



# Graduated driver licensing and differential deterrence: The effect of license type on intentions to violate road rules



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## ABSTRACT

In keeping with the differential deterrence theory, this article assesses the moderating effect of license type on the relationship between social control and intention to violate road rules. More precisely, the article has two objectives: (1) to assess the effect of license type on intentions to infringe road rules; and (2) to pinpoint mechanisms of social control affecting intentions to violate road rules based on one's type of driver license (a restricted license or a full license). This effect is examined among a sample of 392 young drivers in the province of Quebec, Canada. Drivers taking part in the Graduated Driver Licensing (GDL) program have limited demerit points and there is zero tolerance for drinking-and-driving. Propensity score matching techniques were used to assess the effect of the license type on intentions to violate road rules and on various mechanisms of social control. Regression analyses were then conducted to estimate the moderating effect of license type. Average treatment effects from propensity score matching analyses indicate that respondents with a restricted license have lower levels of intention to infringe road rules. While moral commitment and, to a lesser extent, the perceived risk of arrest are both negatively associated with intentions to violate road rules, the license type moderates the relationship between delinquent peers and intentions to violate road rules. The effect of delinquent peers is reduced among respondents with a restricted driver license. Finally, a diminished capability to resist peer pressure could explain the increased crash risk in months following full licensing.

## 1. Introduction

In high-income countries, young drivers are generally over-represented in traffic fatalities (Elvik, 2010). The Province of Quebec, Canada, is no exception. In 2015, 20% of drivers involved in road crashes and 14% of fatally-injured drivers were under 25 years old, while only 9% of all license holders fell into this age category (Société de l'assurance automobile, 2016). Their inexperience, immaturity, and reckless behaviors all increase their risk of fatal crash (Hedlund et al., 2003). Many jurisdictions have consequently adopted Graduated Driver Licensing (GDL) programs to reduce crashes among young and novice drivers (Shope, 2007). GDL introduces a learning stage and maintains a low-risk, supervised learning environment. While deterrent mechanisms are central components of GDL, few studies have investigated how GDL influences the effect of mechanisms of social control on driving violations (Simpson, 2003; Williams, 2007). Given the fact that crash risk significantly increases once drivers obtain their full license (Williams, 2007; Curry et al., 2015), examining this influence is of paramount importance.

In keeping with the recent scholarship on differential deterrence (Piquero et al., 2011), this study compares the effect of mechanisms of formal and informal social control on non-compliance of road rules among young Quebec drivers with a restricted driver license (GDL) and those with a full license. This article has two objectives: (1) to estimate the effect of license type on intentions to violate road rules; and (2) to identify formal and informal mechanisms of social control affecting intentions to violate road rules based on one's type of driver license (a restricted license or a full license).

## 2. Literature review

The literature review is divided in three sections. The first section describes GDL components and objectives. The second presents findings of studies that have investigated the effect of formal and informal mechanisms of social control on intentions to violate road rules among young drivers. Finally, the third section introduces the differential deterrence theory and demonstrates its relevance to the investigation of factors associated with the intentions to violate road rules among young

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drivers. This last section also highlights the potential moderating effect of the license type on the relationship between mechanisms of social control and intentions to infringe road rules.

### 2.1. Graduated driver licensing: components and objectives

GDL aims to provide a safe learning environment to novice drivers by extending their learning phase and by incorporating driving restrictions (Vanlaar et al., 2009). GDL is usually divided into three stages. Drivers in the first stage (learner license) can drive only when accompanied by a full license holder. Drivers must successfully pass a driving test to access the next stage. In the second stage (provisional license), drivers can drive unsupervised but under some restrictions (e.g. limiting the number of young passengers and prohibiting nighttime driving) (Fell et al., 2011; Lin and Fearn, 2003; Chen et al., 2001; Cooper et al., 2005). There is generally zero tolerance for drinking-and-driving in the first two stages and drivers have a limited number of demerit points. If they respect all restrictions imposed in the second stage, after a predetermined period of time (e.g. two years), drivers earn a full permit in the third stage.

Previous research shows that GDL reduces the crash risk among young drivers (Russell et al., 2011; Shope, 2007; Williams and Shults, 2010). Shope (2007) reviewed 27 studies published since 2002 and concluded that GDL reduces crash risk by 20% to 40%. Effects of GDL are enhanced when it includes: (1) nighttime driving restrictions, (2) limitations on teenage passengers, (3) a six-month learning period, (4) a minimum age for full licensing, and (5) mandatory driving lessons (Dee et al., 2005; Masten et al., 2011; Vanlaar et al., 2009; Williams, 2007; Williams and Shults, 2010).

Despite the benefits of GDL, young drivers still display increased crash risk (Conner and Smith, 2017; Gregersen et al., 2003). Curry et al., (2015) studied 410 230 drivers aged 17–20 years old, and report that « (...) independent of age and experience, teen drivers' crash risk increased substantially at the point of transition to a full license, while drivers of a similar age who remained in the intermediate phase continued to experience a decline in crash rates » (p. 243). Although novice drivers acquire additional skills in the learning phase, the long-term benefits of GDL remain unclear (Conner and Smith, 2017; Curry et al., 2015; Gregersen et al., 2003). Others argue that lower crash risk is not attributable to GDL and the development of new skills but rather to limited risk exposure (Karaca-Mandic and Ridgeway, 2010). The factors responsible for the lower crash risk during GDL need to be further explored (Simpson, 2003; Williams, 2007).

### 2.2. GDL restrictions and the prevention of traffic violations

In order to pinpoint factors associated with compliance among young drivers with a restricted license, some studies have investigated the role of formal and informal social control (Allen et al., 2015; Bates et al., 2015).<sup>1</sup> For Simpson (2003), « (t)he probationary scheme is anchored in the concept of deterrence. It is assumed that safe driving habits, at least when the initial risk of collision is much higher, will be encouraged by the threat of punishment and its application » (p. 26). Deterrent mechanisms are, however, seldom addressed in studies on GDL.

One exception is Bates et al. (2015) who used a sample of 236 young drivers holding P1 and P2 licenses in Queensland, Australia (P1 and P2 correspond to two types of restricted licenses).<sup>2</sup> Data on formal and

<sup>1</sup> From now on, we will refer to drivers participating in GDL as restricted license holders.

<sup>2</sup> In Queensland (Australia), new drivers under 25 years old first hold a Provisional 1 (P1) license after completing the “apprentice” stage. To obtain a P1 license, they must be at least 17 years old, hold an apprentice license for at least 12 months, and complete 100 h of supervised driving. P1 license plates are identified with a red P. After holding the P1 license for a year and successfully passing a driving exam, drivers get a Provisional 2 license. A full license can be obtained after holding a Provisional license for three years.

informal deterrence mechanisms were collected through an online survey. Their results indicate that P2 holders have higher rates of non-compliance than P1 holders with GDL restrictions. The latter have a higher perceived risk of being punished by their parents if they disobey restrictions. Accordingly, informal mechanisms of social control increase compliance (Bates et al., 2015). Another study shows similar findings (Allen et al., 2015). Among a sample of 151 young Australian drivers, “informal deterrence” (such as feelings of guilt) elevates compliance with GDL restrictions.

### 2.3. The present study: GDL and differential deterrence

Previous studies show that informal social control increases compliance with GDL restrictions (Allen et al., 2015; Bates et al., 2015). Prior studies, however, use samples of restricted license holders only. Consequently, their findings do not explain the increase in the crash risk right after full licensing among young drivers. Two central questions about the effectiveness of restricted licensing are not addressed by previous studies: (1) what is the relationship between license type and non-compliance; and (2) how does license type moderate the effect of formal and informal mechanisms of social control on non-compliance?

Differential deterrence theory can address both questions. Classical deterrence theory posits that in order to prevent an offense, a sanction must be sufficiently certain, severe and swiftly applied. Studies in differential deterrence identify contextual and individual characteristics that moderate the effect of sanctions (Andenaes, 1974; Geerken and Gove, 1975; Piquero et al., 2011). Social capital, moral beliefs, self-control, emotional arousal and drug/alcohol consumption have been shown to affect perceptions and reactions to the threat of sanction (Piquero et al., 2011).

A neglected aspect of conditions likely to affect compliance is a person's status in a sanction system. Indeed, the type and severity of sanction vary according to a person's status in a sanction system. A radical example is the “three strikes” law applied in several American states. Felons who have already received “two strikes” (i.e. have already been convicted twice for a felony) are exposed to longer imprisonment penalties than those with a clean record (Zimring et al., 2001).

In traffic safety, demerit point systems are implemented in several jurisdictions. A demerit point system aims at deterring drivers from committing traffic infringements (Castillo-Manzano and Castro-Nuño, 2012). The “system” threatens to suspend the license of drivers exceeding a predetermined level of demerit points (Basili and Nicita, 2005). According to the number of accumulated points, the driver's status changes. A driver approaching the limit of demerit points may see sanctions as more threatening than a driver without any demerit points. In the former situation, a license suspension is added to the fine.

In comparison to fully licensed drivers, drivers enrolled in GDL are exposed to a zero-tolerance policy for drinking-and-driving and to harsher demerit point systems.<sup>3</sup> Hence, drivers in GDL expose themselves to increased consequences when they violate road rules (Simpson, 2003). Holding a restricted license is therefore likely to activate or enhance mechanisms of formal and informal social control in at least three ways. First, in keeping with the deterrence theory, GDL restrictions can increase levels of perceived certainty and severity of sanction (Homel, 1988; Zimring et al., 1973). Several studies emphasize that the sanction threat not only deters drivers but it also changes the social norm (i.e. moral commitment) and educates drivers about the crash risk associated with traffic infringements (Blais and Ouimet, 2005; Kennedy, 2009).<sup>4</sup>

<sup>3</sup> In Quebec, drivers under 25 years old or participating in GDL have a limited number of demerit points. GDL drivers get their license suspended once they accumulate four demerit points in comparison to 15 for drivers over 25 with a full license.

<sup>4</sup> Morally committed individuals have internalized the social norms – that is, that violating road rules is likely to cause a prejudice to other road users – and such individuals will not infringe road rules because their self-concept will not allow them to do so, regardless of possible sanctions (Andenaes, 1974; Grasmick and Green, 1981).

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