PARENTAL MANAGEMENT OF TEEN DRIVERS AFTER RECEIVING THEIR FIRST TRAFFIC CITATION AND HAVING ATTENDED THE 4-H CARTEENS PROGRAM

DISSERTATION

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By

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ABSTRACT

The United States is a vehicle-dependent society and allows teens to obtain drivers licenses at age 16 or younger. Many factors have been linked to teen risky driving behaviors that resulted in teens receiving their first citations.

This was the first study to investigate parental management of teens after they received their first citations for risky driving behaviors and the effect of parent attendance at 4-H CARTEENS, a remedial program developed by The Ohio State University Extension (4-H Youth Development program), Ohio State Highway Patrol, and the county juvenile justice system.

The study used a quasi-experimental design to analyze 243 teen drivers in attendance at 4-H CARTEENS who responded to a survey about risky driving behaviors, parental control, and parental restrictions; 187 respondents completed the study.

Most of the teens were 17 years old (55%), male (51%), and White (92%), and most were high school juniors and seniors who had received their drivers license at age 16 (86%). The most frequent risky driving behavior was “driving distractions,” and the least frequent was “substance abuse driving.”

Young male drivers reported more risky driving behaviors on average (29 more times per month) than did females. The teen drivers indicated that their parents ensured they had enough practice driving before getting their license. They strongly agreed with the restriction of not drinking and driving. The teen drivers responded more in agreement to parent control issues than parent restrictions. Parent management for control and restrictions was related to reducing risky driving behaviors. As teens advanced in school and drove more frequently per week, their risky driving behaviors increased. The data showed a reduction in risky driving behaviors from Time 1 to Time 2 with a medium effect after the teens attended the 4-H CARTEENS program. 4-H CARTEENS had a medium effect for reducing risky driving behaviors in the areas of speeding, lane use, and vehicle control. 4-H CARTEENS counties with parents attending reported fewer risky driving behaviors than did those counties without parents attending. The regression analysis indicated that more parent management control and less frequency of driving per week predicted a reduction of risky driving behaviors.

Overall, this investigation found that the 4-H CARTEENS program reduced teens' risky driving behaviors. Future studies should replicate this study using a larger sample size involving more 4-H CARTEENS counties to assess the program in reducing risky driving behaviors and measure the importance of parents attending the 4-H CARTEENS program with their teens.

Dedication

My work on this research is dedicated to

my parents, Vetha M. and the late Lawrence R. Jordan, and my

best friend, roommate, and constant supporter, Anthony J. Puchley.

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CHAPTER 1

INTRODUCTION

Introduction

The United States is a highly vehicle-dependent society with a long tradition of allowing driver licensing at age 16 or younger in most states (Simons-Morton, Hartos, Leaf, & Preusser, 2006). With that dependence, inexperienced teen drivers demonstrate risky driving behaviors that put themselves, their passengers, other motorists, and personal property at risk. Risky driving behaviors performed by inexperienced teen drivers include but are not limited to speeding, running a red light or stop sign, lack of clear distance, failure to yield, failure to control, and having no drivers license. Motor vehicle crashes are the major cause of death and disability among teens age 16-20, resulting in more than 5,000 deaths annually (Beck, Hartos, & Simons-Morton, 2002; Hartos, Beck, & Simons-Morton, 2004; Hartos, Eitel, Haynie, & Simons-Morton, 2000; Hartos, Eitel, & Simons-Morton, 2001, 2002; Simons-Morton, 2007; Simons-Morton & Hartos, 2003; Simons-Morton, Hartos, & Beck, 2004; National Highway Traffic Safety Administration, 2005). Obtaining a drivers license in the United States is a rite of passage for teens (Hartos et al., 2004) and in

some cases not the best choice given the maturity level of the teen. This is the time when most teens develop risky behaviors and risky driving behaviors.

Parents of teens are gatekeepers for deciding when the teen receives driving privileges. Parents are ambivalent about teen driving and concerned about the risks involved in teen driving (Hartos et al., 2004) but interested in reducing the time they spend transporting teens (Simons-Morton & Hartos, 2003). Hence, increasing parental management of teen driving privileges may require changes in parental perceptions of risky teen driving and the benefits, acceptability, and effectiveness of parental restrictions (Simons-Morton et al., 2006). There is growing interest in promoting increased parental involvement in teen driving (Hartos et al., 2004).

Teen driver intervention programs exist across the United States. One program that has had some documented successes (Chesnick, 2002; Corbin, 1999; Cropper, 1999; Cropper et al., 1994; Shipe, 2006) in the State of Ohio is called 4-H CARTEENS, is a peer educational program that focuses on four or five skill stations of the most common risky driving behaviors that cause teens to receive their first traffic citations. 4-H CARTEENS is a 2-hour educational intervention program consisting of educational modules selected by local juvenile courts, the State Highway Patrol, and teen volunteers from skill stations (i.e., Ohio laws and traffic signs, speeding, seat belts, weather conditions, inattentive driving, reckless operation, operating a vehicle under the influence, etc.) and court-ordered speakers fulfilling community service hours or parents who have lost teens to driving crashes.

Not all 4-H CARTEENS programs are similar but are designed by local counties to meet the needs of the teen risky driving behaviors performed most frequently there. Most of the teens are court-ordered to the program because of a driving citation. In one 4-H CARTEENS county, the juvenile court data revealed a reduction in the recidivism rates of teens who were mandated to attend the program (Butler County Juvenile Court, 2006). Additionally, the same data collected showed the number of days of recidivism had increased from 33 days to 111 days (Butler County Juvenile Court, 2006). Eleven of the 44 4-H CARTEENS counties require parents to attend the program. This study reviewed the impact 4-H CARTEENS has on altering risky driving behaviors by teens. In addition, the study examined the impacts on risky driving behaviors and changes in parental management when parents attended the program with their teen.

Statement of the Problem

Many factors have been linked to risky driving behaviors that result in the teen receiving their first driving citation. Sixteen-year-old drivers have a larger proportion of rollover crashes than do individuals of any other age (COMSIS Corporation and The Johns Hopkins University, 1995; Evans, 1991). Higher rates of crashes and risky driving behaviors among teens also are attributable to their lack of driving experience and judgment and propensity for risk-taking behaviors (Beck et al., 2002). COMSIS Corporation and The Johns Hopkins University (1995) and McKnight and Resnick, (1993) reported that teens who owned cars tended to drive smaller and older vehicles

and were less likely to demonstrate risky driving behaviors than vehicles driven by teens who did not own the vehicles they drove regularly, thus teens not owning their vehicles were more likely to demonstrate risky driving behaviors. Teens who had ridden with a drunk driver were less likely to use a seat belt, more like to smoke, more likely to drink alcohol, more likely to drink alcohol and drive, less likely to use contraceptives, and less likely to use condoms to prevent sexually transmitted diseases (Jelalian, Alday, Spirito, Rasile, & Nobile, 2000; Petridrou, Zavitsanos, & Dessypris, 1997). In addition, risky driving behaviors included drug use and driving, and other practices such as speeding, following other cars too closely, passing at intersections, driving through yellow lights, and sudden lane changes (Donovan, 1992). Males also may rate dangerous driving behaviors as less serious than females (Brown & Copeman, 1975; DeJoy, 1992) and were less anxious about crashes (Barjonet, 1988). Williams (2003) noted that young males had higher crash rates than did young females, but these differences were not large. Teen risky driving behaviors are examined in this study.

Beck et al. (2002) noted that, apart from regulatory policies, parenting was a potentially important source of social influence on teen driving. Parents were the gatekeepers for time of licensure, setting driving times, distances driven, passengers being transported, and vehicle maintenance. Parents served as a monitor for teen driving because they were required to supervise the teen during the 50 hours of practice driving. Nonetheless, parents appeared to exert less control over teen driving than might have been expected and that was consistent with safety (Beck et al., 2002).

Parents signed their teen's driving privileges stating they were taking full responsibility for the teen's actions behind the wheel.

Parental management was important in teen independent driving. Research showed that lenient parent restrictions placed on teen driving, especially in terms of allowing teen passengers, were related to decreases in teen risky driving, traffic violations, and crashes (Hartos et al., 2000; Hartos et al., 2001; Hartos et al., 2002; Hartos et al., 2004). Researchers have not considered the parental management of teen drivers after the teen received their first citation. Research of parental management in areas of control and restriction, this study provides data that will enhance the call by published researchers for more research on parental management of teen drivers (Beck et al., 2002; Hartos et al., 2000; Hartos et al., 2002; Hartos et al., 2004; Hartos Simons-Morton, Beck, & Leaf, 2005; Simons-Morton, 2007; Simons-Morton et al., 2004; Simons-Morton & Hartos, 2003; Simons-Morton et al., 2006;). In addition, this study can provide useful information and practices that can be incorporated into other teen driving programs across the country.

Simons-Morton (2007) noted that driving was like other complex, skilled behaviors in which subtle improvements in perception and judgment developed gradually over a period of years. Teen driver intervention programs were designed to decrease the risky driving behaviors demonstrated by the inexperienced teen. Given the limits of training, safety effects could best be achieved by countermeasures that delayed licensure or limited novice teen driving under high risk driving conditions, while novices gained experience and developed safety competence (Simons-Morton,

2007). Simons-Morton et al. (2004) noted that Checkpoints initially was designed to increase parental management of teen driving through the use of persuasive communications – educational materials that altered salient beliefs or attitudes that motivated behavior and presented target behaviors as widely accepted. The Checkpoints program results have shown more strict driving limits, lowering driving outcomes (i.e., risky driving, violations, and crashes), and safe driver programs (i.e., driving rules, participating in setting driving rules, written contract, riding with other youths, and driving under the influence of alcohol) (Haggerty, Fleming, Catalano, Harachi, & Abbot, 2006; Simons-Morton & Hartos, 2003; Simons-Morton, Hartos, & Beck, 2004; Simons-Morton et al., 2005; Simons-Morton et al., 2006.

Graduated Drivers license (GDL) programs increased the safety of teenage drivers by delaying teenage licensure and restricting high-risk teenage driving in various ways–raising the ages at permit and licensure, increasing the amount of practice driving required during the learner's phase, lengthening the time periods for learners and provisional phases, increasing parental concern about early driving, implementing night time driving curfews, establishing a zero tolerance policy for alcohol or other drugs, restricting teenage driving with teenage passengers or on high-speed roads, and requiring seat belt use (Beck et al., 2002; COMSIS Corporation & The Johns Hopkins University, 1995; Hartos et al., 2001; Hartos et al., 2004; Hartos et al., 2005; Simons-Morton et al., 2006c).

Ohio County juvenile court judges used intervention programs like Defensive Driving (an 8-hour, 1-day program) that focused on showing videos of crashes

attributable to speed, reckless operation and inattentive driving, guest speakers, and law enforcement as lecturers. The new driver Car Control Clinic sponsored by Cincinnati Teen Driving Fund was a 2-day intensive program about stopping, skidding, and avoiding crashes. The Teen Driving Clinic sponsored by Honda Corporation was a weekend program that taught teens how to avoid a crash, maneuvering in turns, and stopping distance. 4-H CARTEENS was a 2-hour 1-time intervention program for first-time traffic offenders covering the topics of speeding, seat belt usage, Ohio laws, traffic signs, inattentive distraction driving, reckless operation, and operating a vehicle under the influence.

4-H CARTEENS was developed in 1987 in Brown County, Ohio, through the efforts of a juvenile court judge who was concerned about the risky driving behaviors performed by teen drivers. The judge assembled and worked with county agencies to study ways to reduce the number of teens that were being injured and fatalities. The 4-H CARTEENS program was established and partners with The Ohio State University Extension (4-H Youth Development program), Ohio State Highway Patrol, and the county juvenile justice system. The 4-H CARTEENS program was created as an educational training for first-time traffic offenders.

Driver intervention programs for teens lacked formal state recognition or adoption with none including a component of parental involvement (Simons-Morton, 2007). GDL policies vary from state to state, and most are rated as acceptable but few if any are rated as good (Insurance Institute for Highway Safety, 2005). The Insurance Institute for Highway Safety (IIHS, 2005) noted a lack of qualified

instructors that taught the information rather than lectured to the participants, and company promotion of product was a priority to actually teaching safety education and reducing risky driving behaviors. This study is critical because there is a need for further development and evaluation of the effectiveness of 4-H CARTEENS and the role of parent attendance.

This study considered the impact that 4-H CARTEENS has on altering a teen's risky driving behaviors. In addition, the study examined the impacts on risky driving behaviors and changes in parental management when parents attended the program with their teen after they received their first citation. The analysis of the 4-H CARTEENS program was needed to determine if peer education programs were having an impact on reducing teen risky driving behaviors. By having parents attend 4-H CARTEENS programs, the assumption was that the adult parent recognized the responsibility and seriousness of signing the teen's diving privileges, resulting in improved parental management.

Conceptual Framework with Logic Model

The following logic model (Table 1) illustrates the 4-H CARTEENS program's components and objectives. The logic model diagram shows how a program was developed and evaluated using situations (need and assets), inputs (resources, contributions, investments that went into the program), outputs (activities services, events and products that reached people who participated or who were targeted), outcomes (results or changes for individuals, groups, communities,

organizations, or systems), program assumptions (the beliefs about the program, the people involved, the context, and the way people thought the program would work), and external factors (the environment in which the program existed included a variety of external factors that interacted with and influence the program action) for the success of the program.

Situation	Inputs	Output Activities	Output Participation	Outcomes Short Term	Outcomes Medium Term	Outcomes Long Term
Teen Risky Driving Behaviors Parental Management (control & restriction or no control and restriction)	OSU Ext. Staff Teen volunteers State Highway Patrol Juvenile Court Program Fees Program Resources Program Facilities	Program offering for county needs Program teaching stations subject matter Statewide in-service Guest speakers Pre-/Post-testing on teen driving Volunteer orientation Safety fair events – educational display Newsletters on teen driving issues	First-time traffic offenders mandated Parents mandated to attend in some counties Coalitions dealing with teen driving safety	Awareness of driving laws Knowledge of risky driving issues Changes in driving attitudes Skills of managing a motor vehicle safely Motivating parents to restrict and control teen driving	Increasing the time between first citation and second Parents taking a more active role in controlling teen driving activities Parents restricting teen driving behavior Reducing risky driving behavior with experience and age	Decreasing teen driving fatalities Reducing recidivism rates

Assumptions	External
• Teens learn to drive safely • Teens are monitored by parents	• Teens are taught driving properly by parents and driving schools • Parents are doing the required 50 hours

Table 1. Logic Model of the 4-H CARTEENS Program

The inputs of the program were the partnership of The Ohio State University Extension staff, state highway patrol presence at each program, mandates for attendance by the juvenile court system; set program fees to cover program expenses; program skill station resources available online through the state 4-H web site; a

centralized program facility that was handicap accessible; and teens serving as peer educators by volunteering their service to the program.

The outputs were the 2-hour 4-H CARTEENS program; continuously updated subject matter (i.e., road rage, seat belts, operating a vehicle while under the influence, driving distractions, road signs, speeding Ohio laws, cost of driving, and tire smart) and teaching methods to ensure learning for skill stations; statewide in-services to learn from other counties successes and challenges; fresh and inspiring guest speakers that articulated their message; a volunteer orientation so the teens volunteering had an appreciation of their importance to the program; sharing the message at safety events and fairs; and sharing information in a quarterly newsletter and a final written exercise that measured learning, knowledge gained, and change in attitude. The output participation consisted of juvenile courts mandating first-time traffic offenders, increasing parental management by mandating parents to attend the program (11 counties at the time of the present study), and having a place at the table on countywide coalitions that dealt with driving issues.

The outcomes were measured according to three levels – short term, medium term, and long term. The short-term outcomes were having an awareness of changes made in adolescent driving laws by communicating with state legislators pending or new teen driving laws; recognizing risky driving issues in the media, citations, and from law enforcement; measuring changes in driving attitudes by tracking recidivism rates; making unannounced inspections at schools by checking seat belt usage for safety week promotions; and motivating parental management by media coverage on

television and in the written sources. Medium-term outcomes were working with juvenile courts in reducing recidivism rates, measuring the time elapse between first and second citations by monitoring with law enforcement officials, encouraging parents to take a more active role in monitoring teen driving activities by having periodic phone surveys by teen volunteers, reducing risky driving behaviors by encouraging more driving experience and maturity, and encouraging teen driving restrictions by having teens report to parents risky behaviors through phone surveys or written notices with visual support (pictures). Long-term outcomes were for reducing the number of teen fatalities in a county to zero for more than one year and encouraging parent's supervision and restrictions on the teen driver if demonstrating mature responsibility.

The assumptions were that teens learned to drive safely through driver's education, parental supervision, and maturity, and that teen drivers were monitored by parents engaged in the teen learning to drive defensively. External factors that might have affected the teen driving factor were teens receiving proper driving instruction by driving schools and parental supervision driving times, and parents actually doing the mandatory 50 hours (40 daytime driving hours and 10 nighttime driving hours) of supervised driving time required by the State of Ohio before licensure.

Purpose and Research Questions

The study was a quasi-experimental design conducted in four Ohio counties with similar 4-H CARTEENS programs. A questionnaire was administered to the

teens in each of the four participating counties at the beginning of the 4-H CARTEENS program. Teen drivers were mandated to attend the 4-H CARTEENS program only once. One month after completion of 4-H CARTEENS program, participants were sent a follow-up questionnaire to determine any changes in their driving behaviors and parental management of their driving. The four counties' programs had a monthly attendance at the 4-H CARTEENS programs that were similar in size. Two of the counties were metro counties, and two were considerably more rural with a mid-size urban area. The proposal for this study consisted of 180 teens attending with parents and a comparison group of 180 teens attending without parents. Most were 16- and 17-year-olds, each receiving their first citation, and all being court-ordered to attend the 4-H CARTEENS driver intervention program. All had received their first citations, most were 16 and 17 years old, and all were court-ordered to attend the 4-H CARTEENS driver intervention program

The purpose of this study was to examine the influence of the 4-H CARTEENS program and parent management for reducing risky driving behaviors among teens. The analysis of the 4-H CARTEENS program helped determine if mandated parent participation in the 11 Ohio counties had an impact on monitoring teen driving behaviors and their parenting practices and skills as compared to the counties that did not mandate parent attendance. By having parents attend 4-H CARTEENS programs, the adult should realize that signing the teen's driving privileges were a responsibility to be taken seriously by improving parental management. Parental management might have contributed to a reduction in teens

receiving their second citation or decrease the percentage of recidivism in Ohio's counties. Improving parental management of teen driving might be the necessary tool to reduce the number of teen fatalities inasmuch as more than 5,100 deaths occurred annual from motor vehicle crashes that affected teens ages 16-19 years old (U.S. Department of Transportation, 2006).

The following research questions guided this study:

1. What are the risky driving behaviors of 4-H CARTEENS participants?

2. What are the parental management practices of parents of 4-H CARTEENS participants?

3. What are demographics and other driver characteristics related to risky driving behaviors of study participants with parent attendance?

4. Does 4-H CARTEENS attendance reduce risky driving behaviors?

5. What effect does parental attendance at 4-H CARTEENS play in reducing risky driving behaviors?

Research hypotheses were developed and derived from the literature review. The hypotheses predicted:

1. Risky driving behaviors will be prevalent among of younger youths at the time of their first citation and type of citation. Other personal characteristics are age, sex, race/ethnicity, school grade level, type of vehicle driven, age of vehicle, and age of first citation.

2. Teen drivers who complete 4-H CARTEENS program will reduce their risky driving behaviors.

3. Teens who attend the 4-H CARTEENS program with their parent/legal guardian will exhibit less risky driving behaviors than those youths who do not have a parent/legal guardian attending.

4. Parents will improve their driving management (control and restrictions) of their teens after they attend the 4-H CARTEENS program as reported by the teen driver.

To determine the accuracy of this study, the researcher assumed that teens in the study would provide honest answers to the questionnaire and an honest appraisal of their parents' parental management of their driving.

Definition of Terms

4-H CARTEENS. A partnership between The Ohio State University Extension, juvenile court judges, and Ohio State Highway Patrol for teen drivers after receiving their first citation (Cropper et al., 1994).

Cohen's d Effect Size. The difference between the means, M_1-M_2, divided by the standard deviations of either group (Cohen, 1988). Effect size was a name given to a family of indices that measured the magnitude of a treatment effect. Unlike significance tests, these indices were independent of sample size. Effect size measures were the common currency of meta-analysis studies that summarized the findings from a specific area of research (Lipsey & Wilson, 1993).

Driving Skills. The driving task "as a skilled activity with several distinct levels, hierarchically organized. It is usual to differentiate, from top to bottom, the

control (operational), maneuvering (guidance), and planning (navigational) levels" (Summala, 1987, p. 79).

Graduated Drivers License (GDL) Program. Policies that increased the duration of the permit phase, thereby somewhat delaying the age of licensure and introducing a provisional licensing stage that restricted for a time independent driving under high-risk driving conditions before full licensure (Ferguson, Leaf, Williams, & Preusser, 1996; McKnight & Peck, 2002; Simons-Morton & Ouimet, 2006).

Logic Model. A sequence of actions that described what the program was and would do – how investments link to results (University of Wisconsin-Extension, 2002).

Parental Management (Control). Setting and enforcing clear standards for behavior, actively monitoring and supervising children's activities, and making reasonable maturity demands on children (Beck et al., 2002).

Parental Management (Restrictions). Restricting limits on behavior, monitoring activities and whereabouts, involvement in daily life, and support of autonomy (Beck et al., 2002).

Risk Taking. Behaviors that directly or indirectly led to mortality or morbidity (COMSIS Corporation & The Johns Hopkins University, 1995; Irwin, 1993; Tonkin, 1987). Jessor (1992) defined risk taking as transcending physical health outcomes and referring to behaviors that could compromise the normal psychosocial development of the individual.

Risky Driving Behaviors. Part of an over-all teen problem behavior syndrome characterized by "unconventionality" or their orientations toward deviance or risky behaviors (Hartos et al., 2002).

Theoretical Orientation

This study was guided by the problem behavior theory and the social control theory. The researcher was not testing these theories but recognized them because they were the theories that guided this study and utilized by other researchers who developed the instruments used for this study.

The problem behavior theory as followed by Donovan (1992) demonstrated risky driving behavior performed by adolescents based on their social interaction with others and driving a motor vehicle. Donovan (1992) researched the risky driving behaviors of teen drivers at the time of licensure based on their responses to a questionnaire about their driving skills and risks of drinking and driving, drug use and driving, sensation seeking driving and aggressive driving. Hartos et al. (2002) noted that the problem behavior theory was most useful for studying risky driving behaviors and intervention programming. To support this theory, Hartos et al. (2002) cited risky driving may have had less to do with unconventionality and more to do with youthful inexperience and enthusiasm. As with other teen problem behaviors (e.g., substance use and deviance), teens' risky driving behaviors were linked to such individual characteristics as sensation seeking, low self-control, tolerance of social deviance, and having problem-behaving friends (Hartos et al., 2002), leading to their exhibiting risky

driving behaviors to impress peers. The problem behavior theory (Jessor, Turbin, & Costa, 1997) suggested that risky driving behavior was part of a constellation of problem behavior and (Shope & Bingham, 2002) posited that problem behaviors co-occur within individuals to form a problem behavior syndrome.

Simons-Morton and Hartos (2003) cited how the teen driver and their parent's management were linked to the social control theory. They used the social control theory as the foundation to measure teen driving skills and parental management at the time of licensure. Gottfredson and Hirschi's (1990) concept of parental management was an essential component of influencing self-control, wherein self-control was measured by crime or equivalent acts by the teen in risky behavior situations like driving. Hirschi's (1969) research noted the social control theory predicted teen behavior and posited that, without adequate motivation, individuals would fail to control to social rules and norms. Hartos et al. (2002) suggested that risky driving behaviors among teens were part of an overall adolescent problem behavior syndrome characterized by "unconventionality" or their orientation toward deviance or risky behaviors linking risky driving behaviors to the social control theory.

CHAPTER 2

REVIEW OF LITERATURE

Introduction

This review of literature provides a synthesis of the research that has been conducted in areas of risky driving behaviors of teens, parental management skills of teen drivers or other behaviors, parental monitoring literature, and the 4-H CARTEENS intervention program. Teenagers who have been exposed to risky driving practices were more accepting of risky driving behavior (Sarkar & Andreas, 2004) and generally demonstrated risky driving behaviors at times when they were compelled to impress peers. Much published research was devoted to the benefits of authoritative parenting on teens development (Hartos et al., 2002; Lamborn, Mounts, Steinberg, & Dornbusch, 1991); however, this study focused on parental management in the areas of control and restrictions of teen drivers. This chapter is organized as follows: (a) teen driving, (b) risky driving behaviors, (c) predictors of risky driving behaviors, (d) parental management, (e) 4-H CARTEENS, and (f) theories of risky driving behaviors and parental management

Teen Driving

Obtaining a drivers license is a rite of passage for teens to gain independence and autonomy (Hartos et al., 2000, 2002). Driver performance pertained to skills involved in the driving task, while driver behavior referred to the manner in which individuals actually drove (COMSIS Corporation & The Johns Hopkins University, 1995). When beginning to drive, teens performed the driving skills of steering, braking, and tracking under conscious control, and with more practice these driving skills became more automatic (COMSIS Corporation & The Johns Hopkins University, 1995). Teen driving issues identified two factors that contributed to high crash rates among teens, including age-related driving inexperience and teens' propensity for risk-taking behaviors (Committee on Injury and Poison Prevention and Committee on Adolescence, 1996; Hartos et al., 2000; Jonah, 1986, 1990; Young, 1993).

Driver distractions were involved in 16% of fatal crashes and 22% of injury crashes (National Highway Traffic Safety Administration, 2005). According to the Ohio Department of Public Safety (2008), specific behaviors were associated with teen traffic crashes, such as inexperience combined with speed, alcohol, and/or drug use; not wearing a seat belt; distracted driving (cell phone use, loud music, teen passengers, etc.); drowsy or nighttime driving. Although teen risky driving behaviors have been studied at the time of licensure, little to no research has been conducted after a teen's first citation.

Age-Related Driving Inexperience

Teens usually obtain a drivers license at the age of 16 and have access to motor vehicles. Simons-Morton (2007) concluded that some aspects of risk taking that may be understood in the context of inexperience as novices explored a vehicle's potential and their own by demonstrating risky driving behaviors that resulted in injury, fatality, or developing a learned behavior. Teens drove for the pleasure of being grown-up, but risky driving behaviors were a factor with their inexperience behind the wheel. Driving experience comes with exposure to more time driving, maneuvering in weather conditions, and making decisions that affect themselves and other drivers. Driving is an acquired skill that requires experience of driving a motor vehicle.

Williams (2003) concluded that driving in bad weather conditions would carry more risk for teens because of their inexperience. Simons-Morton (2007) reported that exposure was the most important factor in crash risk – the more one drives, the greater the risk of a crash. Teen inexperience error rather than chance were the primary occurrences for vehicle crashes. Lin, Huang, Hwang, Wu, and Yen (2004) determined that young people with driving inexperience and crash experience had higher risk-taking scores at the time of the initial assessment but that crash experience, in terms of its frequency, severity, and time elapsed since the most recent crash, did not significantly change their risk-taking paths over the study period. In general, novices exhibited less frequent and useful visual scanning performance than did experienced adults (Mourant & Rockwell, 1972), failed to identify and react to hazards (Pradhan, Fisher, & Pollatske, 2006), and utilized a greater cognitive

workload (Crundall & Underwood, 1998; Pattern, Kircher, Ostlund, Nilsson, & Svenson, 2006) under complex driving conditions.

Teens' Propensity for Risk-Taking Behaviors

Driving behaviors are manners that drivers perform while driving. Whenever a teen drives a motor vehicle, there is always some degree of risk that the teen might be involved or perform some aspect of risky driving behavior. Simons-Morton (2007) found that a long history of research compared novices with experienced drivers on a variety of driving performance measures. Ferguson (2003) noted that younger drivers tended to rate hazardous situations as less risky than did older drivers.

Teens develop risky behaviors long before they reach the age of legal driving by exploring or facing challenges in their pre-driving years. Developing or learning risky behaviors overall could lead to demonstrating risky driving behaviors while driving. Teen drivers have been found to be more dangerous than other driving groups. They may be more likely to speed and engage in other risky driving behaviors, make driving more complex, reduce safety margins, and increase the likelihood of a crash (Simons-Morton, 2007). It is not clear the extent to which this behavior is risk taking in the sense of thrill seeking and the extent to which it is normal learning behavior (Simons-Morton, 2007).

Many factors lead to teens demonstrating risky driving behaviors. Risky behaviors were developed at an early age during adolescence such as accepting a dare, willingness to try unsafe challenges from peers, and personality development

attributable to home environment or peer selections. From several research studies (Clark, Sommerfeldt, Schwartz, Hedeker, & Watel, 1990), COMSIS Corporation and The Johns Hopkins University (1995) formulated the relationship of teen personality factors that transcended into risky driving behaviors:

> 1. Risk taking is an unconscious manifestation of suicidal intent.
> 2. Individuals who tend to be impulsive and prone to deviant social behavior tend to be heavy used of intoxicating substances, which puts them at increased risk of risk taking and crashes.
> 3. Risk taking is a personality factor such as sensation seeking.
> 4. Adolescents engage in risk taking behaviors to attain status with their peers.
> 5. Risk taking as a failure to protect one's health or safety may be related to development arrest. (pg. 88)

Risky Driving Behaviors

Risk taking had several definitions, examples of which were drinking alcohol and driving, drug abuse and driving, acting hostile or aggressive, inexperience of operating a motor vehicle, not wearing a seat belt while driving, operating a vehicle that had too much power for the driving skill, driving a motor vehicle recklessly, and not obeying parents. In general, risk taking referred to behaviors that could potentially lead to some form of loss and the processes involved in making those behavioral choices. Risk taking in teens was equated with behaviors that directly or indirectly led to mortality or morbidity (Irwin, 1993; Tonkin, 1987). COMSIS Corporation and The Johns Hopkins University, (1995) cited increasing risk taking among youths appeared to be a critical factor in explaining the high crash incidence.

Sarkar and Andreas (2004) reported that in their study of traffic violators, 17% had driven drunk, 20.9% reported drag racing, 27.2% had driven recklessly, and 17.8% had taken illegal drugs while driving. Teens viewed driving a motor vehicle as a rite of passage into later adolescent development because it assured them independence and autonomy (Hartos et al., 2000, 2002). A driver's performance explained the skills-involved driving tasks, whereas a driver's behavior referred to the manner in which the teen controlled the car and its speed in new and challenging driving circumstances (Mayhew & Simpson, 1990).

High-risk driving by teens was considered a problem behavior likely to be predicted by other problem behaviors, such as alcohol use (Shope, Waller et al., 2001), illicit drug use (Barnes & Welte, 1988; Hingson, Heeren, Mangione, Morelock, & Mucatel, 1982; Swisher, 1988; Wechsler, Rohman, Kotch, & Idelson, 1984), hostility/aggression (Donovan, 1992), adolescents' problem driving (Jessor & Jessor, 1977), traffic violations and motor vehicle crashes (Doherty, Andrey, & MacGregor, 1998; Farrow, 1987; Ulmer, Williams, & Preusser, 1997; Williams, 1985; Williams & Preusser, 1997). The risky driving behaviors most frequently demonstrated by teen drivers were drinking and driving (Beck et al., 2002; Donovan, 1992; Shope, Raghunathan & Patil, 2003; Williams, 2003), drugs use and driving (Barnes & Welte, 1988; Hingson et al., 1982; Swisher, 1988; Wechsler et al., 1984), teens driving recklessly (Jessor & Jessor, 1977), and hostility and aggressive driving (Donovan, 1992). These risky driving behaviors have led to first-time driving citations (i.e., assured clear distance, failure to control, failure to yield, improper lane

movement, no drivers license, reckless operation, lack of seat belt use, stop sign/light, traffic signs, and speeding).

Driving Recklessly

Risk-taking behaviors by teen driver warranted a broader view than highway safety. The risks occurred in the context of social, cultural, developmental and other influences. Behaviors like engaging in unprotected sexual intercourse, substance abuse, and reckless driving were considered risk-taking because they could be linked with specific morbidity and mortality (e.g., sexually transmitted disease, unplanned pregnancy, and death attributable to injuries) (Irwin, 1993). Risky driving behaviors referred to those patterns of driving behavior that placed drivers at risk for morbidity and mortality and that involved legal violations but did not involve alcohol or drug use (Jessor et al., 1997). The first year of licensure, a period of high crash rates (i.e., fender benders, significant damage to a vehicle, totally destroying a vehicle), has come to be known as the "novice young driver problem" (Simons-Morton, 2007).

Studies of teen driving behaviors revealed that teens were more likely than adults to engage in risky driving behaviors, such as speeding, running red lights, making illegal turns, riding with an intoxicated driver, and driving after using drugs or alcohol (Hingson et al., 1982; Jelalian et al., 2000). The risk taking most teens demonstrated behind the wheel of a motor vehicle was important, not because it led to illness or death but severely compromised a teen's mastery of normal developmental tasks and social role fulfillment abilities. Risky driving had less to do with

unconventionality and more to do with youthful inexperience and enthusiasm (Hartos et al., 2002). Teens' risky driving behaviors have been linked to individual characteristics such as sensation seeking, low self-control, tolerance of social deviance, and having problem-behaving friends (Hartos et al., 2002).

Teen drivers tended to engage in numerous risky driving behaviors because they felt independent and autonomous while operating the motor vehicle. Simons-Morton et al. (2005) noted that teenage drivers engaged in greater risky driving behaviors than did the general public (i.e., shorter headways, higher speeds), particularly in the presence of male teenage passengers, recognized as an acceptance factor or peer pressure, leading to risky driving behaviors that later became difficult to correct.

Teens exposed to risky driving behaviors were more likely to adopt some of those behaviors as their own and were more likely to attempt risky driving behaviors. West and Hall (1997) found that teen drivers more accepting of risky driving behaviors were more likely to engage in dangerous driving and were involved in more accidents. Teens who demonstrated problem behaviors usually performed risk acts when others were present to establish risky lifestyles or tasks. Human error was by chance, but research concluded that teen drivers had the potential to perform risky driving behaviors more often than any other age groups because of their inexperience and teen development. Risky driving behaviors may have accounted for some portion of the novice young drivers problems (Simons-Morton, 2007; Williams, 2003) that

they demonstrated in front of peers, leading to higher crash rates and citations for committing vehicular infractions.

Crash rates in the United States increased dramatically starting at about age 14 when teenagers begin to ride with other teenage drivers and then drive on their own, and these rates remained elevated relative to adult levels well into their 20s (National Highway Traffic Safety Administration, 2005). Driving at night, on the weekends, and with friends as passengers increased the likelihood of risky driving behavior, traffic violations, and motor vehicle crashes (Doherty et al., 1998; Farrow, 1987; Ulmer et al., 1997; Williams, 1985; Williams & Preusser, 1997).

Teen Drinking and Driving

Several studies examined teen drinking and driving. One study in particular (Beck et al., 2002) noted that approximately one-third of high school seniors were exposed to drinking and driving, either as a driver or as a passenger. There was no significant difference in the sex of the alcohol user. Younger adolescents' consumption of alcohol often occurred while attending parties, at social gatherings, or just driving around and led to a higher tendency to consume alcohol to establish relationships with or impress older peers. In addition, inexperienced teen drivers sought older peer acceptance and were more likely to drink and drive.

Beck et al. (2002) found that alcohol was a factor in 3% of property damage crashes, 4% of crashes where an injury occurred, and 21% of fatal crashes among drivers aged 15 to 20. Identified risk factors for crashes included teenage passengers

(Chen, Baker, Braver, & Li, 2000; Preusser, Ferguson, & Williams, 1998), use of alcohol (Donovan, 1992; Hyman, 1968), and time of day (Preusser et al., 1998) with the location of the crash being a strong factor. Williams (2003) noted that, although alcohol-impaired driving among teens was limited (i.e., they drank less, drove less, and consumed less alcohol than adults), alcohol use rendered teens more crash-prone than adults. Sarkar and Andreas (2004) noted that 55% of teen drivers reported exposure to risky driving by being in a car with a driver engaging in such activities as drunken driving, drag racing, and reckless driving. Limited research has been conducted on the low levels of parental management awareness of teen drinking and parental restrictions on teen drinking and driving (Hartos et al., 2002).

Teen Drug Use and Driving

Another risky driving behavior included drug (illegal and prescription) use and driving. Inexperienced teen drivers affected by drug use (either illegal or prescription) have put drivers or pedestrians in jeopardy because of their risky driving behaviors. Young adults and teens who more frequently drove after drinking also tended to drive after using marijuana and other illicit drugs, and they tended to violate a variety of other traffic laws (Donovan, 1992). Based on comments at 4-H CARTEENS programs, State Highway Patrol officers can tell when a teen was under the influence of controlled substance based on their risky driving behaviors, such as driving slowly, erratic driving, and crossing the lines on the highway. Shope, Waller et al. (2008) noted that when substance use and parental influences were included, different factors

remained important for each sex as to how parents reacted. In predicting serious offenses among young men, cigarette use, marijuana use, parental monitoring, and parental leniency regarding young people's driving remained important (Shope, Waller, et al., 2001), whereas parents were stricter on young females by monitoring their driving closer.

Teen Hostility, Aggression, and Driving

Driving an automobile could be used to express hostility and anger (Donovan, Umlauf, & Salzberg, 1988), as confirmed by 85% of participants reporting anger while driving on at least one occasion (Underwood, Chapman, Wright, & Crundall, 1999). Driving angry may have been directly related to accident liability. The high rate of dangerous driving by teenage drivers and the high rate of recidivism indicated that a strong deterrent was needed (Sarkar & Andreas, 2004), and the risky driving behaviors demonstrated by teens resulted in aggressive driving or hostility toward other drivers or themselves. Additionally, Sarkar and Andreas (2004) noted that 43% of young drivers having a traffic violation had been engaged in one or more of the risky driving behaviors at an average length of time of licensure of 12.7 months.

Predictors of Risky Driving Behaviors

Predictors of motor vehicle accident involvement have been widely studied. Kim and Bishu (2004) developed an approach to predict teen vehicle accidents based on a relationship between human cognitive abilities and driving behaviors. Their

constructs were perceptual style, selective attention, and perceptual-motor reaction time as they related information processing abilities and human error when driving.

There were several variables that led to teens demonstrating risky driving behaviors, most of which manifest as citations within a few months of licensure. These included the type and characteristics of the vehicle driven and the number of seat belts in the vehicle that were in working order. Race/ethnicity and sex were variables that had assumptions based on history of teen driver's skills. Teens took more care of motor vehicles when they were responsible for payments and maintenance. Age of the vehicle was also a factor. Teens with high academic achievements were more likely to demonstrate less risky driving behaviors, especially if they were female rather than male.

Age and First Citation

Age-related and experience-related predictors have been implicated in the elevated crash rates for young drivers (COMSIS Corporation and The Johns Hopkins University, 1995) in that 16-year-old drivers had a larger proportion of rollover crashes than did individuals of any other age (Evans, 1991). The crash rate was highest in the first month of licensure, dropped sharply during the next few months, and showed a slower decline during the next year and a half (Williams, 2003). As teens grew older, the likelihood of having a rollover crash decreased while side impact crashes increased because of failure to yield, failure to control, and assured clear distance.

Many teens received their first citation within the first year of driving if they practiced risky driving behaviors. In a study based on self-reported data from four U.S. states, McCartt, Shaboanova, and Leaf (2003) found that the likelihood of a first crash or first citation was higher during the first month than during any of the next 11 months. McCartt et al. (2003) noted that the likelihood of a first citation during the first year of licensure was double for males and nearly double for students with a C or D grade average versus those with an A or B average.

McCartt et al. (2003) cited a research study of 203 teenagers (23%) reported receiving such a citation, 33% of them receiving more than one post-licensure citation. The citations issued for the 203 teenagers were for speeding (66%), disobeying a red light or stop sign (10%), failing to buckle up (4%), and making an illegal turn (4%). Additionally, 54% were males, with 42% residing in suburban areas, 35% in rural areas, and 23% in urban areas. McCartt et al. (2003) concluded that students in urban areas or suburban areas were less likely than students in rural areas to receive a first citation attributable to less driving. The risky driving behaviors demonstrated most frequently by Ohio's teens were lack of assured clear distance (ACD), failure to yield (FTY), failure to control (FTC), lack of seatbelt or restraint usage, stop sign or red light violations, speed, and operating a vehicle without a drivers license.

Distractions result in teens causing property damage to people or other drivers and non-moving situations. Although Sarkar and Andreas (2004) reported that 14% of teen drivers believed it was never acceptable to use a cell phone while driving, most teen drivers used them, resulting in inattentionand increased teen fatalities.

Teenagers who had been exposed to risky driving practices were more accepting of risky driving behaviors (Sarkar & Andreas, 2004). Sarkar and Andreas (2004) found that teens demonstrated risky driving to show off to peers, to gain appreciation from peers, to duplicate some adult actions, and to master risk and overcome their own limitations. Motor vehicle crashes were the leading cause of death and injury among teenagers between the ages of 16 and 19 (Beck et al., 2002; Doherty et al., 1998; Hartos et al., 2004, 2000, 2001, 2002; Jonah, 1986; McCartt, Leaf, Farmer, Ferguson, & Williams, 2001; Morrisey & Grabowski, 2005; Simons-Morton et al., 2002; Simons-Morton & Hartos, 2003; Ulmer et al., 1997; Williams, 1985). Teen crash rates were higher than those of any other age group (Centers for Disease Control and Prevention, 1999; Cvijanovich, Cook, Mann, & Dean, 2001; Doherty et al., 1998; Jonah, 1986; Ulmer et al., 1997; Williams, 1985) and disproportionately high on weekends, with teen passengers, and at nighttime (Chen et al., 2000; Cvijanovich et al., 2001; Doherty et al., 1998; Farrow, 1987; Preusser et al., 1998; Ulmer et al., 1997; Williams, 1985). High crash rates among teens were attributed to their young age, lack of driving experience, and relative propensity for risky driving (Jonah, 1986, 1987; Romanowicz & Gebers, 1990). Drivers who had driving records with citations, crashes, or both generally could be considered as crash-prone drivers (Chandraratna, Nikiforos, & Stromberg, 2006).

Seat Belt Usage

Seat belts were perhaps the most important safety invention in automobile history and were an effective means of reducing the risk of an injury or death in a crash (Beck et al., 2002). While failure to wear a seat belt may not directly cause crashes, non-compliance places the driver and any passenger at higher risk of injury if involved in a crash (COMSIS Corporation and The Johns Hopkins University, 1995). Teenagers were less likely to use seat belts than older drivers, which greatly increased their risk of injury in a crash. Teens that have ridden with a drunk driver were less likely to use seat belts, more likely to smoke, more likely to drink alcohol, more likely to drink alcohol and drive, and less likely to use contraceptives to prevent sexually transmitted diseases (Jelalian et al., 2000; Petridrou et al., 1997), resulting in not taking precautions seriously. In addition, teens who engaged in such problem behaviors were less likely to engage in health-enhancing behaviors, such as wearing a seat belt (Hawkins, 1992).

Seat belt laws with primary enforcement allowed the police to cite motorists for not wearing seat belts rather than only citing them if they were also charged with some other driving violation (Morrisey, Grabowski, Dee, & Campbell, 2006). Studies examining seat belt usage among fatally injured teenage drivers indicated that seat belt use was lower in situations of higher crash risk, such as late at night or when drivers had consumed alcohol, increasing further the potential for injury (McCartt et al., 2003; Williams & Shabanova, 2002). Enforcement of seat belt laws have been shown to reduce motor fatality rates (Evans & Graham, 1991; Morrisey & Grabowski,

2005). Observational studies of teenagers reported lower use rates among males vs. females, passengers vs. drivers, passenger with teenage drivers vs. adult drivers, and occupants of pick-up trucks vs. cars (Williams, McCartt, & Geary, in press; Williams, Rappold, Ferguson, & Wells, 1997; Williams, Wells, & Lund, 1983, Womack, Trout, & Davies, 1997). Kmet and Macarthur (2006) concluded a lower prevalence of seat belt use in rural areas. The prevalence of seat belt use among drivers and front-seat passengers of light-duty vehicles (i.e., pick-up trucks) was about 69% in rural areas as compared with 89%. They found a lower prevalence of seat belt use in rural areas, especially in pick-up trucks, farm equipment, and large farm trucks. The State of Ohio has a set a standard for Ohio counties to have a compliance check with restraint usage at 80% (Ohio Department of Public Safety, 2008).

Vehicle Characteristics and Type

A few studies indicated that teenagers were more likely than the overall driving population to drive older and smaller vehicles, a factor that increased their chance of injury in the event of a crash (Cammisa, Williams, & Leaf, 1999; Williams, Preusser, Lund, & Rasmussen, 1987). Cammisa et al. (1999) found that, once licensed, 60% of teenagers most often drove vehicles different than the ones used for practice driving. Data showed that 28% of these teenagers changed from larger to smaller cars, 22% continued to drive the same size cars, 10% changed from smaller to larger cars, 20% changed vehicle type, and 1% continued to drive pick-up or utility vehicles.

Contributing to the risk from poor vehicle choice was that teenagers who owned their own vehicles drove more miles, reported more risky driving behaviors than non-owners, and reported more crashes (Cammisa et al., 1999). McKnight and Resnick (1993) reported that students who owned cars tended to drive smaller and older vehicles than did students who did not own vehicles.

Vehicle Ownership and Payments/Maintenance

Teen drivers respected their personal property more when they were owners of motor vehicles. Teens who owned their own vehicles and were making monthly payments demonstrated fewer risky driving behaviors because of personal pride and dependence on transportation. Cammisa et al. (1999) concluded that 37% of teenage owners bought the vehicles themselves, 34% received them as a gift, and 29% shared the cost with parents. There were various reasons for choosing the teenager's vehicle: already owned vehicle (38%), vehicle was cheap (22%), teenager wanted it (13%), small/maneuverable (10%), reliable (8%), large size (6%), gift (6%) (Cammisa et al., 1999).

In addition, Ferguson (2003) noted practical concerns versus teenager preferences when it came to choosing a teenager's vehicle, resulting in teenagers generally tending to drive the least safe vehicles. Rivara, Firvara, and Bartol (1998) found that factors most commonly rated important or very important in the purchase of a an additional vehicle for use by the student were insurance cost (93.6%), price (87.2%), repair record (84.7%), gas mileage (77.2%), presence of antilock brakes

(72.9%), presence of airbags (64.5%), and other safety features (84.4%). Teens who were responsible for the maintenance of the motor vehicle demonstrated fewer risky driving behaviors because they were solely responsible for paying for repair costs.

Sex

Sex differences played an important role in teen driving practices. There was some evidence that young men were more attached to the idea of driving than were young women (Stoddart, 1987), used the automobile more to enhance self-efficacy or self-image (Farrow & Brissing, 1990), and were more confident about their driving skills than were young women (DeJoy, 1992; Rothe, 1987; Stoddart 1987).

Males rated dangerous driving behaviors as less serious than did females (Brown & Copeman, 1975; DeJoy, 1992) and were less anxious about crashes (Barjonet, 1988). Male drivers showed a higher likelihood of being the at-fault driver in a future crash than did female drivers, another finding consistent with past research (Chandraratna et al., 2006). Males had higher crash fatality rates than did females for every age group per 100,000 population. Among the 16- to 20-year-olds and 21- to 24-year-olds, male fatality rates were more than twice as high as those for females (Chandraratna et al., 2006). Less proportional disparity occurred between sexes with injury rates, with females age 16 to 20 showing a slightly higher injury rate than did their male counterparts (COMSIS Corporation and The Johns Hopkins University, 1995).

Research studies consistently found that men (particularly young men) engaged in more illegal and risky driving behavior than did women, no matter what was measured, (Harré, Field, & Kirkwood, 1996). Over time, young women drivers changed their driving behavior and became increasingly similar to young men. Harré et al. (1996) noted that females made up an increasing proportion of the drivers killed in single vehicle night-time crashes. Ulleberg (2004) found that female passengers were most likely to speak out to the driver when feeling unsafe in the car and that males seemed to perceive more negative consequences of addressing unsafe drivers, to be less confident in their ability to influence an unsafe driver, to be more likely to accept risk taking from other drivers, and perceived less risk than did females. Young males were more likely to overestimate their driving ability (Gregersen & Bjurulf, 1996), and this overconfidence was shown to be correlated with increased risk-taking behavior resulting in accidents and violations (Elander, West, & French, 1993). Williams and Shabanova (2003) determined that the youngest drivers had the highest crash rates, rates declined with age, and males had higher rates than did females in all age categories.

Male drivers showed a higher likelihood of being the at-fault driver in a future crash than were female drivers (Chandraratna et al., 2006), and male drivers attempted to take more driving risks, influenced by movies, television, and observing other teen drivers. Zhao et al. (2006) reported on self-reported collisions among young drivers that female drivers were more likely to be involved in collisions than were male

drivers. Roles were changing, and it may have been that risk seeking was considered by women as a more appropriate way of behaving.

Race/Ethnicity

There was little published information about the relationship of crash/fatality rate to ethnicity or race. Only two relevant sources were found during the conduct of this literature review. Baker, O'Neill, Ginsburg, and Li (1992) reported that Native Americans as a group (all ages combined) had the highest crash fatality rate compared to other ethnic and racial groups. They also found age-related differences among groups in the pattern of fatality rates. Fatality rates peaked between the ages of 15 to 24 for Whites and between ages 20 to 24 for Native Americans and Blacks. Popkin and Council (1991) examined the race/ethnicity issues from a slightly different perspective and found that alcohol-related crash rates were lower for Whites than for a group of non-Whites that was predominately Black in all age groups studied with the exception of younger drivers (16 to 24).

Age of Licensure

Williams (2003) noted that the "learner stage" was a period of low crash risk. This was understandable because driving during this stage was generally under the supervision of a parent, driving instructor, or other adult; exposure was relatively low; and higher risk conditions were generally avoided. Driving was particularly dangerous during the first year of licensure, with highly elevated crash rates during the

first month of independent driving, declining rapidly for about six months and then more slowly over time (Simons-Morton, 2007) as the teen driver increased the amount of time driving and gained experience. Sixteen-year-old drivers had a larger proportion of rollover crashes than did individuals of any other age (Evans, 1991). Rural and suburban teens had a greater possibility of learning to operate and manage a motorized vehicle at an earlier age than did most urban teens. Rural and suburban teens learned to operate a motorized vehicle by driving a farm tractor, riding lawn mower, all terrain vehicles (ATV), or a go-cart. Kmet and Macarthur (2006) found that, in both the rural and urban areas, motor vehicle crash injury rates (deaths and hospitalizations) were considerably higher among youths 15 to 19 years of age, compared to younger children who were passengers in motor vehicles. In both areas, the rates were highest among 15- to 19-year-old males with rural males 10 times more likely to die in motor vehicle crashes (Kmet & Macarthur, 2006). Urban data showed an increase relative risk (males versus females) for motor vehicle crash fatalities among teens only (Kmet & Macaruthur, 2006).

Age-related and experience-related factors have been implicated in the elevated crash rates for youthful drivers (COMSIS Corporation and The Johns Hopkins University, 1995). Finn and Bragg (1986) found that drivers, particularly younger drivers, were more likely to engage in risky driving when they perceived such driving as non-risky. Regarding crashes per license holder, Williams (2003) noted that 16-year-olds had the highest rate of any age group, and 16- to 19-year-old drivers exceeded drivers of any older ages for both fatal crashes and all crashes. Williams

(2003) showed that young males had higher crash rates than did young females, but these differences were not significant (for 16-year-olds, about 1 in 5 crashes, both males (21%) and females (18%). According to Kmet and Macarthur, (2005), in both rural and urban areas, motor vehicle crashes injury rates (deaths and hospitalizations) were considerably higher among youths 15- to 19-years of age, compared to younger children. In both areas, the rates were highest among 15- to 19-year-old males. Teen fatality rates, however, continued to be 3 to 4 times higher than for middle-aged cohorts (Morrisey et al., 2006).

Parental Management of Driving Behavior

Hartos et al. (2002) defined parental management as monitoring (i.e., knowing where teens were and what they were doing) and behavioral control (i.e., having rules and expectations about teens behavior) as impacting teens responsible driving. Researchers (Beck et al., 2002; Hartos et al., 2004, 2000, 2001, 2002, 2005; Lamborn et al., 1991; Simons-Morton, 2007; Simons-Morton & Hartos, 2003; Simons-Morton et al., 2004; Simons-Morton et al., 2006b, 2006c) found that parental managing of teen driving was not thoroughly examined, but much research was devoted to the benefits of authoritative parenting on overall youth development.

Democratic parenting was characterized by a clear statement of rules, use of reasoning, and allowing children to participate in setting rules (Aquilino & Supple, 2001), thus giving the child a say in disciplinary actions if cited for risky driving behaviors. Parents who regularly had not monitored their teen's activities were at risk

of allowing developmental problems to emerge, resulting in risky behaviors that could promote adolescent developmental challenges. Parental restrictiveness and/or supervision during adolescence was associated with lower levels of alcohol consumption and binge drinking in young adulthood (Aquilino & Supple, 2001) and other risky behaviors, especially driving. Parental control had more long-lasting influence on sons' and daughters' risk-taking behavior than did parental support (Aquilino & Supple, 2001).

Parents had a substantial opportunity to effect safe teenage driving because they were involved in their teenagers' driving from the beginning, teaching them to drive and governing their access to vehicles (Hartos et al., 2004, 2001, 2002; Simons-Morton et al., 2006a), and establishing ground rules for risky driving behaviors. Simons-Morton (2007) found professional driver's training and parent-supervised practice driving were necessary and useful for novices to manage a vehicle and develop an appreciation for the risks involved. Additionally, substantial independent driving experience provided the type of experiences and feedback that led to competent and safe driving. A review by Simons-Morton and Ouimet (2006) concluded that risky driving, traffic violations, and crashes were lower among teens whose parents set limits on initial driving privileges. Nonetheless, once the teen had some experience behind the wheel of a vehicle, they developed driving habits that were risky both to themselves and others on the roads. Furthermore, these problem behaviors were related to risky driving behaviors (Donovan, 1992; Jessor, 1987a; Vingilis & Adlaf, 1990).

Parental Management: Control

Parental support and control were the two key factors for understanding how parenting influenced development outcomes (Maccoby & Martin, 1983; Rollins & Thomas, 1979) of teens, especially when it came to parental management. Research found that supportive parenting was linked to adolescent self-esteem (Dekovic & Meeus, 1997; Hoelter & Harper, 1987; Parker & Benson, 2004; Rice, 1990; Spoth, Redmond, Hockadaya, & Yoo, 1996). According to Hartos et al. (2002), parent monitoring (knowing where adolescents were and what they were doing) and behavioral control (having rules and expectations about adolescents' behaviors) could have an impact on teens' responsible driving. Hartos et al. (2002) noted that parenting practices such as parental monitoring (behavioral control and restrictions on driving) may have been protective against teens' risky driving practices during the formative period (i.e., first years of unsupervised driving) when young drivers were developing their driving behaviors. Parental limitations on teenage driving during the first month of licensure also positively affected risky driving (Hartos et al., 2001). These forms of parenting were necessary when the teen was learning to drive by teaching them and governing their access to motor vehicles.

Simons-Morton (2007) found that there were no clear guidelines about how parents should teach their teens; namely, it was unclear how capable parents were teaching driving skills and what types and amounts of supervised practice novices should have had. It was unknown how much and what types of parent-supervised

practice teens experienced before licensure, and the few efforts to increase the amount and type of supervised practice driving have not been shown to increase or improve supervision or safety outcomes (Chaudhary, Ferguson, & Herbel, 2004; Goodwin, Waller, Foss, & Margolis, 2006). Morrisey et al. (2006) noted that programs sought to reduce fatalities by increasing the opportunities for young, inexperienced drivers to obtain more supervised driving experience and to limit their exposure to risky driving situations. The more supervised practice driving that teens were required to have before licensure, the longer it took to get licensed, the older and more mature they were at licensure, and the longer they were not exposed to driving, all of which reduced their risk of a crash (McKnight & Peck, 2002).

The entire focus of prevention science was to delay the age of initiation and progression of risky behaviors (i.e., smoking, drinking, marijuana use, and sexual intercourse) because maturity came with age and allowed older teenager to better deal with risk situations and with the risk behaviors in ways that would tend to moderate their most negative effects (Simons-Morton, 2007). Parents and teens were not always in agreement on what the rules were, with parents generally perceiving stricter rules than did their teens (Beck, Hartos, & Simons-Morton, 2005) when it came to risky behaviors like teen driving. Studies have been conducted to evaluate programs designed to increase parental management of risky behaviors, but there have been very few programs designed to study parental management of teen risky driving behavior. There are none known to relate to risky driving behaviors after a teenager received the first driving citation.

Beck, Shattuck, and Raleigh (2001) found that more frequent parental supervision and less unrestricted teen access to a car were associated with the less likelihood of teens speeding and the more likelihood of their using seat belts when driving. Many parents altered their parental control and time restrictions after the adolescent received driving privileges. Hartos et al. (2002) noted that parents who monitored their teens' behaviors did so by maintaining open communication, thereby increasing their teens' willingness to socialize and reduce their propensity to engage in problem behaviors such as risky driving.

Parents were the primary responsibility for the teens' risky driving behaviors and when signing the teenager's driving privileges assumed that their teenager understood their responsibilities when insisting on teen driving safety (Simons-Morton & Hartos, 2003). Parents had control and restrictions when teenagers received their learner's permits, driving privileges, vehicle permitted to drive, and setting driving times and destinations. The reason to have a drivers license was to increase and extend parental management of the teen driver and to give the parent more time to control and monitor the behaviors the teenager was developing while driving. Simons-Morton (2007) found that increased parental management of novice young drivers was implied by drivers license policies and was strongly endorsed by policy statements on the subject (Committee on Injury, Violence, and Poison Prevention and Committee on Adolescence, 2006), but there were few formal state programs to increase parental involvement. It was understandable that most parents exercised relatively passive management practices. Hartos et al. (2005), Simons-Morton et al.

(2006c), and Simons-Morton (2007) have researched parental supervision of novice drivers and the Graduated Drivers License program, but virtually no research has been conducted after teen have received their first citations.

Parental Management: Restrictions

Parental management of restricting the teen driver has been not thoroughly investigated, such restrictions to include monitoring their driving times, passengers, and setting curfews. A growing body of research indicated that teen driving risks were associated with parenting practices (Beck et al., 2002), including parental monitoring and restrictions of teen driving that were related inversely to teen traffic violations, risky driving behaviors, and motor vehicle crashes (Beck et al., 2001; Hartos et al., 2000, 2001). Hartos et al. (2001) found, regarding parental restriction, that teenagers reported rather high levels of parent monitoring of and parent concern about teenage driving, and there were no sex differences in parental restrictions. Additionally, they found that, over time, when comparing teens with low-risk driving to teens with high-risk driving, teens demonstrating higher-risk driving behaviors were about 3 times more likely to report low parental monitoring and 2 times more likey to report low parental restrictions on driving.

Research has shown that lenient parent restrictions placed on teen driving, especially in terms of allowing teen passengers, were related to increased teen risky driving, traffic violations, and crashes (Hartos et al., 2000, 2001, 2002). Hartos et al. (2004) found that parents and teens may greatly benefit from using a parent-teen

driving agreement that increased clarity of driving rules and consequences for rule violations as a part of the parental restrictions. Simons-Morton and Hartos (2003) indicated that parental management practices were important influences on teen driving practices and safety when imposed and that parents did not perceive teen driving as highly risky; therefore, parents established few restrictions on teens after licensure. Hartos et al. (2005) suggested that driving restrictions at one month predicted subsequent restrictions on adolescent driving over the first year of driving (Simons-Morton et al., 2002) and risky driving behaviors later in driving (Hartos et al., 2001). Placing restrictions on the teen driver was a necessary decision that parents made to ensure the safety of driving teenagers.

Parents were to supervise the teen for 50 hours of driving with 10 being after sunset, but some question if the notarized documents were falsely signed stating the requirements had been met. Simons-Morton and Hartos (2003) found the many parents perceived their teenagers to be generally responsible and wanted to provide the teenagers' wishes, namely to drive. The influence of parenting on teen driving has not been examined thoroughly (Hartos et al., 2002).

Parental restrictive management of the teen driver has been researched at the time of licensure. Parents had primary responsibility for establishing limits so their teen learned to drive and gain initial experience as safely as possible (Hartos et al., 2005). A strength of restrictive and engaged parents who managed the teen driving experience resulted in both parents and teens reporting that parents imposed driving rules and that they covered the range of issues for teen driver safety, including getting

permission, reporting the destination, reporting passengers, calling in, night driving limits, passenger limits, road limits, distance limits, weather limits, and safety limits (Hartos et al., 2004) before the teen received the first citation. Nonetheless, after the teen was licensed, miscommunication might have occurred if the driving rules were not enforced by the restrictive parent. Additionally, authoritative parenting practices including setting restrictions or limits on behavior, monitoring activities and whereabouts, involvement in daily life, and support of autonomy have been positively linked to many teen outcomes, including psychosocial competence and school functioning (Beck et al., 2002; Lamborn et al., 1991).

Graduated Driver License Program

A major effect of Graduated Drivers License program was to increase and extend parental management of novice teen drivers or at least help increase parents' perceptions of risk and establish an environment that would encourage and empower parents to increase and extend limits on their novice teen driving (Simons-Morton & Hartos, 2003). Parents played an important role in the management of young drivers by determining when teens could test for a permit or license, supervising practice driving, and enforcing GDL provisions (Beck, Shattuck, Raleigh, & Hartos, 2003). Parents were ambivalent about teen driving, concerned about the risks but interested in reducing the time they spent transporting teens (Simons-Morton & Hartos, 2003). Most teens wanted to drive and their parents/legal guardians believed that, because they were 16 years old, they earned the right to drive whether they were mature,

responsible, and capable of fulfilling the tasks of driving a motor vehicle. Parental support and control were the two key dimensions for understanding how parenting influenced developmental outcomes (Maccoby & Martin, 1983; Rollins & Thomas, 1979) of the teen, especially when it came to parental management. Parental monitoring and control were found to be inversely associated with other adolescent problem behaviors such as substance use and deviant behavior (Dishion & Loeber, 1985; Hartos et al., 2000; Reid & Patterson, 1989; Smith & Krohn, 1995; Steinberg, 1987; Stice & Barrera, 1995; Stice, Barrera, & Chassin, 1993).

Much of the research showed that teens in GDL states go through a licensure restriction process that should reduce the risky driving behaviors demonstrated by the teen and increase the amount of parental management. GDL research indicated that certain components of GDL programs, including delayed ages at permit, provisional licensing, increased supervised driving, and nighttime driving restrictions, resulted in reduced rates of teen risky driving behaviors, crashes, violations, and overall amount of driving (Ferguson et al., 1996; Foss, Feaganes, & Rodgman, 2001; McKnight & Peck, 2002; McCartt et al., 2001; Preusser, Zador, & Williams, 1993; Shope, Waller, Raghunathan, & Patil, 2001; Simons-Morton & Hartos, 2003; Williams & Ferguson, 2002).

Simons-Morton (2007) noted that GDL and parent management practices were evidence-based approaches addressing the goals and providing safety effects. Although nearly all 50 states have adopted some type of GDL laws as a measure to reduce the number of teen fatalities, the number of fatalities remains stable because of

teens demonstrating risky driving behaviors. They found there was no evidence that greater amounts of parent-supervised practice driving were associated with better independent driving performance and safety. The more supervised practice that driving teens were required to have before licensure, the longer it took to get licensed, the older and more mature the teen should be at licensure, and the longer they were not exposed to driving, all of which reduced their risk of a crash (McKnight & Peck, 2002; Simons-Morton, 2007). Not all vehicle crashes involving teen drivers were the fault of the teen driver; some drivers were victims of crashes.

A GDL program ensured that teens gained driving experience before going through the restrictive driving stages preceding licensure. The GDL program was designed to reduce the risky driving behaviors and increase parental management. In Ohio, Graduated Drivers License Law 343 (Ohio Department of Public Safety, 2007) was implemented because of a record number of teen fatalities and because Ohio state legislators sensed the need to revise the old legislation by increasing the restrictions and making parents more responsible. Beck et al. (2002) noted that GDL increase the amount of supervised practice that teens must receive before full unrestricted licensure. GDL delayed teens' unsupervised driving until they were older and presumably had developed more judgment and maturity (Beck et al., 2002). Also, Ohio's GDL restricted newly licensed teens from driving under high-risk conditions (e.g., late at night and with teen passengers) and penalized young drivers for moving violations, alcohol, or drug offenses by taking away their driving privileges. Hartos et al. (2004) concluded that increasing parental involvement was viewed as an important

population approach for reducing teen driving risks. A great deal remained unknown about how parents managed young drivers (including how much effort they put into supervised practice driving), how they determined when their teenage children could apply for a driver license, how they determined initial teen driving restrictions and modified them, and the effects each of these on teen driving risk in non-GDL states. Several of these findings were formulated in Ohio's GDL 343 (Ohio Department of Public Safety, 2007).

There was growing interest in promoting increased parental involvement in teen driving (Hartos et al., 2004) and enforcing teen driving laws. The potential effectiveness of parental education was not known, although a few studies had evaluated the effects of providing parents with educational materials (Simons-Morton et al., 2002). Parental management and adolescent risky behaviors apart from driving behaviors have been studied by many researchers. Some of the parental management research focused in the areas of peer relationships, truancy, substance abuse, and juvenile diversion. The research of parental management and these risky behaviors resulted in some changes in the adolescent behaviors.

4-H CARTEENS

4-H CARTEENS Partnership

In 1986, a Brown County (Ohio) juvenile court judge had read about teen peer education programs used by schools and courts throughout the United States (Cropper, 1999). The judge, concerned about the increasing number of juvenile traffic offenders

seen in his court and the increasing number with recidivism citations, approached the Brown County Extension Service in 1987 to solicit help in finding a solution, and the State of Ohio has had in place since 1987 a program called 4-H CARTEENS. It is defined (Cropper et al., 1994) as Caution and Responsibility (CAR) and Teens (TEENS) who volunteer to teach motor vehicle education to first-time peer traffic offenders in a one-time educational program lasting about 2 hours. 4-H CARTEENS has been a partnership between The Ohio State University Extension, juvenile court judges, and the Ohio State Highway Patrol for teen drivers after they have received their first citation. Other counties have added additional partnerships, such as county coroners, county health department, and local funeral homes, but the main partners are the juvenile court, State Highway Patrol, and The Ohio State University Extension.

4-H CARTEENS and Court Mandates

The 4-H CARTEENS program has been functioning since 1987. During the past few years, unpublished county data regarding risky driving behaviors resulted in teens receiving their first citations (i.e., distracted driving, cell phone use or texting, etc.) in additional to the original risky driving behaviors identified by Donovan (1992). The risky driving behaviors data have resulted in the courts, State Highway Patrol, The Ohio State University Extension, and high schools expanding educational programming about changing driving behaviors. Juvenile courts have requested a standardized evaluation instrument to be administered by all Ohio 4-H CARTEENS

counties to measure other driving risks that teens perform in addition to those they were cited for on their first citation.

Eleven of the 44 participating 4-H CARTEENS counties required an adult to attend the program with the teen driver. Thus, the parental responsibility did not stop when the teen received a drivers license but continued with court-mandated parental attendance in the 4-H CARTEENS program. Many parents have expressed on their evaluations that they had wished the program was mandatory before their adolescent received their citation because of the educational information that was taught reducing risky driving behaviors.

4-H CARTEENS Program Delivery

Throughout the State of Ohio, teenagers daily drive on urban, suburban, and rural driving roadways. Nearly 44 of the 88 counties have implemented a 4-H CARTEENS program as a driver intervention program for first time offenders. Chesnick (2002) found the 4-H CARTEENS program effectiveness was measured by the rate of repeat juvenile motor vehicle offenders.

The 4-H CARTEENS program consist of a 2-hour safety program run by junior leaders or other teen facilitators, with technical assistance from the Ohio State Highway Patrol (Cropper, 1999). The 4-H CARTEENS teen volunteers meet with the Juvenile Court Judge or Chief Magistrate to review the four or five highest ranked reasons why teens received their first citations. The 4-H CARTEENS teen volunteers researched and prepared lesson plans, educational activities, and demonstrations on

those topics and had the materials reviewed by the juvenile court and State Highway Patrol for validity and reliability. In addition to the four or five educational teaching stations, some programs utilized innovations such as rollover simulations, docudramas, mock funerals, and brain-injury demonstrations.

Chesnick (2002) noted that teenage counselors associated with the program came from various backgrounds, and several were first-time motor vehicle law violators themselves. It was the interaction among these teenage counselors and violators that created the atmosphere of understanding and learning. Cropper (1999) found that teen educators used a variety of teaching methods to reach participants with different learning styles and keep participants engaged. Many law enforcement agencies and county-based safety groups targeted teen driving at school entrances and exits, extracurricular events, and during school daily announcements encouraging the teens to practice safe driving skills and reduce risky driving behaviors, especially during National Teen Driving Safety Week observed during October of each year.

4-H CARTEENS Delivery Mode

Teenagers had a positive impact on knowledge, attitudes, and behaviors (Meyer, Nicholson, Danish, Fries, & Polk, 2000). The most effective mode of program delivery was the teens who volunteered as teachers. Volunteering teens were organized, actively involved, and responsible for positive community change (Hoover & Weisenbach, 1999; Jordan, 2008), thus the long-term outcomes of the program as noted in the logic model diagram (Table 1, page 10). Two masters studies completed

at The Ohio State University (Corbin, 1999; Shipe, 2006) provided a description of the Ohio 4-H CARTEENS program model and suggested that the peer-led approach for promoting safer teen driving habits was effective. The Corbin (1999) and Shipe (2006) studies also documented that, in addition to the positive perceptions reported by program participants as a result of 4-H CARTEENS, the experiences of planning and conducting 4-H CARTEENS program sessions benefited the teen leaders serving as peer-teachers in terms of leadership development, enhanced communications abilities, and improved personal driving attitudes and habits. Community benefits from teens as teachers could help create cooperation, caring, and mutual respect (Benard, 1990).

The success of participants retaining the content that was being presented during the program was attributable to the teenagers serving as effective teachers (Lee & Murdock, 2001). The 4-H CARTEENS teen had a way special way of ensuring the learner understood the importance of the subject matter.

One effective part of the 4-H CARTEENS program has been guest speakers, receiving rave reviews, because participants realized they were hearing directly from people who had experienced driving situations that changed their lives. Juvenile courts mandated that vehicular homicide or vehicular assault teens do community service with the 4-H CARTEENS program as a result of their risky driving behaviors. In addition, parents who had lost teens to crashes have come forward and spoke about their loss as a part of the healing process of losing a loved one to a crash. Other guest speakers have been teens charged with operating a vehicle under the influence, funeral

home directors, defense or prosecutor attorneys, and teens who have lost a sibling to a crash.

Theories of Risky Driving Behavior and Parental Management

Problem behavior theory and social control theory were the foundations of the instruments used by Donovan (1992) and Hartos et al. (2002) when conducting their studies. Both researchers have granted permission to use their instruments for conducting this study. Although inexperience does not provide a full explanation of teen driving risk, it makes sense for parents to limit novice teenagers' driving to lower risk driving conditions (Simons-Morton & Hartos, 2003). Both Donovan (1992) and Hartos et al. (2002) conducted their research at the time of licensure, thus giving this study a different dimension to their work.

Problem Behavior Theory

Problem behavior theory was defined as behavior that departed from the norm, both legal and social, of the larger society. The basic premise was that teen problem behavior derived from the psychological, social, and behavioral characteristics of the adolescent, the relevant dimensions of the larger social environment, and the attributes of the situation in which the behavior took place (Jessor, 1987b). Research suggested that risky driving behaviors among teens were part of an overall teen problem behavior syndrome characterized by "unconventionality" or their orientations toward

deviance or risky behaviors (Hartos et al., 2002; Jessor & Jessor, 1977), linking risky driving behaviors to the social control theory (Hartos, et al., 2002).

Jessor (1992), one of the foremost researchers of risk taking and the foundation of the research instrument used by Donovan (1992), noted that risk taking transcended physical health outcomes and referred to behaviors that could compromise the normal psychosocial development of the individual. Hartos et al. (2002) found that the problem behavior theory surfaced in their research and data analysis as the theory having the most significance. Effective intervention required a better understanding of the antecedents of problem driving (Bingham & Shope, 2004). Problem behavior theory was identified by several researchers as the best theory to predict teen problem driving (i.e., drug-, drinking-, and risky-driving) because the teens were going through puberty and experiencing brain development.

The problem behavior theory proposed by Jessor (1987b) and Jessor, Turbin, and Costa (1997) stressed the need to consider youth driving in the more general context of teen development and to evaluate the influence of lifestyle factors on risky driving (Bina, Graziano, & Bonino, 2006). Problem behavior theory has been promoted as an approach to understanding adolescent risk-taking behaviors, including risky driving (Jessor, 1987a, 1987b; Jessor & Jessor, 1977; Jessor, Donovan, & Costa, 1991; Wilson & Jonah, 1988). Hartos et al. (2002) suggested that risky driving behaviors among teens were part of an overall adolescent problem behavior syndrome characterized by "unconventionality" or their orientations toward deviance or risky behaviors, linking risky driving behaviors to the social control theory. Risky driving

by teens appears to be part of a larger syndrome of problem behavior involvement (Jessor et al., 1997).

Social Control Theory

Bingham and Shope (2004) suggested that social bonds involved individual attachment and commitment to conventional social institutions (i.e., school, community, family, religious organizations) and rules (i.e., laws) were strengthened by involvement and belief in the values and activities of conventional society. The social control theory referred to different types of criminal delinquency while stating that adolescence was the age group in which most criminal activity began (Gottfredson & Hirschi, 1990). The social control theory attempted to understand what prevented people from committing crimes that stopped them from realizing their natural motivation of breaking laws or rules. Hirschi (1969) stated that social control theory also predicted adolescent behavior and posited that, without adequate motivation, individuals would fail to control to social rules and norms. Most people became conformists because of the social control that had been imposed on them by family and society. The social control theory formulated why teen individuals conformed to set rules and values of society and how the teens conformed to the social bonding within the society. Parental management influenced self-control that, in turn, influenced criminal behavior (Gibbs, Giever, & Martin, 1998). Gottfredson and Hirschi (1990) proposed that self-control was a product of child-rearing practices by parental management and the components were (1) monitoring or tracking the child's

behavior, (2) recognition of deviant behavior when it occurred, and (3) consistent and proportionate punishment of the deviant behavior when it was recognized.

Hirschi (1969) noted that the social control theory attributed lack of control to lack of parental concern for the welfare and behavior of the child (as manifested in hostility toward the child and lack of warmth). Gottfredson and Hirschi (1990) found that parental concern about trouble in school and poor school performance also led to supervision and parental insistence on meeting socialization goals that, in turn, was thought to move the child psychologically from external, monitored control to internal control. Hirschi (1969) contended that the social control theory postulated a change from a child lacking a secure attachment to their parents to a somewhat older child who had a weak bond to society. Hirschi (1969) continued that the older adolescent's lack of supervision and failure to monitor seemed likely to condone the antisocial behavior in the child's mind and prevent the growth of internalizing control.

Teens connecting socially through social bonds were highly unlikely to break social rules and damage their connection to people with whom they had established strong bonds, such as parents, teachers, peers, neighbors, religious leaders, and siblings. Bingham and Shope (2004) continued that social bonds represented the participant's bond to the institutions of education and family and beliefs in social rules that restricted deviant behavior. The social control theory analyzed bonding that the adolescent established with society and their values to society norms. According to the social control theory, the stronger and more positive the fabric of these relationships, the more conformist the individual's behavior; the weaker the social

bond theory became, the more liable the individual was to turn to criminal behavior (Hirschi, 1969) and risky driving behaviors.

Summary

In summary, this chapter provided an in-depth review of issues relating to teen risky driving behaviors. The review of the literature provided an in-depth review of the issues regarding parental management and risky driving behaviors of teens who had received their first citations. There were several factors (i.e., accepting dates, trying unsafe challenges, etc.) that teens demonstrated before licensure that led to risky behaviors before driving. Those factors contributed to the teen's development and learned behaviors pertaining to driving.

Although predictors of risky driving behaviors have been researched, few were studied after the teens received their first citations. Predictors have been identified as age of the adolescent at citation, lack of seat belt usage, vehicle characteristics and type driven, vehicle ownership and responsibility for expenses, sex and race/ethnicity of the driver, age of licensure, academic achievement, and time of licensure.

Driving a motor vehicle was dangerous for teens who had not been introduced to some other type of driving before licensure. Driving was an acquired skill that required experience. Teen driving resulted in increased frequencies of risky driving behaviors during the first year of licensure that, in turn, resulted in receiving traffic citations or elevated crash rates. Teens could improve their inexperienced driving skills. Teens demonstrated risky driving behaviors for peer acceptance. Driver's

education curricula required teens to learn safety driving skills from the classroom and practice driving to prevent adopting risky driving skills.

Parental management of the teen did not stop when driving privileges were signed at the Bureau of Motor Vehicles. Most parents did not believe their inexperienced teen driver could cost them deeply because they did not realize they were taking full responsibility for the teen's driving actions. Democratic parents set clear rules for the teen driver and utilized their responsibilities of controlling and restricting the adolescent's behavior and driving skills. Many states have implemented a GDL to ensure that parents would take a more engaged role in monitoring the teen driver. Two focused themes emerged from the research:

1. Risky driving behaviors. Most teens were aware of the risks of driving and intended to practice safe driving, but peer pressure contributed to their risky driving behaviors. Driver's education and GDL were implemented for teens to achieve the goals of safe driving. Most teen deaths were caused by risky driving behaviors, and driver's education and GDL did not address them. The 4-H CARTEENS program addressed the issue of teen risky driving behaviors and crashes with their skill stations that had been approved by the Ohio State Highway Patrol and juvenile court judges. No known research existed about dealing with the risks of driving after teens received their first driving citations.

2. Parental management. By the time of this writing, parental management had not been fully explored as an avenue to reduce teen risky driving behaviors. Authoritative parenting practices had been researched thoroughly. The authoritative

parenting style skills identified were parental responsiveness and degrees of demand, but not much research had been conducted on parental management that dealt with control and restrictions after teens received their first citations. Parental management might have contributed to a reduction in teens receiving second citations after attending the 4-H CARTEEN intervention program or a decrease the percentage of recidivism rates in participating Ohio counties. Improving parental management of teen driving was needed to reduce these numbers. With parents and legal guardians signing the driving privileges of the teen driver, parental management was the focus of this research to determine if parents and/or legal guardians were willing to take more responsibility for the teens driving actions after receiving their first citations.

CHAPTER 3

METHODOLOGY

Introduction

The study utilized a quasi-experimental design conducted in four Ohio counties with similar 4-H CARTEENS programming. A questionnaire was administered to teens in each of the four counties at the start of a 4-H CARTEENS program session during a 2-month period. Teen drivers were mandated to attend the 4-H CARTEENS program only once. One month after completing 4-H CARTEENS, participants were sent a follow-up questionnaire to determine if any changes might have occurred in their risky driving behaviors and parental management of their driving. Both Time 1 and Time 2 questionnaires asked the respondents to reflect on their risky driving behaviors and parent management during a 1-month period. This study targeted approximately 180 teens in the mandated 4-H CARTEENS program with accompanying parents in two counties and approximately 180 teens in the mandated 4-H CARTEENS program without accompanying parents in two counties. Most of the participants were 16 and 17 years old, all had received their first citations, and all had been court ordered to attend the 4-H CARTEENS driver intervention program.

The clerk of the juvenile courts distributed a letter to participants announcing that the study was approved by Internal Review Board (IRB). This researcher administered the pre-questionnaire at the beginning of the program in all four counties. Participants, whose parents signed waivers at juvenile court, were sent a post-questionnaire one month after their mandate to 4-H CARTEENS. All participants with signed waivers received a post-questionnaire one month after attending the 4-H CARTEENS program. Those teenagers responding received an incentive award for their responses with a gas card for the following levels of return rates: postmarked within the first 10 days postmarked, a $25 gas card, postmarked within 11 to 15 days, a $15 gas card, and postmarked within 16 to 25 days, a $10 gas card.

This chapter describes the procedures used to conduct this study. The chapter is presented in the following sections: (1) research questions and hypotheses, (2) research design, (3) data collection, (4) instrumentation, (5) sample, and (6) data analysis.

Research Questions and Hypotheses

The following restated research questions were developed to guide this study:

1. What are the risky driving behaviors of 4-H CARTEENS participants?

2. What are the parental management practices of parents of 4-H CARTEENS participants?

3. What are the demographics and other driver characteristics related to risky driving behaviors of study participants with parental attendance?

4. Does 4-H CARTEENS attendance reduce risky driving behaviors?

5. What effect does parental attendance at 4-H CARTEENS play in reducing risky driving behaviors?

This study considered the relationship between parental management and teen risky driving behaviors by analyzing these hypotheses:

1. Risky driving behaviors will be prevalent among of younger youths at the time of their first citation and type of citation. Other personal characteristics are age, sex, race/ethnicity, school grade level, type of vehicle driven, age of vehicle, and age of first citation.

2. Teen drivers who complete 4-H CARTEENS program will reduce their risky driving behaviors.

3. Teens who attend the 4-H CARTEENS program with their parent/legal guardian will exhibit less risky driving behaviors than those youths who do not have a parent/legal guardian attending.

4. Parents will improve their driving management (control and restrictions) of their teens after they attend the 4-H CARTEENS program as reported by the teen driver.

Research Design

The research design was the pre- and post-questionnaire quasi-experimental comparison control group design. In the quasi-experimental comparison diagram below, the O represents teens that had been mandated to the 4-H CARTEENS intervention program by juvenile courts as a result of receiving their first citations. The X represents parents who had been mandated to attend the 4-H CARTEENS program with their son/daughter.

Group 1 - Teen with Parent Attendance	O	X	O
Group 2 - Teen without Parent Attendance	O		O

The advantage of this design was that the pre-questionnaires were administered to all groups at the beginning of the 4-H CARTEENS program and the post-questionnaires were administered to all groups one month after 4-H CARTEENS program participation. The quasi-experimental design (Ary, Jacobs, & Razavieh, 2002; Babbie, 1992; Fraenkel & Wallen, 2003) was distinguished from "true" experiments primarily by the lack of random assignment of subjects to an experimental and a control group. The subjects already were in intact groups because they were enrolled by the juvenile courts in the 4-H CARTEENS program.

The study compared the data collected from the teens who attended the 4-H CARTEENS program with a parent/legal guardian as compared to those teens who did not have a parent/legal guardian in attendance. The teens with or without parents had been mandated to attend the 4-H CARTEENS program as a result of receiving their

first driving citations. The teens attending the program were mostly under the age of 17 because juvenile courts had jurisdiction over adolescents who had not reached their 18th birthday.

The four counties involved in the study were nearly identical in their 4-H CARTEENS program delivery, teens mandated to the program, and utilizing teens as teaching volunteers. Two counties required a parent/legal guardian attend with teens, having an attendance of approximately 152 in a 2-month time period. Two counties did not require parents/legal guardians to attend and had an attendance of 91 teens in two months. The program was delivered in three stages: all four counties had an introduction with reviewing the court-mandated rules and had a state highway patrol representative speak about law enforcement's safety of vehicular driving, skill station educational programming performed by teen volunteer teachers, and guest speakers talking about their family's loss as a result of a traffic accident. The study's initial questionnaire was administered at the beginning of the program before any programming took place.

The selection of the four counties in the study was based on county population, number of participants in the 4-H CARTEENS program each month, skill station subject matter content, mode of delivery of the 4-H CARTEENS program, and use of teens as teachers. Two of the counties were considered to be metro counties because of their geographic locations next to an urban center, and two were primarily rural with one large urban area. The comparison group had a metro and a rural county, and the study group had a mid-size metro and rural county, thus giving balance to the

study. The four counties in the study were close to size of 4-H CARTEENS attendance per month, similar in county population size, and geographically near to large urban centers. Two counties were considered metro Ohio counties because of population size, and two counties had nearly the same population size with mid-size metropolitan centers and had a larger agricultural emphasis. Each of the counties had the 4-H CARTEENS program more than once a month because of the numbers of teens mandated to attend.

Data Collection

The data were collected via Time 1 and Time 2 questionnaires. The 4-page Time 1 questionnaire included several personality, perceived social environment, and self-reported behavior measures originally developed to test problem behavior theory (Jessor & Jessor, 1977) and social control theory (Hirschi, 1969). These theories were not tested in this study. The Time 1 questionnaire was administered before the participants attended the 4-H CARTEENS program by key personnel in the four counties during a 2-month period in fall 2009. A Time 2 follow-up questionnaire was mailed to the participants one month following the initial assessment to measure risky driving behaviors and parental management.

Data collection followed the process outlined by Dillman (2000), who studied why people did or did not respond to questionnaires. To increase participation, the researcher sent a follow-up letter. The total design method (TDM) of the questionnaire and the incentives should have increased the number of Time 2

questionnaires being returned, as outlined by Dillman (2000). Two hundred forty three of the 344 (70.6%) mandated to attend 4-H CARTEENS completed the Time 1 questionnaire, and 187 of the 243 (76.9%) completed the Time 2 questionnaire. A gas card was used as the incentive from 4-H CARTEENS cost recovery funds for those participants who submitted the Time 2 questionnaire.

Before any data were collected, the material was approved by The Ohio State University's Internal Review Board (IRB). Each item was checked to ensure it met the criteria established by the university to protect anonymity and that answers were confidential. Several pieces of information were given to the parents (Appendix A). Questionnaire letter Time 1 explained to the teen that their answers on the questionnaire and the process they went through as a participant in the study would be confidential. Follow-up letter to participants Time 2 explained asked them to respond again to the questionnaire within a deadline, thereby qualifying to receive a gas incentive card. The gas card was sent with an appreciation letter, thanking them for their participation in the study.

Instrumentation

The questionnaire contained the independent variables of parental management, participant demographics, teen driving attitudes, and teen driving experience. The dependent variable included in the instrument was risky driving behaviors.

Risky driving behaviors (33 items). This modified measure (Appendix B, Section I) assessed the number of times the adolescent participated in various risky driving behaviors, including driving 10-19 mph over the posted speed limit, driving through a red light, tailgating a slow car, and passing two or more cars at once. The 33-item scale of frequency was measured with an alpha = .88 (Donovan, 1992; Hartos et al., 2002). This researcher used the same instrument with 243 teen drivers at Time 1 (Cronbach alpha = .85) and 187 teen drivers at Time 2 (Cronbach alpha = .82).

Parental Management (Appendix B, Section II). Items of Parental Management: Control (7 items) and Parental Management: Restrictions (5 items) responded to the seven statement items for control with a 4-point scale of strongly disagree, moderately disagree, moderately agree, and strongly agree.

The Parental Management: Control items were "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." The alpha for adolescent responses for parental control was .68 (Hartos et al., 2002). This researcher used the same instrument, and data analysis had a Cronbach's alpha = .85 on Time 1 for Parental Management: Control. This researcher, using the same instrument, found a Cronbach's alpha of .85 at Time 1 and .86 at Time 2 for Parental Management: Control.

The Parental Management: Restrictions items were "my parent restricts where I can go in the car," "my parent restricts who can ride with me in the car," "my parent restricts how late I can be out with the car," "my parent restricts me from driving

aggressively," and "my parent restricts me from not drinking and driving." The alpha for adolescents' baseline responses was = .74 (Hartos et al., 2002). This researcher, using the same instrument, found a Cronbach's alpha = .80 at Time 1 and .82 at Time 2 for Parental Management: Restrictions.

Demographics (Appendix B, Section III). Demographics consisted of county, present age, sex (male or female), ethnic heritage or racial culture (white/Anglo American, Black/African American, Hispanic/Latino/Latin American, Native American/Eskimo/Indian, Pacific Islander, Asian/Asian American, Middle East/Muslim, Bi-Racial), current grade in school, age at licensure, length of driver's licensure, kind of vehicle most frequently driven (car, pick-up, SUV, minivan, van, motorcycle), age of vehicle (1 to 2 years old, 3 to 5 years old, 6 to 10 years old, more than 10 years old), ownership of vehicle driven (gift, purchased and making payments, purchased in full, family owned, owned by some else, borrowed), age at first citation, type of first citation (assuring clear distance, failure to control, failure to yield, no drivers license, lane change, operating or driving a vehicle under the influence, reckless operation, stop sign or red light, seat belts, speeding, signs), license suspension (yes or no), restraint usage (yes, no, cannot remember), required adult driving supervision of 50 hours (yes, almost, no), and financial responsibility for vehicle maintenance and care (vehicle damage, drivers license, gas, license plates/registration, oil changes, vehicle insurance, vehicle maintenance, vehicle payments, vehicle upgrades).

Sample

4-H CARTEENS programs are established in 44 of Ohio's 88 counties, with 11 of those mandating parents/legal guardians to attend the program with the teen drivers; 33 counties require only the teen to attend the program. Two of the 4-H CARTEENS programs studied requires parent/legal guardians to attend program and were conducted in a similar fashion while comparing to two counties without parental requirement (Table 2). The participating four counties were similar in program delivery, two were similar in size, two had targeted populations that similar in census, and all offered the same subjects in their skill stations during the program. The four counties had teens as teachers, coordinating the educational part of the program. The four counties conducted the 4-H CARTEENS program more than once a month, helping to keep the teen volunteers engaged in teaching skills. Two of the counties were classified by The Ohio State University Extension as metro counties because of population size and because they were close to larger urban centers; the other two counties were rural with mid-size metro centers. Two of the counties were similar in population and had medium-sizes populations and larger agriculture geographic areas within the county.

Comparison Group (no adult involvement)		**Study Group (adult involvement)**	
Urban County	100 teens	Urban County	120 teens with adults
Mid-size County	80 teens	Mid-size County	60 teens with adults
Totals (2 months)	180 teens	Totals (2 months)	180 teens with adults

Table 2. Counties Involved in the Study (Targeted Participation)

Data Analysis

Quantitative data were entered into the Statistical Package for Social Sciences (SPSS, 2008) for statistical analysis. The alpha level was set at Type I error at .05 for all levels of significance. Descriptive statistics of frequencies, t-test for differences between groups, regression analysis, and multivariate methods were used to summarize and organize the data.

Research Questions

The research questions and data analysis methods are summarized.

1. What are the risky driving behaviors of 4-H CARTEENS participants? Measurement scale - interval. Statistics - descriptive (mean, standard deviation, minimum, maximum, rank).

2. What are the parental management practices of parents of 4-H CARTEENS participants? Measurement scale - ordinal. Statistics - descriptive (frequency, percentage, mean, standard deviation, minimum, maximum).

3. What are demographics and other driver characteristics related to risky driving behaviors of study participants with parent attendance? Measurement scale - nominal, ordinal, interval. Statistics - descriptive (number, mean, standard deviation), inferential (correlation).

4. Does 4-H CARTEENS attendance reduce risky driving behaviors? Measurement scale - nominal, interval. Statistics - descriptive (mean, standard deviation), inferential (Cohen's d, paired t-test).

5. What effect does parental attendance at 4-H CARTEENS play in reducing risky driving behaviors? Measurement scale - nominal, ordinal, interval. Statistics - descriptive (number, mean, standard deviation), inferential (Cohen's d, independent sample t-test, paired t-test, correlation, regression). Data were collected from the 243 teens who enrolled in the study before the start of the 4-H CARTEENS program using the 4-page instrument (Appendix B). Teens were encouraged to give answers that best reflected their driving or opinion for each statement.

CHAPTER 4

ANALYSIS OF THE DATA

Introduction

The study was a quasi-experimental design conducted in four Ohio counties with similar 4-H CARTEENS programming. A questionnaire was administered to teens in the four participating counties at the beginning of the 4-H CARTEENS program. Teen drivers were mandated to attend the 4-H CARTEENS program only once. Two counties had parental involvement, and two counties did not. One month after completing the 4-H CARTEENS program, participants were sent a follow-up questionnaire to identify changes that might have occurred in their driving behaviors and parental management of their driving.

Sample Characteristics

The sample consisted of 243 teens who completed the 4-H CARTEENS program in October and November 2009. Of that total, 91 teens had no parent-mandated attendance, and 152 had parent-mandated attendance. Most of the teens (55%) were 17 years old, ranging from 15 to 19 years. Fifty-one percent were male

and ethnically were white (92%). Most of the students were juniors (48%) or seniors (48%) (Table 3).

	n	%
Sex		
Male	124	51
Female	119	49
Age		
15	3	1
16	86	35
17	134	55
18	19	8
19	1	n/a
Ethnicity		
White	223	92
Bi- or Multi-Racial	8	3
Black/African-American	4	2
Hispanic or Latino	4	2
Asian	4	2
Grade in School		
Sophomore	10	4
Junior	116	48
Senior	117	48

Table 3. Demographics of Study Participants

Driver Characteristics

Most participants (86%) received their drivers license at age 16, and most had their licenses for 1 to 5 months (Table 4). The most common ages for the first citation were 17 years (47%) and 16 years (45%). The courts suspended nearly 42% of the drivers licenses at their first citation (Table 4).

	Age at Licensing		Age at First Citation	
	n	%	n	%
15 years	1	0	1	0
16 years	208	86	110	45
17 years	30	12	118	49
18 years			1	0

Table 4. Age at First Citation

Type of Vehicle

Automobiles were the most frequent vehicle (69%) driven (Table 5), and vehicles driven reportedly were more than 10 years old.

	n	%
Vehicle Type		
Car	167	69
Pick-up	34	14
SUV	33	14
Minivan	4	2
Other	4	2
Vehicle Age		
1-2 years	26	11
3-5 years	36	15
6-10 years	89	37
10+ years	91	38

Table 5. Vehicle Demographics at Time of Teens' First Citations

Ninety percent (90%) of the teens were wearing their seat belts at the time of being cited with a traffic violation. The teens' citations included speeding (40%), assured clear distance (18%), failure to control (12%), and failure to yield (10%).

Many of the teens (91%) completed the 50 hours of supervised driving required by the Bureau of Motor Vehicles before licensure (Table 6).

	n	%
Seat Belt Usage		
No	11	5
Yes	218	90
Cannot remember	4	2
Type of Citation		
Assure clear distance	44	18
Fail to control	30	12
Fail to yield	24	10
Improper lane use	3	1
No drivers license	3	1
No seat belt	1	0
Speeding	96	40
Stop light/sign	10	4
Traffic sign	2	0
Other citations	17	7
50 hours of practice		
Yes	221	91
Some of the 50 hours	13	5
No	4	2

Table 6. Information Regarding First Citations

Research Questions

The findings are organized by the five research questions. Statistics used in this study were descriptive statistics (mean, standard deviation, maximum, minimum, rank, frequency, and percentage) and inferential statistics (correlations, t-tests [paired samples, independent samples], Cohen's (1988) d, and linear regression analysis). Data were calculated using SPSS (2008).

1. What are the risky driving behaviors of 4-H CARTEENS participants?

Before the start of the 4-H CARTEENS program (Time 1), the teen drivers were asked to report how many times during the past 30 days they were involved in risky driving behaviors. One driving time was defined as leaving and returning to the same location. Data were collected for 33 risky driving behaviors (Donovan, 1992).

The most frequent risky driving behavior was "read, ate, used a cell phone (talked, texted, etc.), put on make-up, horsed around with passengers or other such activities while driving" (M = 13.25). The second most frequent risky driving behavior was "driven through an intersection just as a light changed to yellow or was yellow" (M= 9.85) followed by "played the radio so loudly you are unable to hear other vehicles horns or sirens" (M = 8.65). The least frequently reported risky driving behavior was "driven after using other illicit drugs" (M = .07), followed by "passed a car on a blind curve or when coming to the top of a hill and driven after drinking alcohol" (M = .16) (Table 7, arranged from the highest to lowest mean score).

Risky Driving Behavior	M	SD	Min	Max	Rank
Read, ate, used a cell phone (talk, texting, etc.), put on make-up, horsed around with passengers or other such activities while driving	13.25	24.99	0	300	1
Drove through an intersection just as a light changed to yellow or was yellow	9.85	16.05	0	150	2
Played the radio so loudly you are unable to hear other vehicles horns or sirens	8.65	19.29	0	157	3
Drove 10-19 mph over the posted speed limit	6.62	12.62	0	100	4
Drove through a stop sign without coming to a full stop	5.28	9.48	0	100	5
Drove without wearing a seat belt	3.89	20.28	0	300	6
Changed lanes without signaling	3.56	7.64	0	60	7
Drove through an intersection just as a light changed from yellow to red	3.51	5.12	0	40	8
Drove at a high speed through a residential neighborhood or school zone	2.37	6.46	0	48	9
Took chances for the fun of it when driving in traffic	1.89	8.61	0	100	10
Drove 20 mph or more over the posted speed limit	1.82	5.74	0	50	11
Followed another car so closely that you couldn't stop safely	1.56	5.22	0	65	12
Pulled out from the curb without waiting for a real break in traffic	1.43	4.77	0	60	13
Sped through slower traffic by switching quickly back and forth between lanes	1.25	3.25	0	33	14
Raced another car a short distance	1.23	6.98	0	100	15
Drove so you were drifting in and out of your lane	1.22	4.07	0	42	16
Tailgated another car to get it to go faster or caused it to pull over into a slower lane	1.19	4.05	0	52	17
Changed lanes when it really wasn't safe	1.18	3.02	0	27	18
Took some risks while driving in traffic because it made driving more fun	0.90	4.24	0	50	19
Drove in a way to show off to other people	0.82	3.73	0	50	20
Cut in front of another car at full speed so you could make a turn	0.74	2.42	0	30	21
Forced your way into traffic, out of turn after stopping at a stop sign	0.73	2.97	0	73	22
Turned right at a red light where signs said not to	0.72	2.94	0	40	23
Drove through a light that was red before you got there	0.70	1.91	0	20	24
Cut in front of a vehicle to turn	0.66	1.78	0	20	25
Made a U-turn where a sign said not to	0.53	1.88	0	21	26
Passed 2 or 3 cars at a time on a 2-lane road	0.40	2.66	0	40	28
Made a left or right turn where it wasn't allowed	0.40	1.24	0	10	29
Drove after using marijuana	0.27	2.09	0	30	30
Passed a car on a blind curve or when coming to the top of a hill	0.16	1.36	0	20	31
Drove after drinking alcohol	0.16	0.98	0	10	32
Drove after using other illicit drugs	0.07	0.55	0	7	33

Table 7. Frequency of Risky Driving Behaviors

The risky driving behaviors for Time 1 were summed for a total risky driving behavior score. The data showed that young male drivers reported more risky driving behaviors than did females on average 29 more times per month (Table 8).

	n	M	SD	Min	Max
Sum of Risky Driving Behaviors 1	243	77.78	117.02	0	965
Males	124	91.92	144.31	0	965
Females	119	62.91	76.64	0	562

Table 8. Sum of Risky Driving Behavior and Sex of Teens

2. What are the parental management practices of parents of 4-H CARTEENS participants?

Parental Management practices were determined according to Control (7 items) and Restrictions (5 items). A Likert-type scale was used with four values ranging from Strongly Agree to Strongly Disagree. For Control, teen drivers reported perceived parental management of their driving for control (Table 9). The item most strongly agreed upon by the respondents was “my parent made sure I had enough practice driving before getting my license” (69%). The least rated item was “after getting my license, my parent continued to supervise some of my driving” (34% strongly agreed).

	Strongly Disagree		Moderately Disagree		Moderately Agree		Strongly Agree	
	f	%	f	%	f	%	f	%
My parent made sure I had enough practice driving before getting my license.	7	3	10	4	58	24	167	69
My parent has carefully monitored my driving activity (i.e., known where I was going in the vehicle, what I was doing, and when I would return).	12	5	19	8	74	31	137	56
My parent gave me more driving privileges as I showed responsible behavior at home and/or school.	14	6	24	10	76	31	128	53
My parent set up consequences for breaking the rules related to my driving privileges.	19	8	38	16	68	28	116	48
My parent tried to keep track of whether I was driving safely (e.g., not speeding, running stop signs).	20	8	30	12	95	39	96	40
My parent has had strict enough rules restricting my access to the vehicle and driving privileges.	18	7	37	15	92	38	94	39
After getting my license, my parent continued to supervise some of my driving.	21	9	42	17	93	38	83	34

Table 9. Frequency of Parental Management: Control

For Parental Management: Restrictions, the item reported most frequently as strongly agreed (89%) was "my parent restricts me from not drinking and driving." The least strongly agreed selection for Parental Management: Restrictions was "my parent restricts who can ride with me in the car" (24% strongly agreed) (Table 10).

	Strongly Disagree		Moderately Disagree		Moderately Agree		Strongly Agree	
	f	%	f	%	f	%	f	%
My parent restricts me from not drinking and driving.	8	3	2	0	16	7	215	89
My parent restricts me from driving aggressively.	14	6	27	11	67	28	132	54
My parent restricts how late I can be out with the car.	20	8	18	7	73	30	130	54
My parent restricts where I can go in the car.	42	17	46	19	85	35	68	28
My parent restricts who can ride with me in the car.	54	22	50	21	79	33	58	24

Table 10. Frequency of Parental Management: Restrictions

Parental Management Time 1 was summed for control and restrictions (Table 11). Teen drivers responded more in agreement to Parent Management: Control than they did Parent Management: Restriction (M = 22.63 vs. M = 15.77).

	N	M	SD	Min	Max
Control	243	22.63	4.47	7.00	28.00
Restrictions	243	15.77	3.44	5.00	20.00

Table 11. Summed Parental Management: Control and Restrictions (Time 1)

3. What are demographics and other driver characteristics related to risky driving behaviors of study participants with parent attendance?

Correlations were calculated to determine the relationship between risky driving behaviors and demographics or other driver characteristics. Davis (1971) conventions were followed describing magnitude of relationships (Table 12).

Coefficient	Description
.70 or higher	Very strong association
.50 - .69	Substantial association
.30 - .49	Moderate association
.10 - .29	Low association
.01 - .09	Negligible association

Table 12. Convention for Describing Magnitude of Relationships

Risky Driving Behavior at Time 2 and Parental Management: Control at Time 2 was moderately associated (-.35). In other words, less parental management was related to riskier driving behaviors. The Risky Driving Behavior and Parental Management: Restrictions Time 2 also was moderately associated at (-.36). Less parental restrictions resulted in riskier driving behaviors. In addition, as participants advanced in school grade and drove more frequently, weekly driving had moderate association (.46) and the risky driving behaviors increased.

The point-biserial correlation coefficient was defined as a statistic used to estimate the degree of relationship between a naturally occurring dichotomous nominal scale and an interval or ratio scale (Brown, 1988). The point-biserial correlation coefficient was used to investigate the degree of relationship between sex (naturally occurring dichotomous nominal scale) and risky driving behaviors (an interval scale) (Brown, 1988). The point-biserial correlation coefficient for sex was negatively related to risky driving behaviors (-.09). Pearson product-moment correlation coefficients for the other variables in the correlation. Table 13 shows the relationships among the variables.

Variable	1	2	3	4	5	6	7	8	9	10
1. Risky Driving Behaviors Time 2	1.00									
2. Parent Management: Control Time 2	-0.35**	1.00								
3. Parent Management: Restrict Time 2	-0.36**	0.80**	1.00							
4. Parent Attendance (0 = not attend, 1 = attend)	-0.14	0.11	0.14	1.00						
5. Present Age of Teen	0.14	-0.17*	-0.33**	-0.01	1.00					
6. Teen's Sex (0 = Male, 1 = Female)	-0.09	0.06	0.15*	0.01	-0.03	1.00				
7. Present Grade in School	0.15*	-0.18*	-0.28**	0.12	0.66**	0.13	1.00			
8. Age at First Citation	0.08	-0.08	-0.11	0.11	0.38**	0.14	0.33**	1.00		
9. Age of Vehicle Driven	0.05	-0.02	-0.04	0.05	-0.01	0.06	-0.03	-0.09	1.00	
10. Weekly Driving Frequency	0.46**	-0.10	-0.16*	-0.12	-0.02	0.24	0.01	0.03	0.08	1.00

Table 13. Correlations for Risky Driving Behaviors and Variables

n = 187, **p ≤ .01, *p ≤ .05

4. Does 4-H CARTEENS attendance reduce risky driving behaviors?

Risky driving behaviors were analyzed using t-tests (paired sample) and Cohen's (1988) d to determine effect size, which measures the magnitude of a treatment effect on the variables (Table 14).

Cohen's Standard	Effect size
Large	.60 - 2.00
Medium	.30 - 0.59
Small	0.00 - 0.29

Table 14. Cohen's d Effect Size

The paired samples t-test was calculated to measure the difference between Risky Driving Behaviors Time 1 and Time 2. The data showed a reduction in Risky Driving Behaviors from Time 1 to Time 2 with mean scores decreasing from 75.65 to 47.82. Using Cohen's (1988) d, 4-H CARTEENS programming had a medium effect (.31) on the reduction of Risky Driving Behaviors from Time 1 to Time 2 (Table 15).

Variable	n	M	SD	t	S	Cohen's d	Effect
Risky Driving Behaviors 1	243	75.65	109.92				
Risky Driving Behaviors 2	187	47.82	64.88	3.61	0.00	0.31	Medium

Table 15. Paired Sample t-test on Risky Driving Behaviors, Time 1 vs. Time 2

The 33 Risky Driving Behaviors were categorized into 10 subscales violations (Donovan, 1992). The Risky Driving Behaviors data collected from the Time 1 and Time 2 were analyzed to determine if teen drivers changed their risky driving

behaviors after attending 4-H CARTEENS. There was a reduction from Time 1 to Time 2 in all of the violation categories except for Substance Abuse.

The Risky Driving Behaviors with a medium effect were speeding violations (.34), lane use violations (.34), and control violations (.30) (Table 16).

	Time 1 (n = 243)		Time 2 (n = 187)					
Variable	**M**	**SD**	**M**	**SD**	**t**	**S**	**Cohen's d**	**Effect**
Risky Driving Behavior	75.65	109.92	47.82	64.88	3.61	0.00	0.31	Medium
Speeding Violations	10.86	20.35	5.36	10.63	4.04	0.00	0.34	Medium
Passing Violations	1.02	6.94	0.84	3.47	0.59	0.00	0.03	Small
Following Violations	2.75	8.58	2.06	4.45	1.05	0.00	0.10	Small
Lane Use Violations	7.98	13.58	4.27	7.69	3.53	0.00	0.34	Medium
Right of Way Violations	2.16	6.42	1.27	2.84	2.16	0.00	0.18	Small
Turn Violations	2.30	5.32	1.52	4.89	1.92	0.00	0.15	Small
Control Violations	19.34	24.97	12.95	16.98	3.34	0.00	0.30	Medium
Reckless Violations	8.72	28.66	4.59	12.55	1.42	0.00	0.19	Small
Substance Abuse Violations	0.50	2.65	1.03	11.17	-0.79	0.00	-0.06	Small
Distractions Violations	21.91	36.44	13.33	23.25	3.01	0.00	0.28	Small

Table 16. Paired Samples t-test for Risky Driving Behaviors and Driving Violations at Time 1 & Time 2

5. What effect does parental attendance at 4-H CARTEENS play in reducing risky driving behaviors?

An inferential statistic (independent samples t-test) was calculated for risky driving behaviors among teen drivers whose parents attended 4-H CARTEENS and those parents who did not attend at Time 2. 4-H CARTEENS counties with parents

attending on average reported a mean difference of 41.99 fewer risky driving behaviors than the 4-H CARTEENS counties without parents attending at Time 2 (Table 17).

	n	M	SD	t	S	Cohen's d	Effect
No Parent Attendance	91	53.35	136.09				
Parent Attendance	152	11.36	72.26	2.7	0.01	.39	Medium

Table 17. Risky Driving Behaviors and Parent Attendance at Time 2

The Cohen's (1988) d effect size was large (.60) for parents attending 4-H CARTEENS from Time 1 to Time 2 in reducing risky driving behaviors. The 4-H CARTEENS counties without parents attending had a reduction in risky driving behaviors from an average mean score of 102.86 at Time 1 to 53.35 at Time 2. The Cohen's d effect size was medium (Table 18).

	n	M	SD	t	S	Cohen's d	Effect
No Parents Attending							
Time 1	91	102.86	141.90				
Time 2	91	53.35	136.09	2.70	0.01	0.36	Medium
Parents Attending							
Time 1	152	62.56	96.15				
Time 2	152	11.36	72.26	2.39	0.02	0.60	Large

Table 18. Independent Sample t-test for Parental Attendance at 4-H CARTEENS

To determine if Parental Management: Control and Parental Management: Restrictions practices changed from Time 1 to Time 2, this researcher calculated a paired samples t-test. The findings indicated an increase in Parental Management:

Control scores from 22.83 to 23.58. The Cohen's (1988) d effect size for Parent Management: Control was small (.18). The Parental Management: Restriction increased scores from 15.94 at Time 1 to 16.44 at Time 2. Cohen's (1988) d effect size (.15) was small for Parent Management: Restrictions (Table 19).

Variable	n	M	SD	t	S	Cohen's d	Effect
Parental Management: Control							
Time 1	243	22.83	4.32	-2.75	0.00		
Time 2	187	23.58	4.18			0.18	Small
Parental Management: Restrictions							
Time 1	243	15.94	3.35	-2.22	0.00		
Time 2	187	16.44	3.45			0.15	Small

Table 19. Paired t-test for Parent Management: Control vs. Parent Management: Restrictions

A paired samples t-test was used to determine changes in Parental Management: Control and Parental Management: Restrictions for counties with and without parent involvement. Parental Management: Control and Parental Management: Restrictions increased at Time 1 and Time 2 for all groups. The Cohen's (1988) d test calculated a medium effect for Time 1 and Time 2 without parents attending (Table 20).

	n	M	SD	t	S	Cohen's d	Effect
Parent Management: Control							
No Parent Time 1	152	21.05	4.55				
No Parent Time 2	91	23.03	3.88	4.87	0.00	0.47	Medium
Parent Time 1	152	23.49	4.13				
Parent Time 2	91	23.94	4.34	5.06	0.00	0.11	Small
Parent Management: Restrictions							
No Parent Time 1	152	14.70	3.60				
No Parent Time 2	91	15.86	3.61	6.36	0.00	0.32	Medium
Parent Time 1	152	16.39	3.20				
Parent Time 2	91	16.82	3.30	6.49	0.00	0.13	Small

Table 20. Paired t-test for Risky Driving Behaviors, Parent Management, and Parent Attendance

Regression analysis was used to determine which independent variable predicted the dependent variable of Risky Driving Behaviors at Time 2. When considering driving frequency per week and Parental Management: Control, less predicted an increase in Risky Driving Behaviors, showing that 32.9% of the variance was explained by the model (Table 21). Multicollinearity, examined in the regression, determined that the independent variables of sex, present age of teen, and age at first citation were associated.

	Beta	t	S
Parent Attendance (0 = not attend, 1 = attend)	-0.05	-0.67	0.50
Parent Management: Control Time 2	-0.22	-1.98	0.05
Parent Management: Restrictions Time 2	-0.07	-0.62	0.54
Sex (0 = male, 1 = female)	-0.03	-0.38	0.71
Driving Frequency per Week Time 2	0.41	6.05	0.00
Present Age of Teens	0.09	1.19	0.24
Age at First Citation	0.02	0.32	0.75

Table 21. Regression of Risky Driving Behaviors on Parent Attendance, Parental Management, Teen Driver Demographics

$R = .57$; $R^2 = .329$; $n = 187$

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This chapter presents a summary of the study, conclusions drawn from findings, and recommendations for practitioners, organized as follows: Purpose and Research Questions, Limitations of the Study, Research Procedures, Summary and Discussion of Findings, Conclusions and Recommendations, Need for Further Study, and Conclusions.

Purpose and Research Questions

The purpose of this study was to examine the influence of the 4-H CARTEENS program and parent management for reducing risky driving behaviors among teens and determine if mandated parent participation had an impact on monitoring teen driving behaviors and their parenting practices and skills as compared to the counties that did not mandate parents to attend the program. By having parents attend 4-H CARTEENS programs, adults realized that signing the teen's driving privileges was a responsibility that should be taken seriously by improving their parental management.

The following research questions were developed to guide this study:

1. What are the risky driving behaviors of 4-H CARTEENS participants?

2. What are the parental management practices of parents of 4-H CARTEENS participants?

3. What are demographics and other driver characteristics related to risky driving behaviors of study participants with parent attendance?

4. Does 4-H CARTEENS attendance reduce risky driving behaviors?

5. What effect does parental attendance at 4-H CARTEENS play in reducing risky driving behaviors?

Limitations of the Study

This study was limited to 243 teens who received their first driving citations in the four participating counties in a Midwest state during October and November 2009. The limitations for the study were:

1. Non-random samples. The teen drivers were a non-random sample as a result of receiving a driving citation for risky driving behaviors. The participating juvenile courts mandated the first-time cited teen drivers to 4-H CARTEENS as a teen driver intervention program.

2. Sample. The number of teens in the study was lower than anticipated when compared to the number of teens who participated in the 4-H CARTEENS program. The teens in the study were representative of teens who had received a first citation before the study. The number projected for the study was 360 teens, only 344

were mandated, and 243 teens enrolled in the study. The cost of gasoline and the economic climate during the study may have affected teens' driving frequencies.

3. Response rate. The response rate was less than the researcher anticipated. The Time 1 questionnaire was given before the teen attending the 4-H CARTEENS program, with 70.64% enrolling in the study. The Time 2 questionnaire had a 79.91% response rate. Results generated from the study were based on the questionnaire responses from the teen drivers.

4. Self reporting. The teens were asked to complete the survey that best reflected their driving for the 30 days before attending 4-H CARTEENS. They were asked to respond sincerely and honestly.

Research Procedures

This study used a quasi-experimental design. The 4-H CARTEENS programs in the four counties were similar in subject matter, program design, and method of teaching, except for parent involvement. Two counties required parent attendance to 4-H CARTEENS, while two other counties did not require parent attendance.

Research Design

The research design was the pre- and post-questionnaire quasi-experimental comparison control group design. The major advantage of this design was that the pre-questionnaire helped the researcher know what the differences between two groups before treatment were.

Group 1 - Teen with Parent Attendance	O	X	O
Group 2 - Teen without Parent Attendance	O		O

Sample

The study sample consisted of 243 teen drivers enrolled in 4-H CARTEENS in four counties in a Midwest state during October and November 2009. The teen drivers had received their first driving citation and were mandated to attend 4-H CARTEENS as a driver intervention program by the juvenile courts.

Instrumentation

Many items in the instrument were used with permission from two experts in this field of study. The risky driving behavior items were adapted from Donovan (1992), and the parental management items were adapted from Hartos et al. (2002). The questionnaire consisted of three parts: (1) The Risky Driving Behaviors (teen drivers responded to 33 risky driving behaviors by giving the number of times they had demonstrated one or more within a 30-day period), (2) Parental Management: Control and Parental Management: Restriction used a Likert-type scale ranging from 1 (strongly disagree) to 4 (strongly agree) in which teens were asked to rate their level of agreement for parent's management (7 items researching control and five items researching restrictions), and (3) 20 questions concerning demographic and other teen driver characteristics.

Content and face validity were established through experts in the field and the use of established instruments from previous research. Cronbach's alpha was calculated for each section of the instrument. The instrument was found to be valid and reliable.

Data Collection

The data were collected via Time 1 and Time 2 questionnaires. The Time 1 questionnaire was four pages concerning Risky Driving Behaviors, Parental Management: Control, and Parental Management: Restrictions, and demographics. The Time 2 questionnaire was two pages concerning Risky Driving Behaviors and Parent Management: Control, and Parental Management: Restrictions. The Time 1 questionnaire was administered in October and November 2009 to teens who attended 4-H CARTEENS. The Time 2 questionnaire was sent to the participants 30 days after attending 4-H CARTEENS. Follow-up procedures included a letter to the non-respondents. The response rate for the Time 1 questionnaire was 243 of the 344 (70.64%). The response rate for the Time 2 questionnaire was 187 of the 243 (76.95%). Respondents who returned the questionnaires within 10 days received a $25 gas incentive card from 4-H CARTEENS cost recovery monies administered by the state's 4-H office.

Data Analysis

This study consisted of five research questions analyzed by quantitative data analyses. This study utilized descriptive statistics (mean, standard deviation, maximum, minimum, range, frequency, and percentage), and inferential statistics (correlations, partial correlations, t-tests [paired samples, independent samples], Cohen's d, and linear regression analysis). Data were calculated using SPSS (2008).

Summary and Discussion of Findings

Profile of the Teen Drivers

Descriptive statistics were used to summarize the demographic data. Respondents were 243 teen drivers enrolled in 4-H CARTEENS programs in four counties in a Midwest state during October and November 2009. Two counties required parents to attend the 4-H CARTEENS program, and two counties did not require parents to attend the 4-H CARTEENS program. The average age of the teens were 17 years (55%), followed by 16-year-olds (35%). The respondents were 51% males and 49% females. Ethnically, the group was primarily 92% White with other ethnic groups being 3% bi -racial or multi-racial, and 2% each for Black/African American, Hispanic/Latino, and Asians. Participants consisted mostly of high school seniors (48%) and juniors (48%).

Nearly 86% received their drivers license at age 16, and most had their license for 1 to 5 months. Forty-nine percent were 17 years of age, and 45% were 16 years of

age when they received their first citations. The courts suspended nearly 42% of the teens' drivers licenses at their first citation.

Ninety percent of the teen drivers were wearing seat belts at the time of their first traffic citations, which consisted of speeding (40%), assured clear distance (18%), failure to control (12%), and failure to yield (10%). Most teen drivers (91%) had a parent complete the 50 hours of supervised driving that was required by the Bureau of Motor Vehicles before licensure.

Discussion

The researcher attended each of the 4-H CARTEENS sessions and collected the questionnaires. One noticeable component of this study was the limited ethnic diversity in the teens with three of the four counties having large diverse populations. The average age of the teens attending 4-H CARTEENS was expected by the researcher. The age at first citation was a year older than usually reported by the literature (Williams, 2003). The percentage of males (51%) vs. females (49%) was in contrast to most of the literature published by Chandraratna et al. (2006), who determined that male drivers showed a higher likelihood of being the at-fault driver than would female drivers. Harré et al. (1996) found that men (particularly young men) engaged in more illegal and risky driving behaviors than did women, no matter which metric was measured. Both sexes in the present study demonstrated the Risky Driving Behaviors, similarly reporting them on their surveys. The participants were in higher grades in high school, with most being juniors and seniors. This finding was in

contrast to the literature stating that most of the teens were younger at the time of citation (usually within the first 6 to 11 months after licensure). The teens were a representative demographic of teens as mandated to attend 4-H CARTEENS.

1. What are the risky driving behaviors of 4-H CARTEENS participants?

Descriptive statistics were used to summarize the Risky Driving Behaviors of the 243 teens answering the survey. The most frequent Risky Driving Behavior was "read, ate, used a cell phone (talked, texted, etc.), put on make-up, horsed around with passengers, or other such activities while driving." Teen drivers mandated to attend 4-H CARTEENS were cited for driver inattention at higher rates. The teens rated "drove through an intersection just as a light changed to yellow or was yellow" as the second most frequently reported behavior. Failure to yield was another citation the teens received. Another frequently reported risky driving behavior was "played the radio so loudly they were unable to hear other vehicles horns or sirens." Teen drivers continued to drive with many distractions inside and outside the vehicle, and many did not recognize the dangers of putting themselves, their passengers, and other motorists and personal property at risk, nor possibly being involved in a crash with serious injuries or fatalities. Males (M = 91.92) engaged in risky driving behaviors more frequently than did females (M = 62.91).

The least reported risky driving behavior was "drove after using other illicit drugs." The other least frequent risky driving behaviors were "passed a car on a blind curve or when coming to the top of a hill" and "drove after drinking alcohol."

Teen drivers in the study demonstrated risky driving behaviors that resulted in receiving their first driving citations. Many teens reported several risky driving behaviors, and the data were entered in SPSS (2008) for analysis. Simons-Morton (2007) noted some aspects of risk taking that may be understood in the context of inexperience as novices explored the vehicle's potential and their own potential by demonstrating risky driving behaviors that resulted in injury, fatality, or developing a learned behavior. The data seem to confirm the findings of Simons-Morton (2007). While teens drove for the pleasure of being grown-up, risky driving behaviors were a factor because of their inexperience behind the wheel. The findings showed that the sex differences were not as prominent as the research published by Brown and Copeman (1975) and Dejoy (1992), showing that males rated dangerous driving behaviors as less serious than did females. The young males in the study had higher frequencies of risky driving behaviors than did the young females.

Driving inattention was the most common risky driving behavior. Teen drivers rated "read, at, used a cell phone (talked, texted, etc.), put on make-up, horsed around with passengers or other such activities while driving" as the most common risky driving behavior. For inattentive driving, Simons-Morton (2007) strongly suggested that teens for some period of time should not drive at night, with teen passengers, while using electronic devices, on high speed roads, or in otherwise complex driving situations so they could develop competence and judgment through experience. The teens response to the highest rated risky driving behavior seemed to support the findings of Simons-Morton (2007), Sarkar and Andreas (2004), and Ship (2010).

Sarkar and Andreas (2004) reported 14% of teen drivers believed it was never acceptable to use a cell phone while driving, but most teen drivers willingly used them, resulting in inattentive driving distractions. Many teen drivers performed a risk known as "distractive driving" and had no understanding of the seriousness of the risks. Many states including Ohio were diligently addressing distractive driving with new legislation by passing GDL 343 (Ohio Department of Public Safety, 2007). Ship (2010) reported that 81% of teen drivers talked and/or texted while driving, resulting in driving distractions considered a Risky Driving Behavior. Data suggested that each year, at least 1.6 million traffic accidents (28% of all crashes) in the United States were caused by drivers talking on cell phones or texting (National Safety Council, 2010; Ship, 2010).

The second most frequent Risky Driving Behavior was failure to stop or yield at an intersection when the light was yellow or changed to yellow. Many teens were not observant of the risk and seriousness of failure to pay attention to the color of stop lights. Teen drivers failed to understand the significance of the three colors of a stop light and their meaning to drivers. This finding supported research by McCartt et al. (2003) in that teens recognized only two colors (red and green) as important. McCartt et al. (2003) found that 10% of the teenagers disobeyed a red light or stop sign.

Several studies examined teen drinking and driving. Beck et al. (2002) found that approximately one-third of high school seniors were exposed to drinking. Sarkar and Andreas (2004) noted that 55% of teen drivers reported exposure to risky driving by being in a car with a driver engaging in such activities as drunken driving, drag

racing, and reckless driving. In the present study, however, the two risky driving behaviors that were at or near the bottom of the listing with mean scores were "drove after using other illicit drugs" and "drove after drinking alcohol," rated lower than expected based on the existing research. These findings contrasted with the published literature of teens drinking and driving or driving after doing drugs as reported by Beck et al. (2002), Sarkar and Andreas, (2004), and Donovan (1992).

Risky driving has less to do with unconventionality and more to do with youthful inexperience and enthusiasm (Hartos et al., 2002). A notable risky driving behavior in many Ohio counties is hill hopping. The respondents were from four Ohio counties with topography and road conditions that could lead to problems such as passing in hilly regions. With two counties being rural and hilly, the low risky driving behaviors were evident to the researcher. For example, teens who lived in hilly counties were known to participate in the risky driving behavior of hill hopping wherein they sped, stepped on the brakes when they reached the crest of a hill, and coasted through the air before touch down. In addition, teens from rural counties needed to deal with the risky driving behavior of "passing a car on a blind curve or when coming to the top of a hill" safely. These findings were in contrast to the published research about teens engaging in risky driving behaviors like passing on a top of a hill or on a blind curve because teens were less apt to drive recklessly (Sarkar & Andreas, 2004; Hartos et al., 2002). West and Hall (1997) found that teen drivers who were more accepting of risky driving behaviors were more likely to engage in dangerous driving and were involved in more accidents. Another risk hazard was

when teens inexperienced or unknowledgeable about their surroundings might not have known the roads well enough to avoid crashes because of curves or other vehicles on the road.

2. What are the parental management practices of parents of 4-H CARTEENS participants?

Parental management in this investigation evaluated participants' perceptions of how their parents managed their driving for control and restrictions. For Parental Management: Control, the item most strongly agreed "my parent made sure I had enough practice driving before getting my license" (69%). The control item with the fewest frequency of strongly agrees was "after getting my license, my parent continued to supervise some of my driving" (34%).

For Parental Management: Restriction, the most frequently rated item for strongly agree was "my parent restricts me from not drinking and driving" (89%). The least rated item for strongly agreed was "my parent restricts who can ride with me in the car" (28%).

The teens in the study evaluated their parent's management of their driving with control and restrictions. Parents had a substantial opportunity to effect safe teenage driving because they were involved in their teenagers' driving from when they first started to drive, governing their access to vehicles (Hartos et al., 2004, 2001, 2002; Simons-Morton et al., 2006). Parents established ground rules to prevent risky

driving behaviors. The teens' perceptions of their parents' management practices were analyzed with descriptive statistics for frequency and percentages.

Many parents altered their management for control and restriction of their teen after receiving their driving privileges. Hartos et al. (2002) cited that parents who monitored their teens' behaviors did so by maintaining frequent opportunities for communication, thereby increasing their teens' willingness to socialize and reduce their propensity to engage in problem behaviors such as risky driving. The participants rated their parents' management practices. For Parental Management: Control, the item most often strongly agreed was "my parent made sure I had enough practice driving before getting my license," indicating parents took parenting responsibilities seriously and ensured the teen was prepared before receiving driving privileges. Additionally, parents ensured the teen driver was well prepared for their driving examinations, which contrasted with some literature about parental involvement. Simons-Morton (2007) found there was no evidence that greater amounts of parent-supervised practice driving were associated with better independent driving performance and safety. When signing the teen's drivers license, parents took primary responsibility for the teen's actions in the vehicle and their risky driving behaviors with the assumption the teen understood their responsibilities (Simons-Morton & Hartos, 2003). Parental commitment to their teen driving and ensuring they had adequate practice before licensure supported earlier research.

According to the literature, Beck et al. (2002) found that approximately one-third of high school seniors were exposed to drinking and driving either as a driver or

a passenger. It was unexpected with the low rate of teen substance abuse and driving; however, the data in the Parent Management: Restrictions supported this finding in conjunction with the rather large frequency responding with strongly agrees to "my parent restricts me from not drinking and driving." The participants' strongly agreed response of not drinking and driving parental restriction supported the lower ranking of "driven after drinking alcohol" in the 33 risky driving behaviors. This finding was in contrast with Beck et al. (2002), Hartos et al. (2002), Sarkar and Andreas (2004), and Williams (2003), indicating that the teens in the survey were heeding their parents and not drinking and driving. A strong agreement of parental restrictions of the teen from drinking and driving based on data distributed by the Ohio Department of Public Safety was unexpected.

Hartos et al. (2004) found that parents and teens may have benefited greatly by signing parent-teen driving release, thereby increasing clarity of driving rules and consequences for rule violations. Ohio's GDL 343 legislation (Ohio Department of Public Safety, 2007) restricted the number of passengers a teen could transport who were not family members. Teens' risky driving behaviors were affected by the amount of Parental Management: Control and Parental Management: Restrictions demonstrated by the parent. Teens recognized and found Parental Management: Control to be more effective than was Parent Management: Restrictions. Although parents reduced the amount of restrictions on the teen drivers as they increased in age and driving experience, they continued to enforce control measures, no matter what age or driving experience.

Hartos et al. (2001) found, with regard to parent restriction, teenagers reported high levels of parent monitoring of and parent concern about teenage driving, and there were no sex differences in parental restrictions. The most frequently reported parent restriction was "my parent restricts me from not drinking and driving." This restriction was rated by 89% of the respondents strongly agreeing. Research has shown that lenient parent restrictions placed on teen driving, especially in terms of allowing teen passengers, were related to increases in risky driving, traffic violations, and crashes (Hartos et al., 2000, 2001, 2002). Twenty-four percent of the respondents strongly agreed with the restriction "my parent restricts who can ride with me in the car." The response to this restriction supported the research by Hartos et al. (2002), who found that, over time, when comparing teens with low-risk driving to teens with high-risk driving, teens demonstrating risky driving behaviors were about three times more likely to report low parental monitoring and two times more likely to report low parental restrictions on driving. The findings aligned with the research that parents restricted who could ride with the teen driver.

According to Hartos et al. (2002), parent monitoring (knowing where teens were and what they were doing) and behavior control (having rules and expectations about teen behavior) could have had an impact on the teens' responsible driving. As a result, the respondents rated Parental Management: Control more favorably than Parental Management: Restrictions. It was interesting to note the difference between Parental Management: Control and Parental Management: Restrictions as the respondents rated their parent's involvement in their driving. The respondents seemed

to respond favorably to the control items for the 30 days before attending 4-H CARTEENS. Parents did not ease up on teen drivers and reduce the monitoring of their driving to reduce risky driving behaviors. The findings of the research fit with the literature published by Hartos et al. (2002).

3. What are demographics and other driver characteristics related to risky driving behaviors of study participants with parent attendance?

Risky Driving Behavior and Parental Management: Control at Time 2 was moderately associated at -.35, indicating that less parental control was related to more risky driving behaviors. Risky Driving Behavior and Parental Management: Restriction at Time 2 also was moderately associated at -.36 with less parent restrictions of the teen driver, resulting in more risky driving behaviors. As the teens drove more frequently per week, there was a moderate association (.46) of increasing their risky driving behaviors. As the teen's age was younger, greater parental management practices were strongly associated.

Teens viewed driving motor vehicles as a rite of passage into later teen development because it ensured them independence and autonomy (Hartos et al., 2000, 2002). Teenagers who had been exposed to risky driving practices were more accepting of risky driving behaviors (Sarkar & Andrreas, 2004). Increased risky driving behaviors resulted in teen drivers receiving their first citations and being mandated to attend the 4-H CARTEENS program. Parents increasing control of their teens resulted in fewer risky driving behaviors. The findings showed the teen drivers

responded to the 33 Risky Driving Behaviors with a wide range of responses (Table 6, page 77). The high frequency of risky driving behaviors supported the existing research published that teen's exposures to risky driving behaviors are more accepting of them as noted by Donovan (1992), Hartos et al.(2002), Mayhew and Simpson (1990), Simons-Morton et al. (2005), and West and Hall (1997).

Many teens received their first citations within the first year of driving if they practiced risky driving behaviors and drove more frequently each week. McCartt et al. (2003) found that the likelihood of a first crash or first citation was higher during the first month than during the next 11 months. In contrast, the current study showed a higher number of older teens receiving their first citation within the first 11 months of licensure. McCartt et al. (2003) noted that the likelihood of a first citation during the first year of licensure was double for males and nearly double for students with C or D grade averages, and other researchers found that male drivers were more accepting of risky driving behavior (Chandraratna et al., 2006; Harré et al., 1996; Simons-Morton et al., 2005). In contrast, the current study showed a nearly even split between males and females engaging in risky driving behavior. The teens in the study reported the number of times they performed a risky driving behavior, and several of the young females engaged in risky driving behaviors as frequently as did the young males. The young females reported that they had driven 20 miles per hour over the posted speed limit more frequently than did the young men. In addition, several young females were cited for assured clear distance, meaning they had been involved in crash. As teens drove more frequently per week, their risky driving behaviors had

low association to other demographics (i.e., present age and present grade). The findings supported research by Chandraratna et al. (2006) in that drivers age 16 to 19 years who demonstrated risky driving behaviors were showing off to peers, gaining appreciation from peers, and duplicating some adult actions at young ages and lower grades in school.

West and Hall (1997) found that teen drivers who were more accepting of risky driving behaviors were more likely to engage in dangerous driving and were involved in more accidents. The association of violations with risky driving behaviors, driving frequency per week, and parental management practices resulted in higher crash results (Evans, 1991). As parental management for control and restriction was lessened, the teens increased their risky driving behaviors and their driving frequency per week increased. Similarly in the present study, as Parental Management: Restrictions increased, risky driving behaviors of younger teen drivers decreased.

Sarkar and Andreas (2004) noted that young drivers with traffic violations were engaged in one or more of the risky driving behaviors, including speeding, thereby making driving more complex, reducing safety margins, and increasing the likelihood of a crash (Simons-Morton, 2007). Risky driving behaviors may have accounted for some portion of the novice young drivers' problems (Simons-Morton, 2007; Williams, 2003) that they demonstrated in front of peers, leading to higher crash rates, and committing vehicular acts that resulted in citations. That teen drivers demonstrated risky driving behaviors with more frequency of driving per week and in

the absence of their parents control and restrictions, supported research of Sarkar and Andreas (2004), Simons-Morton (2007), and Williams (2003).

4. Does 4-H CARTEENS attendance reduce risky driving behaviors?

Risky driving behaviors as influenced by 4-H CARTEENS were analyzed using descriptive (mean and standard deviation), inferential statistics (t-tests), and Cohen's (1988) d to test for effect size, both at Time 1 (before attending 4-H CARTEENS) and at Time 2 (30 days after attending 4-H CARTEENS). The Cohen's d effect size measured the magnitude of the treatment effect on risky driving behaviors.

The t-test (paired sample) measured the difference between Time 1 and Time 2 risky driving behaviors (categorized into the 10 violation subscales used by Donovan, 1992). The data showed a reduction in risky driving behaviors from Time 1 to Time 2, with the means decreasing from 75.65 to 47.82 overall. Additionally, the findings showed a reduction in the mean scores for all violations except for Substance Abuse violations. Cohen's d calculations indicated the 4-H CARTEENS program had a medium effect for speeding violations (.34), lane use violations (.34), and control violations (.30). The difference indicated that the respondents reduced their risky driving behaviors after attending the 4-H CARTEENS program.

The 4-H CARTEENS teen driver intervention education program, developed in 1987, has been a partnership between The Ohio State University Extension, juvenile court judges, and the Ohio State Highway Patrol. The methods of program

delivery for reducing risky driving behaviors were taught through skill stations concept, determined by input from the juvenile court, Ohio State Highway Patrol, and teens who volunteered as peer teachers. The four counties of the present study had similar educational skill stations and taught driver intervention concepts referencing speeding, lane use, control (stopping distance), distraction driving, and substance abuse violations. The findings determined that the 4-H CARTEENS program did an effective job of reducing risky driving behaviors from Time 1 to Time 2. The topics taught at 4-H CARTEENS fit with the existing literature of reducing risky driving behaviors in the areas of speeding, lane use, and controlling. The only behavior that was in contrast to the literature concerned substance abuse.

Reducing risky driving behaviors in teen drivers was a challenge. Cropper, (1999) noted that teen educators used multiple teaching methods to reach participants with different learning styles to keep participants engaged and comprehend the materials. Teaching methods used at 4-H CARTEENS were jeopardy type games re-enforcing Ohio Bureau of Motor Vehicle Laws, name connection with traffic signs, fatal vision goggles to simulate being impaired, stopping distance at posted speed limits using lengths of rope, and writing a phrase while being distracted for 7/10s of a second (the time it took for a driver to die in a fatal crash). Chesnick (2002) found that teenage teachers associated with the program came from various backgrounds and several were first-time motor vehicle law violators themselves. The findings of the present study showed that utilizing teen volunteers to help conduct the 4-H CARTEENS program reduced risky driving behaviors. By using teens as teachers and

selecting new methods of teaching the materials, teen drivers retained information, changed their driving habits, and reduced the frequency of risky driving behaviors. The 4-H CARTEENS skill station topics (speeding, distractions, seat belt use, traffic signs) showed a medium reduction in the frequency of risky driving behaviors. The recidivism rates from one county in the present study showed an increase from 23 to 111 after attending 4-H CARTEENS. This supported research that 4-H CARTEENS skill stations did an effective job of imprinting on the teen about risky driving behaviors.

5. What effect does parental attendance at 4-H CARTEENS play in reducing risky driving behaviors?

Parents attending 4-H CARTEENS was a vital part of this research study, leading to increased Parental Management: Control and Parental Management: Restrictions, in turn reducing the frequency of risky driving behaviors. Data were analyzed using inferential statistics (t-test and regression analysis).

The frequency of risky driving behaviors was reduced in the parent-attendance counties to an average of 11.62, compared to 53.35 in counties where parents did not attend. For parent attendance, 4-H CARTEENS resulted in a large effect for reducing risky driving behaviors. The mean difference for risky driving behaviors in counties without parent attendance at 4-H CARTEENS was 102.86 for Time 1 to 53.35 for Time 2. Cohen's (1988) d effect size was medium for reducing risky driving behaviors.

Parental Management: Control and Parental Management: Restriction were examined at Time 1 and Time 2. There was an increase in Parental Management: Control and Parental Management: Restriction with parents attending 4-H CARTEENS from Time 1 to Time 2. Parents attending 4-H CARTEENS increased their responsibilities of reducing risky driving behaviors by increasing their control and restrictions of the teen driver. Cohen's (1988) d showed a small effect size for each parental management practice.

The research calculated a regression correlation to predict if risky driving behaviors at Time 2 was affected by parent attendance, parental management practices, and teen driver demographics. The findings indicated that risky driver behaviors increased when the teen drove more frequently. An increase in Parent Management: Control predicted a decrease in the frequency risky driving behaviors. The variance was explained by 32.9% of the model.

Parents had a substantial opportunity to effect safe teenage driving because they were involved in their teenagers' driving from the beginning, teaching them to drive, governing their access to vehicles (Hartos et al., 2004, 2001, 2002; Simons-Morton et al., 2006), and establishing ground rules. When parents reduced their parenting responsibilities, the teens increased their risky driving behaviors. Simons-Morton and Hartos (2003) noted parents were ambivalent about teen driving – concerned about the risks, but interested in reducing the time they spent transporting teens. The findings were in contrast to the literature that parents were ambivalent about the teen's driving. It was interpreted that, when parents attended 4-H

CARTEENS programs, they took their parental management involvement seriously and stayed engaged in the driving skills of the teen driver. The findings showed a large effect in parental management from Time 1 to Time 2 when parents were mandated to attend as compared to when parents were not mandated to attend.

A key focus of this study was to determine if mandating parents to attend 4-H CARTEENS made a difference in their parenting management practices at Time 2 and reducing risky driving behaviors. Parents were the gatekeepers when deciding if the teen received driving privileges. Parents were ambivalent about teen driving and concerned about the risks involved in teen driving (Hartos et al., 2004) but interested in reducing the time they spent transporting teens (Simons-Morton & Hartos, 2003). Parents who had not regularly monitored their teens' driving were at risk of allowing an increase in risky driving behaviors that could result in a first citation. Parent attendance at 4-H CARTEENS did have an effect on reducing the teen's risky driving behaviors. Parents mandated to attend the 4-H CARTEENS program in two counties demonstrated a larger effect size, whereas the effect size was medium in those counties without mandatory parent attendance. With the difference in effect size, the findings showed the importance of parents attending versus parents not attending as parents took a more active role in parental management involvement. Parents and teens were not always in agreement on what the rules were, with parents generally perceiving stricter rules than did teens (Beck et al., 2005) when it came to risky behaviors like teen driving. Hartos et al. (2002) noted that the influence of parenting on teen driving had not been examined thoroughly. The research findings of the

present study showed that parent's attendance at 4-H CARTEENS engaged them more in their parental management of control and restriction as reported by the teen drivers.

A growing body of research indicated that teen driving risk was associated with parenting practices (Beck et al., 2002), including monitoring and limits on teen driving (Beck et al., 2001, Hartos et al., 2000, 2001, Simons-Morton et al., 2004). To determine the change in Parental Management: Control and Parental Management: Restriction and Risky Driving Behaviors from Time 1 to Time 2, the research utilized a paired sample t-test. Results showed that an improvement in Parental Management: Control and Parental Management: Restrictions reduced risky driving behaviors. As a result of the improvement, parents attending 4-H CARTEENS increased their management of the teen driver, thus reducing risky driving behaviors. Parental Management: Control and Parental Management: Restriction increased after parents attended 4-H CARTEENS, leading to a reduction of risky driving behaviors. These findings supported the research by Simons-Morton et al. (2002) for the need to provide parents with relevant educational materials, as did the 4-H CARTEENS program.

Parents attending 4-H CARTEENS with the teen driver showed a reduction in risky driving behaviors and improvement in Parental Management: Control and Parental Management: Restriction practices. Many teens reported they had driving rules (i.e., do not drink and drive, tell parents where you are going and with whom, and be home at a certain time) (Preusser et al., 1985), but several teens reported not having many driving rules or restrictions, even for the highest risk driving conditions

for teens, including driving at night and with teen passengers (Beck et al., 2001, Hartos et al., 2004, 2000). The findings of the present study supported the literature of giving parents educational information to help them enforce parental control and restrictions after attending 4-H CARTEENS.

For Parental Management: Control and Parental Management: Restriction in the regression analysis, parent control was predictive in reducing risky driving behaviors. The findings were supported by Simons-Morton and Ouimet (2006), who concluded that risky driving, traffic violations, and crashes were lower among teens whose parents set control limits on their driving privileges. In addition, driving frequency per week indicated an increase in risky driving behaviors. The other variables (i.e., parent attendance, parental restrictions, sex, current age of teens, and age at first citation) in the regression analysis did not predict a reduction in risky driving behaviors.

Conclusions

The purpose of this study was to evaluate the 4-H CARTEENS program. Based on the findings, the 4-H CARTEENS program reduced the frequency of teen risky driving behaviors. The data were collected at Time 1 (before 4-H CARTEENS attendance) and Time 2 (30 days after 4-H CARTEENS attendance) and showed that the teens reduced their driving risks for 30 days post- 4-H CARTEENS. Most of the risky driving behavior violations decreased from Time 1 to Time 2 with medium significance for topics taught in skill stations during the 4-H CARTEENS program.

This study determined the influence of reducing risky driving behaviors with parental attendance at 4-H CARTEENS. This was the first study to investigate Parental Management: Control and Parental Management: Restriction of teen drivers after they had received their first citation and having parents attend 4-H CARTEENS. Parent management practices increased in that parents implemented more control and restrictions on the teen driver after the first citation. The programs that mandated parent attendance had a medium effect with parent restrictions and reducing risky driving behaviors. The teens reported that parent attendance at 4-H CARTEENS increased parent management practices 30 days after attending 4-H CARTEENS. Requiring parent attendance reduced risky driving behaviors significantly.

1. Juvenile Courts in the four study counties were very interested in participating in the study and interested in the findings when completed.

2. The researcher attended each of the 4-H CARTEENS programs to answer specific questions about the study and collect the completed questionnaires.

3. The participating counties used same skill stations materials and had teen volunteers as peer educators teaching the material. The four programs had the same format of program delivery.

Recommendations for Study Investigators

1. A difference in program delivery might affect data collection. Investigators should examine the potential site to see if the methods of educational delivery are equivalent and the topics being taught have been updated and approved

by the participating partners. The 4-H CARTEENS program was a partnership between State Highway Patrol and juvenile courts, each having the most current and revised laws changes or rule changes that needed to implemented into educational program delivery by teen teachers at their 4-H CARTEENS programs.

2. Select locations of study where the educator or program delivery person has some tenure with the program. Those with tenure generally have a stronger working relationship with program partners and have the respect from the community. Programs with positive rapport in the community generally have a high degree of professionalism and participants appreciate what is expected of them as they attend the session or class.

Recommendations for Practitioners

1. All of Ohio's 88 counties have teen drivers, inexperienced behind the wheel of a vehicle. Many teen drivers are developing risky driving behaviors, and only half of Ohio's counties have an established teen driver intervention program in place called 4-H CARTEENS. Juvenile courts are encouraged to have teen driver intervention programs whereby teens attendance is mandated. The 4-H CARTEENS program offers a unique perspective by using teens as teachers in the program. 4-H CARTEENS gives teens another opportunity to develop leadership, speaking, and organization skills.

2. Parents are responsible for the actions of their teenage driver. Many parents consider driving as a passage into later teenage development, but teen drivers

should recognize that their actions behind the wheel of a vehicle could cost their family vast amounts of money, personal property, and savings. The 4-H CARTEENS program should have parent involvement to remind parents of their responsibilities in contributing to fewer teen risky driving behaviors.

3. Extension educators and Juvenile Court judges with 4-H CARTEENS programs have requested a standardized evaluation instrument, necessary for measuring the effectiveness of the 4-H CARTEENS program. One part of the 4-H CARTEENS program evaluation instrument should include Risky Driving Behaviors so the program can be strengthened to teach teens about the hazards of driving risks. The instrument needs to measure the driving habits the teens develop after being licensed.

4. The signature program designed by The Ohio State University Extension included the total office staff working together on a selected signature program to establish an impact in the county. At the time of this writing, 4-H Youth Development had signature programs designed to improve youth lives in the areas of Real Money and Real World but had not fully adopted the 4-H CARTEENS program that could save teenagers lives, change poorly chosen habits, and enhance teen leadership skills. 4-H CARTEENS should be an Ohio State University Extension signature program to develop stronger bonds within the counties by building coalitions with agencies that have an interest in teen driving issues and safety.

Need for Further Study

The following recommendations are made for future investigation in these areas:

1. Replicate this study using a larger sample size involving more 4-H CARTEENS counties to assess the 4-H CARTEENS program in reducing risky driving behaviors. Continue to measure the importance of parents attending the 4-H CARTEENS program with the teen driver.

2. Assess the Parental Management: Control and Parental Management: Restriction practices of teen drivers after their first citations.

3. Conduct research to measure the impact of parent attendance at 4-H CARTEENS and how their parent management practices change with reducing risky driving behaviors.

4. Conduct research at longer intervals of time with teen drivers who attend 4-H CARTEENS to measure the impact of risky driving behaviors at Time 1, Time 2, and Time 3 (three months later).

5. Measure the impact of 4-H CARTEENS at the county level by studying the recidivism rates of teen drivers who have attended 4-H CARTEENS program and received their second citation.

6. Conduct an experimental design with 4-H CARTEENS mandated participants and first-cited teens who have not been mandated to the 4-H CARTEENS program in the same county to measure if risky driving behaviors were affected by the teens teaching the skill station materials.

Conclusion

Motor vehicle crashes were the major cause of death and disability among teens aged 16 through 20, resulting in more than 5,000 deaths annually (National Highway Traffic Safety Administration, 2005). Many of these crashes were caused by teen driver inexperience and risky driving behaviors that put the drivers, their passengers, other motorists, and personal property at risk. The 4-H CARTEENS program established in 1987 in Brown County (Ohio) was a unique partnership between The Ohio State University Extension, juvenile courts, and the Ohio State Highway Patrol to use the talents, skills, organization, and leadership of teens to work as peer educators teaching the importance of changing the driving habits of those teens having received their first citations. The 4-H CARTEENS driver intervention program used the skill station teaching concept, focusing on risky driving behaviors that represented the most numerous citations for teens in that county.

When signing the teen's drivers license, parents assumed responsibility for the teens' driving. The study asked the teens to report how many times during a 30-day period they were involved in any of the 33 risky driving behaviors. Young men reported more risky driving behaviors than did females on average 29 more times per month. The driving frequency per week and age of the teen increased the frequency of risky driving behaviors. As a result of an increased frequency of risky driving behaviors, 11 of Ohio's juvenile court judges mandated parent attendance at 4-H CARTEENS. Results indicated a perceived reduction of risky driving behaviors by all

participants one month after completing 4-H CARTEENS and an even greater reduction when parents attended the program with their teen driver. Risky driving behaviors decreased as Parent Management: Control increased, 30 days after completing the 4-H CARTEENS program. Parents' involvement with the teen driver had an impact in reducing the frequency of risky driving behaviors.

APPENDIX A

Correspondence

Information Sheet for Parents
Risky Teen Driving and Parental Management

Your teen's participation in this dissertation study on risky driving behaviors and parental management after having attended the 4-H CARTEENS program is very important to understanding how behavioral changes might occur over time. The purposes of this study are to:

- Examine the relationship of risky driving behaviors demonstrated by teens and parental management practices.
- Analyze the 4-H CARTEENS program to determine if this peer education program is having an impact on risky teen driving behaviors.
- Determine if attending 4-H CARTEENS program improves parents or legal guardian management of their teen.

The questionnaire used in this study has effectively been used by two well-published researchers, but there has been no known study on adolescents after they received their first driving citation. There also is no known study of whether parental management techniques may change as a result of the 4-H CARTEENS program. The questionnaire will be used to collect data at the beginning of the 4-H CARTEENS program and again one month later to see if any changes have occurred in the risky driving behaviors of the teen. Additionally, data will be collected to study if changes have occurred in parental management of the teen driver.

The data collected in this study will be used to complete a dissertation of the researcher. Additionally, the data collected will be used in research journal articles and presentations. Your teen's participation in this study is voluntary. The teen can quit at any time during the study.

You are being asked to grant permission for your teen driver to complete two questionnaires. The first questionnaire is at the beginning of the 4-H CARTEENS program, and the second questionnaire will be mailed to your teen 30 days following the completion of the 4-H CARTEENS program. Once the researcher receives the completed second questionnaire, the teen will be sent a gas card as a thank you incentive. A satisfaction questionnaire will be given immediately following the 4-H CARTEENS program but will not be a part of the two questionnaires for the research. This satisfaction questionnaire is only to give the county 4-H CARTEENS program immediate information about their program.

If you agree for your teen driver to participate in this research, please sign the parental permission form. Your son/daughter will be asked only to complete the two questionnaires as part of this study.

The information your teen provides will be held and treated with complete confidentiality. No individuals will be identified in the study. Information will be reported and shared in journal articles or presentations in the aggregate. All identifying information will be destroyed after it has been downloaded in a data file with participants' names deleted.

If you have any questions, please contact your county Extension Educator, 4-H Youth Development, or James L. Jordan, Extension Educator 4-H Youth Development, 1802 Princeton Road, Suite 400, Hamilton, OH 45011. His phone number is 513.785.6650 or jordan.247@osu.edu.

Thank you,

James L. Jordan
Extension Educator, 4-H Youth Development

Questionnaire Letter - Time 1

Dear 4-H CARTEEN Participant:

Thank you for agreeing to take part in this research study of risky driving behaviors and parental management. The hope is you will find the questionnaire interesting and useful. This survey is voluntary, and you may quit at any time. Your answers are held strictly confidential as some of the information being collected contains sensitive information. Answers will be released only in research data, and no individual answers can be identified.

Make sure you have privacy when completing it on your own.

Do not write your NAME anywhere on the questionnaire. Each questionnaire has been coded, and only the researcher has the key to the code.

You can quit at any time or refuse to answer any sensitive items without penalty during the study, including completing the questionnaire.

There is NO right or wrong answer. Your answers are your opinion from the past one month of driving. Choose or record the answer that is best for you. Please be truthful when answering.

If you have any questions about the questionnaire, please ask the researcher at Jordan.247@osu.edu or call him directly on his cell phone at 513-235-5912.

I hope you will complete the questionnaire in about 10-15 minutes of time.

A follow-up questionnaire will be mailed to you in one month. Those responding to the questionnaire in a 10-day time period (postmarked) will receive a $25 gas card, within 11 to 15 days a $15 gas card, and within 16 to 25 days a $10 gas card.

Thank you for your responses.

Sincerely,

James L. Jordan
Extension Educator, 4-H Youth Development

Please turn to page 1 and begin answering the questions/statements.

Follow-up Letter to Participants - Time 2

Dear 4-H CARTEEN Participant:

At your attendance of the 4-H CARTEENS program 30 days ago, you agreed to participate in a study about the 4-H CARTEENS program. You signed an assent form and your parent or guardian signed a consent form stating your willingness to participate. On the first day of the 4-H CARTEENS program, you completed a questionnaire about Risky Driving Behaviors and Parental Management.

The information you provide is for my research study about risky driving behaviors of teen drivers and parental management after having attended 4-H CARTEENS. Enclosed you will find a second questionnaire. **Your answers to questions and statements in this questionnaire need to reflect your driving skills within the past 30 days since you attended 4-H CARTEENS.** Also, record any parental management changes you might have experienced since you attended 4-H CARTEENS. Your honest and truthfulness answering the questionnaires are greatly appreciated. This should take you about 10-15 minutes to complete.

Please keep in mind that your participation in this study is voluntary. Some of the information being collected might be sensitive so you can choose not to answer some of the questions, and it will not affect your participation in the 4-H CARTEENS program, fines assessed, or court orders. Upon completing the questionnaire, place it in the self-addressed stamped envelope and return it to:

James L. Jordan, Extension Educator
[redacted]

Remember, **if your questionnaire is postmarked within 10 days, you will receive from me a $25 gas card as a thank you for your promptness.** Questionnaires postmarked and returned within 11-15 days will receive a $15 gas card, and those postmarked and returned within 16-25 days will receive a $10 gas card. With the price of gasoline, I am sure the gas card will come in handy as you drive to school, work, and school-related functions. I am allowing four business days for postal delivery.

If you have any questions about the study, please feel free to call me at ([redacted] or email me at [redacted]. To discuss other study-related questions with someone who is not part of the research team, you may contact Sandra Meadows, The Ohio State University Institutional Review Board, at The Ohio State University at [redacted].

Thank you,

James L. Jordan
Extension Educator,-4-H Youth Development

Sample Gas Card Incentive Appreciation Letter

Dear 4-H CARTEENS Participant:

Enclosed is your $25 gas card for completing the two questionnaires and returning the second to me within 10 days. I sincerely appreciate your honesty and timeliness with your responses. Your responses have been entered into the data for my study.

I hope you enjoy the $25 gas card incentive for the time you spent filling out the two questionnaires.

Thank you,

James L. Jordan
Extension Educator, 4-H Youth Development

APPENDIX B

Questionnaire

I. Your Risky Driving Behaviors

This section asks about your risky driving behaviors. Please try to give your best estimate or your best idea of how often you did each of the following things while driving. One driving time is leaving and returning to the same location.

During the past **one month**, how many times (use a number) have you:

#	**Risky Driving Behavior**
	Drove 10-19 miles per hour over the posted speed limit.
	Drove 20 miles per hour or more over the posted speed limit.
	Drove at a high speed through a residential neighborhood or school zone.
	Passed a car in a no-passing zone.
	Passed a car on a blind curve or when coming to the top of a hill.
	Passed 2 or 3 cars at a time on a 2-lane road.
	Followed another car so closely that you couldn't stop safely.
	Tailgated another car to get it to go faster or cause it to pull over into a slower lane.
	Changed lanes with it really wasn't safe.
	Drove so you drifted in and out of your lane.
	Changed lanes without signaling.
	Cut in front of another car at full speed so you could make a turn.
	Sped through slower traffic by switching quickly back and forth between lanes.
	Pulled out from the curb without waiting for a real break in traffic.
	Forced your way into traffic, out of turn after stopping at a stop sign.
	Turned right at a red light where signs said not to.
	Made a U-turn where a sign said not to.
	Made a left or right turn where it wasn't allowed.
	Cut in front of a vehicle to turn.
	Drove through a light that was red before you got there.
	Drove through an intersection just as the light changed from yellow to red.
	Drove through a drop sign without coming to a full stop.
	Drove through an intersection just as the light changed to yellow or was yellow.
	Took driving chances for the fun of it.
	Took some risks while driving because it made driving more fun.
	Drove without wearing a seat belt.
	Raced another car a short distance.
	Drove in a way to show off to others.
	Drove after drinking alcohol.
	Drove after using marijuana.
	Drove after using other illicit drugs.
	Played the radio so loudly you were unable to hear sirens or other vehicles' horns
	Read, ate, used a cell phone (talk, texting, etc.), put on make-up, horsed around with passengers, or other such activities during driving.

II. Parental Management

This section asks you about Parental Management and to evaluate your parent's or legal guardian's management of your driving.

During the past month, mark with a "X" the response that best represents your answer. Use the following scale:
SD = Strongly Disagree
MD = Moderately Disagree
MA = Moderately Agree
SA = Strongly Agree

	SD	**MD**	**MA**	**SA**
My parent made sure I had enough practice driving before getting my license.				
My parent has carefully monitored my driving activity (i.e., known where I was going in the vehicle, what I was doing, and when I would return).				
My parent has had strict-enough rules restricting my access to the vehicle and driving privileges.				
My parent set up consequences for breaking the rules related to my driving privileges.				
My parent gave me more driving privileges as I showed responsible behavior at home and/or school.				
After getting my license, my parent continued to supervise some of my driving.				
My parent tried to keep track of whether I was driving safely (e.g., not speeding, running stop signs).				

During the past **month**, please tell how you feel about each statement.

My parent restricts ...	**SD**	**MD**	**MA**	**SA**
where I can go in the car.				
who can ride with me in the car.				
how late I can be out with the car.				
me from driving aggressively.				
me from not drinking and driving.				

III. Demographics

This section asks about your background.

1. Please check in which Ohio county you are taking this survey.
   - ☐ [redacted] [metro]
   - ☐ [redacted] [rural]
   - ☐ [redacted] [mid-size metro]
   - ☐ [redacted] [mid-size rural]

2. What is your age?
   ____ years old

3. What is your sex?
   - ☐ Male
   - ☐ Female

4. What is your ethnic heritage or racial culture?
   - ☐ White
   - ☐ Black, African American
   - ☐ Hispanic, Latino
   - ☐ American Indian, Alaska Native
   - ☐ Native Hawaiian, other Pacific Islander
   - ☐ Asian
   - ☐ Bi-racial, Multi-racial
   - ☐ Other _____

5. What is your grade in school?
   _____

6. How old were you when you received your drivers license?
   ____ years old

7. How long have you had your drivers license?
   ____ years, _____ months

8. What kind of vehicle do you most frequently drive?
   - ☐ Car
   - ☐ Pick-up truck
   - ☐ SUV
   - ☐ Minivan
   - ☐ Van
   - ☐ Motorcycle
   - ☐ Other _____

9. Approximately how old is the vehicle you primarily drive?
   - ☐ 1-2 years
   - ☐ 3-5 years
   - ☐ 6-10 years
   - ☐ 11+ years

10. The vehicle I most frequently drive is:

- ☐ A gift
- ☐ Purchased by me, and I make payments
- ☐ Purchased by me, and it is paid off
- ☐ A family vehicle
- ☐ Owned by someone else
- ☐ Borrowed

11. On average, how often do you typically drive (round trips count as 1 time)?
    ____ times a day
    ____ times a week
    ____ times a month

12. How old were you when you received your first traffic citation?
    ____ years, _____ months

13. Was your drivers license suspended as a result of your citation?
    - ☐ yes ... for how long? _____
    - ☐ no

14. Which type of citation(s) resulted in your attending 4-H CARTEENS?
    - ☐ Assured clear distance
    - ☐ Failure to control
    - ☐ Failure to yield
    - ☐ Improper lane movement
    - ☐ No drivers license
    - ☐ OVI/DUI
    - ☐ Reckless operation
    - ☐ Failure to use seat belts
    - ☐ Speeding: _____ mph in a posted ____ mph zone
    - ☐ Stop light, red light
    - ☐ Traffic signs
    - ☐ Other _____

15. Were you searing your seat belt at the time of the citation?
    - ☐ Yes
    - ☐ No
    - ☐ Can't remember

16. Did your parent or legal guardian attend 4-H CARTEENS with you?
    - ☐ Yes
    - ☐ No

17. Was the 50 hours of supervised driving by your parent or legal guardian completed before your drivers test?
    - ☐ Yes
    - ☐ Almost. I completed about _____ hours.
    - ☐ No. My parents and I didn't really worry about it.

18. Who signed your drivers license?
    - ☐ Mom and/or Dad
    - ☐ Grandparent
    - ☐ Step Parent
    - ☐ Legal Guardian
    - ☐ Aunt or Uncle
    - ☐ Big Brother or Big Sister
    - ☐ Foster Parent
    - ☐ Other _____

19. Which items are you responsible paying for, if any?
    - ☐ Damage to vehicle, if crashed
    - ☐ Drivers license
    - ☐ Gasoline
    - ☐ License plates and/or registration
    - ☐ Oil changes
    - ☐ Vehicle Insurance
    - ☐ Vehicle maintenance
    - ☐ Vehicle payments
    - ☐ Vehicle upgrades (tires, lights, wipers, etc.)
    - ☐ Not applicable

Thank you for being a part of this study! I appreciate your honest answers on this questionnaire. Please return the questionnaire to the adult in charge of the 4-H CARTEENS program when you have finished.

In one month, you will receive another questionnaire. By completing that one, you will be sent a gas card for your time and promptness in returning that questionnaire.

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