

EFFECTIVENESS OF GRADUATED DRIVER LICENSING

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ABSTRACT

Concern about the high crash rates of beginning drivers has prompted a steadily increasing number of jurisdictions in North America to design and implement graduated driver licensing programs. The primary objective of these programs is to reduce crashes by ensuring new drivers gain experience and mature under conditions of low risk before graduating to more demanding driving conditions. Evidence of the effectiveness of graduated licensing has been growing. Formal evaluations in New Zealand, Florida, Ontario, and Nova Scotia have shown that graduated licensing is associated with significant reductions in collisions. Preliminary findings from ongoing evaluations in Michigan, Kentucky, North Carolina and California also suggest that graduated licensing is effective. This paper outlines the rationale of graduated licensing, describes key features and support for such a system, and discusses its safety effectiveness.

INTRODUCTION

Collisions involving young drivers have been a public health and safety concern for decades. In Europe and Australia where the licensing age is often 18, the problem is most evident among 18-to-21-year olds (1). In Canada and the United States where the licensing age is usually 16, the problem is most acute among 16 and 17 year olds. For example, 16-year-old drivers have a crash rate that is three times higher than that for 18-year-olds and ten times higher than it is for 35-39-year-old (2).

Historically, and even today, the major initiatives used to address the young driver problem have been formal driver instruction and driver licensing. The objectives of both are very similar in that they attempt to ensure the novice has the skills, knowledge and attitudes to drive safely and collision free. However, at least in North America, it is generally accepted that the licensing and training systems have been largely unsuccessful in achieving these objectives. As a consequence, new approaches to licensing and driver education are being examined.

One of these is a system of licensing called “graduated”. Such a system differs markedly from conventional licensing in that it promotes skill acquisition at low-risk times and under low-risk conditions and allows the beneficial effects of increased maturity to be realized by delaying full licensure.

The concept of graduated licensing is certainly not new and, in fact, dates to the early 1970s when the National Highway Traffic Safety Administration (NHTSA) recommended a model program (3) to address the overrepresentation of young drivers in crashes. At that time, graduated licensing was viewed with considerable skepticism and only a few states adopted elements of the system. Today, however, the concept of graduated licensing is gaining wider acceptance and has been embraced by many as a potentially effective means for reducing the high rates of collision involvement among novice drivers, especially young ones.

RATIONALE

Graduated licensing is a promising solution to reducing young and new driver crashes because it addresses the causes of the problem. Young and older novice drivers are overrepresented in road crashes because of inexperience – they lack the requisite skills. For some young novices, age-related or lifestyle characteristics, such as risk taking and peer pressure also play an important causal role (4).

Research has shown that the risk of collision decreases with increases in driving experience and this relationship holds for both young and older novice drivers (5). Clearly, new drivers need to gain driving experience but this exposes them to crash risk. What is needed is a method to allow new drivers to gain the needed experience but under conditions of low risk. This is a primary purpose of graduated licensing.

It is also well established that the risk of collision decreases with increases in age. What is needed is a method to allow young drivers insulation from the risky conditions associated with being a teen, while they are maturing. This is also the purpose of graduated licensing. Thus, graduated licensing, somewhat like an apprenticeship program, is intended to ease the novice into the full range of traffic conditions. It achieves this by placing limitations on the new driver in terms of such things as when they can drive, where they can drive, with whom, and how. These restrictions are gradually removed so that new, more complex traffic conditions can be mastered as driving experience is being acquired. Eventually, full "unrestricted" driving privileges are granted.

KEY FEATURES AND DESIGN OF A GRADUATED LICENSING PROGRAM

Graduated licensing systems can and do vary substantially in their operational features (6, 7) – i.e., the restrictions selected, how they are applied and to whom, over what period of time, what sanctions are applied to violators, and so on. For example, in the Canadian provinces of Ontario and Nova Scotia, graduated licensing applies to all new drivers not just to those who are young; in New Zealand, until recently, the system applied only to drivers under the age of 26; and, in the United States, most programs apply to teens under the age of 18. Moreover, the Ontario and Nova Scotia graduated licensing schemes also differ from one another in important ways – e.g., to graduate from the second level of the Ontario program, the driver must pass an advanced road test; by contrast, to do so in Nova Scotia requires completion of an approved driving course.

Although this flexibility is an attractive feature of graduated licensing, because it can be tailored to the particular needs of a jurisdiction, in designing a graduated licensing system, it is critical to ensure that its features are true to the basic prevention principle of providing opportunities to obtain driving experience under conditions that minimize exposure to risk. In addition, the elements of the system should be based, to the extent possible, on scientific evidence and proven effectiveness. A model program would involve three stages (7). The first is an extended learners stage, during which driving is only permitted under supervision, for a period of six months or more. This is followed by an intermediate stage of unsupervised driving but only in less risky situations such as during the day – i.e., crash risk is higher at night than during the day (8). The third and final stage, a full privilege licence, becomes available when conditions of the first two stages have been met – e.g., a crash- and violation-free record; passing an initial on-road test and later a more advanced exit test.

Integrating improved driver education and training could potentially enhance the effectiveness of graduated driver licensing. In this regard, NHTSA, in a 1994 report to Congress recommended the development of a cost-effective two-stage driver education program that is an integral part of a graduated licensing system (9). However, efforts should be made to improve the form and content of existing education and training programs because the safety benefits of the programs that have been evaluated to date have remained unproven (10, 11). Although the benefits of these improvements have not been established, they may offer promise and can only be evaluated if implemented. Until proven, training should not receive special status such as being allowed to substitute for time in the system. Successful completion of driver education and training should not be recognized through a “time discount, which is a feature of graduated licensing programs in Canada that has been shown to have negative safety consequences (12).

Like most traffic laws, the system is largely self-enforcing. For young, new drivers, parents/guardians will often provide informal regulation and a recent study has shown that parents support restrictions and find them easy to enforce (13, 14). Although the program will largely be self regulating, it will be necessary to design a structure of penalties to be applied for violations of the various restrictions – to be effective, the system must have “teeth”. However, some violations are unintentional so there must be some form of remediation available to supplement the punitive action – e.g., youth-oriented driver improvement program(s). To the extent possible, such remediation should be tailored to treat the problems that the violator has exhibited and these programs should be evaluated to ensure they have the intended effect.

SUPPORT FOR GRADUATED LICENSING

Research has shown that parents, and even teens, support the concept of a graduated licensing program, and endorse its specific features, such as a night curfew. Support has been found both in jurisdictions that are considering implementing graduated licensing as well as those that have such a system in operation.

Prior to its introduction graduated licensing attracts widespread support (15, 16). For example, Ferguson and Williams (16) interviewed a national sample of 1,000 parents with 17 year-olds to obtain their views of driver licensing practices in the United States. Nearly 60% of those surveyed supported the notion of graduated licensing programs that include delayed full privilege licensure.

Perhaps of even greater importance, support for graduated licensing has been found in jurisdictions that have implemented a system. For example, Begg et al. (17) has shown that both parents and teenagers have generally accepted the graduated licensing program in New Zealand. Indeed, interviews with 18 year-olds on the various stages of the graduated system revealed that about 70% agreed with the restrictions.

More recently, Mayhew et al. (13) interviewed 450 teens (age 16 to 18) and 500 parents in the province of Nova Scotia to determine if they support a graduated licensing program which had been in place for about two years. Nearly 90% of the parents who have teens in the program approve of the graduated licensing program, as do the majority of teens who face the driving restrictions -- 61% of teens in the first stage of the program and 67% of teens in the second stage expressed approval. In a related study, Mayhew et al. (14) interviewed 500 parents in the province of Ontario and found a comparably high level of support for the graduated licensing program which was implemented in 1994 -- over 80% of parents who had teenagers in the program approved of it. Moreover, eight out of ten (78%) parents said that the graduated licensing program is adequately preparing their teenager for full driving privileges.

Waller et al. (18), in a survey of 814 parents in Michigan, found that nearly all of them (96.9%) reported an overall "good" or "very good" experience with the graduated driver licensing program. Most parents (74.4%) also thought 50 hours of required supervised practice was appropriate -- i.e., Michigan and several other states require parents to certify that a certain number of hours have been driven under supervision, and in some cases, a portion of the driving hours has to be accumulated at night (7).

Concerns that parents and teens will oppose graduated licensing appear to be unfounded. Results of surveys conducted in Canada and elsewhere illustrate a high level of support for graduated licensing among teenagers and especially parents of teenagers before the program has been implemented and after it is in operation.

THE SAFETY IMPACT OF GRADUATED LICENSING PROGRAMS

Until recently, few jurisdictions had graduated licensing programs so only a small number of evaluations have been completed to date. Several programs currently being evaluated have preliminary findings. All of these evaluations have reported the safety benefits of graduated licensing programs. For example, early efforts to implement versions of graduated licensing in the United States in Maryland, California and Oregon were found to reduce the collision involvement of young drivers. McKnight et al. [19] evaluated the Maryland program using time series and found no reduction in nighttime crashes but a 5 percent drop in daytime crashes among both 16 and 17 year-olds. Comparable reductions were found in California by Hagge and Marsh [20] using time series -- a 5.3 percent reduction in crashes among 15-17 year-olds. The evaluation of the program in Oregon had mixed results. Using before and after comparisons, Jones [21] found a 16 percent reduction in crashes among male drivers ages 16-17 in their first year of driving but no significant change among females.

More recent evaluations of stronger graduated licensing programs implemented in New Zealand in 1987, Florida in 1996, Ontario in 1994, and Nova Scotia in 1994 have also found safety benefits. A report released by the Ministry of Transport in New Zealand (22) examined the annual trend in car casualties for 15 to 19 year old drivers before and after implementation of the program. The authors found initially a substantial drop in casualties of about 25%, coincidental with the introduction of graduated licensing. The more stable and sustained effect yielded an 8% reduction in collisions. A more recent evaluation of the New Zealand graduated licensing program employing time series analysis produced similar findings. Langley et al. (23) report that the introduction of the graduated licensing program was closely followed by a substantial reduction in car crash injuries for all age groups, especially 15-19 year olds (23% reduction for 15-19 year olds compared to 16% for drivers aged 25 and over). According to these authors, the excess decline of 7% (23% less 16%) among 15-19 year olds can be attributed to the new program.

A recent study by Ulmer et al. (24) examined the per capita casualty crash rates of 15-17 year old drivers before and after the implementation of the Florida graduated licensing program compared with those of 15-17 year old drivers in Alabama. The per capita casualty crash rate of drivers aged 25 to 54 were used to standardize the rates of the young drivers. The authors found that there was a significant 9 percent reduction in the casualty involvement rate of 15-17 year old drivers in Florida during 1997, the first full year of graduated licensing, compared with 1995. The greatest percent reduction occurred among 15-year olds (-19%), followed by 16 year-olds (-11%) and then 17 year-olds (-7%). There was no significant change for any of the age groups in Alabama, the comparison state.

Boase and Tasca (12) evaluated the Ontario program using a pre- post- matched comparison group design. They found that the overall collision rate (per 10,000) licensed drivers for 1995 novice drivers (program group) was 31 percent lower than the rate observed for 1993 novice drivers (comparison group). They also report that the 1995 G2 novice drivers (intermediate phase) had an overall collision rate that was 16 per cent lower than the rate for 1993 novice drivers.

The recent evaluation of the graduated licensing program in Nova Scotia by Mayhew et al. (25) used a series of increasingly refined analyses that controlled for the influence of other explanatory variables. All the analyses showed that the graduated licensing program in Nova Scotia was associated with a significant reduction in crashes. For drivers age 16, before and after comparisons showed that total crashes in 1995 — the first full year graduated licensing was in effect — were 24 percent lower than they were in 1993. Crashes in 1996 were 36 percent lower than in 1993. Comparable decreases occurred in injury crash ratios. Time series analyses showed that crashes decreased by 37 percent during the first 3 years of the program. Improvements also were observed for all novice drivers, not just those who are young. The crash rate for all novice drivers dropped by 19.4 percent, from a rate of 1,418.9 per 10,000 learners in 1993 to 1,143.0 in 1995.

Several evaluations are currently being conducted of graduated licensing programs implemented in Kentucky in 1996, Michigan in 1997, North Carolina in 1997, and California in 1998. Preliminary findings from these studies are consistent with the results of the completed evaluations described above. The preliminary evaluation of the graduated licensing program in Kentucky found a 33.5% reduction in the per-driver collision rates of 16-year olds but no change in the collision rate among control groups (26). The preliminary evaluation of the Michigan graduated licensing program showed that the per-driver casualty crash rate of 16-year old drivers in 1998, the first full year of the program, was 32% lower than in 1996 (27). In a preliminary evaluation of the graduated licensing program in North Carolina, Foss (28) reported that 16-year old drivers had 26% fewer crashes and 29% fewer fatal and injury crashes after implementation of the program. By comparison, there was a 4% increase in crashes among a control group of drivers age 20 and over. In California, the Automobile Club reported that the number of fatal and injury at-fault crashes of 16-year old drivers declined by 20% following implementation of the graduated licensing program. Teen passenger deaths and injuries in vehicles driven by 16-year old drivers also declined by 21%.

The recent findings from Michigan, Kentucky, North Carolina and California are all preliminary so the direction and magnitude of the changes associated with their programs need to be verified and will not be known until the full evaluations are completed. Taken together, however, these preliminary findings and the results from published studies – i.e., the weight of the evidence -- build a strong case for the safety benefits of graduated driver licensing.

CONCLUSIONS

Graduated licensing is potentially more constructive than other licensing approaches because it provides the opportunity for beginners to gain experience and proficiency under low risk conditions. It also addresses age-related factors by minimizing the opportunities for young drivers to engage in risky behaviours or encounter risky situations – e.g., night curfews, low or zero BAC, lengthy periods of supervised driving. As well, such programs insulate young beginners from risky conditions, and in so doing, allow the beneficial effects of increased maturity to be realized by delaying full licensure. Graduated licensing is also attractive because it can be tailored to address unique economic, social, geographic and political conditions within a jurisdiction.

The concept of graduated licensing is by no means new. It was first described in the 1970s and for years many organizations have advocated its protective benefits. But it was not until 1994 that the first system was introduced in

North America, in the Canadian province of Ontario. Now, some 32 jurisdictions in North America have a form of graduated licensing. More programs will be introduced in the next few years.

Evidence of the effectiveness of graduated licensing has been growing. Several comprehensive and carefully conducted evaluations have shown that the program reduces crashes by as much as 30%. Ongoing evaluations are reporting preliminary findings of crash reductions of the same magnitude. These are very dramatic effects that underscore the safety benefits of graduated driver licensing.

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