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Comprehensive Program for Increasing Use of Safety Seats and Seat Belts for Children and Young Adults

Final Report
1989

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November 1989
HSRC - PR 164

COMPREHENSIVE PROGRAM FOR INCREASING USE OF SAFETY SEATS AND SEAT BELTS FOR CHILDREN AND YOUNG ADULTS

FINAL REPORT
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Chapel Hill, NC

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ACKNOWLEDGMENTS

The authors of this report are very grateful to have had another exciting year continuing in efforts to increase the use of child safety seats and safety belts for infants, children and young adults in our state. The participation in educational and promotional efforts by hundreds of local volunteers, health professionals, educators and law enforcement officers has been amazing and very gratifying. Without their help and cooperation, all of our efforts would be useless.

Enough credit cannot be given to the staff of the NC Governor's Highway Safety Program and NC Seat Belts for Safety, Inc. and the NC Passenger Safety Association who collaborated in the development of and helped fund many of the programs and activities conducted throughout the year.

We were once again pleased to work with the NC High School Athletic Association in the continuation of the "Smart Moves" seat belt program for high school athletes. We are grateful to NBA star Michael Jordan for his endorsement of the "Smart Moves" program and allowing us to feature him in the seat belt salute posters, billboards and GHSP brochure.

Finally, there are many members of the Highway safety Research Center staff other than the authors who have assisted with the efforts of this project. Janie Thomas and Flo Land collected the majority of the observational data with some assistance from Eric Rodgman. Computer programming efforts were performed by Chris Little, Cindy Lohr and Sandy Owens. Secretarial assistance was provided by Paula Hendricks, Peggy James and Teresa Parks. Phyllis Alston has answered the toll-free phone line for many years and has provided information to many of the callers. In addition, she has supervised the UNC student personnel who send out the bulk of the educational materials.

INTRODUCTION

In 1977 the Highway Safety Research Center (HSRC) began a child passenger safety education program. With the financial support of the N. C. Governor's Highway Safety Program, HSRC has continued and expanded its efforts and goals to increase the proper use of safety seats and belts for children and young adults through a wide diversity of programs and activities. Over the past 12 years, legislation mandating the use of restraint systems for children was enacted and later expanded. Due in part to the results of this legislation, the use of safety belts for drivers and front seat occupants was also mandated by the N. C. Legislature. At the same time, state wide public education and education programs were conducted targeting many different audiences, teaching and training of health and safety professionals was routinely provided, and safety seat rental programs were established throughout the state.

Safety seat and belt usage rates for children in accidents have increased dramatically and fatal and serious injury rates have declined. Occupant protection has become an integral part of educational messages and services provided by health professionals. Law enforcement officers serve as role models and educators as well as enforcing the occupant protection laws. The use of safety seats and belts is now the norm rather than the exception.

This report summarizes a year of activity and HSRC's collaboration with other state agencies, advocacy groups, and the law enforcement community to continue efforts to reduce occupant casualties among our state's infants, children and young adults. This report is focused on three areas: (1) Advisory, training and coordination activities, (2) Public information and education efforts, and (3) Evaluation activities. Finally, recommendations for continuing and expanding these efforts in the most effective and efficient manner are made.

ADVISORY, TRAINING AND COORDINATION ACTIVITIES

Over the years that the Highway Safety Research Center (HSRC) has been conducting programs in the use of safety seats and belts for children and young adults, the Center and project staff have gained a great amount of knowledge in the areas of programming activities and hardware issues. This knowledge is shared with other groups and agencies in a variety of ways.

Continued Advice and Counsel to North Carolina Safety Seat Rental Programs

HSRC continued to provide advice and counsel to existing child safety seat rental programs across the state. These programs provide short and long term safety seat rentals at minimal costs to local families. Most of the programs target low income families with half of the programs run by county health departments.

In late summer and early fall, HSRC conducted a telephone survey followed by a questionnaire to all rental programs on our 1988 computer listing of existing programs. Since programs have no obligation to notify HSRC if they transfer or terminate their program, a yearly effort is made to ascertain an approximate number of operational programs, current inventory of seats available for rental, and the current program coordinator and her address. This allows HSRC to update our mailing list for the Directions newsletter and provides a current address for notification and feedback to the programs throughout the coming year.

In reviewing both the telephone survey comments and the returned questionnaires, HSRC can provide an approximate listing of programs and their seat inventories. In many cases the telephone surveys did not agree with the completed questionnaires from the same program and in some cases, we were not able to make contact with programs known to be in operation. Attempts were made to follow-up on many of the discrepancies, and in cases where such attempts failed, a judgment was made as to whether or how to list the programs and their inventories.

North Carolina has approximately 81 existing rental programs with an inventory of over 9500 safety seats available for rental. Refer to Appendix A for a complete listing. These programs are located in 64 counties with some counties having two or three programs. Seventy-five percent of the seats are infant car carriers which indicate that programs are primarily targeting newborns and infants up to approximately 20 pounds.

About 50 percent of the programs are operated by county health departments without volunteer assistance. Approximately 25 percent of the programs are operated by major hospitals and are primarily run by hospital auxiliaries or local service groups. The remaining 25 percent of programs are operated by a mix of groups such as women's clubs, Jaycees, the American Red Cross, Home Extensions, police departments, United Way and advocacy councils. Fort Bragg's Army Community Service Lending Closet temporarily loans seats to newly arrived soldiers and

families until they purchase seats.

The number of rental programs continue to decrease each year for reasons described in earlier project reports -- primarily lack of volunteers and diminished seat inventories. Many of the remaining programs, however, have been in operation for years even with continuous turnover of professional staff and volunteers. These programs have an excellent chance of survival because the health department directors or hospital administrators have made them an integral part of their community service programs.

In addition to efforts to keep track of existing programs in order to assist parents who call for help in locating a rental program in their area, HSRC keeps the programs well informed through mail outs which provide such items as technical updates, articles concerning occupant protection, notification of upcoming workshops and conferences at the state and national level, and safety seat recall information. Rental programs also receive bulk quantities of the, "Growing Up Buckled Up" brochure, HSRC's quarterly newsletter, "Directions," and the North Carolina Child Passenger Safety Association's newsletter, "Beltline." Groups inquiring about setting up a rental program are sent, "A Guide for Establishing a Car Safety Seat Rental Program," which provides step by step instructions and training information.

Rental program contacts often call HSRC's toll free number to obtain technical advice, counseling regarding program operation, information regarding purchase of safety seats in bulk and to request handout materials or to loan one or more of our audiovisual films or videos. During this grant year one of the primary concerns and questions covered in phone conversations with program contacts regarded aging seat inventories and the extent of group or agency liability for loaning out seats that were over five years old.

HSRC continued to offer Occupant Protection Training Workshops which included a component on how to set up and maintain a rental program when requested. Special arrangements were made for those groups who needed immediate training for new personnel or volunteers from existing programs who could not attend one of our scheduled workshops.

The "Special Use Rental Program," is no longer offered by HSRC since our move to new quarters in July 1989. The new location lacks storage space for our seat inventory and there is no close-by parking for HSRC staff to instruct parents to properly secure the rental seat to the family car. Our inventory of poorly designed, old seats were destroyed and newer seats were provided to nonprofit day-care centers who transported children of low income families. Due to similar logistical problems, HSRC's tether strap installation service is no longer offered. In the first three quarters of the grant year, 18 special use safety seat rentals were made to local individuals, primarily grandparents or others with visiting relatives.

Occupant Protection Training Workshops

HSRC offers Occupant Protection Training Workshops for highway safety and health professionals along with volunteers interested in obtaining an overview of the motor vehicle accident problem and what measures can be taken to prevent or reduce the resulting deaths and injuries. Participants receive up-to-date training in the proper use of seat belts and child safety seats and learn how to conduct a safety seat installation clinic and/or how to establish and maintain a safety seat rental program. Those participants attending the breakout session on installation clinics receive hands-on experience working with safety seats and seat belts by going to a local day care center to watch and participate in a safety seat check clinic conducted by the workshop instructors.

HSRC staff conducted the following Occupant Protection Training Workshops during the grant period with the major emphasis being the correct use of safety seats:

Date	Location	Group Represented	# Attendees
10/19/88	Chapel Hill	Mecklenburg Co. Health Dept.	2
		Haywood County Health Dept.	2
		Robeson County Health Dept.	1
		Vermont Dept. of Health	1
02/27/89	Chapel Hill	Hoke County Health Dept.	2
		Montgomery County Memorial Hospital Auxiliary	2
		Wilmington Red Cross	1
06/26/89	Chapel Hill	American Academy of Pediatrics (Chicago, IL)	2
		Davidson County EMS	1
		Orange County Health Dept.	1
		Mecklenburg Co. Health Dept.	1
		Jefferson County (KY) Child Passenger Safety Project	1

Communications and Coordination on the State Level

There are four organizations within North Carolina that conduct programs and activities related to occupant protection. The NC Governor's Highway Safety Program, Seat Belts for Safety, Inc., and the NC Passenger Safety Association conduct these activities along with the UNC Highway Safety Research Center. It is important that these organizations maintain communications among themselves and coordinate activities so that the limited funds and personnel that are available are used in the most efficient and effective manner possible. Representatives of these organizations met on a regular basis to discuss and plan major educational and promotional campaigns, and to divide up tasks and funding responsibilities. Routine communications among

the groups also helped to keep others apprised of everyone else's activities and reduce duplication of effort, and to develop as comprehensive of a program as possible.

During this year, HSRC worked with GHSP and Seat Belts for Safety on the development of two new brochures on safety seats and belts. HSRC assisted SBS in the development and provided technical assistance for the "Usage Guide" brochure which stresses the importance of correct restraint use. HSRC assisted GHSP in the development of the "Smart Moves" brochure which was designed to promote our state's Child Passenger Safety and Seat Belt laws. HSRC obtained permission from Michael Jordan's agent for his seat belt photograph to be used in this brochure and a quote from Jordan was provided to accompany the photo. These two brochures in conjunction with HSRC's "Growing Up Buckled Up" provide North Carolina with comprehensive coverage of the seat belt and safety seat issues. By the agencies working together on content and design, the brochures will complement and reinforce each other's message.

During this project year, administrative support continued to be provided to the NCPSA not only by the Executive Director who is a staff member at HSRC, but also by other members of the HSRC Occupant Protection staff. In addition to attending the communications meetings, the NCPSA also held its own Executive Board and committee meetings throughout the year to plan its own activities and also those held in conjunction with the other occupant protection organizations. Although NCPSA was either a sponsor or cosponsor of activities, support and advice was solicited from the Highway Safety Research Center as well as the Governor's Highway Safety Program and Seat Belts for Safety.

Under this project, HSRC provided staff support for manning the State Fair booth in October, 1988 and also supplied display and handout materials. For Child Passenger Safety Awareness Week in February, HSRC coordinated the mailing of promotional packages to law enforcement agencies, interested health departments and NCPSA members across the state. HSRC helped to coordinate arrangements with the North Carolina Legislature for the visit by elementary school children to present valentines, and also prepared a news release concerning the week's activities and the impact the Child Passenger Safety Law has had in saving children's lives since its enactment.

In addition to these activities, administrative support continued with maintenance of the NCPSA membership roster and editing and mailing of the NCPSA's quarterly newsletter, *Carolina Belt Line*.

For the NCPSA Conference, HSRC staff invited and made arrangements with exhibitors, coordinated preregistration, provided materials for the registration packet, handled some of the hotel arrangements, had staff members serve as conference speakers, and worked with conference sponsors to secure donations.

In addition to the above named groups, HSRC worked with the NC High School Athletic Association (NCHSAA). Through the efforts of the NCHSAA and its member athletic directors, every public high school in North Carolina was provided materials to conduct the "Smart Moves" program and asked to join in Lifesavers Month activities.

Participation at State and National Conferences and Advisory Committees

In an effort to keep abreast of programs and activities being conducted across the United States as well as within North Carolina and to share North Carolina's programs and experiences, HSRC staff members attend relevant conferences whenever possible. During this project year, HSRC staff attended and participated in the National Lifesavers 7 Conference in Cincinnati, and the North Carolina Lifesavers 8 Conference in Wrightsville Beach.

Project staff served on a special committee that developed a national occupant protection training curriculum and served on the planning committee for a workshop that defined national goals for youth traffic safety initiatives. Project staff were asked to make presentations or conduct workshop sessions at the University of Central Florida Passenger Safety Conference.

PUBLIC INFORMATION AND EDUCATION EFFORTS

North Carolina is very similar to the rest of the nation in that the use of restraint devices for children in cars has become the accepted norm rather than the exception. It is also the case that many parents and others who transport children find this subject very confusing. Thus, the distribution of educational materials and dissemination of information related the child safety seats and belts has been a focal point of this project in an attempt to provide accurate and up-to-date information. North Carolina is also similar to the rest of the nation in that as children get older, they are less likely to be buckled up in a safety seat even though they still need this protection and there still continues to be a minority of drivers who do not buckle their children at all. These problems have all been addressed through this project in a number of ways.

Distribution of Educational Materials

HSRC continued to be a major source of information on highway safety in general and occupant protection in particular for the State of North Carolina and to some degree the United States. For the most part, materials developed and produced by HSRC are distributed free of charge to North Carolina residents with certain reports being the exception to this rule.

Growing Up Buckled Up is the brochure developed in 1985 to provide parents with general information on the Child Passenger Safety and Seat Belt Laws as well as basic information on the use of safety seats and belts for children. This brochure, revised during FY88 to present more information on the two laws and updated information on recommendations for the use of seat belts by children was widely distributed during this project year with approximately 50,000 copies given to North Carolina residents. In addition to North Carolina distribution, the State of Florida Bureau of Public Safety Management purchased a set of printer's negatives to print their own modified version for distribution within Florida.

While *Growing Up Buckled Up* is the only brochure provided in bulk, HSRC maintains a supply of other informational handouts that provide more detailed information on a variety of issues related to safety seats and belts. These handouts are designed to be one or two page reproducible handouts that are provided with the intent that local programs will make as many copies as they need. Topics included through these handouts include a safety seat shopping guide, commonly asked questions about the Child Passenger Safety and Seat Belt Laws, safety seat recalls, car pool safety tips, guide to purchasing used safety seats, and restraint options for older children.

HSRC continues to maintain a collection of films and videotapes related to occupant protection that are available on a loan basis to North Carolina residents. These programs are a valuable resource for health professionals, teachers, and other health and safety advocates who are

making presentations within their own communities or who want to preview programs that are available. During this project year, 73 films and videotapes were loaned to schools, police departments and health professionals throughout the state.

One of the most efficient means for the dissemination of timely information is through the *Highway Safety Directions* newsletter that is partially funded under this project. *Directions* is sent to a mailing list of over 3500 including all law enforcement agencies, health department directors and health educators, rental program coordinators and NC Passenger Safety Association members. New or revised informational handouts are published in *Directions* with the intent that they will be reproduced for distribution at the local level. During this project year, handouts included in *Directions* covered car pool safety tips and a guide to buying used safety seats. The *Directions* mailing list contains approximately 1000 out-of state and 130 foreign addresses, therefore reports of North Carolina activities and research results and informational handouts are distributed across the country and in fact internationally. The listing of HSRC as a resource for information on restraint options for older children in "Parents" magazine and a USAA reprint of the "options" article from *Directions* resulted in several hundred requests for information from out-of-state parents. Most requests were in the form of a self-addressed stamped envelope, but many phone calls were also received. The NCPSA continues to publish its own quarterly newsletter, *Carolina Belt Line* with the administrative support of HSRC. *Carolina Belt Line* reports on Association activities, regional and community activities, research findings and other information that may be useful to members.

HSRC's toll-free phone line continues to be a valuable resource of information for North Carolina residents. This service is available to anyone in North Carolina to ask questions pertaining to safety seats or seat belts or to request educational materials or audiovisuals. Most of the calls received through this line come from concerned parents who want information on NC's Child Passenger Safety Law, what is the "best" safety seat to buy, when they can or should move their children out of the safety seat into a booster seat or seat belt, solving car pooling problems, etc. Many people also call in with questions about seat belts for adults and the Seat Belt Law. This line also serves as a means for local programs to contact HSRC with requests for materials, information, or assistance with problems. During this project year, HSRC staff spent a total of 246 hours (or almost 31 working days) responding to North Carolina citizens through this line. In addition, countless hours were spent by HSRC staff responding to call and providing advice or materials for out-of-state callers.

Highway Safety Directions Newsletter

Under the 1986-87 grant, HSRC merged the *Totline* and *Highway Safety Highlights* newsletters into one -- *Highway Safety Directions*. *Highway Safety Directions* covers both

passenger safety and general highway safety issues. The merger combined the mailing lists of the two previous publications and included the addition of other groups and agencies to the list.

The first issue of *Directions*, produced under the 1986-87 grant, went out November 1987. Since then, HSRC staff have produced and mailed five other issues. Three issues went out during this reporting year (copies of covers included as Appendix B). The first issue, Winter 1989, featured articles covering occupant restraint research, a study examining trends among women drivers and driving while impaired, the Smart Moves seat belt program, a recap of 1988 Lifesavers Month activities and an editorial addressing future needs in highway safety research. The occupant restraint article looked at findings which suggest that drivers who rarely or never wear seat belts are involved in more crashes and commit more traffic violations. The article about female drivers and alcohol use reported that more women are being stopped for and charged with DWI violations than in past years.

The second issue, Spring 1989, covered research examining crash exposure at intersections, a three-year evaluation of North Carolina's seat belt law, and activities associated with the Child Passenger Safety Awareness Week. The crash exposure article reported the study's efforts to determine the factors that affect the opportunities for crashes to occur at intersections. The NC seat belt law evaluation showed, among other things, that belt use in the state had more than doubled, and that crash-related injuries dropped-off considerably since the law went into effect. In addition to these articles, two guides were included that could be used as masters for handouts on the local level (Appendix C). "A Guide To Safer Carpools" provides suggested rules for carpool safety, tips on buckling up and other car safety tips. The "Buyers' Guide to Used Child Safety Seats" lists suggestions for parents and other drivers of children who are considering using or purchasing a previously owned safety seat.

The third issue, Summer 1989, included articles detailing a study of U.S. National Parks and Forests highways design safety, summaries of on-going HSRC research projects and a synopsis of 1989 North Carolina Lifesavers Month activities. Overall, each issue has received a favorable response with inquires from the media and requests from agencies, groups and persons for further information or permission to copy and distribute articles. The Fall 1989 issue is scheduled for mailing in December.

Development of Seat Belt Videos for Law Enforcement Officers

Two new videotape presentations were developed and produced this year for training law enforcement officers on seat belt and child passenger safety law enforcement. These segments augment the two existing segments that were distributed to law enforcement agencies during project year 1987-88. The original segments "The Need for Seat Belts" and "North Carolina's Seat Belt Laws" covered the reasons why officers should wear their own belts and the need for

officers to enforce the seat belt law. The new segments entitled "Enforcing North Carolina's Belt Laws" and "Crash Dynamics, How Seat Belts Work" give officers tips on enforcing the seat belt and child passenger safety laws and explain crash dynamics. A final segment is planned for completion in early 1990 that will explain how child safety seats work and the problems that exist when seats are misused.

The topics for these last three segments were chosen as the result of survey information received from the police and sheriff departments and highway patrol troop and district headquarters after distribution of the first two segments. Overall, the responses were very positive and more videotapes were wanted. Responders were asked to prioritize a list of potential additional topics and this served as a guide for constructing the new programs.

As with the first segments, an advisory committee was formed consisting of representatives from local police and sheriff departments, the Highway Patrol, and other law-enforcement-related professions such as the Attorney General's office and police science training programs.

The committee members were as follows:

Earl Hardy, North Carolina Justice Academy, Salemburg, NC
Yvette Ruffin, Governor's Highway Safety Program, Raleigh, NC
Officer Charles Bean, Forsyth County Sheriffs Department, Winston-Salem, NC
Officer Carolyn Hutchison, Carrboro Police Department, Carrboro, NC
John Riley, Director of Public Safety Training, Southwest Technical College, Silva, NC
Captain Wade Henderson, Greensboro Police Department, Greensboro, NC
Officer Steve Hunt, Hickory Police Department, Hickory, NC
Captain Daniel Summey, Hendersonville Police Department, Hendersonville, NC
Chief David Fortson, Cary Police Department, Cary, NC
Captain Jim Carver, Cary Police Department, Cary, NC
Sergeant M.D. Fryer, State Highway Patrol Training Center, Raleigh, NC
Chief Ken Bumgarner, Morehead City Police Department, Morehead City, NC
Officer Wrenn Johnson, Morehead City Police Department, Morehead City, NC
Ralph Strickland, NC Attorney General's Office, Raleigh, NC

The advisory committee met in Chapel Hill and made suggestions and comments on draft scripts. Revised scripts were then sent to the members for further comment. The committee advised HSRC on content, appropriate spokespersons and potential crash testimonials.

The "enforcement tips" tape includes examples of public education and enforcement programs being conducted across North Carolina along with research findings about what affects belt-wearing rates. The tape also discusses the reasons some officers are reluctant to enforce belt laws and the excuses some motorists give for not obeying the law. Officers are given the information to help sell people on the need to buckle up and dispel the myths about belt use often expressed by non-wearers. The "crash dynamics" tape explains the forces in a crash and how the safety belts work to prevent injuries and death by keeping the occupants in place.

HSRC contracted with the company that produced the first segments, Take One Productions in Raleigh, to produce the rest of the series. The final product will be a videotape that contains all

five segments (the first two, the two produced this year and the one to be produced on child safety seats) and will be distributed as part of a police promotion in the spring of 1990.

Development of Public Awareness Campaigns

During this project year, HSRC teamed up with other organizations to conduct several public awareness campaigns. These campaigns represent efforts to reach the largest audiences possible with limited personnel and funds. The basic premise behind all of these efforts is to encourage groups and individuals to conduct activities and disseminate occupant protection information in their own communities. Three major awareness campaigns were continued or conducted during this year.

Smart Moves Seat Belt Campaign

HSRC, with the support of GHSP, Seat Belts for Safety and the NC High School Athletic Association, launched the "Smart Moves" seat belt campaign in October 1988 (Appendix D). The campaign centered around encouraging high school athletes to wear their seat belts. The athletes, in turn, try to influence and convince their peers and younger students to buckle up by conducting educational seat belt safety programs. Athletes present these programs within junior high and elementary schools as well as in their own schools.

Along with seat belt safety programs and incentives, the program features the support of NBA star Michael Jordan. A poster of Jordan serves as a focal point of the campaign. The poster shows Jordan sitting belted in a car and giving the seat belt salute. Jordan's poster is also being used in a statewide billboard project. HSRC, with the help of the other three organizations, created and produced seat belt safety information packages for the athletes to use. Athletes take the packages and put together educational programs for students of all ages. "Smart Moves" packages contain information cards, color-coded for certain age groups, as well as idea sheets that outline suggested presentations and the needed materials.

During the program's pilot run in October 1988, 30 city/county athletic directors received the packages and posters and distributed them to high school athletes under their supervision. In April 1989, the remaining athletic directors in the state received the "Smart Moves" packages as a part of Lifesavers month campaign and the original city/county athletic directors were sent reminders encouraging them to participate in Lifesavers month.

The actual effectiveness of "Smart Moves" is unclear. Few high schools mailed back the packages' enclosed evaluation questionnaire. Of those that did, several reported that the posters were given to athletes and the packages were passed on to driver education instructors or Students Against Driving Drunk groups. HSRC staff feel that more supervision is needed to encourage active participation and monitor effects.

Child Passenger Safety Awareness Week

The week of February 12-18, 1989 was declared Child Passenger Safety Awareness Week in North Carolina by Governor Martin.

To alert the various news media across the state, HSRC prepared and sent out a press release through the UNC News Bureau (Appendix E). This release reported that at least 250 North Carolina children were saved from death in crashes since 1981 due to the Child Passenger Protection Law and the increased use of child safety seats. The release also stated that 39 children died on North Carolina highways in 1988. These 39 deaths topped the average 22 crash-related deaths for children per year between 1982 and 1987.

HSRC, GHSP and NCPSA sponsored the production and distribution of various safety education materials. HSRC mailed Police and Sheriff's departments, State Highway patrol troop and district headquarters and some county health departments coloring sheets, suckers and stickers to give to school-aged children. Law enforcement and health officials gave out these items during awareness programs in an attempt to create a positive attitude among young children toward buckling up. The materials that were distributed centered around the week's theme, "Have a Heart, Click from the Start!"

HSRC and GHSP assisted the NCPSA in the coordination of the official recognition of the week by the North Carolina Legislature. On Wednesday of that week, State Representative George W. Miller conducted a press conference to call attention to the week's purpose and activities. Elementary school children from Wilson, NC, also gave hand-made valentines to State Legislators in celebration of the week and the Child Passenger Protection Law. Members of the House of Representatives honored the children with a standing ovation. See Appendix F for the *Directions* article summarizing CPS Awareness Week activities.

NC Lifesavers Month Activities

For the third consecutive year, Governor James G. Martin, proclaimed the month of May as Lifesavers Month in North Carolina. Governor Martin and GHSP chose May because it is the traditional start of the summer vacation and travel season and to coincide with National Buckle Up America Week. Therefore, May comes as a good time to remind the motoring public of the importance of using safety belts and seats, obeying speed limits and not drinking and driving.

May 1989 brought various national and state activities, focusing on accident prevention for kids, and law enforcement seat belt promotion. Lifesavers Month efforts concentrated on developing a public awareness campaign designed for law enforcement agencies to carry out during Buckle Up America Week (Appendix G).

HSRC's approach to Lifesavers Month and Buckle Up America Week mirrored that of the previous year. As in 1988, HSRC, with participation from GHSP, NCPSA and SBS, provided all local police and county sheriff's departments, and State Highway Patrol troop and district headquarters with educational materials to distribute during the month and week. In all, 400 police departments, 100 sheriff's departments and 67 State Highway Patrol offices were provided with information and materials. These departments and agencies received general crash statistics, reproducible informational handout masters, coloring sheets masters, cartoon stickers and decals featuring Donald Duck and television crash dummies Vince and Larry, and seat belt patrol stick-on badges to "deputize" children as seat belt enforcers. Law enforcement agencies also received Smart Moves folders and were encouraged to offer their assistance to local high schools in the related safety belt programs. Overall, law enforcement officials were asked to take the lead in promoting Lifesavers Month and Buckle Up America Week at the community level.

In addition, health educators within the county health departments received the same materials packet as the law enforcement agencies, excluding the badges. An enclosed letter asked the health educators to offer their support to local schools and law enforcement in conducting the month's activities. Both law enforcement groups and health educators received, and were asked to complete and return, survey postcards so that the activities from across the state could be documented.

HSRC also assisted GHSP and NCPSA in coordinating the eighth annual NC Lifesavers Conference. The Conference, which kicked-off Lifesavers Month activities, opened April 30th and ran through May 2nd at Wrightsville Beach. HSRC handled several administrative responsibilities including contacting and confirming Conference exhibitors and assigning exhibit space.

EVALUATION ACTIVITIES

The NC Governor's Highway Safety Program has been funding activities designed to convince parents to buckle up their children in cars since 1978. This was done due to the large number of children who were being killed or seriously injured in car crashes due to the non-use of restraint systems. Educational activities and especially legislation have had a tremendous impact on child transportation safety in North Carolina but efforts need to be continued to further ensure that as many children and youth are properly protected in car crashes.

Overview of North Carolina Accident Data

Table 1 presents an overview of the restraint and fatality status of children involved in North Carolina car crashes during the past 15 years.

Table 1. Police Reported Restraint Usage and Fatalities for All 0-5 Year Old Occupants in North Carolina Crashes.

Year	% Restrained	# Killed	# Unrestrained	# Restrained
1974	5.4	28	28	0
1975	5.0	29	29	0
1976	4.6	26	26	0
1977	5.9	28	28	0
1978	4.7	36	36	0
1979	7.0	24	24	0
1980	10.5	18	18	0
1981	11.0	22	21	1
1982	17.4	17	16	1
1983	25.1	21	19	2
1984	34.4	20	17	3
1985	61.8	23	20	3
1986	75.7	25	18	7
1987	86.2	21	17	4
1988	86.4	39	28	11

As was previously mentioned, educational efforts were begun in 1978 to attempt to convince parents to use safety seats and belts for their children in cars. Beginning in 1979 there was a slow but steady increase in the percentage of children who were reported to be buckled up in crashes. In July, 1982, the first Child Passenger Safety Law went into effect requiring parents to restrain their children under age two. Larger increases in reported restraint usage rates were seen beginning in 1982. In July, 1985, this law was expanded to require all drivers to buckle up all children less than age six. As would be expected, this legislative activity was associated with the largest increase in usage rates.

The fatality figures in Table 1 show two reasons for concern. First and foremost, the 39 children killed during 1988 was the largest number of any year and this was with the reported usage rate of 86 percent. The reasons for this large increase are not clear, but several aspects will be explored during further analyses. It is clear, however, that the vast majority of these children who were killed were not restrained at the time of the crash. The second area of concern is the increase, from one in 1981 to eleven in 1988, in the number of children who were killed while restrained. Primarily, this concern is related to the potential for negative publicity that could have an adverse effect on continued educational efforts. In reality, it should be the goal of any safety seat or seat belt educational program to see that all occupant fatalities are restrained at the time of the crash. This goal acknowledges the fact that there are going to be crashes that are so severe that they cannot be survived regardless of restraint status. Thus, if all vehicle occupants are properly restrained, all persons killed will be restrained and fatalities will have been reduced to the greatest extent possible.

As shown in Figure 1, the reported restraint usage rate for children less than two (covered by the initial law) has increased from 28 percent in the year prior to the law to 91 percent July 1988 through June 1989. While the usage rate for 2-5 year olds also increased substantially (from 8% to 85%) since 1982, the largest increase came after the expanded law went into effect in 1985. Note that the same trend holds true for the 6-15 year olds. These children became covered under the NC Seat Belt Law in October 1985 if riding in the front seat. Reported restraint usage rates for these children (from 4% prior to 1982 to 72% in 1989) also increased substantially only after it was legislatively mandated.

Figure 2 indicates another important trend that has been occurring during the past few years. Accident data in general indicates that the rear seat tends to be safer than the front seat regardless of restraint status. General child transportation safety information as well as instructions from safety seat manufacturers recommend that children be placed in the rear seat. As Figure 2 shows, more drivers are placing children in the rear seat. In the first six months of 1981, 57 percent of these children in crashes were in the front seat with 43 percent in the rear. During the last year, these proportions had been reversed and the differential was much larger. Between July 1988 and June 1989, only 39 percent of the children were in the front seat and 61 percent were being transported in generally safer rear seating positions. This same trend has not occurred among the 6-15 year olds. Four to five percent more 6-15 year olds have been front seat occupants each year during this time period.

Before proceeding any further in analyses of these accident data, note should be made of possible biases in these restraint usage rates. In the "typical" accident in North Carolina, the investigating officer arrives at the accident scene some time after the crash. By then, the occupants may have already exited the vehicles and perhaps have already been transported for medical

Figure 1. Police Reported Restraint Usage Rates for Accident Involved Children, January, 1981 through June, 1989

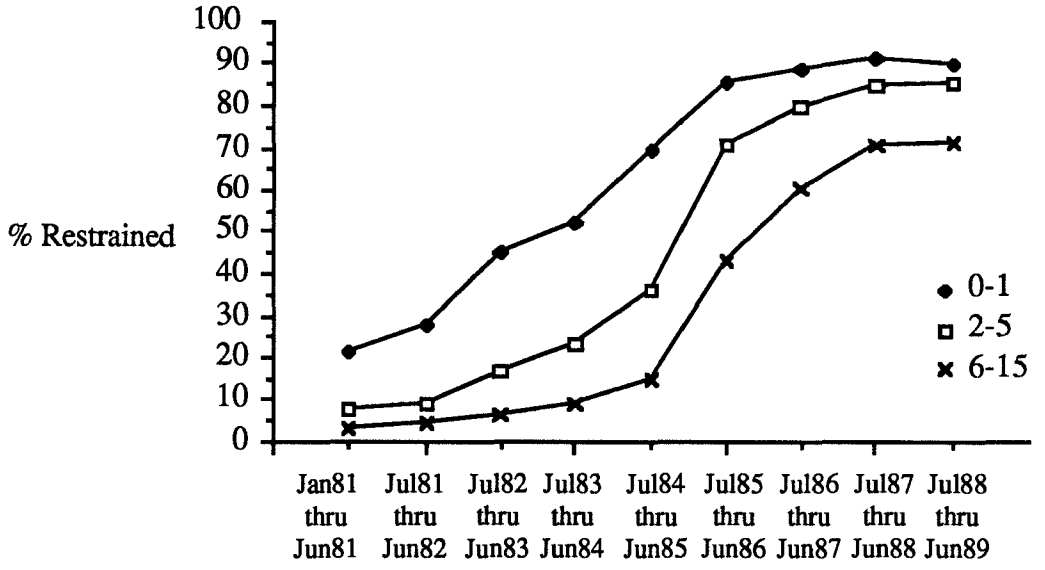
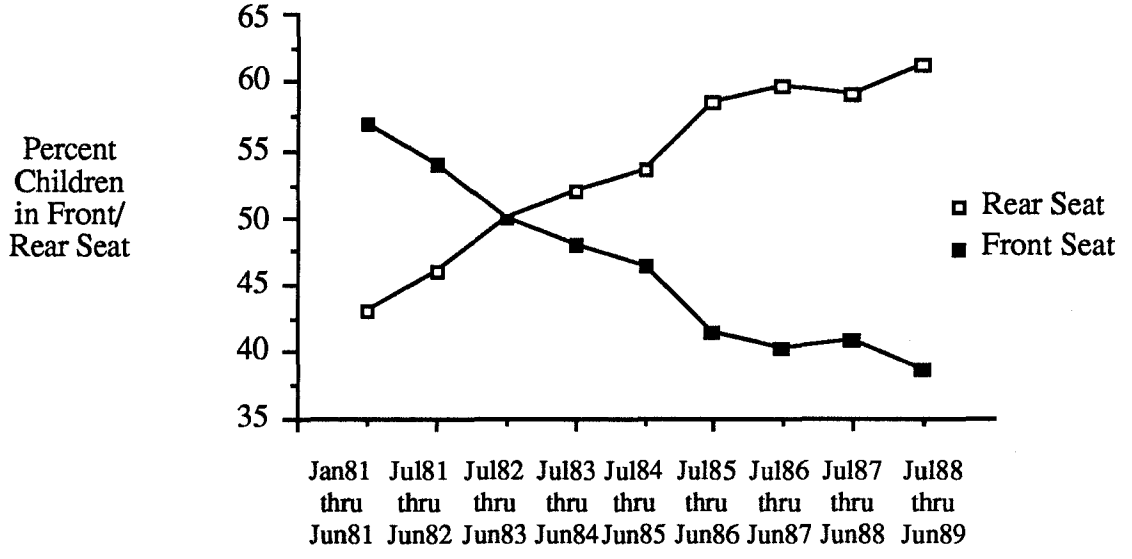


Figure 2. Percentage of Accident Involved 0-5 Year Old Children Riding in Front Seat Versus Rear Seat



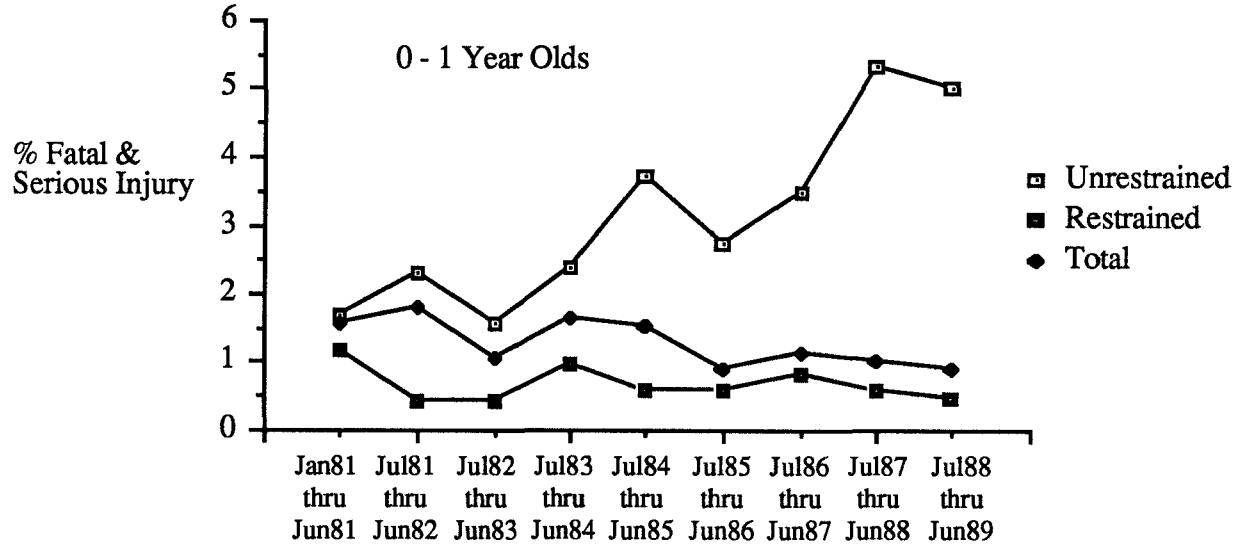
treatment. Many times, the investigating officer will have to rely on the statements of the occupants to determine use or nonuse of restraints. With the use of restraints for children now mandatory, parents may or may not be truthful in their statements of restraint use for their children.

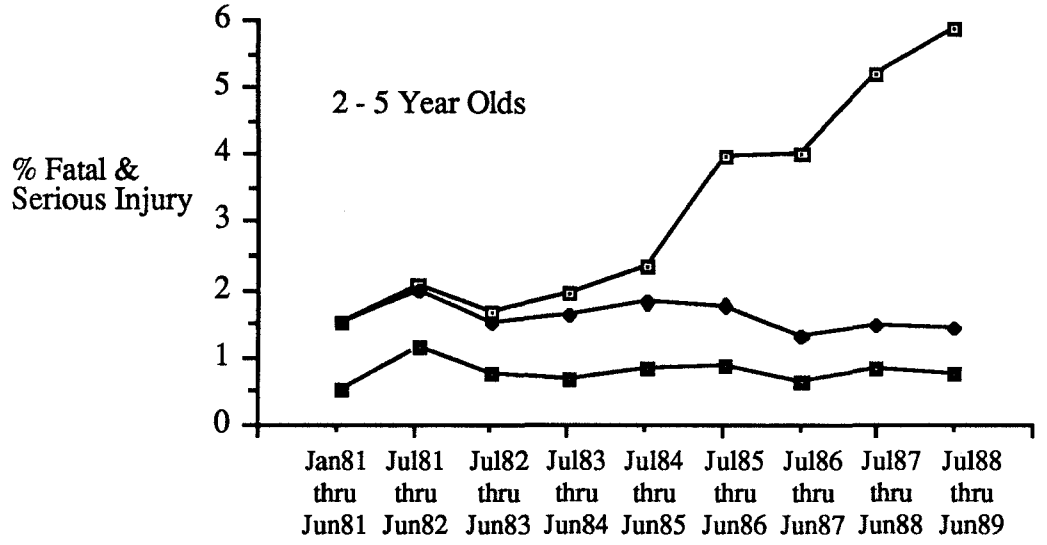
Previous comparisons of observed restraint usage rates for children and reported usage rates from the accident data appears to indicate that as children grow out of, or are taken out of their seats, they are more likely to go unrestrained but that when an accident occurs, the parent or driver tells the officer that the child was in a seat belt. Unless the officer has reason to believe otherwise, he or she will probably accept the statement and record the child as restrained. As will be discussed later, observational surveys conducted this past summer found that 72 percent of the 0-5 year old children were restrained. This figure itself is well below the 86 percent usage rate derived from accident reports but similar to the self-reported figure for respondents buckling up children "all the time" on mail-back questionnaires distributed in conjunction with the observational surveys. In addition, other HSRC research (Hunter, et al. 1988) found non-belt wearers to be overrepresented in crashes and thus one would expect usage rates to be lower for crashes than for observed usage rates.

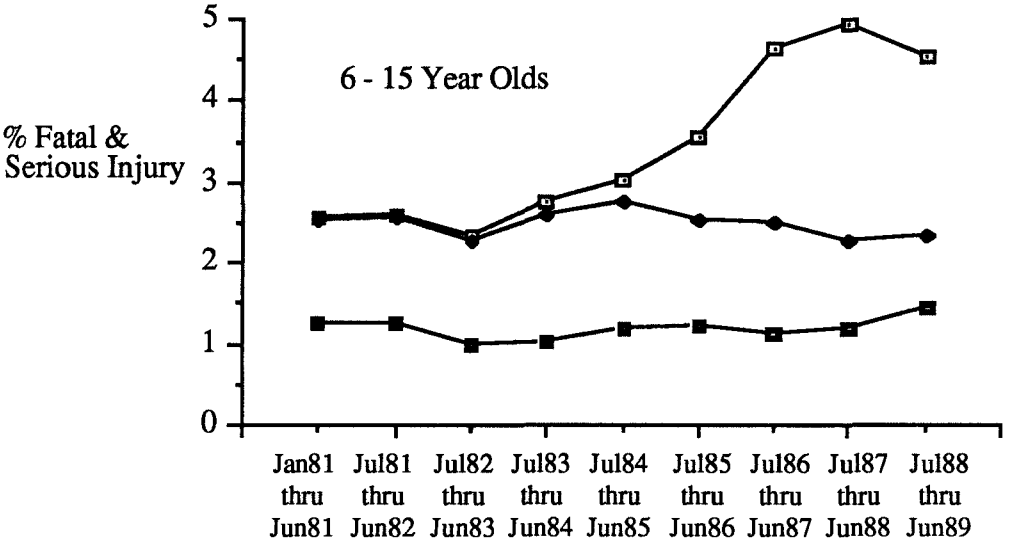
The implications of this situation for the following analyses are several. First, actual restraint usage rates for children will not be as high as the accident data indicates. Secondly, comparisons between children classified as "restrained" and "unrestrained" must be viewed with caution since we cannot really be sure who was and who was not restrained. Thus, trends such as injury rates for the total age group will be more valid than those for children classified as either restrained or unrestrained. Third, this misclassification of restraint use may lead to a conservative estimate of the injury reduction potential of restraint use since many of the unrestrained children are actually being classified as restrained and thus their injuries are being counted among the restrained. On the other hand, an exaggerated estimate of effectiveness can result when bias on the part of the investigating officer leads to assumptions, and subsequent reporting, of restraints being used if injuries are minor and not used if injuries are more severe.

The fatality figures in Table 1 and the fatal and serious injury rates in Figure 3 are encouraging to a degree but reveal that much work still needs to be done in protecting our children. Prior to 1979 when usage rates began to increase, fatalities were averaging 29.4 per year. Since 1979, fatalities have averaged 21.2 per year. Figure 3 plots the fatal plus serious injury (K+A) rates for 0-1, 2-5, and 6-15 year olds since 1981. For all age groups, the K+A rates for children reported to be unrestrained have been increasing across time. At the same time, the K+A rate for 0-1 year olds reported to have been restrained has increased only slightly across time (probably due to the increased exposure of more children to the most severe crashes, high levels of misuse of safety seats, and/or increased misreporting of restraint use), and the rates for the 2-5 and 6-15 year olds reported to have been restrained have stayed much more level. Since the 0-1 year olds have

Figure 3.Fatal plus Serious Injury Rates for Accident Involved Children, January, 1981 through June, 1989







had a much larger proportion of children restrained, with a lower K+A rate, the overall K+A rate has been declining since 1982 with some fluctuations. On the other hand, the relatively small increases in restraint usage rates for the older children had the effect of keeping the K+A rates for the 2-5 and 6-15 year olds almost level rather than decreasing until the last few time periods. It is encouraging, however, to see that even with the extremely high K+A rate for reportedly unrestrained 2-5 year olds during July 1988 - June, 1989, the high proportion of children who were restrained enabled the overall rate to decrease below their rate for the years prior to July 1985 when restraint usage rates were much lower.

Table 2 shows the actual fatal and serious injury rates and the injury and population figures used to calculate these rates for Figure 3. Furthermore, average fatal plus serious injury rates have been computed for three time periods to try to measure the effects of legislation upon these rates. Time period "(A)" consists of the eighteen months immediately preceding the implementation of any child passenger protection law in North Carolina. Time period "(B)" consists of the three years (July 1982 - June 1985) that the original Child Passenger Safety (CPS) Law was in effect. During this time, only children less than age two being driven by their parents were required to be restrained. Period "(C)" consists of the first three years (July 1985 - June 1988) after the effective date of the expanded CPS Law. This expanded law requires all drivers to restrain all children through age five. Also, all drivers and front seat occupants of any age have been required to be buckled up since October 1985.

The youngest age group, 0-1 years old, showed a fatal plus serious (K+A) injury rate of 1.74 per 100 children involved in crashes during the first time period. This rate was reduced by 17 percent to 1.45 during the second time period. The K+A rate dropped 30 percent to 1.02 between the second time period and the third time period representing the expanded law. Overall, the K+A rate for 0-1 year olds was reduced by 41 percent, from 1.74 to 1.02 between the first and third time periods.

K+A rates have also been reduced for the 2-5 year olds as well, though not by the same degree. The second period K+A rate of 1.72 was a 9 percent reduction from the rate of 1.88 for the first time period. During this time, the 2-5 year olds were not covered by the CPS Law, but their restraint usage had increased nonetheless. After they became covered by the CPS Law during the third time period, their K+A rates was reduced another 9 percent to 1.56. The total reduction in the K+A rate for the 2-5 year olds was 17 percent, from 1.88 to 1.56, between the first and the third time periods.

Taken as a whole the expanded Child Passenger Safety Law has resulted in a 22 percent decrease (from 1.85 to 1.45) in fatal plus serious injury rates for children less than age six since the eighteen months prior to implementation of child passenger safety legislation in North Carolina.

The importance of restraint legislation is clearly documented by the K+A experience of the

Table 2. Average Fatal Plus Serious Injury (K+A) Rates and Percent Change for Children < 16 Associated With NC Child Passenger Safety and Seat Belt Legislation

		(A) PRE-LAW		(B) ORIGINAL CPS LAW			(C) CURRENT CPS & BELT LAWS							
		Jan 81 Thru Jun 81	Jul 81 Thru Jun 82	Jul 82 Thru Jun 83	Jul 83 Thru Jun 84	Jul 84 Thru Jun 85	Jul 85 Thru Jun 86	Jul 86 Thru Jun 87	Jul 87 Thru Jun 88	Jul 88 Thru Jun 89				
AGE	# K+A	20	45	30	35	42	33	34	31	31				
0-1	Total #	1221	2514	2553	2133	2701	3337	2895	3046	3380	PERCENT CHANGE			
	% K+A	1.64	1.79	1.18	1.64	1.55	0.99	1.17	1.02	0.92	(A)' (B)	(B)' (C)	(A)' (C)	
	Avg.%	1.74		1.45			1.02				-16.7	-29.7	-41.4	
2-5	# K+A	75	205	169	183	214	213	178	213	207				
	Total #	4729	10204	10671	10926	11290	11798	12782	13479	13899				
	% K+A	1.59	2.01	1.58	1.67	1.90	1.81	1.39	1.58	1.49				
	Avg.%	1.88		1.72			1.56				-8.5	-9.3	-17.0	
0-5	# K+A	95	250	199	218	256	246	212	244	238				
	Total #	5950	12718	13224	13059	13991	15135	15677	16525	17279				
	% K+A	1.60	1.97	1.50	1.67	1.83	1.63	1.35	1.48	1.38				
	Avg. %	1.85		1.67			1.45				-9.7	-13.2	-21.6	
6-15	# K+A	295	660	604	697	780	719	789	737	697				
	Total #	11355	25269	25928	26145	27206	27737	30356	30473	29980				
	% K+A	2.60	2.61	2.33	2.67	2.87	2.59	2.60	2.42	2.32				
	Avg. %	2.61		2.65			2.48				+1.5	-6.4	-5.0	

6-15 year olds. These children and youths were not covered by any mandatory usage legislation until October 1985, and then only when riding in the front seat. Furthermore, high levels of restraint usage for all front seat occupants (60-78%) was not achieved until January, 1987 when the penalty phase of the Seat Belt Law went into effect. As shown in Figure 1, reported usage rates for the 6-15 year olds did not increase to any significant degree until they became covered and this is reflected in their K+A rates that have remained virtually constant across the three time periods. In fact, there was actually a 2 percent increase in the K+A rate between the first and second time periods. There was, however, a 6 percent decrease between the second and third time periods after they became subject to the Seat Belt Law.

Table 3 shows how these reductions in fatal and serious injury rates can be translated into estimates of actual lives saved and serious injuries reduced by increased restraint use associated with the Child Passenger Safety Law and to some degree the Seat Belt Law. In this table, an expected number of K+A injuries was computed for two time periods for each age group. This expected number was produced by multiplying the actual number of accident involved children of each age for the time periods July 82 - June 85 and July 85 - June 88 by the average K+A rate for the January 81 - June 82 period for the appropriate age group (from Table 2). This expected number is then compared to the actual number of K+A injuries seen in that time period. For instance, if the 0-1 year olds had continued to be killed at the same rate during July 82 - June 85 that they had during the Jan. 81 - June 82 period (1.74%), 129 0-1 year olds would have been killed or seriously injured during the time (.0174 x 7387 = 128.5). Instead, there were 107 actual

Table 3. Casualty Benefits for Children and Youths Associated with Implementation of Restraint Laws in North Carolina.

	July 82 - June 85			July 85 - June 88			July 82 - June 89
Age	Expected K+A	- Actual K+A	= K+A Benefit (% Change)	Expected K+A	- Actual K+A	= K+A Benefit (% Change)	K+A Benefit (% Change)
0-1	129	107	-22 (-17.1%)	220	129	-91 (-41.4%)	-113 (-32.4%)
2-5	618	566	-52 (-8.4%)	977	811	-166 (-17.0%)	-218 (-13.7%)
0-5	747	673	-74 (-9.9%)	1197	940	-257 (-21.5%)	-331 (-17.0%)
6-15	2069	2081	+12 (+0.6%)	3094	2942	-152 (-4.9%)	-140 (-2.8%)

K+A injuries during that time for a 17.1 percent reduction in K+A injuries of 22. Stated another way, this means that 22 children below age two were saved from death or serious injury between July 1982 and June 1985 due to implementation of the original Child Passenger Safety Law. During the next three years (July 85 - June 88), there was a 41 percent reduction in K+A injuries of 91. Overall, there has been a benefit of 113 0-1 year old children saved from K+A injuries since the original CPS Law was implemented in July 1985.

Among the 2-5 year olds, there has been a reduction of 218 K+A injuries below what would have been expected since July 1982. These children were not actually covered in the July 82 - June 85 period, but there was apparently enough of a spillover effect in terms of increased restraint use to produce an 8.4 percent (-52 K+A) benefit to these children during that time. Once they became covered by the expanded law in July 1985 the benefits basically doubled (8.4% vs. 17% reduction).

Apparently, the 6-15 year olds have benefitted very little from any spillover effects of the Child Passenger Safety Law. In fact, during the July 82 - June 85 period, a slight increase in the actual K+A rate translated into a 0.6 percent increase in actual K+A injuries over the expected number. There was a small 4.9 percent benefit associated with the actual number of K+A injuries seen in the July 85 - June 89 period (2942) when compared to the expected number (3094) based on the 2.61 K+A rate for the first time period. There was an overall reduction of 140 K+A injuries seen for the 6-15 year olds after July, 1982.

One may wonder, however, why the actual number of fatalities for 0-5 year olds has not declined very much in recent years even with a reported restraint usage rate of 86 percent. It appears that there are several factors operating to keep this number up. One is exposure. That is, in the July 1981 - June 1982 period, 12,718 children between ages of 0-5 were involved in N.C. car crashes. In the July 1988 - June 1989 period, however, 17,279 children were involved meaning that over 4500 additional children were exposed to car crashes during that time period.

Another factor to consider is crash severity. It does appear that crash severity is related to the increasing K+A rates for children reported to be unrestrained. Figure 4 illustrates that for each time period, children reported to be unrestrained tend to be involved more in severe crashes than the restrained children. Crash severity here is measured as the investigating officer's assessment of vehicle deformation (TAD rating). Severe crashes are herein defined as TAD ratings 4-7 on the 1-7 point TAD scale. For each time period, children reported to be unrestrained are overrepresented in severe crashes. Beginning in the July 84-June 85 period, the proportion of unrestrained children in severe crashes began to increase even more. While it appears that overall crashes are not becoming more severe, it is the case that the children who are reported not to be protected by restraint systems tend to be in more of the severe crashes and thus doubly exposed to serious injuries. While much of this difference is possibly real, it may be the fact that some of this

Figure 4. Proportion of Restrained and Unrestrained Children in Severe (TAD Severity 4-7) Crashes, 1981 through June, 1989

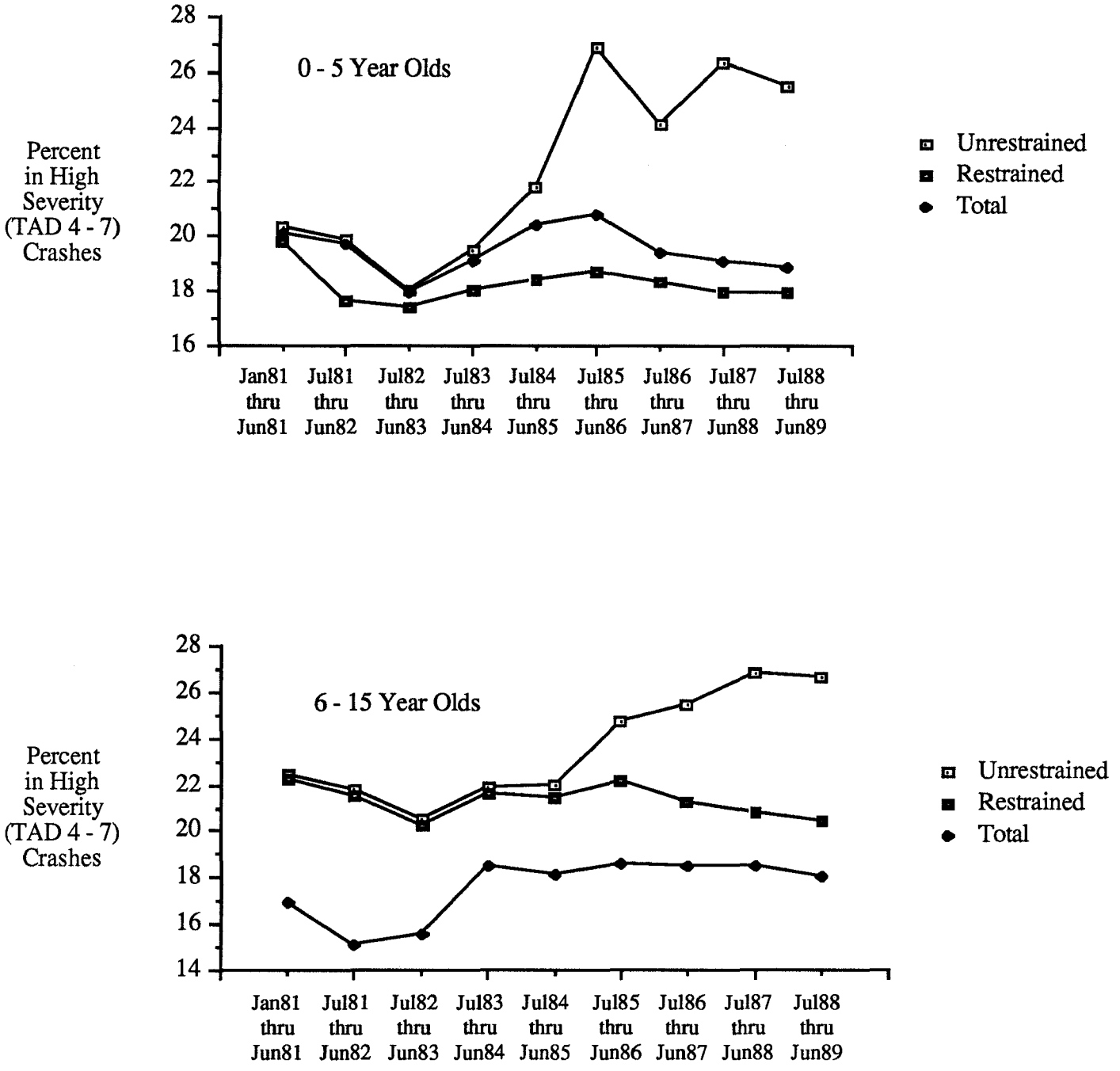
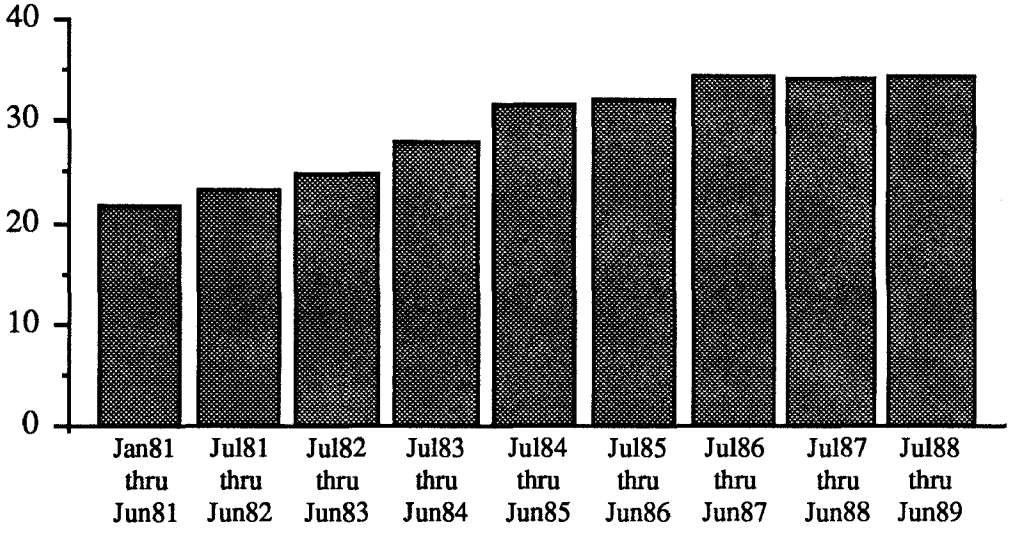


Figure 5. Percentage of Accident Involved 0-5 Year Old Children Riding in Vehicles Weighing Less than 2500 Pounds



difference is due to reporting bias. That is, an unrestrained child in a severe crash is more likely to be injured than in a less severe crash and the investigating officer would be less likely to accept the drivers report that the child was restrained and thus code the child as unrestrained.

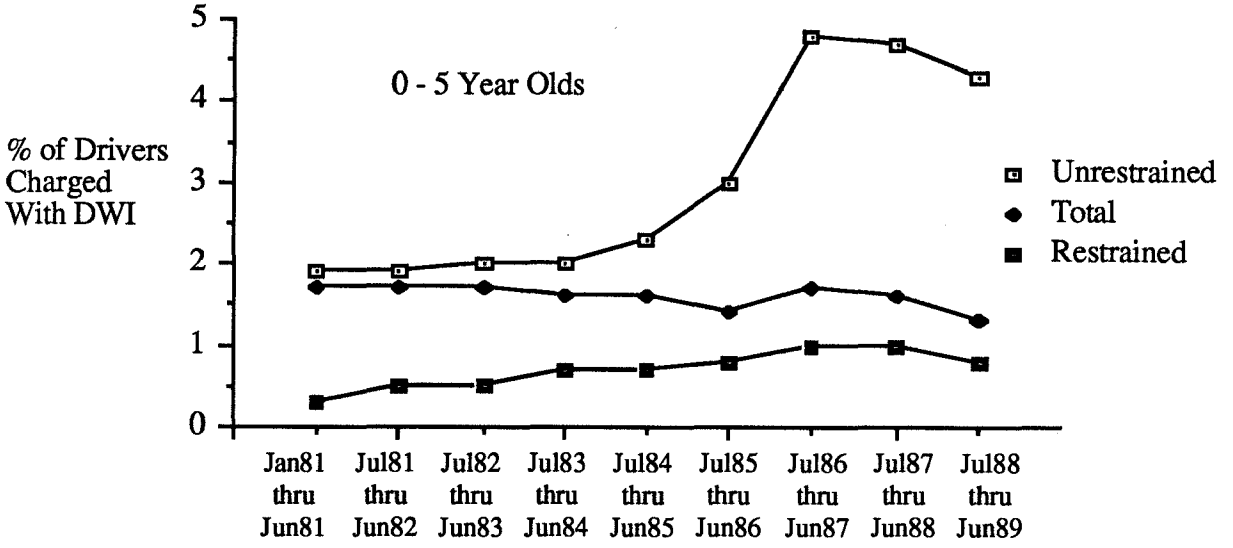
Crash severity is affected by various factors, one of which is vehicle size. Due to their greater mass, larger heavier vehicles are inherently safer than smaller vehicles in similar crashes. The population of accident involved North Carolina children reflects current trends toward downsizing of vehicles. As Figure 5 indicates, about 21-23 percent of the accident involved children were in vehicles weighing less than 2500 pounds (roughly comparable to light compact and subcompact sized cars) during the first two time periods. This proportion increased to about 34 percent for the last three years, a 50 percent increase. This trend is important for at least two reasons. First, with the shift toward less safe downsized vehicles it is crucial that efforts be continued to get children properly buckled up. Second, this trend may help to explain why overall injury rates for young children have not decreased as much as might be expected based on the increased proportion of children reported to be buckled up. Even with correct restraint use, injuries are more likely to occur in smaller vehicles.

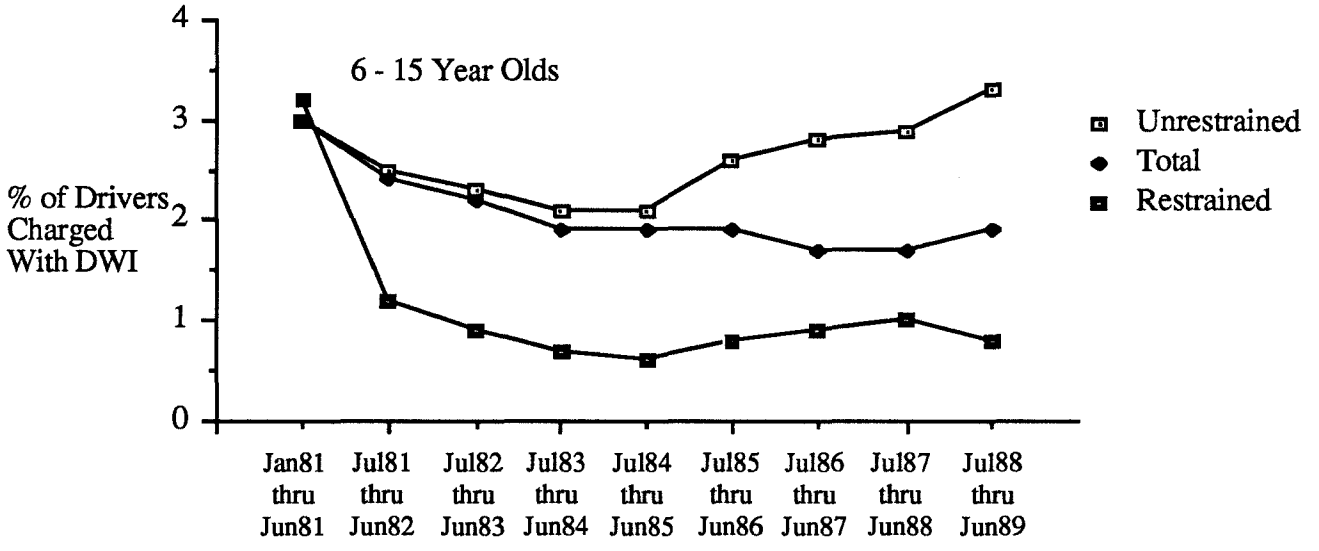
While looking at various trends associated with accident involved children, it is important to look at various factors in addition to restraint use to try to determine why the increased use of restraints for children has not had as great an impact on injuries, and especially fatalities, as might be expected. In addition to restraint use and vehicle factors, the driver is also an important component of safe transportation.

One of the most dangerous practices is that of drinking while driving and Figure 6 indicates the percentage of drivers who were charged by the investigating officer with a Driving While Impaired violation after the accident. As can be seen, there has been an almost constant proportion, about 1.7 percent of all drivers with some yearly fluctuations, who were charged with DWI after the accidents involving 0-5 year olds. As can also be seen, there have always been large differences between drivers of children reported to be unrestrained and restrained with drivers of unrestrained children to have been much more likely to have been charged with DWI. This difference increased greatly during the past three years. The same general relationship is found for the 6-15 year olds as well. In essence, what Figure 6 indicates is that the children who need protection the most, that is, riding with drinking drivers, are much less likely to receive the protection that they need.

In large part, what the above discussion has shown is that the issue of restraint use for children is a complex one. North Carolina has a law that has had a great impact on this issue in that it has been the most effective means of getting parents and other drivers to restrain children in cars. At odds with the primary intent of this law -- to reduce deaths and injuries to children in car crashes -- are various driver and vehicles issues. As has been shown, most drivers are buckling

Figure 6. Percent of Drivers of 0-5 Year Old Children Charged with Driving While Impaired





up their children but the nonuse of restraints by a minority of "bad drivers" may be counteracting some of the potential overall benefits of increased restraint usage. As was shown, drivers of children reported to be unrestrained were more likely to have been drinking prior to the accident. At the same time, more and more children are riding in smaller vehicles which means that even when buckled up, chances of injury are increased.

Observational Surveys

Observational surveys were last conducted during the spring and summer of 1986. These surveys were repeated during this project year for several reasons. Through these surveys, we are able to actually see how children are being restrained in cars rather than relying entirely on information contained in the NC accident files and to some degree determine the accuracy of information on the accident files. Through these surveys we can determine the type of safety seats that are being used and to some degree we are able to determine whether or not these seats are being used correctly. In order to compare the results obtained through the 1989 surveys with those conducted during 1986, the same methodology and instruments were used for both. A detailed discussion of the 1986 surveys can be found in Orr, et al., 1986.

Observational surveys were conducted during June, July, August, and September in the eight North Carolina cities of Wilmington, Greenville, Fayetteville, Greensboro, Winston-Salem, Charlotte, North Wilkesboro, and Asheville. Two days were spent in each city with surveys being conducted at a shopping center during the morning and at a day care center during the afternoon pick-up time. Shopping centers were based on factors such as traffic flow, the presence of a stop light at one or more major exits, and the cooperation of the shopping center management. Day care centers were selected based on factors such as size, presence of a parking lot rather than on-street parking, and the cooperation of the center director. In addition, one day care center in each city was subsidized, that is, the fees for at least some of the children were subsidized for parents who need assistance. The other center in each city was non-subsidized, that is, no public assistance was provided for any of the children at the center. This was done in order to assure as much variation in socioeconomic status as possible. In general, observations were conducted from 10:00 in the morning until 3:00 in the afternoon at the shopping centers. The observers then moved to the day care center to collect data from about 3:30 until the centers closed at 5:30 or 6:00.

The observers, who were HSRC project staff or hired and trained by HSRC for seat belt and child safety seat data collection, conducted the surveys by positioning themselves at one or two exits (depending on traffic flow) at each location to catch children in cars as they were preparing to pull out into traffic. At shopping centers, only those drivers who were already stopped for a stop light or sign were approached by the observers. The observers attempted to get all of the cars exiting the day care centers to stop. At all locations, drivers who did not wish to participate were

allowed to drive past.

Once the observers approached a stopped car, the driver was asked to give the ages of the children in the car and how they were related to the driver. For each occupant in the car, the observer noted and recorded their seating position, age, sex, race, their relationship to the driver (for children), and restraint status. If time allowed, the drivers were asked if they were aware of the existence of North Carolina's Child Passenger Safety and Seat Belt laws and how far they would be travelling to their next stop. See Appendix H for a copy of the observational survey form.

In 1986, 4,114 occupants in 1,437 cars were observed with 1,555 of the occupants being less than six years of age. In 1989, 2,396 occupants in 928 cars were observed with 1,056 being less than six. The reasons for the reduced numbers for 1989 are not clear. For the most part, the same data collection sites were used for both years, but in some cases changes in sites had to be made or various reasons. Some of these alternate sites were not as productive as the ones used in 1986.

The hurried nature of the surveys did not allow for the observers to ask for as much information as was desired. For this reason, each driver was handed an envelope containing a mail back questionnaire (Appendix H). Also enclosed in the envelope was another sealed envelope containing information on North Carolina's restraint laws. Respondents were asked not to open and review this material until after they had completed the survey. As an incentive for the drivers to fill out and return these questionnaires, the envelopes also contained a card that made the respondents eligible for a drawing for $100 if they returned the card along with their completed questionnaire. A total of 409 mail-back questionaires were received for a 44 percent completion rate.

Table 4 shows the observed restraint usage rates for children less than age six for the years 1986 and 1989. In 1986, 69 percent of the 0-5 year old children were restrained in some manner. In 1989, this figure increased by four percentage points to 73 percent. The biggest changes seem to be among the infants less than age one and the four year olds. In 1986, 14 percent of the infants were unrestrained but in 1989 only 2 percent were. Forty-one percent of the four year olds were unrestrained in 1986 and this figure decreased to 30 percent in 1989. Overall, there was a moderate increase from 34 to 38 percent in the percentage of 0-5 year olds who were buckled in safety seats. There was no difference in the proportion of children who were buckled in safety belts, but there was a definite shift in the types of belts being used. In 1986, 26 percent of the 0-5 year olds were in lap belts and 8 percent were in lap/shoulder combinations. In 1989, The percentage secured by lap belts declined to 16 percent and those in lap/shoulder belts increased to 19 percent. The same general trends show up for each age group in the 2-5 range. This shift could very well be the result of the recent negative publicity surrounding lap belts.

Table 4. Observed Restraint Usage Rates for Children by Age

	1986					1989				
	None	Lap Belt	Lap & Shldr	Safety Seat	Total	None	Lap Belt	Lap & Shldr	Safety Seat	Total
	Row %/(N)				Col. %	Row %/(N)				Col. %
Age 0	13.8 (19)	2.2 (3)	0.7 (1)	83.3 (115)	9.1 (138)	2.4 (2)	1.2 (1)	0.0 (0)	96.4 (81)	7.95 (84)
1	15.4 (25)	7.4 (12)	3.1 (5)	74.1 (120)	10.7 (162)	10.6 (15)	3.5 (5)	2.8 (4)	83.1 (118)	13.5 (142)
2	27.9 (76)	17.7 (48)	4.0 (11)	50.4 (137)	18.0 (272)	24.4 (51)	12.4 (26)	9.6 (20)	53.6 (112)	19.8 (209)
3	29.6 (99)	36.8 (123)	6.6 (22)	27.0 (90)	22.1 (334)	30.1 (75)	22.9 (57)	22.1 (55)	24.9 (62)	23.6 (249)
4	40.6 (131)	37.5 (121)	12.1 (39)	9.9 (32)	21.3 (323)	30.0 (86)	34.3 (68)	33.3 (56)	5.2 (21)	21.9 (231)
5	42.7 (122)	32.5 (93)	16.8 (48)	8.0 (23)	18.9 (286)	41.1 (58)	23.4 (33)	29.1 (41)	6.4 (9)	13.4 (141)
0-5	31.2 (472)	26.4 (400)	8.3 (126)	34.1 (517)	100.0 (1515)	27.2 (287)	15.9 (168)	18.8 (198)	38.2 (403)	100.0 (1056)

Table 5. Observed Restraint Usage Rates for Children <6 by Survey Location

Location	1986 None	1986 Lap Belt	1986 Lap & Shldr	1986 Safety Seat	1986 Total	1989 None	1989 Lap Belt	1989 Lap & Shldr	1989 Safety Seat	1989 Total
	Row %/(N)				Col. %	Row %/(N)				Col. %
Subsidized Day Care	37.9 (155)	24.0 (98)	11.3 (46)	26.9 (110)	26.3 (409)	27.5 (104)	20.1 (76)	21.7 (82)	30.7 (116)	36.0 (378)
Non-Sbsdzed Day Care	18.1 (64)	31.9 (113)	13.6 (48)	36.4 (129)	22.8 (354)	29.0 (102)	21.3 (75)	15.1 (53)	34.7 (122)	33.5 (352)
Shopping Center	35.1 (278)	24.0 (190)	5.6 (44)	35.4 (280)	50.9 (792)	24.6 (79)	14.6 (47)	9.4 (30)	51.4 (165)	30.5 (321)
Total	31.9 (497)	25.8 (401)	8.9 (138)	33.4 (519)	100.0 (1555)	27.1 (285)	18.8 (198)	15.7 (165)	38.3 (403)	100.0 (1051)

Table 6. Observed Restraint Use for Children <6 by Race

Race	1986 Yes	1986 No	1986 Total	1989 Yes	1989 No	1989 Total
	Row %/(N)		Col. %	Row %/(N)		Col. %
White	76.8 (817)	23.2 (247)	73.4 (1064)	79.9 (581)	20.1 (146)	68.9 (727)
Non-White	48.1 (185)	51.9 (200)	26.6 (385)	56.7 (486)	43.3 (142)	31.1 (328)
Total	69.2 (1002)	30.8 (447)	100.0 (1449)	72.7 (767)	27.3 288	100.0 (1055)

The level of safety seat usage shows mixed results. Overall, there was an increase from 34 to 38 percent in the percentage of 0-5 year olds observed to be in safety seats. Looking at the separate ages, however, it can be seen that there were large increases between the two years in safety seat usage for the infants and 1 year olds and a small increase for the two year olds, but there were decreases for the 3-5 year olds. It appears that while more children are being buckled up, parents of older children are relying on safety belts rather than seats.

The biggest area of concern in 1989 is the same as for 1986 and that is that the older children are protected by restraint systems much less often that the younger ones. The difference is much larger, however, for the 1989 sample. In 1986, 14 percent of the infants under one were unrestrained and this proportion increased to 43 percent unrestrained for the 5 year olds for a difference of 29 percentage points. In 1989, only two percent of the infants were unrestrained and 41 percent of the 5 year olds were for a difference of 39 percentage points.

Table 5 shows restraint usage status for children observed at the three different types of locations of subsidized day care centers, non-subsidized day cares, and shopping centers. This table also shows that the largest portion of the difference between the total number of observations collected between the two times was at shopping centers. In 1986, 792 children were observed at shopping centers but in 1989 only 321 were observed at these locations. Table 5 contains some relatively surprising findings. In 1986, subsidized day care centers, with a presumably lower socioeconomic status clientele, showed a rate of 38 percent of the children unrestrained. In 1989 this figure was reduced to 27 percent. In contrast, the non-subsidized day cares in 1986 showed a much lower unrestrained rate of 18 percent but in 1989 this figure actually increased to 29 percent unrestrained. In 1986, children at non-subsidized day care centers were unrestrained only about half as often as at the other locations but in 1989 the rates for children being unrestrained were very similar. The reason for this cannot be explained.

Table 6 presents a breakdown of restraint status for children less than six by race. In 1989 as was the case in 1986, white children were observed to be restrained more often than the non-white children. There was however a closing of the difference between the two time periods. In 1986, 77 percent of the white children and only 48 percent of the non-white children were observed to be restrained. In 1989, the restraint rate for white children had increased slightly to 79 percent but there was a much larger increase in the restraint usage rate for the non-white children to 57 percent. This increase among a specific population is encouraging.

As Table 7 shows, parents and grandparents were about twice as likely to buckle children in their cars as were other relatives and non-relatives in 1986. The results for 1989 are encouraging in that both the other relative and non-relative groups greatly increased in the proportion of children riding in their cars being buckled up. In fact, in 1989 the non-relatives

Table 7. Observed Restraint Use for Children <6 by Their Relationship to Driver

Relationship to Driver	1986			1989		
	Yes	No	Total	Yes	No	Total
	Row %/(N)		Col. %	Row %/(N)		Col. %
Child	73.0 (831)	27.0 (308)	84.7 (1139)	74.5 (631)	25.5 (216)	83.2 (847)
Grandchild	64.6 (73)	35.4 (40)	8.4 (113)	70.4 (57)	29.6 (24)	8.0 (81)
Other Relative	36.1 (12)	63.9 (24)	2.7 (36)	56.8 (21)	43.2 (16)	3.6 (37)
Non-Relative	32.1 (18)	67.7 (38)	4.2 (56)	69.8 (37)	30.2 (16)	5.2 (53)
Total	69.5 (934)	30.5 (410)	100.0 (1344)	73.3 (746)	26.7 (272)	100.0 (1018)

Table 8. Proportion of Safety Seats Observed to be Correctly and Incorrectly Used.

Type of Use	1986	1989
	Col%/(N)	Col%/(N)
Correct Use	78.8 (341)	86.2 (325)
Front/Rear Error	9.5 (41)	2.7 (10)
No Harness Used	9.9 (43)	7.7 (29)
No Seat Belt Used	1.8 (8)	3.4 (13)
Total	100.0 (433)	100.0 (377)

buckled up children in their cars as much as grandparents but the other relatives are still lagging about 13 percentage points behind.

During the 1989 surveys, 403 children were observed to be riding in some type of safety seat, either an infant carrier, toddler seat or booster seat. Of that number the observers were able to make a judgment on the correctness of use for 377 safety seats. The proportion of safety seats observed to be correctly and incorrectly used are shown in Table 8. It must be pointed out that due to the nature of the survey procedures, the observers were able to make judgments on "gross misuse" only. With the short amount of time for each observation and with the observer positioned outside of the vehicle where it was often difficult to see inside clearly, it was possible only to determine if the seat was facing in the proper position, if there was a harness being used at all to hold the child within the seat, and if there was a seat belt being used at all to hold the seat within the vehicle. Other surveys done with more time allowed for closer inspections of seats in use have found much higher levels of misuse than were found with this method (Cynecki and Goryl, 1984). Table 8 does show, however, that the level of gross misuse has declined from 1986 to 1989. In 1986, 79 percent of the seats were observed to be used correctly to the extent that they were facing in the right direction and that there was a harness or shield holding the child and a safety belt holding the seat in place. In 1989 the percentage of seats being used correctly increased to 86 percent. Of the remaining 14 percent, three percent were infants facing to the front of the car, 8 percent had no harness being used and 3 percent had no safety belt being used to secure the seat. The percentages for front/rear facing errors and no harness being used were both reductions from the levels seen in 1986 but the three percent no belt used was a slight increase over the figure for 1986. Even though the gross misuse of seats has been reduced, there is still much room for improvement to help insure that all children in safety seats are getting all of the protection that they deserve.

Mail-back Questionnaires

Tables 9-13 are based on the data obtained through the mail-back questionnaires. As was previously mentioned, there were 409 questionnaires that were completed and returned. Table 9 shows the level of knowledge that the respondents had concerning the Child Passenger Safety Law for both 1986 and 1989. Overall, there is very little difference between the two years in terms of the levels of knowledge for the individual components. There was a decrease in the proportion of respondents that knew that this law covers children less than six years of age and there was a two-fold increase in the proportion of respondents who knew that the penalty for a violation is a fine of $25. Table 10 lists the proportion of respondents who got various numbers of questions in this series about the CPS Law correct. There were relatively small decreases in the percentage of respondents who scored either one, two, or three questions correct. The percentage that scored all

Table 9. Respondents' Knowledge of Components of Child Passenger Safety Law. Mail-back Questionnaire.

Law Component	1986 Correct Answer	1986 Incorrect Answer	1986 Total	1989 Correct Answer	1989 Incorrect Answer	1989 Total
	Row%/(N)			Row%/(N)		
Children <6 Covered	68.8 (335)	31.2 (152)	100.0 (487)	60.4 (247)	39.6 (162)	100.0 (409)
Belt Substitute at Age 3	71.8 (349)	28.2 (137)	100.0 (486)	72.4 (296)	27.6 (113)	100.0 (409)
Affects All Drivers	95.1 (463)	4.9 (24)	100.0 (487)	95.6 (391)	4.4 (18)	100.0 (409)
Penalty of $25	18.9 (92)	81.1 (394)	100.0 (486)	45.2 (185)	54.8 (224)	100.0 (409)

Table 10. Number of Correct Answers to Series of Child Passenger Safety Law Questions. Mail-back Questionnaires.

# of Correct Answers	1986	1989
	Col%/(N)	Col%/(N)
0	0.6 (3)	1.2 (5)
1	8.7 (42)	5.9 (24)
2	35.3 (171)	31.3 (128)
3	46.0 (223)	41.3 (169)
4	9.5 (46)	20.3 (83)
Total	100.0 (485)	100.0 (409)

Table 11. Respondents' Knowledge of Components of Seat Belt Law. Mail-back Questionnaire.

Law Component	1986 Correct Answer Row%/(N)	1986 Incorrect Answer Row%/(N)	1986 Total	1989 Correct Answer Row%/(N)	1989 Incorrect Answer Row%/(N)	1989 Total
Drivers and Front Occupants Covered	65.9 (325)	34.1 (168)	100.0 (493)	68.7 (281)	31.3 (128)	100.0 (409)
Vehicles Exempted	59.2 (292)	40.8 (201)	100.0 (493)	12.5 (51)	87.5 (358)	100.0 (409)
Penalty of $25	20.8 (102)	79.2 (389)	100.0 (491)	43.5 (178)	56.5 (231)	100.0 (409)

Table 12. Number of Correct Answers to Series of Seat Belt Law Questions. Mail-back Questionnaires.

# of Correct Answers	1986 Col%/(N)	1989 Col%/(N)
0	16.3 (80)	18.6 (76)
1	31.8 (156)	43.8 (179)
2	41.8 (205)	32.0 (131)
3	10.2 (50)	5.6 (23)
Total	100.0 (491)	100.0 (409)

four correct doubled from 10 to 20 percent between the two years. It appears that more people are becoming aware of the components of this law but there is certainly much room for improvement.

Tables 11 and 12 present the same type of information for the Seat Belt Law. As Table 11 shows, the respondents' knowledge of the individual components of the Seat Belt Law are similar to the CPS Law for the items of who is covered and what the penalties are. As with the CPS Law, there was little difference between the two years for who is covered and there is a doubling of the percentage who knew the correct penalty is a fine of $25. There was an extremely large decrease in the percentage of respondents who knew that vehicles not required to have belts and certain delivery vehicles are exempt. Table 12 indicates that there may be more confusion over the components of the Seat Belt Law than for the CPS Law. Due to the low number of respondents who knew the correct exemptions to the Seat Belt Law, only 6 percent answered all three questions in the series correctly. Whereas close to two-thirds answered either three or four questions on the CPS Law correctly, only a little more than a third were able to answer either two or three of the questions on the Seat Belt Law correctly. At the other end, only 1 percent did not answer any of the CPS Law questions correctly but 17 percent did not answer any of the Seat Belt Law questions correctly.

The respondents were asked to indicate how often they buckled up their children in cars. As Table 13 shows, 83 percent said that they buckled up their children all of the time. This self-reported figure is a full ten percentage points higher than the 72 percent of the children who were actually observed to be restrained. When the category of "most of the time" is included, 96 percent of the respondents said that they buckle up their children all or most of the time.

If the respondents indicated that they buckled up their children other than all of the time, they were asked to indicate the reasons that they did not do so all the time and when they were most likely to buckle them up. Table 14 shows that the major reason (24%) given in 1989 for not buckling their children all of the time was for the child to sleep or to feed or otherwise tend to the child's needs. This is in contrast to 1986 when the primary reason (28%) given was because they forgot or were not in the habit. In 1989, only 5 percent said that they forgot or were not in the habit. Those who indicated that they were less likely to buckle their children on short trips increased from 11 percent in 1986 to 19 percent in 1989. There was also a small increase in the percentage who gave being in a hurry or that is was a hassle as a reason for not buckling up children all of the time. This pattern seems to indicate that drivers are making a conscious decision while driving children that restraints are not needed on that particular trip or under particular conditions. This would indicate that more effort needs to be made to convince drivers that protection is needed at all times and the increased protection is worth the extra effort.

Table 15 lists the times when the respondents are most likely to restrain their children. The second most reported reason (34%) is when they remember to buckle them up which includes

Table 13. How Often Do Respondents Buckle Children?
Mail-back Questionnaire.

Buckle Children	1986	1989
	Col%/(N)	Col%/(N)
All of the time	79.0 (388)	82.7 (334)
Most of the time	14.5 (71)	13.1 (53)
Half of the time	3.3 (16)	1.5 (6)
Some of the time	3.1 (15)	2.5 (10)
Never	0.2 (1)	0.2 (1)
Total	100.0 (491)	100.0 (404)

Table 14. Why Do Respondents Not Buckle Children All the Time?
Mail-back Questionnaire.

Reason	1986	1989
	Col%/(N)	Col%/(N)
Forget, not in habit	28.4 (27)	5.2 (3)
Short trips	10.5 (10)	19.0 (11)
To sleep, feed, tend child	12.6 (12)	24.1 (14)
Hassle, in a hurry	11.6 (11)	15.5 (9)
Child doesn't like	16.8 (16)	19.0 (11)
Other	20.0 (19)	17.2 (10)
Total	100.0 (95)	100.0 (58)

Table 15. When Are Respondents Most Likely to Buckle Their Children? Mail-back Questionnaire.

Reason	1986	1989
	Col%/(N)	Col%/(N)
Bad conditions, weather	13.1 (11)	9.4 (5)
Long trips	41.7 (35)	37.7 (20)
Not sleeping, feeding	7.1 (6)	0.0 (0)
When remember	13.1 (11)	34.0 (18)
Other	25.0 (21)	18.9 (10)
Total	100.0 (84)	100.0 (53)

Table 16. How Often Do Respondents Wear Their Own Seat Belts? Mail-back Questionnaire.

Buckle Selves	1986	1989
	Col%/(N)	Col%/(N)
All of the time	59.8 (295)	73.8 (301)
Most of the time	21.7 (107)	19.1 (78)
Half of the time	5.9 (29)	2.9 (12)
Some of the time	9.1 (45)	3.2 (13)
Never	3.4 (17)	1.0 (4)
Total	100.0 (493)	100.0 (408)

Table 17. Why Do Respondents Not Wear Their Own Seat Belts All the Time? Mail-back Questionnaire.

Reason	1986	1989
	Col%/(N)	Col%/(N)
Forget, not in habit	45.7 (86)	43.5 (37)
Short trips	11.7 (22)	18.8 (16)
Uncomfortable, don't like them	20.7 (39)	16.5 (14)
Hassle, in a hurry	5.3 (10)	10.6 (9)
Personal choice	2.1 (4)	2.4 (2)
Other	14.4 (27)	8.2 (7)
Total	100.0 (188)	100.0 (85)

Table 18. When Are Respondents Most Likely Wear Their Own Seat Belts? Mail-back Questionnaire.

Reason	1986	1989
	Col%/(N)	Col%/(N)
Bad conditions, weather	14.4 (23)	14.1 (11)
Long trips	48.1 (77)	43.6 (34)
When remember	20.6 (33)	29.5 (23)
Other	16.9 (27)	12.8 (10)
Total	100.0 (160)	100.0 (78)

being reminded by their children. The reason reported the most (38%) was that they are most likely to buckle children on long trips. It appears that the perception that restraints are needed most on long trips continues to persist.

Respondents were also asked to indicate how often they wear their own safety belts. As Table 16 shows, 74% of the respondents indicated that they wear their own belts all of the time. This is a large increase over the 60 percent who reported likewise in 1986. When the "most of the time" category is added in, 93 percent indicated that they wear their own belts all or most of the time. This self-reported usage is much higher than the 68 percent observed usage rate for drivers in the 1989 observations.

Tables 17 and 18 show the reasons that the respondents do not wear their own belts all of the time and when they are most likely to wear their belts. There is not much difference in Table 17 between 1986 and 1989 for the reasons given for not wearing belts. For both years, the reason given most was that they forget to buckle up or that they are not in the habit. There were increases in the percentage that said that they were least likely to buckle up on short trips and when they were in a hurry. As Table 18 shows, the respondents reported in 1989 that they were most likely to wear their own belts when they are on long trips or when they remember. This is basically the same pattern that was reported in 1986. From this information it appears that work continues to need to be done in the area of getting drivers in the habit of wearing their belts for every trip regardless of conditions and distance.

Conclusions

The following conclusions can be drawn based on this analysis of children involved in North Carolina accidents:

a) The North Carolina Child Passenger Protection and Seat Belt Laws, along with associated public information and education efforts, have resulted in large increases in restraint use as reported on police accident forms. In the year prior to the initial CPP Law's effective date of July 1, 1982, 21% of the 0-1 year olds, 8% of the 2-5 year olds and 4% of the 6-15 year olds were reported to be restrained. During the year July 1988 - June, 1989, these rates were 91%, 86% and 72% respectively.

b) Average fatal plus serious (K+A) injury rates for children involved in accidents during this same time period have declined. During the eighteen months (January 1981 - June 1982) immediately preceding the implementation of the original CPP Law, K+A rates were 1.74 for 0-1 year olds, 1.88 for 2-5 year olds, and 2.61 for 6-15 year olds. During the July 1985 - June 1989 time period, average K+A rates were reduced 41% to 1.02 for 0-1 year olds, by 17% to 1.56 for 2-5 year olds, and by 5% to 2.48 for the 6-15 year olds.

c) Children reported to be unrestrained are more likely to have been in more severe crashes and/or to have been riding with a driver charged with Driving While Impaired.

d) The downsizing of the cars in which children are riding means that there will continue to be a need to stress the importance of correct restraint use for children and adults.

e) The implementation of restraint legislation has resulted in 17 percent reduction in fatal and serious injuries to 0-5 year old children in North Carolina crashes since July 1982. For 6-15 year olds, a 2.8 percent reduction was found. In terms of actual numbers, fatal and serious injuries have been reduced by 331 for 0-5 year olds and by 140 for 6-15 year olds since July 1982.

The following conclusions can be drawn from the analysis of observational and mailback questionnaire data collected during this project year:

f) There was a moderate increase in the percentage of children observed to have been restrained between the years 1986 and 1989. In 1986, 69 percent of the 0-5 year old children were restrained in some manner. In 1989, this figure increased by four percentage points to 73 percent. Overall, there was an increase from 34 to 38 percent in the percentage of 0-5 year olds who were buckled in safety seats. There was no difference in the proportion of children who were buckled in safety belts, but there was a definite shift in the types of belts being used. In 1986, 26 percent of the 0-5 year olds were in lap belts and 8 percent were in lap/shoulder combinations. In 1989, The percentage secured by lap belts declined to 16 percent and those in lap/shoulder belts increased to 19 percent. The same general trends show up for each age group in the 2-5 range.

g) Overall, there was an increase from 34 to 38 percent in the percentage of 0-5 year olds observed to be in safety seats. Looking at the separate ages, however, it can be seen that there were large increases between the two years in safety seat usage for the infants and 1 year olds and a small increase for the two year olds, but there were decreases for the 3-5 year olds. It appears that while more children are being buckled up, parents of older children are relying on safety belts rather than seats.

h) The fact that older children are protected by restraint systems much less often that the younger ones continues to be an area of concern. In 1986, 14 percent of the infants under one were unrestrained and this proportion increased to 43 percent unrestrained for the 5 year olds for a difference of 29 percentage points. In 1989, only two percent of the infants were unrestrained and 41 percent of the 5 year olds were for a difference of 39 percentage points.

i) In 1989 as was the case in 1986, white children were observed to be restrained more often than the non-white children. There was however a closing of the difference between the two time periods. In 1986, 77 percent of the white children and only 48 percent of the non-white children were observed to be restrained. In 1989, the restraint rate for white children had increased slightly to 79 percent but there was a much larger increase in the restraint usage rate for the non-

white children to 57 percent.

j) Parents and grandparents were about twice as likely to buckle children in their cars as were other relatives and non-relatives in 1986. In 1989, both the "other relative" and "non-relative" groups greatly increased in the proportion of children riding in their cars being buckled up. In fact, in 1989 the "non-relatives" buckled up children in their cars as much as grandparents but the "other relatives" are still lagging about 13 percentage points behind.

k) The level of gross misuse of safety seats has declined from 1986 to 1989. In 1986, 79 percent of the seats were observed to be used correctly to the extent that they were facing in the right direction and that there was a harness or shield holding the child and a safety belt holding the seat in place. In 1989 the percentage of seats being used correctly increased to 86 percent. Of the remaining 14 percent, three percent were infants facing to the front of the car, 8 percent had no harness being used and 3 percent had no safety belt being used to secure the seat. The percentages for front/rear facing errors and no harness being used were both reductions from the levels seen in 1986 but the three percent no belt used was a slight increase over the figure for 1986.

l) There is very little difference between the two years in terms of the levels of knowledge that the respondents had concerning the Child Passenger Safety Law for the individual components. There was a decrease in the proportion of respondents that knew that this law covers children less than six years of age and there was a two-fold increase in the proportion of respondents who knew that the penalty for a violation is a fine of $25. The percentage that scored all four components correct doubled from 10 to 20 percent between the two years.

m) The respondents' knowledge of the individual components of the Seat Belt Law are similar to the CPS Law for the items of who is covered and what the penalties are. As with the CPS Law, there was little difference between the two years for who is covered and there is a doubling of the percentage who knew the correct penalty is a fine of $25. There was an extremely large decrease in the percentage of respondents who knew that vehicles not required to have belts and certain delivery vehicles are exempt. Due to the low number of respondents who knew the correct exemptions to the Seat Belt Law, only 6 percent answered all three questions in the series correctly.

n) Eighty-three percent of the questionnaire respondents said that they buckled up their children all of the time. This self-reported figure is a full ten percentage points higher than the 72 percent of the children who were actually observed to be restrained. The major reason (24%) given in 1989 for not buckling their children all of the time was for the child to sleep or to feed or otherwise tend to the child's needs. This is in contrast to 1986 when the primary reason (28%) given was because they forgot or were not in the habit. In 1989, only 5 percent said that they forgot or were not in the habit. Table 15 lists the times when the respondents are most likely to

restrain their children. The reason reported most often (38%) for when they are most likely to buckle thier children was when on long trips.

o) Seventy-four percent of the respondents indicated that they wear their own belts all of the time. This is a large increase over the 60 percent who reported likewise in 1986. There is not much difference in between 1986 and 1989 for the reasons given for not wearing belts. For both years, the reason given most was that they forget to buckle up or that they are not in the habit. The respondents reported in 1989 that they were most likely to wear their own belts when they are on long trips or when they remember. This is basically the same pattern that was reported in 1986.

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Appendix A

N.C. Operational Safety Seat Loaner Programs - 10/89

NORTH CAROLINA OPERATIONAL SAFETY SEAT RENTAL PROGRAMS - NOV. 1989

COUNTY	ORGANIZATION(S)	PHONE	INF SEATS	CNVRT SEATS	BSTR SEATS	TOTAL SEATS
ALLEGHANY	PROTECT OUR LITTLE ONES	919-372-5641	22	29	0	51
ASHE	ASHE CO HEALTH DEPT	919-246-9449	50	0	0	50
BERTIE	BERTIE COUNTY HEALTH DEPT	919-794-2057	0	53	0	53
BRUNSWICK	BRUNSWICK HOSP. VOL. AUX.	919-579-3791	0	34	0	34
BRUNSWICK	BRUNSWICK CO. HEALTH DEPT.	919-253-4381	0	70	0	70
BUNCOMBE	BUNCOMBE CO. MEDICAL AUX.	704-258-9710	400	0	0	400
BURKE	BURKE CO. HEALTH DEPT.	704-433-4250	79	0	0	79
CABARRUS	CABARRUS CO HEALTH DEPT	704-782-8437	250	0	0	250
CASWELL	CASWELL CO HEALTH DEPT	919-694-4129	0	5	0	5
CHATHAM	PITTSBORO SAFE	919-542-2989	59	148	0	207
CHEROKEE	CHEROKEE CO HEALTH DEPT	704-837-7486	31	38	0	69
CHOWAN	CHOWAN HOSPITAL	919-482-8451	15	0	0	15
CHOWAN	CHOWAN CO HEALTH DEPT	919-482-7001	0	115	0	115
CLAY	CLAY COUNTY HEALTH DEPT	704-389-8052	10	30	0	40
CLEVELAND	CLEVELAND CO. HEALTH DEPT	704-484-5170	135	103	0	238
CLEVELAND	SHELBY JR WOMANS CLUB	704-434-7319	45	0	0	45
COLUMBUS	COLUMBUS CO HEALTH DEPT	919-642-5700	80	60	0	140
CUMBERLAND	ARMY COMM. SERV. LENDING CLOSET	919-396-6013	150	75	0	225
CUMBERLAND	E NEWTON SMITH PUB HLTH CENTER	919-483-9046	200	150	0	350
DARE	DARE CO. HEALTH DEPT.	919-473-1101	24	20	0	44
DAVIDSON	COMMUNITY GENERAL HOSP.	919-472-2000	40	0	0	40
DAVIDSON	LEXINGTON MEMORIAL HOSP.	704-246-5161	53	0	0	53
DAVIE	DAVIE COUNTY HOSPITAL	704-634-8100	35	0	0	35
DUPLIN	DUPLIN CO INFANT SEAT RENT	919-296-0441	21	0	0	21
DURHAM	DURHAM CO. HOSPITAL CORP	919-470-4151	500	0	0	500
EDGECOMBE	SOUTH EDGECOMBE JAYCEES	919-827-5627	22	2	0	24
FORSYTH	UNITED WAY OF FORSYTH CO.	919-723-3601	75	0	0	75
FRANKLIN	LOUISBURG WOMEN'S CLUB	919-496-2533	75	170	0	245
GASTON	GASTON MEM HOSP VOLUNTEER SERV	704-866-2257	50	0	0	50
GATES	SUNBURY WOMAN'S CLUB	919-465-8861	10	0	0	10
GRANVILLE	GRANVILLE MEDICAL CENTER	919-693-5115	250	0	0	250
GREENE	GREENE COUNTY HEALTH DEPT	919-747-8181	4	35	4	43
GUILFORD	GRNSBRO JR WO CLUB & GUILFD CO HD	919-854-1478	800	0	0	800
GUILFORD	WESLEY LONG COMMUNITY HOSP.	919-854-7613	287	0	0	287
HARNETT	BOONE TRAIL MEDICAL CENTER	919-893-3063	78	58	0	136
HARNETT	WESTERN MEDICAL GROUP	919-436-2901	5	0	4	9
HAYWOOD	HAYWOOD CO. HEALTH DEPT.	704-452-6675	49	4	0	53
HENDERSON	AMERICAN RED CROSS	704-693-5605	15	10	0	25
HOKE	HOKE CO HEALTH DEPT	919-875-3717	62	10	0	72
IREDELL	DAVIS COMMUNITY HOSPITAL	704-873-0281	325	0	0	325
IREDELL	LAKE NORMAN MED CEN AUX.	704-664-4967	33	0	0	33
JOHNSTON	JOHNSTON CO HEALTH CENTER	919-989-5200	6	0	0	6
LENOIR	LENOIR CO. HOME EXTENSION	919-527-2191	92	67	0	159
LINCOLN	LINCOLN CO. HOSPITAL AUXILIARY	704-735-3071	0	3	0	3
LINCOLN	LINCOLN COUNTY HEALTH DEPT.	704-735-3001	54	0	0	54
MACON	MACON COUNTY HEALTH DEPT	704-369-9526	110	0	0	110
MADISON	MADISON COUNTY HEALTH DEPT	704-649-3531	75	0	0	75
MARTIN	MARTIN COUNTY HEALTH DEPT	919-792-7811	110	104	11	225
MONTGOMERY	MONTGOMERY HOSPITAL	919-572-1301	15	0	0	15
NASH	TAR RIVER JAYCEES	919-442-5762	40	0	0	40
NEW HANOVER	AMERICAN RED CROSS	919-762-2683	84	1	1	86
NORTHAMPTON	NORTHAMPTON CO. HEALTH DEPT	919-534-5841	12	0	0	12
PASQUOTANK	PPCC DISTRICT HEALTH DEPT	919-336-4316	20	63	0	83

NORTH CAROLINA OPERATIONAL SAFETY SEAT RENTAL PROGRAMS - NOV. 1989

COUNTY	ORGANIZATION(S)	PHONE	INF SEATS	CNVRT SEATS	BSTR SEATS	TOTAL SEATS
PITT	PITT CO MEMORIAL HOSP. AUX	919-551-4491	100	0	0	100
PITT	TAR RIVER CIVITAN CLUB/PITT CO. H.D.	919-752-4141	250	125	0	375
POLK	HICKORY GROVE BAPT YOUNG WOMEN	704-894-8413	6	2	2	10
ROBESON	ROBESON COUNTY HEALTH DEPT	919-738-7231	266	132	0	398
ROCKINGHAM	EDEN JAYCEE WOMEN	919-623-9711	43	0	0	43
ROCKINGHAM	ANNIE PENN MEMORIAL HOSP.	919-349-8461	50	0	0	50
ROCKINGHAM	FATERNAL ORDER OF POLICE	919-623-9755	0	48	0	48
ROWAN	ZETA PHI BETA SORORITY INC	704-633-0411	30	0	0	30
ROWAN	ROWAN COUNTY HEALTH DEPT	704-633-0411	0	91	0	91
RUTHERFORD	RUTHERFORD CO. HOSPITAL	704-286-5000	12	0	0	12
SAMPSON	TRI-COUNTY COMM HEALTH CENTER	919-567-6194	30	0	0	30
STOKES	STOKES CO. HEALTH DEPT.	919-593-2811	20	20	0	40
SURRY	SURRY CO HEALTH DEPT	919-374-2131	45	0	0	45
SWAIN	SWAIN COUNTY HEALTH DEPT	704-488-3198	32	18	0	50
SWAIN	COMMUNITY INJ. PREVENTION CRD PGM.	704-497-7297	0	50	0	50
TRANSYLVANIA	BREVARD JAYCEES	704-883-3116	65	65	0	130
TYRRELL	TYRRELL COUNTY HEALTH DEPT	919-796-2681	25	10	0	35
VANCE	FAMILY ADVOCACY COUNCIL	919-492-9003	48	0	0	48
WAKE	APEX JAYCEES	919-362-8210	10	10	0	20
WAKE	WAKE CO. HOSPITAL SYSTEM	919-755-8293	677	0	0	677
WAKE	RALEIGH MOTHER OF TWINS CLUB	919-467-2927	18	22	0	40
WARREN	WARREN COUNTY HEALTH DEPT	919-257-1185	32	0	0	32
WASHINGTON	WASHINGTON CO. HEALTH DEPT	919-793-3023	65	0	0	65
WATAUGA	CHILDRENS CNCL OF WATAUGA CO	704-264-1280	30	7	2	39
WAYNE	GOLDSBORO JR WOMANS CLUB	919-736-1110	500	0	0	500
WILSON	WILSON CNTY EXT HOMEMAKER ASSN	919-237-0112	7	3	0	10
WILSON	WILSON MEMORIAL HOSP. AUX.	919-243-2972	159	0	0	159
YADKIN	YADKIN CO. HEALTH DEPT.	919-679-4203	30	9	0	39
		TOTAL	7507	2069	24	9600

Appendix B

Highway Safety Directions Newsletter Covers

HIGHWAY ○ SAFETY
DIRECTIONS

Do Regular Seat Belt Users Make Safer Drivers?

Television commercials, radio public service announcements and posters alike proclaim the message: Seat Belts Save Lives. While seat belts do protect drivers and passengers when in accidents, they can't keep accidents from happening. Recent research however, shows that drivers who wear their seat belts regularly tend to experience fewer crashes. The research also explores the reasons drivers choose to wear or not to wear their safety belts. The story, on page two, looks at this research and the relationship between seat belt use and the likelihood of being in an accident.

In This Issue

A Newsletter of the University of North Carolina Highway Safety Research Center
WINTER 1989 ○ VOLUME I, NUMBER 4

HIGHWAY ○ SAFETY
DIRECTIONS

Examining busy intersections, looking for traffic-easing solutions

Crowded, congested intersections hinder and irritate motorists everyday. Drivers try to avoid these intersections while traffic engineers work to make them more passable and safe. A study, completed by the UNC Highway Safety Research Center, looks for ways to generate data that will aid engineers in identifying potentially dangerous intersections and possible solutions. This research focuses on crash exposure or the opportunities for accidents to occur at certain intersections. The story, on page two, profiles this study and the components of crash exposure.

In This Issue

Child Safety Awareness Week

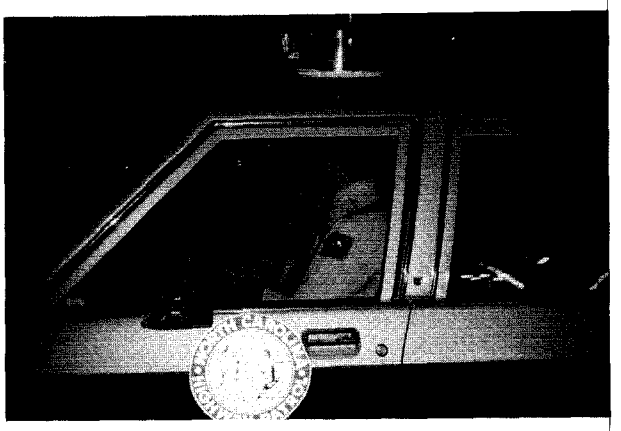
A Newsletter of the University of North Carolina Highway Safety Research Center
SPRING 1989 ○ VOLUME II, NUMBER 1

HIGHWAY ○ SAFETY
DIRECTIONS

Highway safety and scenic beauty, searching for realistic compromises

Each year, U.S. National Parks and Forests draw millions of visitors. These persons and families pack cars, trucks, campers and other vehicles, and hit, what are many times, unfamiliar and difficult roads. A study conducted by researchers at the UNC Highway Safety Research Center, is looking at National Park and Forest roads from the standpoint of design safety and design deficiencies. This research seeks to determine when roadway design allowances made for natural features become too hazardous. The story, on page two, looks at this study and its efforts to arrive at scenic road safety.

In This Issue



A Newsletter of the University of North Carolina Highway Safety Research Center
SUMMER 1989 ○ VOLUME II, NUMBER 2

Appendix C

"A Guide To Safer Carpools" and "Buyer's Guide to Used Child Safety Seats"

A Guide To Safer Carpools

As highway congestion increases and commuting time and distances lengthen, more neighbors, friends and co-workers are taking part in carpools. These shared-rides get the kids to school and mom and dad to work. The following guidelines will help ensure that every trip to school, little league, work or home is safe for children and adults.

- The carpool should be no bigger than the number of belts in the smallest car. Check that each car has one usable safety belt for each person in the carpool, including the driver, and babies and small children who ride in car safety seats.

- Insist that all drivers buckle up themselves and urge their passengers to buckle up before every ride. North Carolina law requires drivers, front seat occupants of any age, and all children less than six to be buckled up.

- Never transport children in the back of station wagons, hatchbacks, vans, or trucks etc. unless they have seats and safety belts.

- Children under forty pounds should be buckled up in a car safety seat, which must be belted in the car according to the manufacturer's instructions. North Carolina law requires children less than three to ride in a safety seat and allows children three and older to use safety belts. The back seat is generally the safest place for young children to ride.

- Let all the children in the carpool know in advance that they will be expected to behave properly in the car and that they must *always* ride buckled up.

- Instruct your own children to insist on wearing safety belts any time they ride in a car without you.

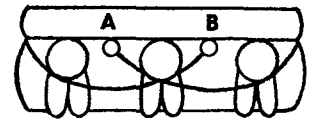
- Plan your routines and pickup points carefully. Avoid backing where young children are pedestrians and have children enter and exit the car on the curb side.

TIPS ON BUCKLING UP

- Lap belts must be worn snugly across the upper thighs, never loosely or across the stomach. If an attached shoulder belt crosses a child's face or throat, try having the child slide toward the middle of the car to move the shoulder belt off of his or her neck. Do not place the shoulder belt under a child's (or an adult's) arm to get it off of the neck. Some lap and shoulder belts, by design, won't allow the lap belt to rest snug on the hips. If these problems occur, do not place a child behind a safety belt that will not allow proper adjustment. Try putting another child in that position or use a booster seat.

- If a child weighs 20 pounds and can sit up alone, using a safety belt is better than riding unrestrained and should be used for emergency situations. A car safety seat, however, provides more protection for small children and is the only safe way to transport infants less than 18-20 pounds.

- In an emergency situation, three children can be buckled into two seat belts by criss-crossing the belts with the largest child in the middle if the distance between the belt anchor points (A and B, see diagram) is at least as wide as the child's hips. This provides better protection than buckling two children into one seat belt, *but should not be used as a routine practice.*



Three Children—Two Belts

- Help younger passengers behave by encouraging them to sing together, by talking to them, or by providing them with soft toys or books. Praise them for being good passengers and be firm about stopping undesirable behavior. Stop the car in a safe location to deal with behavioral problems rather than trying to deal with them while driving.

OTHER CAR SAFETY TIPS

- Choose responsible drivers with well-maintained vehicles and a concern for safety.

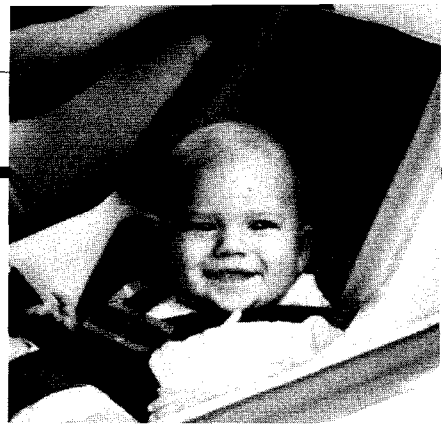
- For field trips, be sure your school or other group has a firm policy on safety belt use and states the policy clearly on permission slips.

- Check your insurance coverage in regard to car pooling and transporting children for field trips.

- Keep doors locked and windows open only slightly and keep sharp or heavy objects in the trunk or on the floor.

For more information, contact:
University of North Carolina Highway Safety Research Center, CB# 3430, Chapel Hill, NC 27599-3430
toll free (in NC) (800) 672-4572 or (919) 962-2202. ❑

Developed by the Los Angeles Area Child Passenger Safety Association. Adapted by the University of North Carolina Highway Safety Research Center. June 1989



Buyers' Guide to Used Child Safety Seats

Choose with Care

Condition should come before price when shopping for a used safety seat

Below are some suggestions for parents and other drivers of children who are considering using or purchasing a previously owned safety seat. Parents can obtain good, safe, second-hand seats but should use caution in selecting one. Some manufacturers' warranties do not cover seats bought from private parties. The buyer then must take responsibility for problems with workmanship and maintenance. Safety seats manufactured before 1981 are not certified to meet current federal motor vehicle standards and should not be used.

• **Decide if the lower cost of a used safety seat is really worth it.** Many of the newer safety seats are more convenient and easier to use correctly than older models. An inexpensive but hard-to-use seat may not be a bargain over time.

• **Ask if the safety seat has ever been involved in an accident.** If it has, do not use the seat.

• **Do not rely on the current user to tell you how to use the seat.** A safety seat must be used according to the manufacturer's instructions in order to provide adequate protection. The current owners may not use the seat correctly.

• **Ask for a copy of the manufacturer's instruction booklet.** Labels on the seat itself do not give enough information for using the seat correctly. Request instructions from the manufacturer, the American Academy of Pediatrics (send a self-addressed, stamped, legal-sized envelope) or the University of North Carolina Highway Safety Research Center (HSRC) if none are with the seat. To obtain the correct instructions, you must know the brand name, model name or number and the date of manufacture of the seat. This information should be on a label glued to the seat. If the label is missing, do not use the seat.

• **Check to see if any recalls or safety notices have been issued on the seat.** This information can be obtained through HSRC or the National Highway Traffic Safety Administration (1-800-424-9393).

• **Make sure that all parts are included with the seat, using the manufacturer's instructions as a guide.** If parts are missing, they may or may not still be available through the manufacturer. If not available, do not use the seat.

• **If a top tether strap is required (e.g., some Strolee models, GM and Century Child Love seats, and many auto booster models), the strap and anchoring bolts must be available and used.** Additional straps and hardware may be ordered from the manufacturer. If you do not want to use the tether, do not use the seat.

• **Check to see that the plastic shell is intact and has not cracked, been tampered with, or modified in any way. Check to see that the metal frame is intact with no bends, warping, cracks, or breaks.** Particularly check the joints; be sure all screws are tight. Do not use damaged seats.

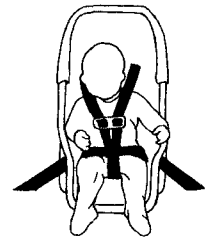
• **Check to see that buttons, buckles, fasteners, and straps close tightly, hold well, and release easily and that the harness straps are easily adjustable.** If the harness straps appear worn or frayed, they can be replaced (in most cases) at minimal cost through the manufacturer.

For more information, write or call:

University of North Carolina Highway Safety Research Center, CB# 3430, Chapel Hill, NC 27599-3430
toll free (in NC) (800) 672-4572 or (919) 962-2202.

American Academy of Pediatrics, "Make Every Ride A Safe Ride," 41 Northwest Point Road, P.O. Box 927, Elk Grove, IL 60007. ❑

Developed by Mark Simonian, M.D.
Adapted by the University of North Carolina Highway Safety Research Center. June 1989



✓ *Manufactured since 1981*
✓ *Seat never in an accident*
✓ *Manufacturer's instructions*
✓ *No recalls*
✓ *No damage to seat or its parts*
✓ *All parts present and working*

Prospective buyers should be able to answer *yes* to all six of the checked items, if not, the seat is not a safe buy.

Appendix D

Summary of "Smart Moves" Activities from *Directions*

Smart Moves

Athletes and seat belts – a winning team

High school athletes across North Carolina have joined together in a campaign to promote seat belt use.

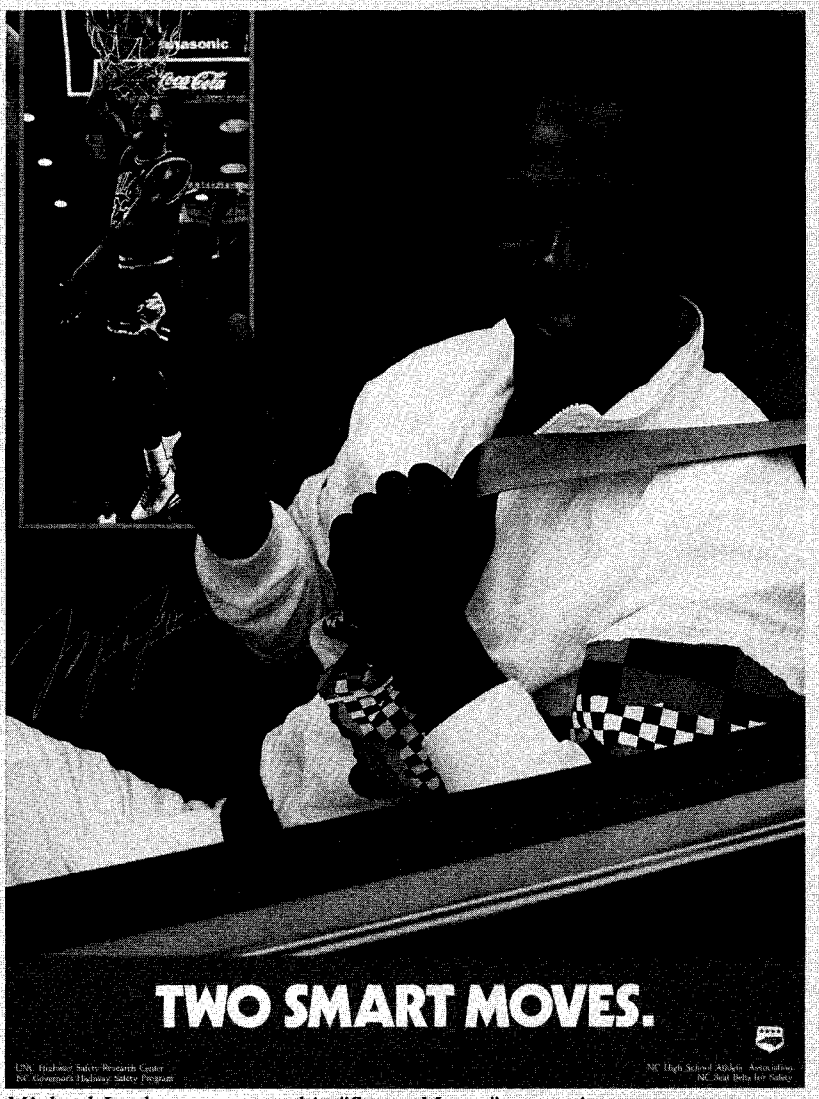
The campaign, called "Smart Moves," centers around encouraging high school athletes to wear their seat belts. The athletes, in turn, try to influence and convince their peers and younger students to buckle up by conducting educational seat belt safety programs. Athletes present these programs within their own schools as well as in junior high and elementary schools.

Along with seat belt safety programs and incentives, the campaign features the support and help of former University of North Carolina and current NBA star Michael Jordan. A poster of Jordan serves as a focal point of the campaign. The poster shows Jordan in two scenes — soaring for a dunk, and flashing a smile while giving the thumbs-up sign after buckling his seat belt. Underneath, a caption reads, "Two Smart Moves." Jordan's poster is also being used in a state-wide billboard project. Jordan has backed other North Carolina seat belt programs in the past.

"Smart Moves" comes from the cooperative efforts of the North Carolina High School Athletic Association, the UNC Highway Safety Research Center, the N.C. Governor's Highway Safety Program and N.C. Seat Belts for Safety.

The four organizations created and produced seat belt safety information packages for the athletes to use. Athletes take the packages and put together educational programs for students of all ages. Athletic directors from 30 counties received the packages and distributed them to area high school athletes.

"In high school and the lower grades, athletes are looked up to," says program organizer Lauren Marchetti. "Additionally, athletes are good spokespersons because they have to take particular care to keep physically fit. One of the best ways to keep your body fit is to wear that seat belt."



Michael Jordan poster used in "Smart Moves" campaign

"Smart Moves" offers participating athletes a variety of ways of getting-out the safety belt message. Each "Smart Moves" package contains information cards, color-coded for certain age groups, as well as idea sheets that outline suggested presentations and the needed materials.

At the elementary level, for example, athletes can teach seat belt safety by using a toy car and raw eggs as passengers in crash tests. Older students can take part in mascot promotions, incentive programs and contests with rival schools. All presentations and programs include facts about seat belts along with state and national accident statistics.

"Smart Moves" also encourages bringing in expert speakers such as emergency-room nurses, law officers and survivors of serious accidents. Organizers also suggest that schools strapped for resources seek assistance from PTA's, local health departments, law enforcement agencies and local merchants.

According to Marchetti, the need for

campaigns like "Smart Moves" is evident. "The automobile accident is the number one killer from age 1 to 38, and teenagers are especially vulnerable. They are just developing their driving skills and are doing a lot of their driving in the evenings and on weekends when most crashes occur." Marchetti concludes: "When you look at the accident statistics, young drivers are involved in more fatal crashes than any other group. We hope this program will help turn that around in North Carolina."

The "Smart Moves" campaign started in October 1988. Organizers plan to expand the program to all North Carolina public high schools in spring 1989 and then continue the campaign with each new academic year. An evaluation questionnaire will be mailed to all participating athletic directors and schools to determine the strengths and weaknesses of the "Smart Moves" campaign.

In addition, the N.C. Governor's Highway Safety Program (GHSP) plans to sponsor a spring "Smart Moves" conference for high school athletes and athletic directors. The conference will focus on safety education. "We want to provide high school athletes and administrators with first-hand knowledge of the highway safety programs available to them," says Yvette Ruffin of GSHP. "We also hope to train these students so they can produce their own safety programs." ❑

For more information about "Smart Moves," contact the UNC Highway Safety Research Center, CB# 3430, Chapel Hill, NC 27599, (919) 962-2202, in state 1-800- 672-4527, or the North Carolina High School Athletic Association, P.O. Box 3216, Chapel Hill, NC 27515, (919) 962-2345, or the N.C. Governor's Highway Safety Program, 215 E. Lane Street, Raleigh, NC 27611, (919) 733-3083.

Below is a sample of the materials found in the "Smart Moves" package. The cards contain information such as North Carolina accident statistics, while the sheets outline suggested programs. High school athletes use these materials to prepare and present seat belt safety education programs within their own schools as well as in junior high and elementary schools. Organizers hope to install "Smart Moves" in all North Carolina public high schools by spring 1989.

North Carolina Accident Facts

- Each year in North Carolina there are over 150,000 accidents involving over 250,000 vehicles.
- In 1987:
  - 1 out of 15 licensed drivers was involved in an accident.
  - One accident was reported every 3 minutes.
  - One person was injured every 5 minutes.
  - One person was killed every 5 hours.
- In 1987, almost 120,000 young children and teens in NC were involved in car crashes and over 3,700 were killed or seriously injured.

Age	Involved in Crashes	Killed	Seriously Injured
0-5	16,325	20	236
6-10	12,214	16	227
11-15	18,490	39	470
16-19	72,424	167	2,588

Many of these deaths and serious injuries could have been prevented if safety seats and belts had been used.

Dynamics of a Crash

- When a car strikes an object such as a tree or another car, it comes to a crushing halt within 1/10 of a second - a blink of an eye.
- The occupants in the car continue moving at the original speed of the car until they too hit something and stop. It is this human collision that causes injuries.
- An easy way to compute the force of the human collision is to take the weight of the person and multiple it times the speed of the car. For instance, a 100 lb. person in a 30 mph crash will be thrown with a force of over 3000 lbs. [100 (weight of person) x 30 (speed of car) = 3000 (force of impact)].

The Human Collision

Within 1 10 of a second, the car has come to a stop but the person is still moving forward

1 50 of a second after the car has stopped, the unbelted person slams into the dashboard or windshield. This is the human collision

With effective safety belts the person will stop before hitting the steering wheel, dash or windshield

The car has come to a complete stop within one tenth of a second. However, the unbelted driver is still moving along inside the car at 30 mph. It will take the driver about one-fifteen of a second more to hit something—say the windshield or the steering wheel. That is the human collision. It happens about 0.50 seconds after the first collisions, and belts can make a big difference in determining how serious that second collision is. A lot of people think they are strong enough to brace themselves in a crash. They aren't. At just 30 mph you'd be thrown forward the same with the same force as if you'd jumped head first off a three-story building. No one's arms are anywhere near strong enough to "catch himself" and break a three-story fall. Safety belts are, though. And that's why people need them, even in a low-speed crash.

Egg Car Crash Demonstration **SMART MOVE**

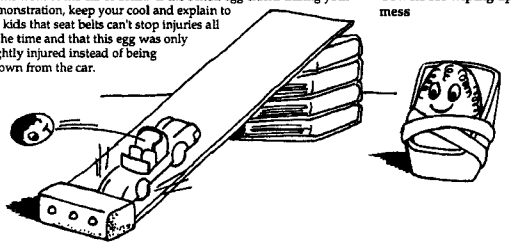
Demonstrating an egg car crash for elementary school children can be lots of fun and a real eye opener for the kids. What happens in a crash is shown as a raw egg (representing the driver) rides down a ramp in a toy car and hits a barrier at the bottom. An unbelted egg goes flying through the air and smashes on the table or floor. A second egg then takes the same trip, only this egg is smart enough to buckle up. Of course, it survives the same crash by staying safely in place.

First, get the children's interest by asking them to give the egg a name. The children select a name (Eggbert, Sally, Joe) and describe how he or she looks (curly hair, mustache, etc.). Use a magic marker to draw the features on the egg. Make up a story about the egg who was going to the _____ (have the children decide where), but was in a hurry and forgot to buckle up. There was a hill and .... (the toy car with the unbelted egg is released at the top of the ramp, crashes at the bottom and the egg flies out of the car and smashes . Then the story is continued using another raw egg with a different name and face. This egg remembers to use its seat belt and when it goes down the same ramp and crashes, it stays safe inside its belts.

NOTE: You will need to get a toy car or jeep without a top so that the unbelted egg can fly out. Cut a styrofoam cup into the shape of a bucket seat for the egg to sit in and be belted (taped) around. Glue or tape the cup to the car. Use as much tape around the egg as needed to keep it in place and tell the kids that it's a special egg seat belt. Practice several times to make sure you can make the unbelted egg go flying and keep the belted egg safely in place. If the car hits the brick too hard, lower the ramp or put some padding on the front of the car or brick. If the belted egg cracks during your demonstration, keep your cool and explain to the kids that seat belts can't stop injuries all of the time and that this egg was only slightly injured instead of being thrown from the car.

Materials Needed:

- **Raw Eggs**
- **Truck or Car with open top such as jeep or convertible car (to hold the egg)**
- **Small Styrofoam Cup to place egg in while riding in the toy car**
- **Masking Tape to serve as seat belt - use as much tape as necessary around egg and styrofoam cup to hold the egg in place**
- **Magic Marker**
- **Board with a brick at the end (for the car to hit) plus something to prop up the board at a slant (can use books)**
- **Plastic Drop Cloth (for area where egg will land)**
- **Towels for wiping up mess**



Appendix E

Child Passenger Safety Awareness Week News Release

NEWS

Print Contact: Mike McFarland
Broadcast Contact: Barbara Thompson
Release Number:

University News Bureau The University of North Carolina at Chapel Hill CB# 6210 210 Pittsboro Street Chapel Hill, N.C. 27599-6210
Wes Lefler, *Director* (919) 962-2091

2/10/89

FOR IMMEDIATE RELEASE

EDITOR'S NOTE: A related news release about a news conference being held by Rep. George Miller, D-Durham, on Wednesday, Feb. 15, will be mailed today by the N.C. Department of Transportation. That event, plus a visit by Wilson schoolchildren to legislators, is part of North Carolina's observance of Child Passenger Safety Awareness Week, Feb. 12-18.

CHILD PASSENGER SAFETY LAW PREVENTED
DEATHS, INJURIES TO 250 N.C. CHILDREN

CHAPEL HILL -- North Carolina's Child Passenger Protection Law prevented deaths and serious injuries to at least 250 children during the first 5 1/2 years it was in effect, according to the University of North Carolina Highway Safety Research Center.

Despite the law, however, more child passengers under age 6 died in auto crashes in North Carolina in 1988 than in any year since the mid-1970s, according to figures compiled by the center.

Thirty-nine children in that age category died on N.C. highways in 1988, up from an average of 22 between 1982 and 1987. Previously, the highest rate was xxxWHAT??xxxxxxx in 197 xxYEAR?xxxx.

"Most parents are doing a good job buckling up, but many still fail to protect their most precious cargo -- their children," said William L. Hall, research associate at the center.

"Twenty-six of the 39 children who were killed in 1988 were not buckled up at all, he said. "Two others were in misused seats that offered virtually no protection. So there's 28 lives that might have been saved if they had been properly protected in safety seats."

Under a law that went into effect in July 1985, safety seat use is required for all children under age 3. Children between ages 3 and 6 are required to ride in safety seats or wear seat belts. Drivers not buckling up children face up to a $25 fine plus court costs. The original 1982 law covered children under age 2 being driven by a parent.

About 16,500 children under age 6 were involved in car accidents in North Carolina between July 1987 and June 1988, according to the UNC center's figures, which are based on data from the N.C. Division of Motor Vehicles. That marked nearly a 6 percent increase from the previous year. The number of children involved in accidents has steadily increased since the safety law went into effect. Hall attributed the trend to more N.C. residents driving more miles.

The 1987-88 figures also show that 85 percent of children less than 6 who were involved in accidents were restrained by safety seats or seat belts. That is up from xxWHAT?xxxxxx percent the previous year. Hall cautioned that such figures can be artificially high because people involved in accidents are not always truthful in reporting whether they and their children were buckled up.

Hall said parents must take the time to use safety seats and belts consistently and correctly.

Younger children often become irritable and some parents do not take the time to buckle them in, especially for a short trip to the store or to run errands, he said.

"Accident records show that more than half of North Carolina car crashes happen within five miles of home and at lower speeds," Hall said. "The inconvenience

of buckling up a fussy child is nothing compared to the trauma of losing a child or coping with serious injuries."

Hall said the state's observance of Child Passenger Safety Awareness Week Feb. 12-18 was a good time for parents to think about the importance of buckling up their children.

"Parents can rededicate themselves to protecting their children," he said. "The week also gives parents not in the habit of buckling in their children the chance to begin."

The theme of the observance, sponsored by the N.C. Child Passenger Safety Association, is "Have a Heart, Click from the Start."

Parents who have questions about safety seats and seat belts can call staff members at the UNC center toll-free in North Carolina at 1-800-672-4572 or at (919) 962-2202.

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Appendix F

Summary of Child Passenger Safety Awareness Week Activities
from *Directions*

Students present North Carolina State lawmakers with Valentines during safety week

Child Passenger Safety Awareness Week

Celebration of lives saved and a reminder of the need for regular, correct use of child safety seats

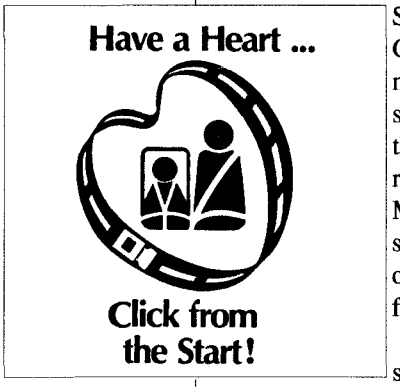
February 12th through 18th, the nation and North Carolina observed Child Passenger Safety Awareness Week.

In North Carolina, the week served as a reminder to parents, of the many children saved from injury and death because they were riding in safety seats and belts. The week, however, also recounted the number of children injured or killed in the state because they were riding unrestrained in automobiles.

Child Passenger Safety Awareness Week brought the news that North Carolina's Child Passenger Protection Law prevented the deaths and serious injuries of at least 250 children since it went into effect in 1982. According to figures compiled by the UNC Highway Safety Research Center (HSRC), at least 250 children, under age 6, avoided death and serious injuries because of the Child Passenger Protection Law and the increased use of safety seats and belts.

Despite the law, however, more child passengers under age 6 died in auto accidents in North Carolina in 1988 than in any year since the mid-1970s. Thirty-nine children, under age 6, died on North Carolina highways in 1988. Between 1982 and 1987, an average of only 22 children died each year in North Carolina car crashes. The 39 children deaths topped the previously recorded high of 36 in 1978.

"We hope that parents in North Carolina used Child Passenger Safety Awareness Week as an opportunity to rededicate themselves to protecting their children," commented Bill Hall, HSRC research associate. "Twenty-six of the 39 children who were killed in 1988 were not buckled up at all. Two others were in misused seats that offered virtually no protection. So there's 28 lives that might have been saved if they had been properly protected in safety seats or belts," said Hall.



North Carolina law requires that all children under age 3 ride in properly used safety seats. Children between the ages of 3 and 6 must ride in safety seats or wear seat belts. This law covers parents and all other drivers of children. Drivers not buckling up children face up to a $25 fine and court costs.

Hall added that parents and other drivers of children need to buckle up youngsters correctly and consistently. "Accident records show that more than half of North Carolina car crashes with children involved happen within five miles of home and at lower speeds. The inconvenience of buckling up a child is nothing compared to the trauma of losing a child or coping with serious injuries."

North Carolinians observed Child Passenger Safety Awareness Week in a number of ways. Police and Sheriff's departments and State Highway Patrol Troops across North Carolina distributed various materials to school-age children including coloring sheets, suckers and stickers bearing the week's theme, "Have a Heart, Click from the Start." Law enforcement officials gave out these items in an attempt to create a positive attitude among young children toward buckling up, and to influence more parents through their children.

The highlight of the week came on Wednesday the 15th. Sixty elementary school students from Wilson, N.C. traveled to the State Legislative building in Raleigh. There, the students gave State Senators and House Representatives valentine hearts. The children presented the hearts to say thank you for the Child Passenger Protection Law and the 250 lives saved since 1982. An official press conference conducted by State Representative George W. Miller announced the Wilson students' arrival. Then the N.C. House of Representatives, led by Miller, recognized the students with a standing ovation from the House floor.

The N.C. Child Passenger Safety Association served as the principal sponsor of the week's observance. ❑

For more information about the North Carolina Child Passenger Protection Law and child safety seats, parents can contact the UNC Highway Safety Research Center, CB# 3430 , Chapel Hill, NC 27599-3430. In North Carolina toll free at 1-800-672-4572, or at (919) 962-2202.

Appendix G

Summary of NC Lifesavers Month Activities from *Directions*

North Carolina Lifesavers Month

1989 marked the third consecutive year that the month of May carried the title of North Carolina Lifesavers Month. Made official by a proclamation by NC Governor, James Martin, May '89 hosted activities aimed at making the State's roads safer year round.

Highway safety advocates ranging from law enforcement personnel and health educators to concerned citizens worked, at state and community levels, to increase awareness and make known the benefits of safe driving, seat belts, child safety seats and the dangers of drinking and driving. The following profiles the month's activities.

NC Lifesavers Conference, Wrightsville Beach

North Carolina Lifesavers month got under way with the NC Lifesavers Conference held at Wrightsville Beach. Sponsored by the NC Passenger Safety Association, NC Governor's Highway Safety Program and the UNC Highway Safety Research Center, the eighth annual Lifesavers Conference opened April 30th and ran through May 2nd. The Blockade Runner Hotel and Resort hosted the conference of about 200 highway safety advocates from across North Carolina, and seven other states. Those attending included law enforcement officials, health educators, nurses, emergency medicine specialists, researchers, and other state highway officials.

Attendees participated in workshops and panel discussions led by state, regional and national highway safety authorities. Conference topics featured motor vehicle injury prevention, bicycle safety, teenage alcohol use countermeasures, effective enforcement programs, school bus safety, and local community safety programs.

Larry E. Moles served as the conference's key note speaker. Moles opened the activities with humor, advice and encouraged attendees to keep working to make North Carolina's roads safer. Afterwards, conference goers participated in the workshops and discussions, studied and took part in exhibits, shared information and ideas and enjoyed the beach.

The conference closed Tuesday, May 2nd with an awards luncheon. Former Major League baseball pitcher Gaylord Perry gave the closing remarks. Several people received recognition for their efforts in promoting highway safety. An Outstanding Service Award went to Offi-

Operation CARE

Another important part of Lifesavers Month came with the involvement of law enforcement agencies across the state. The NC State Highway Patrol, municipal police and county sheriff's departments all sponsored or participated in enforcement and/or public information activities to encourage safe driving.

During the high-traffic Memorial Day weekend, May 26-29, the NC Highway Patrol represented the state and watched over motorists by taking part in Operation CARE (Combined Accident Reduction Efforts). Through Operation CARE, state police and highway patrol agencies across the nation join together in trying to limit highway crashes, injuries and deaths during holiday weekends. The NC Highway Patrol put every available trooper on the road, all four days, to guard against speeding, driving while impaired (DWI) and other traffic violations.

Some Highway Patrol personnel worked at checking stations set up along busy roadways and near recreational areas. There Troopers checked for valid driver licenses and DWI violators. Others moved in "Wolfpacks," a large number of Troopers saturating a high traffic incident area and watching for any type of hazardous violation.

Statewide, Troopers issued 4,451 speeding tickets on 55 mph roadways, and 442 tickets in 65 mph areas, forming the bulk of a four-day total of 5,137 speeding citations. State Troopers also made 1,110 DWI arrests on North Carolina highways.

In combination with moving violations, the Highway Patrol issued 2,730 seat belt citations and 286 child restraint citations during the Memorial Day weekend and Operation CARE. State Troopers coordinated similar Operation CARE efforts during the July 4th and Labor Day weekends, and will do likewise during the Thanksgiving weekend. ❑

NC Trooper questions driver during Operation CARE . The Highway Patrol used checkpoints across the state, throughout the Memorial Day weekend to watch for DWI offenders and persons driving without valid driver licenses.

cer Jimmy Walker of the Zebulon Police Department for community service. Walker received the award for taking on the role of "Officer Friendly," teaching young children about highway safety. Trooper Phil Wadsworth of the State Highway Patrol in Greensboro, received the President's Award for service he provided to NCPSA during the past year. The Greene County Health Department received a Loaner Award for efforts to make its child safety seat loaner program a more visible and used service of its community.

Media Service Awards went to a pair of Greensboro television stations. WFMY-TV Channel 2 claimed an award for devoting 5000 hours of free air time to promoting seat belt use. WGGT Channel 48 received an award for seat belt promotion during afternoon shows for school-aged children. A final Special Award recognized Marguerite Bunn of the North Carolina Division of Motor Vehicles. Bunn received the award for her 40 years with the North Carolina DMV and her work in highway safety and NCPSA. Bunn retired from the DMV at the end of April. ❑

Saved by the Belt Awards

As part of the NC Lifesavers Conference, the NC Passenger Safety Association presented two Saved by the Belt Awards. The awards recognize the wearing of safety belts and the use of child safety car seats during serious motor vehicle crashes. The NC Highway Patrol and the UNC Highway Safety Research Center review accident reports and make award recipient recommendations.

Debra P. Sewell of Wilmington and her 2-year-old daughter, Julie, received an award after surviving a head-on collision March 1st. The Sewells were traveling west on Murrayville Road, near Wilmington, around 7:30 pm when a pick-up truck going east crossed the median and hit their car head-on. The driver of the truck had fallen asleep.

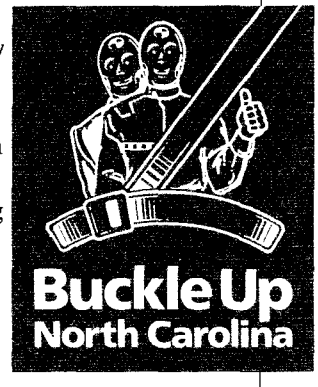
Although both vehicles were traveling between 40 and 45 miles per hour, Sewell, who was wearing her lap and shoulder belt, suffered only a bruised knee. Julie was secured in a child safety seat and rode out the crash with no injuries.

Bonnie H. Roark of Creston and her 2-year-old son, Sammuel, claimed their Saved by the Belt Award after experiencing an uncommon collision May 17, 1988. The Roarks were driving west on NC 88 in Ashe County during a heavy rain. As Mrs. Roark's car entered a curve, it slid into the opposite lane into the path of a NC Department of Transportation motor grader. Unable to stop the car, Roark slid directly into the front of the motor grader. The grader drove completely over the car and came to rest with its left front tire sitting on top of the car.

After the grader driver climbed out of his cab he saw Roark sliding out of the car's left side window. He and Roark then saw that the motor grader tire was actually pushing down on and sitting on the child car seat that contained Sammuel. The seat supported the weight of the grader, protecting Sammuel from being crushed. The child stayed pinned for more than an hour until equipment arrived to lift the grader off of the car and him. Roark, who was wearing her seat belt, received bumps and bruises. Sammuel suffered cuts from broken glass and a broken left arm. State Highway Patrol Trooper J.G. Judson, who investigated the collision, stated that the child owed his life to the safety seat that protected him. ❑

Buckle Up America Week

In accordance with national activities, North Carolinians observed and participated in Buckle Up America Week, May 22-29. The National Highway Traffic Safety Administration, the National Safety Council and the National Association of Governor's Highway Safety Representatives created the week to reinforce seat belt use and encourage more motorists to wear their belts. Buckle Up America Week brought varied programs and activities to the Tarheel State.



North Carolina law enforcement agencies and health educators participated in Buckle Up America Week by distributing educational seat belt promotion materials, and conducting safety programs. Local police and county Sheriff's departments, State Highway Patrol troop and district headquarters, and county health departments handed out fact sheets, buckle up pledge cards, coloring sheets featuring TV crash dummies Vince and Larry, cartoon buckle up stickers and stick-on "Seat Belt Patrol" badges. Officers and educators gave out these items during safety programs in schools, day care centers, shopping malls, churches, civic club meetings, at seat belt and child safety seat checkpoints and in corporate safety programs for employees.

The NC Governor's Highway Safety Program, NC Seat Belts for Safety and the UNC Highway Safety Research Center sponsored the production and distribution of these materials. Emergency medical personnel, Students Against Driving Drunk and Mothers Against Drunk Driving groups, newspapers, radio and television stations and others all helped spread the message that seat belts and child car seats save lives, and prevent injuries. ❑

Appendix H

Observational Survey and Mail-Back Questionnaire Forms

DATE: ___/___/___ (M / D / Y)

OBSERVER: ___ ___ ___

CITY: AVLE CRLT FTVL GBRO GVLE WKBO WMTN WSTN

LOCATION: SHOPPING CENTER / DAY CARE

	OCCUPANTS →	DR	2	3	4	5	6	7	COMMENTS
POSITION	DRIVER	DR	DR	DR	DR	DR	DR	DR	
	CENTER FRONT		CF	CF	CF	CF	CF	CF	
	RIGHT FRONT		RF	RF	RF	RF	RF	RF	
	LEFT REAR		LR	LR	LR	LR	LR	LR	
	CENTER REAR		CR	CR	CR	CR	CR	CR	
	RIGHT REAR		RR	RR	RR	RR	RR	RR	
	OTHER		OT	OT	OT	OT	OT	OT	=
AGE									
SEX	MALE	M	M	M	M	M	M	M	
	FEMALE	F	F	F	F	F	F	F	
RACE	WHITE	W	W	W	W	W	W	W	
	BLACK	B	B	B	B	B	B	B	
	OTHER	O	O	O	O	O	O	O	
RELATION TO DRIVER	CHILD		C	C	C	C	C	C	
	GRANDCHILD		G	G	G	G	G	G	
	OTHER RELATIVE		R	R	R	R	R	R	
	NON RELATIVE		N	N	N	N	N	N	
RESTRAINT ☐Manual Automatic ☐3pt L/S ☐Motorized ☐Non-Motor ☐ShldrOnly	NONE	1	1	1	1	1	1	1	
	ON LAP	2	2	2	2	2	2	2	
	SHOULDER ONLY	3	3	3	3	3	3	3	
	LAP ONLY	4	4	4	4	4	4	4	
	L&S - CORRECT	5	5	5	5	5	5	5	
	L&S - BEHIND BACK	6	6	6	6	6	6	6	
	L&S - UNDER ARM	7	7	7	7	7	7	7	
	NON CRASH TESTED	8	8	8	8	8	8	8	
CHILD RESTRAINT	INFANT ONLY	9	9	9	9	9	9	9	
	CONVERTIBLE-HARNESS	10	10	10	10	10	10	10	
	CNVRTBLE-HAR/SHIELD	11	11	11	11	11	11	11	
	BOOSTER-HARNESS	12	12	12	12	12	12	12	
	BOOSTER-SHIELD	13	13	13	13	13	13	13	
HOW CHILD RESTRAINT USED	CORRECT	1	1	1	1	1	1	1	
	FACING ERROR	2	2	2	2	2	2	2	
	NO HARNESS	3	3	3	3	3	3	3	
	NO BELT	4	4	4	4	4	4	4	

ASK ALL DRIVERS:

1. Are you aware that NC has a law requiring children to be buckled up in cars? YES NO
2. Are you aware that NC has a law requiring adults to be buckled up? YES NO
3. About how far will you be driving to your next stop? _____ MILES

STATE OF CAR LICENSE: NC OTHER: ___ ___ LICENSE # _____

THANK YOU FOR TAKING THE TIME TO TALK WITH US

This survey is being done by the University of North Carolina Highway Safety Research Center in an effort to find out how people in North Carolina feel about car seats for children and seat belts for adults. As driver of the car that was stopped and given this survey, you should answer the questions. It is important that you fill out and return the survey as soon as possible. Your responses will be strictly confidential. Please be honest in your answers; we want to find out how successful publicity efforts have been and how you use car seats and seat belts. If you have any questions, call us toll-free in North Carolina at 1-800-672-4527 between 8:00-5:00 Monday-Friday. Also, you can write us at: UNC Highway Safety Research Center, CB# 3430, Chapel Hill, NC, 27599.

Please circle your answers to the questions.

1) Are you the driver of the car that was stopped by a data collector at the shopping center or day care center? **Yes** **No**

2) Are you aware that North Carolina has a law that requires children to be buckled up?

No **Yes**

a) What age children are covered by the law?

1. Under age 2 **2.** Under age 4 **3.** Under age 6 **4.** Don't know

b) At what age can seat belts be used in place of a safety seat?

1. 1 year old **2.** 3 years old **3.** 6 years old **4.** Don't know

c) Which drivers does the law effect?

1. All drivers **2.** Just parents **3.** Parents and relatives **4.** Don't know

d) What are the penalties? (Circle all that apply)

1. Warning ticket
2. 1 insurance point
3. 2 driver's license points
4. $10 fine
5. $25 fine
6. Don't know

e) How did you learn about the child restraint law? (Circle all that apply)

1. Radio
2. TV
3. Newspaper
4. Friend or relative
5. Doctor or nurse
6. Police
7. Other _____
8. Not sure, can't remember

3) Are you aware that North Carolina has a law that requires adults to be buckled up?

No **Yes**

a) Who is covered by the adult seat belt law?

1. Drivers only
2. Drivers and front seat occupants
3. All occupants
4. Don't know

b) Which vehicles are <u>not</u> covered by the law? (Circle all that apply)

1. Cars made without seat belts
2. Cars with seat belts removed
3. Cars used for short trips
4. Pickup trucks
5. Some delivery trucks
6. Don't know

c) What are the penalties? (Circle all that apply)

1. Warning ticket
2. 1 insurance point
3. 2 driver's license points
4. $10 fine
5. $25 fine
6. Don't know

d) How did you learn about the adult restraint law? (Circle all that apply)

1. Radio
2. TV
3. Newspaper
4. Friend or relative
5. Doctor or nurse
6. Police
7. Other _____
8. Not sure, can't remember

Please go to second page

Please circle your answers to the questions.

4) How often do you use car safety seats or seat belts for your child or children?

1. All of the time **2**. Most of the time **4**. Some of the time
3. About half of the time **5**. Never

a) What are your reasons for not using safety seats or beltsfor your child(ren) all the time?

b) When are you most likely to buckle up your child(ren)?

5) How often do you use your own seatbelt?

1. All of the time **2**. Most of the time **4**. Some of the time
3. About half of the time **5**. Never

a) What are your reasons for not using your safety belt all the time?

b) When are you most likely to use your own safety belt?

6) Do you use a safety seat for your child(ren)?

No **Yes**

a) How did you get the seat(s)?

1. Bought new **3**. Gift from a friend or relative **5**. Other _____
2. Bought used **4**. Rented

b) Do you have instructions for the seat(s)?

1. Yes, complete **3**. No, lost or thrown away
2. Yes, a label on the seat only **4**. No, never had them

c) Do you use the safety seat(s) just like the instructions say to?

1. Yes **2**. No **3**. Don't know

d) If not, what do you do differently? _____

e) Why do you use the safety seat differently? _____

The following questions are for research purposes only, remember all answers are confidential.

7) What is your age? _____ years

8) What is your sex? **1**. Male **2**. Female

9) What is your race? **1**. White **2**. Black **3**. Other = _____

10) What is the last grade of school you completed? (Please circle one)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

11) What is your total family income? **1**. Less than $10,000 **3**. $25,000 - 40,000
2. $10,000 - 25,000 **4**. More than $40,000

12) What state and county do you live in? State = _____ County = _____

Thank you very much for your help. Please return your completed questionnaire in the envelope provided. You do not need to put a stamp on this envelope. If you need to use another envelope, please send it to the address listed on the first page.