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The learner's permit

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Abstract

Problem: This paper considers the role and value of an extended learner's period in a graduated licensing system. *Method*: Review and synthesis of the literature. *Results*: The learner's permit allows beginners to practice under supervision before attempting the road test for a driver's license. A learner's permit stage was an integral part of the "provisional" (graduated) licensing model initially formulated by NHTSA in the mid-1970s. Almost all Canadian provinces and U.S. states now have graduated licensing (GDL) programs that typically include an extended period of supervised driving. Most parents and teens favor the learner stage, and consistent with the intent of GDL, most learners are practicing and gaining driving experience under low-risk conditions. Research shows that very few learners crash while under supervision and that an extended learner stage has safety benefits. *Impact on Research, Practice and Policy*: Further research is needed on the safety benefits of an extended learner stage and on its optimal features.

Keywords: Learner's permit; Graduated licensing; Novice drivers; Young drivers; Driver licensing

1. Introduction

Young drivers have a higher risk of collision than older more experienced drivers (Mayhew & Simpson, 1990). For example, Williams (1999) reported that, in 1995 in the United States, 16- to 19-year-old drivers were involved in 17 crashes per million miles of travel compared with drivers in their early 20s and those 40–44, who were involved in 9 and 4 crashes per million miles, respectively. Among teenagers, the youngest and least experienced drivers have the highest crash risk. Sixteen-year-old drivers have 35 crashes per million miles compared to rates of 20 crashes per million miles for 17 year olds, 14 crashes for 18 year olds, and 13 crashes for 19 year olds.

It is generally accepted that both age- and experience-related factors contribute to this overrepresentation because risk declines with increases in age, during which young drivers presumably mature out of their risky lifestyle and their driving skills improve (Simpson, 1996). Recent research also suggests that increasing driving experience is somewhat more important than increased age in reducing collisions among young novices (Mayhew, Simpson & Pak, in press-b). That experience is important is not surprising given that driving is a complex, self-paced task that needs to be learned to gain proficiency and to reduce crash risk.

Recognition that beginners need to learn how to drive and to accumulate their initial experience under low-risk conditions is the main reason why learner's permits are issued as the critical first step in the licensing process. The learner's permit allows beginners to practice under supervision before attempting the road test for a driver's license. The role and features of learner's permits have evolved considerably, especially with the advent of graduated driver licensing (GDL) programs in the past decade.

2. Origins of learner's permits

Since the advent of the automobile at the turn of the century and the emerging concern with the escalating problem of road crashes, it became increasingly recognized that people needed to be qualified to drive. At issue was the means by which they gained the needed practice to obtain a license. Jurisdictions resolved this issue by adopting provisions that allowed unlicensed drivers to operate vehicles under supervision, a practice that dates back to the early 1900s (Mayhew, Fields, & Simpson, 2000). The rationale for this was articulated as early as 1911 by the Supreme Court of Massachusetts: "Evidently it was intended to provide an opportunity for persons to learn to use an

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automobile by running it under the supervision of a licensed person, and thus acquire skill by practice, without which one never could become skillful."

This concept eventually was incorporated into law in the form of an instructional or learner's permit. In this regard, the 1926 Uniform Vehicle Code recommended that a temporary instruction permit be issued to any person 16 or older to allow driving on the highway for a period of 60 days when accompanied by a licensed operator or chauffeur, provided there was no other person in the vehicle.

Since this initial recommendation, most states have adopted some form of instructional permit to allow novices to practice before applying for and obtaining full-privilege driver's licenses. In these early systems, once the beginner passed the vision and knowledge test, he or she was issued a learner's permit. This learner's permit was, therefore, issued prior to regular licensing to allow beginners to practice and gain experience in driving under direct supervision of a licensed driver (Coppin, 1977).

These initial laws varied across states in terms of the specific age requirements and the requirements of the permit itself. As indicated in Table 1, for example, several states initially adopted 14 as the minimum age for a learner's permit, whereas others adopted age 15 or 16. States also differ on the length of time a permit should be held and, in many jurisdictions, learner's permits were optional. In these cases, the learner's permit did not constitute a necessary condition for obtaining a license. It could be bypassed, and the novice could apply immediately for a higher class license.

Although variations existed in the characteristics of learner's permits, their adoption reflected the explicit recognition that beginners need the time and opportunity to develop driving skills under supervised conditions before obtaining driver's licenses. Thus, the learner's permit provides a safeguard against the inexperience associated with youth. It is intended to provide the opportunity to gain experience under the direct supervision of a licensed driver.

3. Learner's permits and graduated driver licensing

The rationale for and history of GDL programs are described in other papers at this conference (Simpson, 2003; Waller, 2003; Williams, 2003) and are not covered here. However, it is important to recognize that a learner's permit stage was an integral part of the "provisional" (graduated) licensing model initially formulated by NHTSA in the mid-1970s (Croke & Wilson, 1977).

This early model recommended a voluntary, parent-supervised, learning phase that would apply for 3–6 months. The objective was to provide beginners with the

Table 1
First minimum learner's permit age requirements

Jurisdiction	Minimum age for learner's permit (year, month)	Year introduced	Jurisdiction	Minimum age for learner's permit (year, month)	Year introduced
Alaska	14	–	Montana	14, 6	1947
Alabama	15	1935	Nebraska	15	1955
Arizona	15, 7	1927	Nevada	15, 6	1940
Arkansas	14	1937	New Hampshire	–	–
California	14	–	New Jersey	17	–
Colorado	15, 9	1963	New Mexico	15	–
Connecticut	16	1921	New York	16	1925
Delaware	16	–	North Carolina	16	1953
District of Columbia	16	–	North Dakota	14	–
Florida	14	–	Ohio	16	1941
Georgia	15	1937	Oklahoma	15, 6	–
Hawaii	–	–	Oregon	15	1920
Idaho	14	1938	Pennsylvania	–	–
Illinois	15	1939	Rhode Island	16	1950
Indiana	15	–	South Carolina	14	–
Iowa	14	1932	South Dakota	14	1959
Kansas	14	–	Tennessee	–	–
Kentucky	16	–	Texas	15	1967
Louisiana	15	–	Utah	16	–
Maine	15	1955	Vermont	15	–
Maryland	15	–	Virginia	15, 8	–
Massachusetts	16	1964	Washington	16	1961
Michigan	14	1937	West Virginia	16	–
Minnesota	15	–	Wisconsin	15, 6	–
Mississippi	15	–	Wyoming	15	1957
Missouri	16	–			

– = unknown.

opportunity for more supervised on-road practice of both basic and advanced driving skills and to "...create a learning situation which reinforce safe driving practices by gradually exposing novice drivers to more difficult driving situations" (Croke & Wilson, 1977, p. A-6).

Although the learner's phase was emphasized in this early model, the demonstration projects conducted in the late 1970s and early 1980s in Maryland and California to test the safety value of the model, focused on other features, related mostly to the intermediate or the second stage of GDL (Hagge & Marsh, 1988; McKnight, Hyle, & Albrecht, 1983). However, the licensing model evaluated in California included an instruction permit period of "at least 1 month." The Maryland program also emphasized parent-supervised practice, for example, by providing parents with handbooks, and by asking parents to certify the amount of supervised practice given. According to McKnight et al. (1983, p. iv), however, the requirement that parents certify the number of hours of supervised practice was never fully enforced (i.e., only 30% of parents provided certificates).

Although the Maryland and California programs failed to adopt the full NHTSA recommendations for a 3- to 6-month extended period of supervised practice, they do represent early efforts to improve the safety value of the entry-level learner phase. Further major inroads did not occur until the advent of graduated driver licensing (GDL) programs in Canada and the United States in the 1990s.

4. Recent developments with learner's permits in GDL programs

In North America, the province of Ontario in April 1994 was the first jurisdiction to introduce a version of GDL with an extended learner's permit. The program for drivers of passenger vehicles phases in on-road driving over a 24-month period in two distinct stages. The 12-month learner stage (G1) requires that the novice is supervised by a fully licensed driver, the supervisor must have a BAC < 0.05; only the accompanying driver can be in the front seat; the number of additional passengers is limited to the number of seat belts in the rear seat; no driving is permitted between midnight and 5 a.m.; no driving is permitted on freeways and urban expressways; and the learner must have a zero BAC. This stage can be reduced to 8 months by completing an approved driver education course. A basic on-road-driving test of operating skill must be passed by the novice to move from the learner stage (G1) to the next stage of the program (G2).

Nova Scotia implemented a GDL program shortly after Ontario in October 1994, before which a novice driver was required to hold a learner's permit for only 60 days before moving to a full (probationary) license without restrictions. The program changed these conditions dramatically, applying to all novice drivers, regardless of age, and spans 2 years 6 months in two stages. The first is a 6-month learner stage during which there are three restrictions: an experienced driver in the front passenger seat must accompany the novice, no other passengers are allowed, and the driver must have a 0% blood alcohol concentration. The learner stage can be reduced from 6 to 3 months if the novice completes a recognized driver education or training course. To enter the second phase, the 24-month newly licensed driver stage, the learner must pass a road test.

Since the adoption of GDL in Ontario and Nova Scotia, other provinces in Canada and states in the United States have implemented versions of GDL programs. Florida in 1996 was the first U.S. state to adopt a modern multiple-stage GDL system (Williams, Nelson, & Leaf, 2002). Their system included a 6-month learner's permit that was not a requirement under the old program.

Almost all Canadian provinces and U.S. states now have GDL programs (i.e., District of Columbia, 47 U.S. states, 9 Canadian provinces, and 1 territory). Typically, these programs include an extended period of supervised driving. However, the features of the learner's stage vary considerably from jurisdiction to jurisdiction. For example, the minimum entry age ranges from 14 in a few jurisdictions to 16 in several jurisdictions. A few U.S. states still do not require a mandatory holding period for the learner stage. Among most jurisdictions that do, the length of time ranges from 2 months to 1 year. The majority of U.S. states also require a minimum amount of supervised driving, which ranges from a low of 12 hours to a high of 50 hours. In a few states, some of the driving hours (e.g., 10 hours) have to be accumulated at night.

Detailed information on U.S. and Canadian licensing systems for young drivers, including the features of the learner stage, can be found on the Insurance Institute for Highway Safety website. For this reason, these tables are not reproduced here.

5. Support for and experience with an extended learner stage

A key factor in the effectiveness of GDL is the level of support it receives. If parents do not support the program, they might not enforce its restrictions or ensure that their sons/daughters are acquiring the needed practice. If teenagers do not support the program, they might be driving unsupervised and not complying with the requirements to practice under supervision.

Research in Canada and the United States has shown that the level of support for the overall GDL program is high, including the learner stage. Mayhew, Simpson, Ferguson, and Williams (1999) surveyed 520 Ontario parents whose teenagers (ages 16–18) were in the GDL program. They found that 83% approved of GDL. Among parents of teenagers in the learner stage, 89% agreed with the supervision requirement. Almost 8 out of 10 (78%) of parents of both learner and intermediate stage teens said that the

program is adequately preparing their teenagers for full driving privileges.

A similar level of support was found in Nova Scotia. Mayhew, Simpson, Ferguson, and Williams (1998) surveyed 450 teenagers ages 16–18 and 500 parents with teenagers ages 16–18. They found that parents and many teenagers endorse the GDL program (87% of parents of teenagers in the learner stage voiced approval, as did 61% of teenagers in the learner stage). Sixty-six percent of learners agreed with the requirement for supervision, as did 97% of parents of teenagers in the learner stage.

Previous U.S. studies have also shown that parents are strong supporters of GDL (Waller et al., 2002; McCartt et al., 2001; Ferguson & Williams, 1996; Ferguson, Williams, Leaf, & Preusser, 2001; Williams, Ferguson, Leaf, & Preusser, 1998). For example, McCartt et al. (2001) surveyed juniors and seniors from eight high schools in Florida in periods before (1996) and after (1998) GDL implementation. They found that the percentage of teens who strongly or somewhat supported GDL increased from the pre-GDL to the GDL surveys. The majority of teens expressed support in both years for the 6-month learner's permit—56% and 67%, respectively.

Williams et al. (2002) recently surveyed teenagers and their parents in California, a state that adopted a relatively strong GDL program in 1998. They found that 79% of parents whose children were subject to the new requirements strongly favored the new system. Eighty-four percent of teenagers in the new system favored the 6-month holding period; 89% favored the requirement that parents certify they had driven at least 50 hours under supervision.

Although support is critical for the success of GDL, the learner stage, and consequently, the overall program would be severely compromised if teenagers did not practice driving under supervision. Studies in Canada and the United States suggest that learners are practicing and gaining experience under low-risk conditions. For example, Mayhew et al. (1999) asked Ontario parents about their teenagers' driving practice during the learner stage. Almost all parents of learners (92%) indicated their teenagers had driven on public streets or roads since getting their permits. During the learner stage, 85% of parents said that their sons or daughters drove at least once a week, the most common practice being 2–3 days a week (37%). Most of the driving occurred on residential streets (55%), as well as on city streets (20%), secondary roads (12%), and back roads (11%), with only 2% of the driving occurring on freeways (i.e., in violations of the highway restriction).

Mayhew, Simpson, Ferguson, & Williams (1998) also found that teenagers in the learner stage of the Nova Scotia graduated driver program where gaining driving experience under supervision. Almost all parents of learners (95%) indicated their teenagers had driven on public streets or roads since getting their permits. Teenagers concurred. Almost all of them (97%) said they had driven vehicles since obtaining their permits, and 70% had driven on public roads or streets during the past 7 days. During the learner stage, the most common practice was driving 2–3 days each week. About 70% of learners drove at least once a week. Most learners (78%) reported they had driven less than 30 miles during the week prior to the survey. The most common practice was to drive 7–15 miles a week. Most learners also said they accumulated their driving experience in the city or town nearest where they live: 76% said they drive close to home. According to parents, virtually all learners (89%) had gained experience on residential streets, and more than half of their driving (52%) had occurred on these streets. About half of the teenagers also are obtaining experience on city streets, freeways, and back roads, and each of these locations accounted for about 10–20% of their driving time. Although 60% of teenagers get some experience at night driving, this accounted for only 12% of their experience.

In the United States, McCartt et al. (2001) examined the effects of Florida's GDL program on the driving behaviors of teens licensed before (1996) and after (1998) the program was implemented. They reported that GDL teens were more likely to obtain permits prior to licensure, obtain permits at a younger age, hold permits for a longer period, and accumulate more practice miles. For example, the percentage who reported driving with a permit more than 500 miles increased from 33% (non-GDL teens) to 38% (GDL teens).

Waller, Ok, and Shope (2000) have found that Michigan teenagers are accumulating more than the required 50 hours of certified driving practice. In their survey of parents of teenagers who had completed the supervised driving requirement, parents reported an average of 75 hours of supervised practice. Thus, most parents were taking more time to supervise their student's driving than was required in Michigan. Seventy-three percent of parents also reported going beyond the requirement of 10 hours of practice at night.

California also requires 50 hours certified practice (including 10 at night) in their GDL learner stage. Williams et al. (2002) compared the behavior of two groups of teenage drivers in California: one group was subject to the GDL program; the other was not. Both teenagers and their parents were surveyed. They found that GDL teenagers held their learner's permits longer, practiced more with parents, and drove more. As well, 81% of parents said their teenager had driven at least the 50-hour requirement, and 79% said they met the requirement for 10 hours of practice at night.

The above studies from both Canada and the United States suggest that, consistent with the intent of GDL, most learners are practicing and gaining driving experience under low-risk conditions.

6. The safety value of the learner stage

Research shows that very few learners crash while under supervision (Williams, Preusser, Ferguson, & Ulmer, 1997).

This fact was illustrated in a recent study by Mayhew, Simpson & Pak (in press-a) that examined changes in collision rates among novice drivers during the first few months of driving in the province of Nova Scotia. The crash rates were for a sample of drivers who obtained their learner's permits during 1990–1993, before Nova Scotia adopted GDL (in 1994). Monthly crash rates were calculated for learners and novice drivers who were fully licensed. Fig. 1 shows the month-by-month crash rates of these learners and novice drivers during their first 24 months of driving. As can be seen, the crash rates for learners are extremely low, compared with rates for novices.

Thus, the learner stage is a relatively safe period in terms of collision involvement and, this is not surprising, given that learners are driving under supervision. Recent research also demonstrates that an extended learner stage can reduce collision involvement.

In 1993, Sweden lowered the age limit for practicing car driving from 17 1/2 to 16 years. Gregersen et al. (2000) evaluated the safety impact of this licensing reform. They found that the group that obtained their permit at age 16 practiced more hours and had fewer crashes per kilometer than those that obtained permits at age 17 1/2 both before and after the law change (e.g., 46% fewer collisions per kilometer).

In 1997, Connecticut implemented the first phase of GDL requiring 16- and 17-year-olds to hold a learner's permit for 6 months (4 months with driver education) prior to obtaining a full license. Ulmer, Preusser, Williams, Ferguson, and Farmer (2000) evaluated the safety effect of this mandatory extended learner's permit. They found that the per-capita casualty crash rate of 16-year-old drivers, relative to the rate among 25- to 54-year-old drivers, declined between 1996 and 1997 by 22%, a statistically significant change.

In 1996, Kentucky implemented an extended minimum 6-month learner permit. Agent et al. (2000) evaluated the impact of this partial GDL program. They compared the number of collisions as well as the per-driver collision rates of 16-year-olds, older teens, and adults, in periods before and after the new law. Collisions of 16-year-old drivers decreased by 33% from the non-GDL (1993–1995) to the GDL (1997–1999) periods. Fatal and injury collision involvements among 16-year-olds were also 34% and 28% lower, respectively, following the implementation of the program. To control for the effects of changes in the number of drivers, the authors compared per-driver crash rates for the various age groups in the before and after periods. The per-driver collision rate of 16-year-old drivers after the introduction of GDL was 32% lower than the rate for 16-year-olds prior to the introduction of GDL. Similar reductions were not observed among older control groups over this period.

Of some importance, however, according to Agent et al. (2000), the lower per-driver crash rates among 16-year-olds were due to the 83% decrease in the number of motor vehicle collisions occurring with drivers during the first 6 months after their 16th birthday (i.e., when they were in the extended learner stage of the new program). By contrast, drivers in the intermediate stage (i.e., ages 16.5–17) had a 3% increase in the number of crashes following GDL. Thus, the overall positive impact of the new program was due to the extended learner stage.

As mentioned previously, the province of Nova Scotia, implemented a GDL program in October 1994 that included an extended 6-month learner stage, considerably longer than the 2-month learner stage under the previous program. Recently, Mayhew, Simpson, and Williams (2002) examined the specific and longer term effects of this GDL program. Collision records of pre-GDL and GDL novices were tracked during their initial year of driving in two 6-month intervals. Results are shown in Table 2. Due to their smaller sample sizes, collision rates for pre-GDL and GDL novices 18 and older are shown for a 12-month interval instead of 6-month intervals (sample sizes 4365 and 2505, respectively). For comparison, collision rates during the first year of driving also are given for pre-GDL and GDL novices ages 16–17 (sample sizes 17,344 and 15,381, respectively).

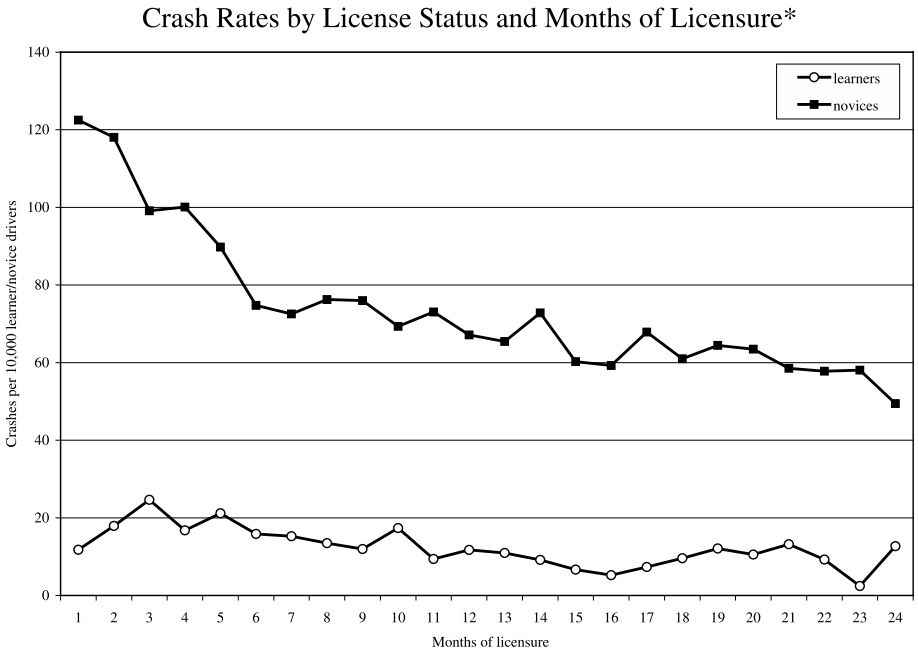
The crash rate for all GDL novices was significantly lower than the rate for all pre-GDL novices during the first 6 months of driving. Although collision rates for both groups of novices increased during the next 6 months, when most would have graduated from the learner stage to driving unsupervised, the crash rate for GDL novices still was 12% lower than for pre-GDL novices. This difference was statistically significant. Thus, during the first year of driving, the crash rate for GDL novices was 28% lower than for pre-GDL novices. Much of this benefit occurred during the first 6 months, when the majority of GDL novices were driving under supervision.

In summary, a few studies have established that the learners have relatively low crash rates. Evidence that an extended learner stage has safety benefits is also growing.

7. GDL learner stage and driver education

A feature of GDL programs in Canada and a few U.S. states is to grant a time discount to beginners who take driver education, allowing them to graduate several months sooner. As mentioned previously, in Ontario, the learner stage can be reduced from 12 to 8 months by completing an approved driver education course; in Nova Scotia, the learner stage can be reduced from 6 to 3 months if the novice completes a recognized driver education or training course. The safety impact of this time discount has been examined in both these provinces.

In Ontario, the interim evaluation by Boase and Tasca (1998) reported that the 4-month time discount for driver education was not associated with a reduction in collisions. Indeed, they found that novice drivers with certificates from approved driving schools had an overall per-driver collision



*Source: Mayhew, Simpson & Pak (in press-a).

Fig. 1. Crash rates by license status and months of licensure.

rate that was 44% higher than novices without this certificate.

Mayhew et al. (2002) have recently reported similar findings in an evaluation of the Nova Scotia GDL program, which includes a 3-month time discount for driver education. They compared the collision rates of a pre-GDL group of drivers to those of two GDL groups: one with driver education and the other without driver education. Collision rates for these groups of novice drivers are displayed in Table 3 for their first 2 years of driving in 6-month intervals. As can be seen, collision rates for the two groups of GDL drivers show higher crash rates for the GDL drivers who took driver education and received the time discount during three of four 6-month intervals of the 24-month period, compared with GDL drivers without the time discount. The difference in crash rates between the two groups in the first 6-month interval was 27%. Collision rates for those who took driver education were comparable to rates for pre-GDL drivers.

The above findings suggest that a time discount for driver education provides no safety benefit and, in fact, appears to compromise the impact of the program. Given that research has also consistently shown that traditional driver education has not reduced crashes raises concerns about the role of driver education in GDL programs (Christie, 2001; Mayhew & Simpson, 1996; Mayhew & Simpson, 2002; Mayhew, Simpson, Williams, & Ferguson, 1998).

Table 2
Collision rates (crashes per 10,000 novices) for 1992–1993 pre-GDL and 1995–1996 GDL groups

Months[a]	Pre-GDL	GDL	% Difference	*p*
All novices				
First 6 months	283	142	−50	.000
7–12 months	407	357	−12	.013
First year	690	499	−28	.000
Novices ages 16–17				
First 6 months	310	152	−51	.000
7–12 months	439	377	−14	.006
First year	749	529	−29	.000
Novices 18 and older				
First year	456	315	−31	.006

[a] Months since issued a learner's permit.

8. GDL learner stage and license testing

Little attention has been given to the testing requirements to move from the learner to the intermediate stage. Typically, jurisdictions require learners to successfully pass an "on-road" driving test which is designed to ensure that people who drive motor vehicles on highways are competent drivers and that they are aware of safe driving practices and road law. Thus, the test sets the minimum standards for "safe" driving and provides a means to ascertain if someone has achieved that standard and can now become fully licensed.

In Canada and the United States, the basic road test focuses primarily on assessing performance and skills in

Table 3
Collision rates (crashes per 10,000 licensed drivers) for pre-GDL drivers and for GDL drivers ages 16–17 with and without driver education

Months licensed	Pre-GDL	GDL with driver education	GDL without driver education	% Difference[a]	p
First 6 months	697	718	522	27	.000
7–12 months	454	472	429	9	.280
13–18 months	428	427	366	14	.098
19–24 months	391	324	345	−6	.565
First year	1,151	1,190	951	20	.000
Second year	819	751	711	5	.421

[a] GDL with driver education compared with GDL with no driver

operating the vehicle. Most current on-road tests have been in place for many years and some are based on the Automobile Driver On-Road Performance Test (ADOPT) developed by McPherson and McKnight (1981) for NHTSA.

The advent of GDL has stimulated some interest in improving the basic road test so that it incorporates elements of hazard perception. As well, a computer–screen-based hazard perception test was developed in the late 1980s and is in use in Victoria, Australia (Hull, 1991). The original intention was to use the test at the end of the graduated licensing period (three years in Victoria) as an exit test. For a variety of reasons this test is used at the time of the basic road test to qualify for a license to drive unsupervised (Christie, 2000). Recent research shows that this hazard perception test was able to predict those novice drivers likely to be involved in casualty crashes (Congdon, 1999).

There have also been recent developments in screen-based computerized testing in New South Wales and in on-road testing in New Zealand that incorporate elements of hazard perception (Christie et al., 1998).

In North America, the implementation of GDL in the province of British Columbia prompted the design of both an improved basic on-road test and an advanced exit test. Hazard perception is included as part of the new basic on-road test. Although developed prior to GDL, California implemented a new Driving Performance Evaluation Road Test (DPE), which is a longer test than most other road tests (about 25 minutes compared to 10–15 minutes from the ADOPT). Although this new test was found to have construct validity (Romanowicz and Hagge, 1995), a large-scale, well designed, field experiment failed to find any reduction in collision involvement resulting from implementation of the program (Gebers et al., 1998). Earlier evaluations of basic road tests have also failed to find any significant safety benefits (Mayhew, Christie, Nickel, & Simpson, in press).

Given the limited state of knowledge, it is not yet possible to identify on-road or computer-based tests that have potential for contributing to the safety benefits of a GDL system. However, hazard perception testing may hold promise.

9. Optimal features of a learner's permit in GDL

To provide direction regarding the best practices in GDL, the Insurance Institute for Highway Safety together with TIRF produced a report "Graduated Licensing: A Blueprint for North America" (IIHS & TIRF, 2002). This document provides recommendations for the structure and contents of such programs, including the learner stage. The key features and recommendations for the learner stage are summarized below:

- *Starting age:* Maintain the starting age at 16, or raise it to 16.
- *Driving restrictions:* Require adult supervision and restrict driving at the discretion of the supervisor—phase in more difficult driving.
- *Minimum amount of practice driving:* Require 30–50 hours of certified driving, some of which should be allocated to nighttime driving.
- *Length of the permit:* Establish a minimum 6-month learner's phase.

Although the scientific research described in previous sections provides compelling support for an extended learner stage, the above recommendations are based principally on an assessment of current best practices. Research has yet to establish the optimal features of a learner's permit.

10. Future directions

There is a growing body of research evidence indicating that an extended period of supervised driving practice is a relatively safe activity. As well, other research suggests that the learner stage is the major contributor to the overall safety effectiveness of GDL. Although studies show that GDL learners do practice driving under diverse conditions and appear to drive more under supervision than non-GDL learners, it is not particularly clear the extent to which the experienced gained is producing safer drivers in the intermediate stage and after graduation. Further research on the relative contribution of the learner stage to the safety effectiveness of GDL programs is definitely warranted.

If an extended learner stage is producing safer drivers, and presumably, more skilled drivers, what skills are improved the most, for example, vehicle handling, hazard perception, sound judgment? It is also not yet clear the role that maturation plays, given that a learner stage of 6 or 12 months means that a beginner issued a permit on turning age 16 will be age 16 1/2 or age 17 when they progress to the intermediate stage. However, any potential safety benefit from maturation may be eroded if teens licensed under GDL obtain permits at a younger age than those licensed under the old program. A few studies suggest that earlier licensure may in fact occur after GDL implementation

(McCartt et al., 2001; Mayhew, Simpson, Groseillers, & Williams, 2001).

The optimal starting age and the minimum length of the learner stage also need to be given further consideration. Although the IIHS and TIRF "Blueprint" recommends a starting age of 16, an earlier or later starting age may have greater safety benefit. As well, the relative benefit of a 6-month learner period versus a shorter or longer period needs investigation. Although it is reasonable to assume that an older starting age and/or a lengthier period of supervised practice should produce greater safety benefits, there may also be a point of diminishing returns. This is an important point because parental support for a later starting age and/or a lengthier learner stage could be jeopardized if such changes are perceived as unreasonable and/or create undue inconveniences.

At issue as well is the optimal minimum number of hours of certified driving practice required overall and at night. The recommended 50 hours of certified practice (10 hours at night) should have safety benefits but may underestimate the actual amount of practice needed to become a proficient and safe driver. Studies in Michigan and California suggest that parents actually exceed the recommended number of hours of certified driving practice. Whether this is the case in other jurisdictions with and without certification requirements is not known. Further research is needed on the amount and type of supervised driving practice in jurisdictions that have a minimum requirement of supervised practice as well as those that do not.

Research suggests that a time discount for driver education has no safety benefits. Evaluations have also shown that traditional driver education fails to reduce collisions. Driver education, however, is an efficient way to learn basic driving skills and provides an opportunity for beginners to practice driving under the supervision of a trained instructor. From this perspective, it is also important not to abandon driver education/training as some might suggest because of its poor safety record. New opportunities for driver education and training as a means for preventing collisions involving young novices need to be examined.

Although GDL has become increasingly popular, particularly in North America, few jurisdictions have considered the adequacy of their basic on-road test to ensure that learners are ready to move to the intermediate stage. Further research is needed on testing requirements, especially the potential safety benefits that could result from hazard perception tests.

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