



Enhancing the effectiveness of graduated driver licensing legislation

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Abstract

Problem: Many states have enacted graduated driver licensing (GDL) systems in an effort to reduce the very high crash rates of young beginning drivers. This article addresses how to achieve the maximum benefit from GDL by ensuring compliance with protective restrictions. *Enhancing GDL through system structure:* The major crash reductions due to GDL systems result from the protective restrictions during the initial two levels, which isolate novice drivers from the highest risk driving situations. Accordingly, GDL systems should include protective restrictions that adequately control the greatest dangers facing young drivers: multiple teen passengers and night driving before midnight. *Encouraging compliance through system structure:* Including protective restrictions that are supported by parents and teens will encourage compliance. Furthermore, linking a teen's advancement through GDL to demonstrated responsible driving will likely encourage compliance more than threatening punishment for violations. *Encouraging compliance through enforcement:* Parents are in a prime position to enforce most GDL restrictions, but there is some evidence they do not enforce those restrictions that they consider too extreme. Little is currently known about the involvement of law enforcement in GDL systems, but there is potential for high visibility law enforcement activities to encourage compliance with restrictions. *Impact on research, practice, and policy:* There is a need for better designed GDL systems in many states; more research is needed to examine compliance with restrictions and to evaluate enforcement efforts by parents and law enforcement. © 2002 National Safety Council and Elsevier Science Ltd. All rights reserved.

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1. Introduction

The most dangerous thing most teenagers will ever do is drive, or ride as a passenger with a teen driver. Motor vehicle crashes are, by far, the greatest threat to the lives of teens in the US (National Center for Injury Prevention and Control, 2002). Seventy-five percent of teen (ages 15–19) deaths are due to injury; half of those result from a single cause: motor vehicle crashes (see Fig. 1). To address this threat to teens, a new approach to driver licensing has recently become widespread. Since 1997, 37 states have implemented three-stage graduated driver licensing (GDL) systems. These systems place progressively fewer restrictions on young beginning drivers as they obtain practical driving experience and, presumably, become better drivers. This article addresses the question of how the effectiveness of existing GDL systems might be enhanced and, by implication, how states that have yet to enact GDL might design and implement a highly effective system.

There are several domains where careful attention can maximize the benefits achieved by a GDL program: (1) structuring the system to provide maximum protection, (2) structuring the system to encourage compliance with provisions, (3) ensuring that the pertinent elements of the system are readily enforceable and enforced, (4) structuring the system to ensure that the most useful practical driving experience is obtained, and (5) ensuring that parents play the most effective possible role. This article focuses on the first three of these; companion papers in this issue address items four (McKnight & Peck, 2003) and five (Simons-Morton & Hartos, 2003).

In contrast to past approaches, GDL requires beginning drivers to spend a year or longer obtaining practical driving experience before earning unrestricted driving privileges. At each of the first two levels in all GDL systems, restrictions on when and with whom a novice is allowed to drive are designed to reduce risk while drivers gain needed experience. The first level of a GDL license is a variant of what was previously known as a learner permit. As in the past, a driver with this type of license is permitted to drive only when accompanied by an experienced driver. The difference is that the initial GDL license is a required first step rather

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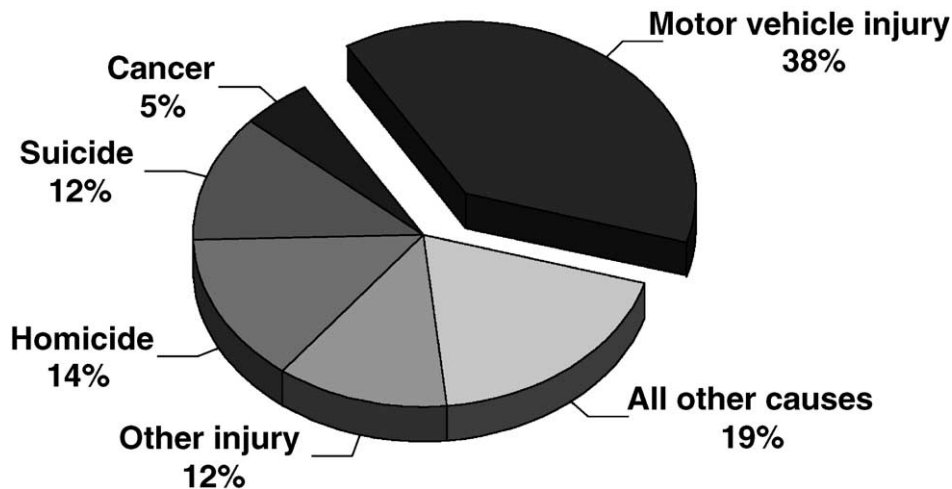


Fig. 1. Cause of death in 2000, ages 15–19, US.

than an option, and the minimum duration is much longer, generally ranging from 6 to 12 months.

The keystone of graduated licensing is the intermediate level license, which allows a novice to drive without an adult in the vehicle, but which restricts that driving to lower risk conditions. These restrictions are intended to provide some continued insulation from the highest risk situations as a new driver, who presumably has achieved competence in basic driving skills, takes on full responsibility for decision-making as the person solely in charge of the vehicle. The two clearly identified high-risk conditions for young novice drivers are nighttime driving and transporting young passengers (Chen, Baker, Braver, & Li, 2000; Preusser, Ferguson, & Williams, 1998; Williams & Preusser, 1997).

2. Enhancing GDL through system structure

To address ways to maximize the protective benefits of GDL, it is important to distinguish between the two distinct but complementary effects that GDL might produce. As generally discussed, GDL is viewed as a program to produce more experienced and, therefore, presumably safer drivers, by providing novices with a more appropriate introduction to the complexities of driving. These effects might be expected to last for many years, but would likely be greatest during the early months or years when individuals begin driving unsupervised. The benefits of the substantial driving practice should accrue by largely eliminating a period during which novices are highly inexperienced.

The second effect to be expected from GDL is the reduction in crash risks that results from the protective restrictions placed on novices at the time in their driving career when crash risks are greatest. This effect could be achieved by raising the driving age. However, there is evidence to suggest that would, to some degree, merely delay high crash rates (Ferguson, Leaf, Williams, & Preusser, 1996). By retaining an earlier driving age, but limiting

driving to relatively safe conditions, GDL seeks to obtain both the benefits of reduced crash exposure during the initial years of driving as well as the more enduring benefits of providing many months driving experience for novice drivers before they begin unrestricted driving.

Presently, a number of GDL programs in the US and Canada are not structured to achieve the available benefits from reducing high-risk exposure during the first one to two years of driving; that is, they employ weak protective restrictions (e.g., night restrictions that begin too late, no limits on passengers, allowing supervising drivers who are too young to provide the desired protective effect). Others do not appear to be structured to ensure the most useful learning experience for beginning drivers. Those systems that do not address the amount and type of driving that new drivers should obtain (e.g., the permit period is too short, the system does not specify the desired amount of practice, or the system does not encourage appropriate kinds of instruction) embody this shortcoming. The effectiveness of GDL can be enhanced by addressing both these mechanisms to reduce novice driver crashes.

2.1. Appropriate protective restrictions

It is clear from a number of studies completed in the past few years (Foss, Feaganes, & Rodgman, 2001; Langley, Wagenaar, & Begg, 1996; Mayhew, Simpson, Groseillers, & Williams, 2001; Shope, Molnar, Elliott, & Waller, 2001; Ulmer, Preusser, Williams, Ferguson, & Farmer, 2000) that GDL produces dramatic decreases in crashes among young, novice drivers. To date, most research has focused on the overall effect of a GDL system, without disaggregating effects of the various elements that GDL systems entail. However, declines in crashes following GDL closely parallel the decline in drivers licensed to drive without a supervisor. Thus, it appears that the major benefits of GDL accrue from the reduced exposure resulting from restrictions on unsupervised driving embodied by

the lengthy learner permit period (Foss, Goodwin, Rodgman, & Feaganes, 2002; McKnight, Peck, & Foss, 2002). However, there is evidence that protective restrictions during the intermediate license can also reduce crashes. In North Carolina, nighttime crashes declined much more than the number of licensed drivers, indicating a specific effect of that particular restriction (Foss et al., 2001). Comparing the results of studies in Michigan and North Carolina provides further evidence that the nature and extent of crash reductions is related to details of the specific restrictions placed on intermediate level drivers. Crashes in North Carolina declined substantially after 9 p.m.—when the driving restriction begins. By contrast, in Michigan, there was no greater decline in nighttime crashes until midnight, at which time the Michigan driving restriction begins (Shope et al., 2001). Thus, by carefully tailoring the restrictions of a GDL system to effectively limit exposure to high-risk conditions, it is possible to achieve reductions in crashes during the intermediate license level.

3. Encouraging compliance through the structure of a GDL system

In addition to including comprehensive risk-reducing restrictions in a GDL system, it is important to ensure that drivers adhere to those restrictions. At present, relatively little is known about young drivers' compliance with the three central protective restrictions: prohibition of driving alone during the initial license phase and—during the intermediate license stage—limits on nighttime driving and the number of passengers that may be transported. Self-report data from several jurisdictions indicate that teens violate all three of these restrictions, although these violations do not appear to occur with great frequency. For example, in North Carolina, 17% of young drivers report that they have driven without the required supervisor (Foss et al., 2002). In both Nova Scotia and California, about 40% of teens report having occasionally driven in violation of the night driving restriction, but only 12–15% report doing so often (Mayhew, Simpson, Ferguson, & Williams, 1998; Williams, Nelson, & Leaf, 2002). Trip data obtained from teens in North Carolina suggest that the 9 p.m. driving restriction is violated more often than the midnight restrictions in Nova Scotia and California.

It is possible to increase compliance with protective restrictions in GDL by carefully attending to the structure of the system. To the extent that system structure encourages compliance there will be less demand on law enforcement resources. It is important to note that most laws, including provisions of GDL systems, are to a large degree self-enforcing. That is, individuals are inclined to abide by laws that codify generally accepted principles for human behavior in social contexts. Laws that go beyond what the large majority of the members in a society generally considers appropriate behavior are largely unenforceable. For this

reason, the restrictions in a GDL system must not go beyond what the majority of parents and teens will consider “reasonable.” Hence, implementing GDL has proved to be highly feasible in the US, whereas raising the driving age to match that which is common in Europe (18) has never been considered possible.

One way to achieve widespread compliance with restrictions is to employ only minimal restrictions. This approach is self-defeating because it also loses the benefits of those restrictions. Nonetheless, many states have opted for this, perhaps unwittingly, by setting night driving restrictions so late in the evening that they fail to address the large majority of young driver nighttime trips. A survey of 16- and 17-year-olds licensed prior to GDL found that only 3% of their trips occurred from midnight to 6 a.m. (Foss et al., 2002). Restrictions that begin late also miss, by several hours, the time of day at which crash risks rise dramatically for young teen drivers. Chen et al. (2000) report that fatal crash risks for 16- and 17 year-old drivers are nearly three times higher between 10 p.m. and midnight than during the daytime and early evening hours (6 a.m.–10 p.m.). Despite this, two-thirds of the night driving restrictions in states with GDL systems begin at midnight or later.

The question then becomes how to structure restrictions that provide meaningful protection from crash risks, which are—by definition—somewhat inconveniencing, without making them so extreme that they are widely disregarded. It is clear from many domains that simply imposing severe restrictions and promising “strict enforcement,” even if politically feasible, is to embark upon the impossible. This is especially true for GDL, in view of the great difficulty in detecting violations of some of the most important restrictions in GDL systems.

3.1. Enact strong but reasonable restrictions

Careful research on public opinions provides valuable guidance when navigating the strait between maximally protective restrictions and general public acceptance. It turns out that both parents and teens are generally much more accepting of the kinds of restrictions that have long been recommended for high-quality GDL systems than is generally assumed. Careful presentation of research evidence about teen driver risks can play an important role as well. The development of the North Carolina GDL system provides a good illustration of this point.

As recommendations for the structure of a GDL system were developed, survey data obtained from 500 licensed drivers (including teens) indicated that the notion of a night driving restriction for novice drivers was widely accepted. When the 73% who approved of such a restriction for beginning drivers were asked the time at which a restriction should begin, 81% suggested a time before midnight, 22% recommended 9 p.m., and 29% said 10 p.m. Information about public support for an early night restriction paralleled the story told by crash information. Data showing the

number of crashes, by hour, from 9 p.m. to 6 a.m.—reflecting the combined effects of exposure and risk per trip during those hours—illustrated clearly that the bulk of the nighttime problem among novice teen drivers was heavily skewed toward the early evening hours and not those after midnight. The result was that the North Carolina legislature adopted a 9 p.m. restriction. A similar approach helped persuade the Delaware legislature to set their night restriction at 9 p.m. as well.

This same approach can be used to select a passenger restriction and to determine how long the supervised driving period should last. Recent interviews with 1253 parents of teens in the North Carolina GDL system indicated that a full year was considered a reasonable period to require adult supervision of beginning drivers. When asked specifically about the duration of the learner permit phase, 82% of parents indicated that 12 months is “about right”; 11% said it is not long enough. Interestingly, although parents (and teens) endorse passenger restrictions less strongly than night driving restrictions, many states have implemented highly limiting passenger restrictions. Presently, 10 states allow no young passengers to ride with an unsupervised driver during the first several months (usually 6) of unsupervised driving. Most other states with passenger restrictions allow no more than one young passenger.

Recent findings from California indicate that a complete prohibition on teen passengers is frequently violated by more than half of teen drivers; moreover, these violations frequently occur with parental approval (Williams et al., 2002). This suggests that prohibiting all young passengers may overstep the bounds of what is generally considered reasonable. In view of the substantial intrusion into the day-to-day lives of teens that a no-passenger provision can create, as well as the difficulty in detecting violations of this restriction either by police officers or by parents, the benefits of such a restriction may fall well short of its theoretical potential. It will be important for future research to address the relative benefits of zero- and one-passenger restrictions, and to determine whether lower compliance with passenger prohibitions offsets the benefit of the greater risk reduction they afford. Chen, Braver, Baker, and Li (2001) addressed this issue by projecting potential benefits assuming various hypothetical responses by young drivers to a passenger prohibition. They found that even if half of drivers disregarded the restriction, there would still likely be a reduction in fatalities resulting from young driver crashes.

3.2. Reward rather than punish

A promising approach to ensuring compliance with GDL restrictions is to include a provision that progressing to the next level of licensure requires carefully adhering to the conditions of the current level. More generally, requiring novice drivers to demonstrate responsible driving behavior by maintaining a clean driving record for a continuous period before restrictions will be lifted incorporates an important

principle of human behavior into the design of the driver licensing system. Behavioral science research clearly indicates that, to influence behavior, providing rewards for desired behavior is more effective than threatening punishment of undesirable actions. McKnight, Hyle, and Albrecht (1983) suggest that this provision for contingent advancement in the early Maryland GDL system was most likely the cause of the crash reductions that system achieved.

4. Encouraging compliance through enforcement

Although most young drivers will generally adhere to the constraints placed on their license, there is a need to ensure that there are enforcement mechanisms in place. This helps to underscore the societal expectation of responsible driving behavior. It also provides a source of direct extrinsic motivation to comply for those individuals who are less concerned about general social expectations.

The visible presence of active enforcement of traffic laws is well documented to increase compliance. With GDL there are two important sources of enforcement: parents and law enforcement officers. Parents are in a far better position to encourage compliance with license restrictions, to detect violations, and to apply swift and certain sanctions when transgressions occur.

4.1. Parents

Due to the great increase in crash risk that passengers create for young novice drivers (Chen et al., 2000) and the much greater prevalence of trips with passengers, passenger restrictions have a greater potential to reduce crashes than do night driving restrictions (Chen et al., 2001; Williams & Ferguson, 2002). Although parents are able to carefully monitor compliance with restrictions governing use of a vehicle (requirement for a supervising driver, night driving restriction), they have far less information about the number of passengers riding with their teen. Hence, it is reasonable to expect greater compliance with a strong night driving restriction than with a strong passenger restriction. Findings from New Zealand and California indicate that compliance with passenger prohibitions is substantially less common than with the night restrictions. Although the California night restriction is weak, beginning at midnight, teens in New Zealand also reported violating the passenger restriction more frequently than the 10 p.m. driving restriction (Begg, Langley, Chalmers, & Reeder, 1995). It is particularly noteworthy that about half of parents in California indicated that they permitted their teen to transport young passengers even though the teen's driver license prohibited it (Williams et al., 2002).

Beyond the recent findings from California, we know relatively little about parental enforcement of GDL restrictions. We do know that they feel empowered by GDL to enforce restrictions that many of them favor, but which are

difficult to impose without the backing that a GDL system can provide. Surveys of parents find that most believe their teens nearly always adhere to their license restrictions (Mayhew et al., 1998, 1999), but interviews with teens and parents from the same family indicate that parents clearly are not aware of all their teens do. For example, in North Carolina, 17% of young drivers report that they have driven without the required supervisor, but only 5% of parents were aware their teen had ever driven without a supervisor (Foss et al., 2002). In sum, we know that parents approve of GDL, but more research is needed to determine the extent to which they endorse and expect compliance with various restrictions.

4.2. *The role of law enforcement*

Presently, we know practically nothing about enforcement of GDL restrictions by law enforcement officers. Primary enforcement of restrictions is impossible since these violations cannot be detected without knowing the teen's license level. Nonetheless, the traditional role for law enforcement officers in young driver safety—enforcing general traffic laws—remains important in GDL. In those jurisdictions where advancement is contingent on maintaining a violation-free driving record, general high visibility traffic enforcement can be particularly beneficial. In addition to the documented deterrent effect of such programs, these efforts should also discourage violation of restrictions, since detection for such an infraction would then delay progression to the next licensing level (if the GDL system includes a contingent advancement provision). Anecdotal evidence also suggests that when teens knowingly violate conditions of their license, they drive more cautiously. This is the same “second order” effect found with license revocations, where most individuals whose license has been suspended continue to drive, but do so more carefully and less frequently (Ross & Gonzales, 1988).

In addition to routine traffic enforcement, some focused attention on enforcement of GDL restrictions, if carefully publicized, would help to increase parents' awareness of the reasons for these restrictions. It might also convince parents that it is important for them to enforce the conditions on their teen's license even if they do not agree with them. A well-publicized, carefully targeted checkpoint program to screen for vehicle registrations or detect seat belt violations could also discourage violations of all the important restrictions in GDL systems.

There is anecdotal evidence that enforcement of restrictions is not a high priority for law enforcement (McKnight & Peck, 2003), and Begg et al. (1995) report that teens who violated provisions of the New Zealand GDL system were rarely detected and cited for doing so. Research in this area is needed to illuminate a variety of issues, including how well officers understand the details of GDL, how often they issue citations for violating restrictions when they come across them in the course of routine enforcement, and whether they

may be inclined to avoid issuing a citation for minor traffic offenses by restricted drivers in order not to interfere with a teen's progress through the licensing process. In North Carolina, nearly 6% of teens are convicted for moving violations while driving on an intermediate license, indicating there is enforcement. This is comparable to the conviction rate for teens with an unrestricted license, but it is not known whether these groups commit violations at a comparable rate.

5. Summary and conclusions

The effectiveness of GDL can be enhanced by implementing (or modifying) protective restrictions that are as strong as possible while remaining reasonable in the eyes of those affected—parents and teens. Parents overwhelmingly favor GDL and the protective restrictions it typically entails and they are well positioned as the primary enforcers. Law enforcement officers can also play an important role in ensuring that teens comply with restrictions, but this is likely to be through high visibility enforcement of all traffic laws rather than through direct enforcement of specific restrictions governing the GDL license.

There is presently relatively little direct evidence about compliance with GDL restrictions. Interviews with parents and teens indicate that all restrictions are violated. Most of these studies indicate that violations are not particularly common, but the one study that looked at this issue most carefully raises cause for some concern about parental enforcement of passenger prohibitions.

6. Impact on research, practice, and policy

It is clear that many states should revise their GDL systems, and those that do not yet have such a program should develop one. States should strive to have a GDL system whose protective restrictions adequately address the highest risk driving conditions for novice drivers; however, the protective restrictions should not be so extreme as to be considered unreasonable by parents and teens. The present paper suggests how this can be done. Research is needed to detail the nature and degree of compliance with GDL restrictions as well as the present activities of parents and law enforcement to support and enforce these important elements of GDL. This information could inform the development of future efforts to ensure that protective restrictions are supported by parents and heeded by novice drivers.

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