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Effect of North Carolina's restriction on teenage driver cell phone use two years after implementation

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ABSTRACT

A majority of states now restrict teenagers from using a mobile communication device while driving. The effect of these restrictions is largely unknown. In a previous study, we found North Carolina's teenage driver cell phone restriction had little influence on young driver behavior four months after the law took effect (Foss et al., 2009). The goal of the present study was to examine the longer-term effect of North Carolina's cell phone restriction. It was expected that compliance with the restriction would increase, as awareness of the restriction grew over time. Teenagers were observed at high schools in North Carolina approximately two years after the law was implemented. Observations were also conducted in South Carolina, which did not have a cell phone restriction. In both states, there was a broad decrease in cell phone use. A logistic regression analysis showed the decrease in cell phone use did not significantly differ between the two states. Although hand-held cell phone use decreased, there was an increase in the likelihood that drivers in North Carolina were observed physically manipulating a phone. Finally, a mail survey of teenagers in North Carolina showed awareness for the cell phone restriction now stands at 78% among licensed teens. Overall, the findings suggest North Carolina's cell phone restriction has had no long-term effect on the behavior of teenage drivers. Moreover, it appears many teenage drivers may be shifting from talking on a phone to texting.

1. Introduction

Cell phone restrictions for teenage drivers are now commonplace. As of December 2011, 30 states and the District of Columbia had laws restricting at least some teenagers from using a mobile communication device while driving (IIHS, 2011). To date, only one study has investigated the effect of such a restriction on young driver behavior. Foss et al. (2009) examined the short-term effect of North Carolina's cell phone restriction for teenage drivers. Observational surveys conducted at high schools prior to the restriction, and approximately four months after the restriction took effect, found essentially no change in phone use. Telephone interviews with teenagers revealed only about 60% were aware of the restriction, and most believed the law was being enforced rarely or not at all (Foss et al., 2009).

Typically, the effects of new laws and programs peak at their beginning and erode over time. In this situation, however, a different pattern was expected. First, there was no "grandfather clause" for the cell phone restriction. Hence, the law was an attempt to change an already-established behavior. This is always a daunting task, but is particularly difficult when the behavior is a central feature in the lives of those affected. Second, there was essentially no publicity of the cell phone restriction other than a number of brief news stories when the restriction initially took effect. Consequently, the lack of change observed in young driver behavior a few months after the prohibition took effect was not surprising.

In recognition of the difficulty publicizing a law that applies to a tiny fraction of the driving population, the North Carolina cell phone restriction was incorporated as an explicit provision for each licensing level of North Carolina's graduated driver licensing (GDL) system. This provided an institutionalized mechanism by which parents and teenagers could learn about the restriction without the need for special promotional efforts. GDL provisions are discussed in mandatory driver education classes, the driver's handbook, information distributed through licensing offices, and other sources of information about licensing such as insurance companies, community safety programs, and various web sites. Apparently as a result of these multiple information channels, there is extensive awareness among teens and parents alike of the main requirements and restrictions embodied in North Carolina's GDL system (Goodwin et al., 2006). Accordingly, it was expected that awareness of the cell phone restriction would increase over time as new teenage drivers entered the GDL process and were alerted to the cell phone restriction via the various mechanisms noted above.

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In the present study, we examined the effect of North Carolina's cell phone restriction on young driver behavior two years after it was implemented. If the law works as planned, awareness should have been extensive among teenage drivers by this point in time. Moreover, phone non-use should have become a well-established habit, since all affected teenagers would have been prohibited from using a cell phone from the time they first obtained a learner permit. We first describe findings from an observational survey to examine the prevalence of phone use among young drivers. We then present findings from a mail survey to measure teenagers' awareness of the restriction.

2. Methods

2.1. North Carolina's cell phone restriction

On December 1, 2006, North Carolina implemented a law prohibiting teenage drivers from using a mobile phone while the vehicle is in motion on a public road. Exceptions permit talking to a parent, legal guardian or spouse, and making a call regarding an emergency situation. The penalty for a violation is a $25 fine. Perhaps more significantly, a conviction results in a 6-month delay in the ability to obtain the next level license for drivers with a learner or intermediate license.

2.2. Observations of teenage drivers

The present study used identical procedures as our previous study to measure cell phone use among teenage drivers. (For a full description of the observational procedure, see Foss et al., 2009.) Observations were conducted at the same 25 high schools in North Carolina. High schools are one of the few locations where the driving population is predominantly drivers who are 16 and 17 years old and, therefore, are known to be subject to the cell phone restriction. All observations were conducted as students left school in the afternoon. Observers usually positioned themselves near the exits of school parking lots, although it was sometimes possible to observe teenage drivers at controlled intersections on roads leading away from schools. To control for any seasonal effects in cell phone use among young drivers, observations were conducted at the same time of year as previously. Observations began October 17, 2008, and were completed December 5, 2008, approximately two years after the cell phone restriction went into effect.

The data collectors in this study were the same as those employed previously. For each vehicle driven by a teenager, observers recorded: driver cell phone use/nonuse, driver sex and belt use, number and sex of passengers (all male, all female, mixed), and vehicle type (car, SUV, pickup, van). Observers used audiotape recorders to enable quick recording of all these data elements.

As before, it was important to observe cell phone use for a comparable group of teenage drivers to whom the law did not apply. Hence, phone use was observed at 15 high schools in South Carolina, where data had been collected previously.[1] The observations in South Carolina were conducted between October 17, 2008 and November 12, 2008.

2.3. Mail survey of teenagers

To ascertain whether teenagers were aware of the cell phone restriction, we conducted a mail survey of high school Juniors in North Carolina. The full procedures and findings from this survey are reported elsewhere (O'Brien et al., 2010). In brief, we selected a random sample of 2015 11th graders attending 22 schools in the two most populous counties in North Carolina. Thirteen of these schools were also included in the observational survey. In May of 2009, a postcard was mailed to the parents of sampled teens. The postcard explained the rationale for the survey, emphasized the voluntary nature of participation, and explained procedures for opting out of the study if parents did not wish for their teen to participate. Subsequently, a 30-item questionnaire, cover letter, and postage-paid return envelope was mailed to teens whose parents did not decline participation. In total, 1949 questionnaires were mailed after removing incorrect addresses and families who declined. Completed questionnaires were received from 537 teenagers, for a response rate of 28%. Of the 537 respondents, 320 had a full or intermediate license, 154 had a learner permit, and 63 had neither a permit nor a license.

To determine whether teenagers were aware of the cell phone restriction – and to ascertain whether there was any confusion regarding the details of the restriction – we asked the following question: "What are the restrictions on using a cell phone while driving in North Carolina?" This question was included near the end of the questionnaire to avoid biasing responses to other items concerning whether and how the respondent used a phone while driving.

2.4. Statistical analyses

Similar to Foss et al. (2009), a logistic regression model was used to make a direct statistical comparison between the change in cell phone use observed in North Carolina and the change in South Carolina, after accounting for differences in vehicle type, driver sex, and passenger presence. For this analysis, data weighting was used to ensure that each school's proportionate contribution to the observations in 2008 was the same as the observations in 2006. In addition, because multiple observations were conducted at each school, all analyses took this within-school clustering into account to ensure that standard errors (hence, confidence intervals) were correctly estimated. Throughout the results, unless otherwise noted, "phone use" refers to any type of phone use while driving including holding a phone to the ear, manipulating a phone (e.g., dialing or texting), or seemingly using a hands-free device.

3. Results

3.1. Observations of teenage drivers

In 2006, prior to implementation of the cell phone restriction, we observed phone use of 6233 teenage drivers in North Carolina and 3384 teenage drivers in South Carolina. In 2008, approximately two years following implementation of the restriction, we observed phone use of 5546 teenage drivers in North Carolina and 3044 teenage drivers in South Carolina.

3.1.1. Sample characteristics

Several differences were observed in the sample characteristics of the two states. In 2006, somewhat more observed drivers in North Carolina were male than in South Carolina (47% vs. 44%; OR = 1.07, 95% CI = 1.02, 1.12). Two years later, the difference was more pronounced (48% vs. 42%; OR = 1.14, 95% CI = 1.09, 1.20). About half of drivers were observed driving alone (transporting no passengers) prior to the restriction in both North Carolina (51%) and South Carolina (50%). However, the proportion of teenagers driving alone in North Carolina increased to 55% two years later (OR = 1.07, 95% CI = 1.03, 1.10), but was unchanged in South Carolina at 52% (OR = 1.02, 95% CI = 0.97, 1.07). Finally, 67% of teenagers in North

[1] Through an oversight, Foss et al. (2009) included data from only 8 of these 15 schools in the analyses. Although that had no effect on the study conclusions, all 15 schools are included here to increase statistical power.