileage driven to distinguish GDL's effects on driving behavior and on driving exposure. The study also will provide more information on the effects of individual GDL components. The study should be completed in 2006. For information, contact Scott Osberg at sosberg@aaafoundation.org.

#### 4.10. Systematic review

Hartling et al. (2004) reviewed 13 high-quality studies of GDL systems in the United States, Canada, New Zealand, and Australia that were implemented from 1979 to 1998. While GDL system components and restrictions differed across these jurisdictions, the authors concluded that GDL reduced crash rates in all jurisdictions and for all crash types.

## 5. GDL components

### 5.1. Nighttime restrictions

Information on the effectiveness of nighttime restrictions is contained in the California evaluations of Masten and Hagge (2004), Rice et al. (2004), and Cooper et al. (2004), and in the nationwide Johns Hopkins study (Section 4.9).

### 5.2. Passengers and passenger restrictions

Cooper et al. (2005), as part of their California study (Cooper et al., 2004) examined the influence of teenage passengers on 16-year-old driver crash rates and the effect of California's teenage passenger restriction. Sixteen-year-old drivers in crashes who were at fault were more frequently carrying teenage passengers than 16-year-old drivers who were not at fault. This suggests that teenage passengers increase crash risk for 16-year-old drivers. The number of teenage passengers of 16-year-old drivers decreased by about 25% in the first three years after California's passenger restriction became effective.

PRG is evaluating the effect of passenger restrictions in at least three states, in a study funded by NHTSA. For information, contact Patricia Ellison-Potter at Patricia.Ellison-Potter@nhtsa.dot.gov.

HSRC is evaluating the effects of North Carolina's passenger restriction. For information, contact Rob Foss at rob\_foss@unc.edu.

Chen, Elliott, Winston, and Durbin (2005) examined whether child passengers riding with teen drivers had a greater injury risk than when riding with adult drivers. Chen and colleagues at the Children's Hospital of Philadelphia (CHOP) are also comparing the trip and crash characteristics of child passengers riding with teen and with adult drivers, in particular differences between daytime and nighttime crashes. For information, contact Tracey Durham at DURHAMT@email.chop.edu.

Information on passenger restrictions also is contained in Masten and Hage (2004) and in the nationwide Johns Hopkins study (Section 4.9).

### 5.3. Safety belt use

Two studies documented again that teenage drivers and passengers have lower safety belt use rates than older drivers and passengers. Williams, McCartt, and Geary (2003) studied driver belt use at 12 high schools in Connecticut and Massachusetts by observing drivers arriving at school in the morning and at evening football games. Average belt use was 9 percentage points lower for teenage male than adult male drivers in the morning and 24 percentage points lower arriving at football games. Teenage female belt use was only slightly lower than adult female belt use. McCartt and Northrup (2004) examined belt use of fatally injured teenagers from 1995 to 2000. Only 36% of fatally injured teenage drivers and 23% of fatally injured teenage passengers were belted. Belt use was higher in states with primary safety belt use laws. Smith and colleagues at CHOP are investigating this relationship in more detail, comparing self-reported belt use by teenagers aged 12–15 in states with primary and secondary belt use laws. For information, contact Tracey Durham at DURHAMT@email.chop.edu.

These results all suggest that GDL laws with explicit safety belt use requirements, including sanctions for failing to wear belts, may increase belt use. While several states incorporate belt use implicitly in their GDL requirements, and North Carolina states this explicitly, the belt use requirement frequently is not well-known or enforced. In a NHTSA-funded project, Tennessee and Wisconsin are publicizing their safety belt GDL requirements. For information, contact Patricia Ellison-Potter at Patricia.Ellison-Potter@nhtsa.dot.gov.

### 5.4. Complete GDL systems

TIRF is developing a model GDL program for Canada. Funded by the Insurance Bureau of Canada, TIRF will document the current GDL programs in the Canadian provinces and the changes planned or proposed to these programs, compare these to GDL programs elsewhere, and discuss the safety benefits of the various GDL components. The report should be available in 2005. For information, contact Barbara Koppe at barbarak@trafficingjuryresearch.com.

### 6. Implementing GDL

Research continues to emphasize the crucial role of parents in teaching and managing their teenage drivers and to produce materials to assist parents.

#### 6.1. GDL implementation in practice

TIRF is continuing its extensive investigation of GDL programs, funded by AAAFTS. Using data from British Columbia, Ontario, Oregon, and Virginia, the study is investigating which GDL components are most effective, how driver education can be integrated with GDL, and how to enhance parental involvement. Results should be available in 2005. For information, contact Scott Osberg at sosberg@aaafoundation.org.

Goodwin and Foss (2004) studied how well North Carolina's GDL restrictions are known, complied with, and enforced, using interviews with 900 teenagers and their parents and discussions with 20 law enforcement officers. Over 90% of both parents and teenagers were aware of the nighttime restriction and knew that it began at 9 p.m. Over 80% were aware of the restriction to no more than one teenage passenger. Almost one-quarter of teenagers reported that they had violated the nighttime driving restriction either with or without their parents' knowledge, though usually only a few times. About one-third violated the passenger restriction, usually without their parents' knowledge, and again usually only a few times. Teenagers expressed little concern about GDL enforcement. Officers strongly supported GDL but were not familiar with its details. GDL enforcement did not appear to be a high priority for officers.

Begg and colleagues in New Zealand hope to begin their large prospective cohort study in 2005. The study, described in the 2004 update, would follow beginning drivers as they progress through the learner's permit, provisional, and full licensure stages. For information, contact Dorothy Begg at dorothy.begg@ipru.otago.ac.nz.

#### 6.2. Learner's permit drivers

Paquette and De Guise (2004) studied how learner's permit drivers in Québec acquire driving information and practice. They used data from telephone and in-person interviews and mail-in questionnaires. The report, in French, is available from Guy Paquette at guy.paquette@com.ulaval.ca.

Berg, Gregerson, and Laflamme (2004) studied 1,081 crashes involving learner's permit drivers in Sweden from 1994 to 1999. They identified four main crash types: (a) on straight roads with a 70 km/h speed limit in rural areas; (b) on straight roads with a higher speed limit in rural areas; (c) low-speed rear-end crashes in built-up areas; and (d) low-speed intersection crashes in built-up areas. Awareness of these types may help learner's permit drivers avoid crashes.

Harrison (2004) studied the driving experience of 110 learner's permit drivers in Victoria, Australia. Participants recorded each trip during their 2-year learner's permit period. They averaged only 1.6 driving trips per month, driving for an average of 52 minutes and covering 50 km. Over the full 2 years they averaged only 40 trips. Parents supervised almost all the trips. Most of the supervised driving occurred in good weather during daylight hours.

### 6.3. Parents and teenage drivers: expectations, knowledge, and behavior

Two studies provide evidence that young drivers "inherit" their driving behavior from their parents. Bianchi and Summala (2004) administered a questionnaire to 174 Brazilian parent-child pairs. The questionnaire asked how frequently subjects commit various driving behaviors such as speeding, aggressive actions, and errors in observation or judgment. Parents' self-reported traffic violations and observation or judgment errors were a strong predictor of their children's self-reported violations and errors.

In the Liberty Mutual Group and SADD survey discussed in Section 3.2, 59% of teen drivers said that their parents have the most influence on their driving.

Sherman, Lapidus, Gelven, and Banco (2004) investigated teenagers' and parent's knowledge and expectations about learning to drive, using a sample of 613 teenagers and parents in Connecticut. Teenagers and parents had substantially different expectations of the rules and restrictions that parents would place on the teen drivers.

Hartos, Shattuck, Simons-Morton, and Beck (2004) studied parental driving rules in 24 parent-teen pairs in Maryland through telephone interviews with parents and teens separately. The 24 families reported 72 individual rules, an average of 3 per family, covering a full range of issues including asking permission to use the car, reporting the trip destination, nighttime and passenger limits, and safety procedures. Parents and teenagers agreed on the content of only half the rules. Most rules carried consequences if they were violated, ranging from warnings to no driving for some period of time. Most of the rules were "spoken," some were "understood," and very few were "written." Many rules were flexible in that exceptions were allowed or consequences for violations could be waived.

Beck, Shattuck, Raleigh, and Hartos (2003) investigated whether Maryland's GDL changes of 1999 encouraged parents to be more active in managing their teenagers' driving.

Interviews of provisionally licensed teenagers found significant increases in the amount of parental driving instruction, supervised driving, and parental restrictions on driving after the 1999 changes.

6.4. *Parents and teenage drivers: programs to assist parents*  
Simons-Morton and colleagues continue their work with the Checkpoints program that helps parents manage their teenagers' driving and adjust driving restrictions over time. Simons-Morton and Hartos (2003) provide an overview of the program. Two papers reported in the 2004 update have appeared: Simons-Morton, Hartos, and Beck (2004) and Simons-Morton, Hartos, Leaf, and Preusser (in press). Shope and colleagues at UMTRI, with funding from the National Institute of Child Health and Human Development (NICHD), will implement and evaluate an adapted version of the program in Michigan. Results should be available in 2006. For information, contact Jean Shope at [jshope@umich.edu](mailto:jshope@umich.edu).

The National Safety Council (NSC) released *Teen Driver*, a guide for parents and teenagers (National Safety Council, 2004). The guide is available from NSC at <http://www.nsc.org/issues/teendiving>.

Senserrick and colleagues at Monash University are developing a resource for parents of beginning drivers. Their initial report (Senserrick, Mulvihill, & Haworth, 2004) provides an overview of young driver safety and GDL, discusses the role of parents in teaching and managing their teenage beginning drivers, reviews what information and other resources parents should have, summarizes the licensing systems and resources provided by the Australian states and territories, and provides recommendations for a model resource package based on the Checkpoints program. The next step is to develop and pilot test a draft resource package. The project is funded by ExxonMobil of Australia. For information, contact Narelle Haworth at [Narelle.Haworth@general.monash.edu.au](mailto:Narelle.Haworth@general.monash.edu.au).

Chaudhary, Ferguson, and Herbel (2004) evaluated measures to help parents in Tennessee. After teenage drivers received their learner's permits, parents received one of three mailings: (a) a welcome letter, (b) the letter together with a booklet providing advice on driving instruction and driving management, or (c) the letter and booklet together with periodic reminder cards. In telephone interviews, parents said that the booklets and reminder cards were helpful. However, neither the booklets nor the booklets and cards had any effect on the amount or type of supervised driving during the learner's stage nor on parental restrictions on driving after licensure.

Goodwin, Waller, Ross, and Margolis (2004) studied a similar parental assistance experiment in North Carolina. Teens with learner's permits and their parents received: (a) a book describing highly structured practice sessions, (b) a series of "tip sheets" with more generalized guidance, or (c) no special information. Although parents thought the book and tip sheets were helpful, most parents used these materials only in a general way. Parents and teens generally enjoyed



their time together as parents supervised their learner's permit teens. But after four months and an average of 43 hours of supervised driving, most parents believed that their teen was not ready to drive unsupervised in any but the most benign traffic conditions. For information, contact Arthur Goodwin at arthur\_goodwin@unc.edu.

### 6.5. GDL enforcement

HSRC is studying whether well-publicized enforcement, including checkpoints near high schools, can increase compliance with GDL provisions in North Carolina. The study, funded by IIHS, will be completed in 2005. For information, contact Susan Ferguson at sferguson@ihs.org.

## 7. Related research and activities

Research continues on methods to integrate driver education more effectively into GDL programs.

### 7.1. Driver education: overviews and evaluations

Driver education continues to generate research, opinion, and controversy, both as a stand-alone program and as a component of GDL. Williams and Ferguson (2004) summarized and documented the prevailing view: driver education may help beginning drivers acquire driving skills, but the standard driver education course of 30 hours in the classroom and 6 on the road does not produce safer drivers. Driver education encourages earlier licensure, both by teaching the skills needed to pass the licensing road test and, in many jurisdictions, by reducing the licensure age through a "driver education discount." Earlier licensure means that more teenagers are driving more miles and are involved in more crashes. Driver education thus reduces overall traffic safety for teenagers.

Two Cochrane reviews found no safety benefits from driver education programs. Roberts, Kwan, and Cochrane Injuries Group Driver Education Reviewers (2001) reviewed studies that randomly assigned students to participate or not participate in school-based driver education classes. The studies were conducted between 1982 and 1984 in Australia, New Zealand, and the United States. The authors found no evidence that school-based driver education reduces crashes. It does lead to earlier licensing, and it may in fact produce a modest increase in crashes.

Ker et al. (2005) reviewed 24 studies of post-licensure driver education. All but one was conducted in the United States. Most were remedial courses. The authors found no evidence that these post-licensure driver education courses reduce crashes.

Hirsch (2003) discussed two reasons why driver education does not improve traffic safety. He argues that public policies favor automobile transportation over safety. They encourage early licensure, justify it with a driver education discount, and ignore the research evidence that earlier licensure increases crashes. Further, he believes that this "mobility bias" is so

pervasive that the research needed to develop a truly effective driver education curriculum has not been conducted.

As Williams and Ferguson (2004) noted, there is no current list of schools in the United States that offer driver education or of the number of teenagers who complete a driver education course. Working with the American Driver and Traffic Safety Education Association (ADTSEA), NHTSA plans to acquire these data. For information, contact Jim Wright at Jim.Wright@nhtsa.dot.gov.

Three recent studies shed more light on the relationships between driver education and GDL. As part of their overall evaluation of the British Columbia GDL program (Section 4.1), ICBC found 27% higher crash rates for teens who reduced their learner's permit holding period by 3 months after completing driver education (Wiggins, 2004). In Oregon, driver education does not lead to earlier licensure but reduces the amount of supervised driving during the learner's permit period from 100 to 50 hours. Preliminary results from the Oregon evaluation suggest that driver education course graduates had lower crash and violation rates than non-graduates (Section 4.6). In Québec, driver education reduces the learner's permit holding period by 4 months. Maag and colleagues at the Université de Montréal are comparing the crash rates of provisional drivers who had taken driver education with those who had not. The study is scheduled for release in 2005. For information, contact Urs Maag at Maag@DMS.Umontreal.ca.

Two current studies are examining methodologies for evaluating driver education. Northport Associates is conducting a thorough review of the driver education evaluation literature, identifying and assessing various evaluation methods and data sources, and will issue recommendations. The study is funded by AAAFTS. For information, contact Scott Osberg at sosberg@aaafoundation.org.

NHTSA is conducting a feasibility study in anticipation of a major evaluation of the benefits of an integrated driver education and GDL program. The feasibility study will review previous research and evaluations in the United States and abroad, examine possible research designs, and recommend to NHTSA whether and how an evaluation should be conducted. For information, contact Patricia Ellison-Potter at Patricia.Ellison-Potter@nhtsa.dot.gov.

The National Transportation Safety Board (NTSB) expects to issue recommendations on driver education in 2005, following on its October 2003 public forum. For information, contact Elaine Weinstein at WEINSTE@ntsb.gov. Shope and Bingham (2004) discuss driver education research needs. The paper documents a presentation at the 2003 NTSB forum.

### 7.2. Driver education: curricula

Research continues into driver education curricula. Christie and colleagues have developed a model "best practice" curriculum for provisional drivers with at least 6 months of driving experience (Christie, Harrison, & Johnston, 2004).

The 8-hour curriculum consists of eight modular sessions with a mentor or coach, including one-on-one driving and discussion, group observation and discussion of driving behavior, and telephone follow-up. A trial involving 14,000 provisional drivers, funded by a consortium of government bodies, insurers, industry groups, and automobile clubs, will be conducted in New South Wales and Victoria beginning in 2005. For information, contact Ron Christie at [christie@melbpc.org.au](mailto:christie@melbpc.org.au).

Katila, Keskinen, Hatakka, and Laapotti (2004) studied the effects of training in driving under more risky conditions. They surveyed 41,000 novice drivers in Finland, half of whom had received skid training on driving on snow surfaces and half of whom had not. There was no difference in crash rates overall or on slippery roads between the two groups. Drivers with skid training were more confident in driving on slippery roads.

Several states allow home-study driver education in lieu of formal classroom instruction. Masten and Chapman (2004) compared teenagers who completed four different courses: classroom instruction, home-study using CD-ROM materials, home-study using a workbook, and a commercial Internet and workbook home-study course. The few differences observed in knowledge and attitudes favored the CD and Internet/workbook courses over the classroom and workbook courses. Classroom students passed the state licensing written exam at a higher rate than other students, perhaps because the classroom courses emphasized the sections of the driver education curriculum that typically appear on the licensing exam.

Texas now allows home-study for both the classroom and on-the-road portions of driver education. The Texas Transportation Institute (TTI) and HSRC are conducting a NHTSA-sponsored evaluation of its impact on citations and crashes, using crash databases and focus groups. For information, contact Patricia Ellison-Potter at [Patricia.Ellison-Potter@nhtsa.dot.gov](mailto:Patricia.Ellison-Potter@nhtsa.dot.gov).

AAAFTS is updating its interactive driver education CDROM, "Driver-ZED." For information, contact Scott Osberg at [sosberg@aaafoundation.org](mailto:sosberg@aaafoundation.org).

NHTSA will work through ADTSEA to update their model curriculum (available at <http://144.80.48.9/adtsea/curriculum/default.aspx>).

### 7.3. Licensing

Wolming and Wiberg (2004) studied the relationship between scores on the Swedish knowledge and road tests. They found a modest relationship: drivers who scored higher on the knowledge test, especially on the questions regarding traffic laws, driver ability limitations, and other regulations, were more likely to pass the road test.

### 7.4. GDL Legislation

Legislation to enact or upgrade GDL laws has been or is expected to be introduced in several states including Arizona, Colorado, Maryland, Vermont, Virginia, and Wyoming. The Virginia Senate Transportation Committee has approved a bill adding a cell phone restriction to Virginia's GDL law (Helderman & Glod, 2005). Maryland bills include both passenger and cell phone restrictions (Helderman & Glod, 2005). The National Conference of State Legislatures tracks state GDL legislation in the Teen Driver Issues section of their database: <http://www.nhtsa-dot.gov/ncsl/Index.cfm>.

The South Australian government is introducing legislation to incorporate additional GDL components, including 50 hours of supervised driving during the learner's phase, computer-based knowledge and hazard perception tests, and additional sanctions for provisional drivers who violate GDL conditions. Details may be found at <http://www.ministers.sa.gov.au/Minister/MediaFrame.asp?article=3549&MinisterID=9>.

The New South Wales government added two GDL requirements in December 2004: provisional drivers cannot drive high-performance cars, and provisional drivers who lose their licenses have a one-passenger limit when their licenses are reinstated. New South Wales is considering several additional changes, including the new driver education course for provisional drivers if the field trial (Section 7.2) has positive results (Roads and Traffic Authority, 2004).

### 7.5. Underage and unlicensed drivers

Lam (2003) described crashes and injuries of underage drivers in New South Wales. Begg is examining unlicensed driving among Maori in New Zealand. She seeks to determine the barriers to licensure among Maori and identify strategies to overcome them. For information, contact Dorothy Begg at [dorothy.begg@ipru.otago.ac.nz](mailto:dorothy.begg@ipru.otago.ac.nz).

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