

# Reducing Risky Driving Behavior: The Impact of an Adolescent Driver Intervention Program With and Without Mandatory Parental Attendance

James L. Jordan

Kristi S. Lekies

Scott D. Scheer

*The Ohio State University*

*The United States is a vehicle-dependent society and allows adolescents to obtain driver's licenses at age 16 or younger. This study examined the impacts of a driver intervention program on reducing risky driving behaviors among youths who had received their first traffic citation, as well as parental management of driving practices. Participants consisted of 243 youths ages 16 and 17 who were court-ordered to attend the Ohio 4-H CARTEENS (CAR = Caution and Responsibility and TEENS = Teens who volunteer as teachers) program with and without parents. Results indicated that risky driving behavior decreased significantly for both groups after the intervention program. Parental management practices, however, increased only for youths attending without parents. Regression analysis indicated that risky driving behavior at Time 1 and levels of parental management (parental control) at Time 2 predicted risky driving behavior after completion of the program. Implications of this study include the importance of adolescent driver intervention and prevention programs to teach youths about unsafe driving practices before licensure.*

*Keywords:* adolescent driving, parental management, traffic citation, intervention program, risky driving behaviors

## Introduction

The United States is a highly vehicle-dependent society with a long tradition of allowing adolescents to obtain a driver's license at age 16 or younger in most states (Simons-Morton, Hartos, Leaf, & Preusser, 2006). With that dependence, inexperienced adolescent drivers demonstrate risky driving behaviors, such as speeding, inattentiveness, and loss of control, which put themselves, their passengers, other motorists, and personal property at risk. The consequences are serious. Motor vehicle crashes are the major cause of death and disability among young people ages 16 to 20, accounting for more than 5,000 U.S. deaths annually (Hartos, Beck, & Simons-Morton, 2004; National Highway Traffic Safety Administration,

---

Direct correspondence to James L. Jordan at [Jordan.247@osu.edu](mailto:Jordan.247@osu.edu)

2005). Furthermore, those who engage in high levels of risky driving during the first 6 months of licensure are likely to continue to engage in high-risk driving (Simons-Morton, Cheon, Guo, & Albert, 2013). Therefore, it is critical that effective efforts are in place to improve driver safety for the adolescent population.

As a result of risky driving behaviors, many adolescents who receive a driving citation receive a monetary fine, loss or suspension of a driver's license, and/or required attendance at a driver intervention program. This paper focuses on the impacts of one such program, the Ohio 4-H CARTEENS (CAR = Caution and Responsibility and TEENS = Teens who volunteer as teachers) program (Cropper, 1999). Established in 1987, the program is implemented in 48 of Ohio's 88 counties and is a collaboration among The Ohio University Extension, county juvenile court judges, and the Ohio Highway Patrol. The 2-hour program is led by youth facilitators, with technical assistance from the Ohio Highway Patrol and an Ohio State University Extension educator or program assistant. Youth leaders prepare lesson plans, educational activities, and demonstrations on driver safety topics. In some counties, youths are court-ordered to attend CARTEENS, while in others, participation is voluntary. Since CARTEENS is a unique program, knowing more about the effectiveness of such a model can be helpful to other states as they plan and implement programs for young drivers.

There is growing interest in understanding the role of parents in adolescent driving behavior. Parents are gatekeepers for deciding when their son or daughter receives driving privileges, and they set restrictions once the license is received (Hartos et al., 2004). However, after their child obtains a traffic citation, parents may need to change their perceptions of risky driving behavior, their understanding of the benefits of adolescent driving, and their parental management practices (Simons-Morton et al., 2006). Parental attendance at driver intervention programs may be helpful to foster greater understanding of driving practices and encourage more careful monitoring.

This study examined the impact of the 4-H CARTEENS program on reducing risky driving behaviors by adolescents who had received their first traffic citation. Furthermore, it examined changes in parental management of adolescent driving behavior and compared youths attending the program with parents to those attending without parents. As adolescent driver programs are established across the country in response to safety concerns (Hassan & Abdel-Aty, 2013; Iliescu & Sârbescu, 2013), more information is needed about the impacts of such programs, as well as the possible benefits of parental attendance, on reducing risky driving behaviors.

### **Risky Driving Behaviors Among Adolescents**

Risky driving behaviors include but are not limited to speeding, general tailgating, running red lights or stop signs, frequent lane changes, failure to yield, failure to control, and having no

driver's license (Dula & Geller, 2003). These behaviors endanger the safety of both the driver and other road users. They are different from both aggressive driving and negative cognitive/emotional driving because they may occur without any intention to harm and without the presence of negative emotions (Iliescu & Sârbescu, 2013).

Adolescents are thought to take more chances than adults in general (Steinberg, 1987) and when driving (Simons-Morton et al., 2013; Williams, 2003). On average, adolescents report relatively high levels of risky driving but with notable variability (Simons-Morton et al., 2006). Reasons include their inexperience, acceptance of higher levels of risk, sensation seeking, prestige seeking, underestimation of danger, alcohol use, in-vehicle distractions (e.g., cell phone use while driving or presence of teen passengers), and their desire to reach the destination more quickly (Groeger, 2006; Hassan & Abdel-Aty, 2013; Lee & Abdel-Aty, 2008; Lin & Fearn, 2003). Also, younger drivers have rated hazardous situations as less risky than older drivers (Ferguson, 2003). In addition, the adolescent brain is still developing and does not reach maturity until the early 20s. One particular area of the brain developing during adolescence is the prefrontal cortex, which helps control impulses and emotions that may lead to risk-taking behaviors (National Institute of Mental Health, 2011).

Some adolescent drivers develop risky behaviors long before they reach the age of legal driving. For example, they may accept dares and be willing to take unsafe challenges from peers. The relationship between friends who take risks and hazardous driving may reflect social influence, which can occur directly in the form of peer pressure or indirectly in the form of social norms (Simons-Morton et al., 2013). Indeed, risky driving may be influenced by adolescent drivers' perceptions that their friends engage in precarious behaviors, even if they actually do not (Fleiter, Lennon, & Watson, 2010).

Studies of adolescent driving have indicated that during the first 18 months of licensure, adolescents with high rates of kinematic risky driving—those whose general style of driving included a high rate of hard stops and sharp turns—were more likely to be involved in vehicle crashes than adolescents with low rates of kinematic risky driving rates (Simons-Morton et al., 2011). In addition, crash rates were higher among adolescent drivers with friends who engaged in high rates of hazardous driving and other behaviors, such as substance use.

In studies of gender analysis, adolescent males score significantly higher than females with regard to dangerous and risky driving (Iliescu & Sârbescu, 2013). Males may be more likely to speed and engage in other risky driving behaviors, reduce safety margins, and increase the likelihood of crashes (Simons-Morton, 2007).

## **Parental Management**

Parental management is comprised of monitoring (i.e., parents knowing where their children are and what their children are doing) and behavioral control (i.e., having rules and expectations about behavior). Both are believed to influence adolescents' responsible driving (Hartos, Eitel, & Simons-Morton, 2002). Although studies have examined effects of parenting style on youth development outcomes (Hartos et al., 2004; Simons-Morton 2007), little is known about the role of parental management on adolescent driving behavior.

Parents are involved in their children's driving before and after licensure. They teach them to drive, regulate access to vehicles, and establish rules for driving behavior (Hartos et al., 2004). Driver education and parent-supported practice have been shown to be useful for novice drivers to learn to manage a vehicle and develop an appreciation of the risks involved (Simons-Morton, 2007). Furthermore, a review by Simons-Morton and Ouimet (2006) concluded that risky driving, traffic violations, and crashes are lower among adolescents whose parents set limits on initial driving privileges. Thus, parental management practices can be protective during the first years of unsupervised driving (Hartos et al., 2002). However, once they have some experience behind the wheel of a vehicle, they may develop driving habits risky both to themselves and others on the road (Donovan, 1993; Vingilis & Adlaf, 1990).

## **4-H CARTEENS**

The 4-H CARTEENS program was established in 1987 by a county juvenile court judge who was concerned about the increasing number of juvenile traffic offenders and a high rate of recidivism citations (Cropper, 1999). Since that time, the program has expanded to over half of Ohio's counties in both urban and rural areas. Past efforts to evaluate the program have focused on the use of peer teachers (Hoover & Weisenbach, 1999; Jordan, 2008) and retention of program content (Lee & Murdock, 2001). Adolescents as peer teachers to deliver the content was found to be effective, as was the use of guest speakers who talked directly with the youth participants about driving situations that had changed their lives. These speakers included adolescents who committed vehicular homicide or vehicular assault and were required by juvenile court judges to speak about their experiences as part of a community service requirement, as well as parents whose children had died in accidents.

## **Purpose of the Study**

The purpose of this study was to examine the impacts of the 4-H CARTEENS program on reducing risky driving behaviors among adolescents who had received their first driving citation, as well as changes in parental management of driving practices before and after the program. The study also assessed differences in risky driving behaviors and parental management

practices between youths attending with parents and those attending without parents. In addition, a model was tested to predict risky driving behaviors after completion of the program.

The following research questions were addressed:

1. What is the impact of the 4-H CARTEENS program on reducing risky driving behaviors and increasing parental management of driving practices?
2. What are the impacts of parental attendance? Can differences in risky driving behaviors and parental management practices be identified for youth attending with parents compared to youth attending without parents?
3. What predicts risky driving behaviors upon completion of the CARTEENS program?

## **Methods**

### **Participants and Procedures**

The participants consisted of youths ages 16 and 17 who had been court-ordered to attend the 4-H CARTEENS program after receiving their first traffic citation. The study utilized a quasi-experimental design conducted in four Ohio counties with similarly designed 4-H CARTEENS programming. In two counties, youths were court-ordered to attend the program with their parents; in the other two counties, youths attended without parents. The quasi-experimental design was distinguished from “true” experiments primarily by the lack of random assignment of subjects to an experimental and a control group (Ary, Jacobs, & Razavieh, 2002; Fraenkel & Wallen, 2003). A total of 344 youths were invited to participate in the study. This group consisted of all youths who had been court-ordered to attend the CARTEENS program in the four counties during a 2-month period in fall 2009.

The selection of the four counties in the study was based on similar county population and demographics, number of participants in the 4-H CARTEENS program each month, mode of delivery of the 4-H CARTEENS program, and use of youth volunteers as teachers. The program was delivered in three stages in a similar manner at each location: (a) review of court-mandated rules and a presentation by a state highway patrol representative about driver safety, (b) skill station educational programming performed by youth volunteer teachers, and (c) guest speakers talking about their family’s loss as a result of a traffic accident. Both study and comparison groups had a metropolitan and nonmetropolitan county.

The study’s initial questionnaire was administered prior to the start of the program (Time 1). One month after completing the program, participants were sent a follow-up questionnaire to

complete and return by mail (Time 2). As an incentive to complete the survey, participants were offered a gas card ranging from \$10 to \$25 depending on when the returned survey was postmarked. Higher valued cards were given to those who returned the survey earlier. The study was approved by the university Institutional Review Board.

## Measures

**Demographics.** Demographics consisted of sex, race/ethnicity, and current age. Additional background variables included age at licensure, length of licensure, number of round trips driven per week, age at first citation, type of first citation (assuring clear distance, failure to control, failure to yield, no driver's license, improper lane use, running through a stop sign or red light, violating traffic signs, no seat belt, speeding, and other), and whether or not their license had been suspended.

**Risky driving behaviors.** Risky driving behaviors were measured before and after the Ohio 4-H CARTEENS program using an instrument adapted from Donovan (1993) and Hartos et al. (2002). This self-report measure asked participants to estimate the number of times in the past month they participated in 33 risky driving behaviors. Behaviors were grouped into 10 categories of violations based on Donovan (1993) and included speeding, passing, following other vehicles, lane use, right of way, turning, control, reckless driving, substance abuse, and distractions. Examples of items include driving 10–19 miles per hour over the posted speed limit, passing in a no passing zone, driving through a red light, tailgating a slow car, making unsafe lane changes, cutting in front of vehicles, passing two or more cars at once, driving without seat belts, driving after using alcohol or other drugs, and using a cell phone or other inattentive behaviors. Cronbach's alpha was 0.78 at Time 1 and 0.80 at Time 2. Items were summed for a total risky driving behavior score that could range from 0 to over 300.

**Parental management.** Youths were asked to assess parental management of their driving behavior over the past month using a measure developed by Hartos et al. (2002) before and after attending the Ohio 4-H CARTEENS program. Seven items examined parental control of driving, such as "my parent has carefully monitored my driving activity," "my parent set up consequences for breaking the rules related to my driving privileges," and "my parent tried to keep track of whether I was driving safely." Five items measured parental restrictions, including "my parent restricts where I can go in the car" and "my parent restricts who can ride with me in the car." Responses were on a 4-point scale ranging from strongly disagree to strongly agree and were summed for a total score for parental control ranging from 7 to 28 and for parental restrictions ranging from 5 to 20. Cronbach's alpha for parental control was 0.84 at Time 1 and 0.86 at Time 2. Cronbach's alpha for parental restrictions was 0.79 at Time 1 and 0.81 at Time 2.

## Analysis

Using SPSS 16.0, independent and paired samples *t*-tests were run to identify differences between groups attending with and without parents and to examine changes in risky driving behavior and parental management of driving before and after the Ohio 4-H CARTEENS program. A standard multiple regression model was used to identify predictors of risky driving behavior after completion of the program. All variables of interest were entered simultaneously.

## Results

### Participants

A total of 243 youths completed the pre-test (Time 1) survey, with 152 attending with parents and 91 attending without parents, for an overall response rate of 70.6%. Ages ranged from 15 to 19 years with an average of 16.71 years. About half were male (51%) and half were female (49%); 92% were white. Of these youths, 187 (77.0%) completed the post-test (Time 2) survey. A total of 132 were from the group with mandatory parental attendance, and 55 were from the group attending without parents. Youths were given the same questionnaires to complete, whether or not they attended with parents.

Approximately 86% of participants received their license at age 16. Youths drove an average of 15.05 round trips per week ( $SD = 11.98$ ). Length of licensure at the time of first citation ranged from 1 to 5 months. The most common citations were speeding (40%), failure to maintain an assured clear distance (18%), failure to control vehicle (12%), and failure to yield (10%).

### CARTEENS Program Impact

A paired samples *t*-test indicated a reduction in risky driving behavior from Time 1 to Time 2 [ $t(174) = 3.23, p < .001$ ], with mean scores decreasing from 59.47 ( $SD = 59.93$ ) to 43.95 ( $SD = 56.73$ ) ( $d = 0.27$ ), a small to medium effect size. There was a significant ( $p < .05$ ) reduction from Time 1 to Time 2 in five of the 10 violation categories, with effect sizes ranging from 0.18 to 0.28. These violations involved speeding, lane use, turn, control, and distractions.

A paired samples *t*-test also indicated a reported change in parental management control practices from Time 1 to Time 2 [ $t(174) = -2.87, p < .01$ ], with mean scores increasing from 22.92 ( $SD = 4.34$ ) to 23.73 ( $SD = 4.20$ ) ( $d = 0.19$ ). Changes were also identified for restrictions [ $t(178) = -2.35, p < .05$ ], with mean scores increasing from 16.01 ( $SD = 3.31$ ) to 16.55 ( $SD = 3.39$ ) ( $d = 0.16$ ).

**Table 1. Differences in Risky Driving Behavior and Parental Management Scores Before and After Attending CARTEENS**

<i>Variable</i>	<b>Time 1</b>		<b>Time 2</b>		<i>df</i>	<i>t</i>	<i>p</i>	<i>Cohen's d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
<i>Risky driving behavior</i>	59.47	59.93	43.95	56.73	174	3.23	.001	0.27
Speeding violations	8.64	14.44	5.08	10.43	179	3.52	.001	0.28
Passing violations	0.50	1.18	0.61	1.95	180	-0.71	.479	
Following violations	1.83	3.55	1.88	4.18	180	-0.15	.879	
Lane use violations	6.24	8.75	4.13	7.62	179	2.78	.006	0.26
Right of way violations	1.80	4.22	1.32	2.43	180	1.65	.101	
Turn violations	1.22	2.66	0.80	2.04	180	2.03	.044	0.18
Control violations	17.48	22.54	12.37	16.43	179	2.91	.004	0.26
Reckless violations	4.27	7.99	4.12	12.13	179	0.16	.870	
Substance abuse violations	0.34	1.67	0.22	0.98	179	0.86	.393	
Distractions violations	16.97	22.18	12.97	23.27	176	2.04	.043	0.18
<i>Parental management</i>								
Control	22.92	4.34	23.73	4.20	174	-2.87	.005	0.19
Restrictions	16.01	3.31	16.55	3.39	178	-2.35	.020	0.16

### Parental Attendance

Further analyses of scores were conducted to identify if changes in driving behaviors and parental management practices occurred for youths attending with and without parents from Time 1 to Time 2. Paired *t*-tests indicated that both groups experienced a significant ( $p < .05$ ) reduction in risky driving behaviors. However, increases in parental management practices for control and restriction occurred only for the group attending without parents. Independent samples *t*-tests indicated that youths attending with parents reported significantly higher levels of parental management at Time 1 than did those attending without parents. These differences were no longer significant at Time 2. The effect size for risky driving behavior was slightly greater for the group attending without parents.



**Table 2. Differences in Risky Driving Behavior and Parental Management Based on Parental Attendance**

Variable	Time 1		Time 2		df	t	p	Cohen's d
	M	SD	M	SD				
<i>Risky driving behavior</i>								
Parents not attending	70.33	63.52	53.03	55.86	66	2.62	.011	0.29
Parents attending	53.44	58.10	39.16	57.98	102	2.05	.043	0.25
<i>Parental management – Control</i>								
Parents not attending	21.23	4.94	23.20	4.19	65	-3.97	.000	0.43
Parents attending	24.01	3.48	24.15	4.16	102	-0.42	.674	
<i>Parental management – Restrictions</i>								
Parents not attending	14.87	3.72	16.03	3.49	67	-2.98	.004	0.32
Parents attending	16.82	2.78	16.98	3.20	104	-0.56	.579	

### Predicting Risky Driving Behavior

Pearson correlation coefficients indicated significant ( $p < .05$ ) relationships between risky driving behavior at Time 2, parental management practices at Time 2, and other background variables. Current age was positively related to risky driving behavior ( $r = 0.22$ ) and age at first citation ( $r = 0.19$ ) and negatively related to parental control ( $r = -0.20$ ) and parental restrictions ( $r = -0.35$ ). Risky driving behavior was negatively related to parental control ( $r = -0.31$ ) and parental restrictions ( $r = -0.32$ ). It was positively related to frequency of driving per week ( $r = 0.21$ ) and risky driving behavior at Time 1 ( $r = 0.41$ ).

A multiple regression model incorporated variables of sex, current age, age of first citation, parental attendance at CARTEENS, number of driving trips per week, risky driving behavior at Time 1, and parental control at Time 2 to predict risky driving behavior at Time 2. Due to the high correlation between parental control and parental management ( $r = 0.80$ ), only parental control was included in the model. Results indicated that the model significantly predicted risky driving behavior at Time 2 [ $F(7, 150) = 6.35, p < .001$ ]. Adjusted  $R^2$  for the model was 0.23. Significant relationships were found for risky driving behavior at Time 1 and parental control at Time 2. Youths with higher levels of risky driving behavior at Time 1 had higher levels of risky driving behavior at Time 2, and youths with higher levels of parental control had fewer risky driving behaviors.

**Table 3. Regression Analysis Results for Risky Driving Behaviors After Completion of the CARTEENS Program**

<b>Variable</b>	<b>B</b>	<b>SE B</b>	<b><math>\beta</math></b>	<b><i>t</i></b>	<b><i>p</i></b>
Sex	-5.02	8.44	-0.04	-0.59	.550
Age	12.18	7.33	0.13	1.67	.098
Age at first citation	1.17	3.13	0.03	0.37	.710
Parental attendance at CARTEENS	-3.83	8.86	-0.03	0.43	.667
Frequency of driving	0.47	0.36	0.10	1.30	.199
Risky driving behavior Time 1	0.28	0.08	0.28	3.62	.000
Parental control Time 2	-2.81	1.04	-0.20	-2.71	.008
<b>Model Statistics</b>					
Intercept	120.52	123.77			
<i>F</i> Value	6.35				
<i>R</i> <sup>2</sup>	0.23				

Note: *n* = 158

### Discussion and Conclusions

This study examined the impacts of an adolescent driver intervention program, the Ohio 4-H CARTEENS program, for youths who have received their first traffic citation. Inexperienced drivers often engage in risky driving behaviors, and the goal of this program is to help young drivers understand the responsibilities of driving and learn safe practices. Of particular interest is the role of parental attendance at the program. Does mandatory parental attendance make a difference in reducing risky driving behaviors?

Overall, the participating youths reported a reduction in hazardous driving practices, particularly control violations, speeding violations, lane use violations, and distracted driving (e.g., cell phone use and text messaging). These were the most common violations reported by the youths. Thus, it appears that this program may be one component that helps reduce those risky driving behaviors adolescents are most likely to commit.

The findings with parents were not as expected. While risky driving behaviors decreased for youths attending with and without parents, slightly stronger effects were found for those attending without parents. Furthermore, parental management practices significantly increased only for youths attending without parents. It was expected that if parents were exposed to the program content, they would increase their awareness of driving risks and modify their practices of monitoring and controlling their children's driving behavior.

Several possibilities may explain these findings. First, there may have been an influence of parental attendance on the reporting of management practices. The practices were self-reported

by the adolescents, not the parents. Given that parents were present in the room when the initial survey was completed, there may have been a tendency to overestimate—or report more frequently—oversight by parents. Indeed, those attending with parents reported significantly higher management practices than those attending without parents at Time 1. The surveys at Time 2 were mailed to the youths and may or may not have been completed in the presence of a parent. Second, the program was designed to focus on changing youth attitudes and behaviors, not those of parents. Perhaps intentional content or instruction for parents was needed to provide an effect for this group. Third, since the program is designed to be peer-led by adolescents for other adolescents, it is unknown how the dynamics of the program may change when parents are present. Fourth, participants with parents who attended 4-H CARTEENS reported higher levels of parent management at Time 1 than participants with parents not attending. Therefore, one is less likely to see a difference in parent management between the two groups, and an increase in parent management may simply be a result of their teen driver getting a traffic violation.

The regression model predicting risky driving behaviors at Time 2 explained a modest amount of the variance with an  $R^2$  value of 0.23. Understandably, the amount of risky driving behaviors at Time 1 had a significant influence, as did parental control at Time 2. Age, age at first citation, sex, parental attendance, and the amount of driving did not have a significant impact. One implication would be the importance of teaching youths and their parents more about unsafe driving practices before licensure. Another implication is to explore how to enhance parental controls of driving, such as monitoring and keeping track of safe driving (Hartos et al., 2002).

### **Limitations**

There are several limitations to this study. First, sample size was limited, and not all participants completed the follow-up survey. All youths participated in the program (i.e., there was no comparison group that did not participate); thus, we do not know if the decrease in risky driving behaviors was due to the program, receiving the citation, or other factors. Without a comparison group of first-time traffic offenders who did not participate in CARTEENS, this study was not able to control for the likely situation that parents are upset with the teen driver for getting a ticket, having to pay a fine, and increasing insurance rates.

Other limitations include that the data were self-reported by the youths and that there were possible inaccuracies in estimates of behaviors over the past month. This method was used in past research (Donovan, 1993) and deemed acceptable for the purposes of this study. In the future, other recording methods could improve accuracy. Follow-up over longer periods of time and using recidivism data for second or third citations would be beneficial.

## Future Directions

For future studies, additional post-tests can help delineate whether program effects are retained over time. The two post-test evaluations could be used to demonstrate the information and methods taught and the retention of the materials by the teens required to attend the 4-H CARTEENS program.

This study indicates promise for adolescent driver intervention programs. The role of parents in such a program needs further investigation, as does understanding what predicts and prevents risky driving behaviors among youths.

## References

- Ary, D., Jacobs, L. C., & Razavieh, A. (2002). *Introduction to research in education* (6<sup>th</sup> ed.). Belmont, CA: Wadsworth Thomson Learning.
- Cropper, R. J. (1999). "Ohio 4-H CARTEENS": Peer intervention safety program. *Journal of Extension*, 37(2), Article 2IAW3. Retrieved from <http://www.joe.org/joe/1999april/iw3.php>
- Donovan, J. E. (1993). Young adult drinking-driving: Behavioral and psychosocial correlations. *Journal of Studies on Alcohol*, 54(5), 600–613.
- Dula, C. S., & Geller, E. S. (2003). Risky, aggressive, or emotional driving: Addressing the need for consistent communication in research. *Journal of Safety Research*, 34(5), 559–566. doi:10.1016/j.jsr.2003.03.004
- Ferguson, S. A. (2003). Other high-risk factors for young drivers: How graduated licensing does, doesn't, or could address them. *Journal of Safety Research*, 34(1), 71–77. doi:10.1016/S0022-4375(02)00082-8
- Fleiter, J. J., Lennon, A., & Watson, B. (2010). How do other people influence your driving speed? Exploring the 'who' and the 'how' of social influences on speeding from a qualitative perspective. *Transportation Research Part F: Traffic Psychology and Behaviour*, 13(1), 49–62. doi:10.1016/j.trf.2009.10.002
- Fraenkel, J. R., & Wallen, N. E. (2003). *How to design and evaluate research in education* (5<sup>th</sup> ed.). New York, NY: McGraw-Hill
- Groeger, J. A. (2006). Youthfulness, inexperience, and sleep loss: The problems young drivers face and those they pose for us. *Injury Prevention*, 12(Suppl I), i19–i24. doi:10.1136/ip.2006.012070
- Hartos, J. L., Beck, K. H., & Simons-Morton, B. G. (2004). Parents' intended limits on adolescents approaching unsupervised driving. *Journal of Adolescent Research*, 19(5), 591–606. doi:10.1177/0743558403260007

- Hartos, J., Eitel, P., & Simons-Morton, B. (2002). Parenting practices and adolescent risky driving: A three-month prospective study. *Health Education & Behavior, 29*(2), 194–206. doi:10.1177/109019810202900205
- Hassan, H. M., & Abdel-Aty, M. A. (2013). Exploring the safety implications of young drivers' behavior, attitudes and perceptions. *Accident Analysis & Prevention, 50*, 361–370. doi:10.1016/j.aap.2012.05.003
- Hoover, A. B., & Weisenbach, A. (1999). Youth leading now! Securing a place at the table. *New Designs for Youth Development, 15*(3), 29–36.
- Iliescu, D., & Sârbescu, P. (2013). The relationship of dangerous driving with traffic offenses: A study on an adapted measure of dangerous driving. *Accident Analysis & Prevention, 51*, 33–41. doi:10.1016/j.aap.2012.10.014
- Jordan, J. L. (2008). *4-H CARTEENS of Butler County: National 4-H Urban Program of Distinction*. Paper presented at the Galaxy III Conference, Indianapolis, IN.
- Lee, C., & Abdel-Aty, M. (2008). Presence of passengers: Does it increase or reduce driver's crash potential? *Accident Analysis & Prevention, 40*(5), 1703–1712. doi:10.1016/j.aap.2008.06.006
- Lee, F. C. H., & Murdock, S. (2001). Teenagers as teachers programs: Ten essential elements. *Journal of Extension, 39*(1), Article 1RIB1. Retrieved from <http://www.joe.org/joe/2001february/rb1.php>
- Lin, M., & Fearn, K. T. (2003). The provisional license: Nighttime and passenger restrictions – A literature review. *Journal of Safety Research, 34*(1), 51–61. doi:10.1016/S0022-4375(02)00081-6
- National Highway Traffic Safety Administration (2005). *Traffic safety facts 2005: A compilation of motor vehicle crash data from the fatality analysis reporting system and the general estimates system*. Washington, DC: National Highway Traffic Safety Administration.
- National Institute of Mental Health. (2011). *The teen brain: Still under construction* (NIH Publication No. 11-4929). Retrieved from <http://www.nimh.nih.gov/health/publications/the-teen-brain-still-under-construction/index.shtml>
- Simons-Morton, B. (2007). Parent involvement in novice teen driving: Rationale, evidence of effects, and potential for enhancing graduated driver licensing effectiveness. *Journal of Safety Research, 38*(2), 193–202. doi:10.1016/j.jsr.2007.02.007
- Simons-Morton, B. G., Cheon, K., Guo, F., & Albert, P. (2013). Trajectories of kinematic risky driving among novice teenagers. *Accident Analysis & Prevention, 51*, 27–32. doi:10.1016/j.aap.2012.10.011
- Simons-Morton, B. G., Hartos, J. L., Leaf, W. A., & Preusser, D. F. (2006). Increasing parent limits on novice young drivers: Cognitive mediation of the effect of persuasive messages. *Journal of Adolescent Research, 21*(1), 83–105. doi:10.1177/0743558405282282

- Simons-Morton, B., & Ouimet, M. C. (2006). Parent involvement in novice teen driving: A review of the literature. *Injury Prevention, 12*(Suppl 1), i30–i37. doi:10.1136/ip.2006.011569
- Simons-Morton, B. G., Ouimet, M. C., Zhang, Z., Klauer, S. E., Lee, S. E., Wang, J., Albert, P. S., & Dingus, T. A. (2011). Crash and risky driving involvement among novice adolescent drivers and their parents. *American Journal of Public Health, 101*(12), 2362–2367. doi:10.2105/AJPH.2011.300248
- Steinberg, L. (1987). Familial factors in delinquency: A developmental perspective. *Journal of Adolescent Research, 2*(3), 255–268. doi:10.1177/074355488723006
- Vingilis, E., & Adlaf, E. (1990). The structure of problem behavior among Ontario high school students: A confirmatory-factor analysis. *Health Education Research, 5*(2), 151–160. doi:10.1093/her/5.2.151
- Williams, A. F. (2003). Teenage drivers: Patterns of risk. *Journal of Safety Research, 34*(1), 5–15. doi:10.1016/S0022-4375(02)00075-0

*James L. Jordan*, Ph.D., is a retired Extension Educator and County Director in 4-H Youth Development at The Ohio State University. His research interests are in parent management of teen drivers.

*Kristi S. Lekies*, Ph.D., is an Assistant Professor and Extension Specialist in Environmental and Natural Resources at The Ohio State University. Her research focuses on experiences of place in community and natural environments with a special emphasis on children and youth from early childhood through young adulthood.

*Scott D. Scheer*, Ph.D., is a Professor in the Department of Agricultural Education, Communication, and Leadership at The Ohio State University, with a partial appointment in The Ohio State University Extension. His research interests are in outreach education and youth development.

### **Acknowledgements**

We thank Dr. David Andrews for his expertise with the data analysis and research methods. Support was provided by the Ohio 4-H Foundation to purchase incentive gas cards for teens who completed the questionnaire.