



Parent comments and instruction during the first four months of supervised driving: An opportunity missed?



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ABSTRACT

The present study examined the nature of the comments and instruction provided by parents during supervised driving. Unlike previous studies which rely on self-report, the data in this study were obtained through direct observation of parents and teens using in-vehicle cameras with audio recording. The cameras were installed in the vehicles of 50 families for the first four months of the learner license stage. The findings show a great deal of conversation takes place while teens are driving with a supervisor, and that much of this conversation concerns driving. Sixty-one percent (61%) of all recorded clips included driving-related conversation. The most common type of comment by parents was instruction about vehicle handling or operation, observed in 53% of those clips with conversation about driving. This was followed by pointing out something about the driving environment (such as when it was clear to enter traffic; 23%), negative comments about the teen's driving (22%), and helping the driver navigate (18%). Other potentially helpful types of instruction, including explanation or insights regarding higher order skills (e.g., hazard anticipation and detection), were noticeably less frequent. Moreover, higher order instruction remained low during the first four months of the learner stage, even as instruction about vehicle handling/operation decreased. These findings suggest parents are not taking full advantage of the opportunity provided by mandatory periods of supervised driving to help their children develop an understanding of important aspects of driving.

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1. Introduction

Most U.S. states, and many countries, now have an extended learner stage as part of their graduated driver licensing (GDL) systems. In the U.S., 47 states have an initial learner period of 6 months or more; 12 of these last a full year (IIHS, 2013). The purpose of the extended learner stage is to give ample opportunity for teens to gain the extensive practical experience that is essential to learning a cognitively complex skill like driving. To encourage practice, most states require teens to complete a certain number of hours of driving during this period, typically 40 or 50 h (IIHS, 2013). A number of studies have attempted to measure the amount of experience teens obtain during the learner stage (Bates et al., 2010; Block and Walker, 2008; Jacobsohn et al., 2012; McCart et al., 2007; Scott-Parker et al., 2011; Waller et al., 2000; Williams et al., 2002). Although accumulating hours is likely helpful (and necessary) for

reducing future crash risk, only a few studies to date have examined the nature and quality of the supervision provided during the learner period. In the U.S., parents generally bear the responsibility of supervising a novice driver. How they approach this, what they try to achieve, and the degree to which they help teens develop both the vehicle-handling and cognitive skills needed to become a safe driver is largely unknown.

It has long been recognized that humans learn to navigate an exceedingly complex world through the development of schemas (Neisser, 1976). Schemas are generalized understandings of the many classes of situations encountered throughout life. Once developed, they enable us to manage routine situations with little or no conscious cognitive effort. New tasks are undertaken at the conscious control level, but with sufficient experience they come to be handled automatically. This has been specifically documented with some of the most central tasks in driving (Brouwer, 2002; Schneider and Shiffrin, 1977; Shiffrin and Schneider, 1977; Underwood et al., 2013). However, many errors are made as this understanding is gained and some of these lead to collisions. GDL and the extended period of supervised driving was introduced with the goal of minimizing the potentially catastrophic consequences of errors made by

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novices as they learn (Foss, 2007; Waller, 2003). Numerous studies clearly show the goal of reducing crashes among novices has been achieved (Shope, 2007; Williams and Shults, 2010). The mechanism for this success has largely been exposure reduction—teens in their 6–12-month learner period drive less and they have a co-driver that can help them avoid mistakes, or at least the crashes that might otherwise result from those mistakes.

As GDL was being developed and implemented, it was also believed that a lengthy period of supervision by an experienced driver would lead to quicker, more effective development of a higher order understanding of driving. Consequently, when novices begin driving on their own, they should have developed a more advanced and internalized understanding of driving (i.e., more fully developed schemata). This expectation about the improvement of drivers' cognitive skill under GDL has been largely unexamined, although one recent study found a decrease in crashes among new drivers in North Carolina beyond that attributable to exposure reduction (Masten and Foss, 2010). This provides some indication that a year of supervised driving may have improved, to some degree, the development of appropriate schemata about driving. It is possible to train new drivers with relative ease, in controlled settings, to help them develop important driving schemata (Pradhan et al., 2009; Taylor et al., 2011; Underwood, 2007). Given that most parents have well-developed schemata of their own, refined through many years of driving, it is important to know whether they attempt to share this understanding as they supervise beginning teen drivers.

Tronsmoen (2011) asked licensed drivers aged 18–20 in Norway to rate how much emphasis lay instructors (e.g., parents) placed on different elements of driver training compared to professional instructors. Responses indicated that lay instructors spent less time than professionals focusing on higher order issues such as hazard detection, risk avoidance, and the importance of predictable driving, whereas lay instructors spent more time focusing on simpler issues like starting-up and stopping. In the U.S., Mirman and Kay (2012) obtained similar results in interviews with parents of teens who were waiting to get a learner's permit at licensing offices. When asked what important skills or concepts teens should know before they get a license, parents typically discussed basic vehicle operation and skills related to vehicle control (e.g., managing speed, parking, and turning), rarely mentioning higher order issues like situational awareness or hazard detection. Although many parents said teens need experience to become safe drivers, few provided details about where, how, and what kinds of practice was needed. The authors concluded that "parents may not be providing a clear instructional framework for their children" (p. 416).

Goodwin et al. (2006) went beyond topical considerations to inquire about the interactional nature of supervision. In a survey of families in North Carolina approximately four months after teens obtained their permit, most parents (69%) reported often pointing out possible hazards to their teen and 65% reported often complimenting their teen. However, a majority also acknowledged sometimes engaging in less helpful behaviors such as raising their voice or stepping on an "imaginary" brake. Teen reports were similar to those of their parents, although they were somewhat less likely to say their parents often pointed out hazards or complimented them. Overall, however, teens gave parents relatively high marks for being helpful, patient and supportive.

Beyond these few studies, all of which relied on self-report, little is known about how parents supervise novice teen drivers. The present study used in-vehicle cameras with audio recording to unobtrusively measure parent-teen communication during supervised driving. Recording was triggered by changes in g-forces, often capturing instances in which the teen made some kind of minor driving error. This provided a unique window on those occasions when parents had opportunities to share their well-developed

understanding (i.e., schemata) from many years of driving experience. Specifically, we examined parent comments to determine whether they attempted to convey their higher order understanding or "wisdom" about driving to their teens.

2. Methods

The data reported here were collected as part of a larger project whose goal was to discern how parents approach and manage their teens' driving during the learner stage of GDL (Goodwin et al., 2010). Although the study included interviews with parents, the present report focuses only on observational data obtained using in-vehicle cameras. The research was reviewed and approved by the University of North Carolina Institutional Review Board. Parent participants provided written informed consent and permission for their children. Adolescent participants provided written assent.

2.1. North Carolina's learner stage

In North Carolina, teens may obtain a permit as early as age 15 after completing a state approved driver education course. They must hold the permit for 12 months before they are eligible for an intermediate (provisional) license. During the learner stage, teens must be supervised by a person who has been licensed at least 5 years. At the time of the study, there was no supervised hours requirement.

2.2. Participants

Participants were recruited through two driver licensing offices in Durham and Chapel Hill, North Carolina. Licensing officials handed a letter to parents of teens applying for a learner permit inviting them to participate in a research study on young drivers. Interested families were asked to provide their contact information on a postcard. A member of the research team collected these postcards daily from the DMV and subsequently contacted families about the study.

Recruitment took place between January 2007 and June 2008. Fifty families were recruited during this period, representing about 20% of the 257 families who visited the licensing offices during that time to obtain a learner permit, and 25% of the 201 who indicated initial interest in the study. Parents received \$150 (in two payments) for participating in the study, and teens received \$50.

Two of the families had twins; hence there were 52 beginning teen drivers in the study sample. Most of the teens (88%) were age 15 at the time of enrollment in the study; two-thirds (67%) were female. Among families participating in the study, 38% had household incomes between \$50,000 and \$99,999 (USD); 60% had household incomes of \$100,000 or more. Parents were highly educated, with 87% having a college degree or higher and nearly half (48%) having a graduate degree.

2.3. Vehicle instrumentation

Each participating family's vehicle was equipped with a DriveCam recording device. A DriveCam is a small (11 cm × 9 cm) video camera that is mounted on the windshield behind the rearview mirror. The camera has a forward-facing lens to record what is happening in front of the vehicle and an inward-facing lens that captures activity inside the vehicle. It is also equipped with a microphone and an accelerometer to measure lateral (side-to-side) and longitudinal (forward/rearward) g-forces.

The camera runs continuously but only saves information when triggered by a sufficient change in either lateral or longitudinal g-forces. Our goal was to capture parent-teen conversation during routine driving as well as in conjunction with potentially significant

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