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Research Note

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The Relationship Between Driver and Child Passenger Restraint Use Among Infants and Toddlers

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Summary

NHTSA's National Center for Statistics and Analysis (NCSA) analyzed data from the Fatality Analysis Reporting System (FARS) to investigate the association between the restraint use of child passengers involved in a crash and their drivers. In addition, National Occupant Protection Use Survey (NOPUS) data were examined regarding general restraint use patterns of children and their drivers. Results show that children are more likely to be restrained when their driver is restrained, and the restraint use of children has improved greatly since the mid-1990s.

Methodology

Data from FARS for the period 1991 – 2001 were used. The FARS database collects information on crashes where at least one person involved in the crash was fatally injured. This study includes both children who were fatally injured and those that survived the crash. Each vehicle included in the study involved a) one or more child passengers age less than five years old, and b) one driver, age 16 or older. Drivers were paired repeatedly with each child passenger in their vehicle. For example, a driver with two child passengers in the vehicle is included in two separate driver-passenger pairs, once for each child.

A driver is categorized as being restrained if a lap and/or shoulder belt was in use at the time of the crash. Drivers of unknown restraint use, as well as their passengers, were not included in this study.

A child passenger is categorized as being restrained if a child restraint or lap and/or shoulder belt was in use at the time of the crash. All remaining child passengers were categorized as either unrestrained or unknown restraint use. Passenger vehicles selected for this study include passenger cars, light trucks, vans and sport utility vehicles.

Regarding restraint use patterns, the National Occupant Protection Use Survey (NOPUS) Controlled Intersection Study collects information on child restraint use among children with an estimated age of less than five years old. This study was conducted in 1996, 1998, and 2000. At the time of this report, data from the 2002 study were not available. Data collection for the controlled intersection study was conducted for 40 minutes at approximately 1200 randomly selected intersections with stop signs or traffic signals. Two observers recorded child restraint usage information in the front and second seats of the vehicles. The NOPUS Controlled Intersection Study covered every day of the week, during the hours 8 a.m. to 6 p.m.

Results

The two charts in Figure 1 below represent FARS crashes, involving nearly 30,000 children 0 to 4 years old. These data illustrate a strong positive correlation between the restraint use of young children and the driver of their vehicle.

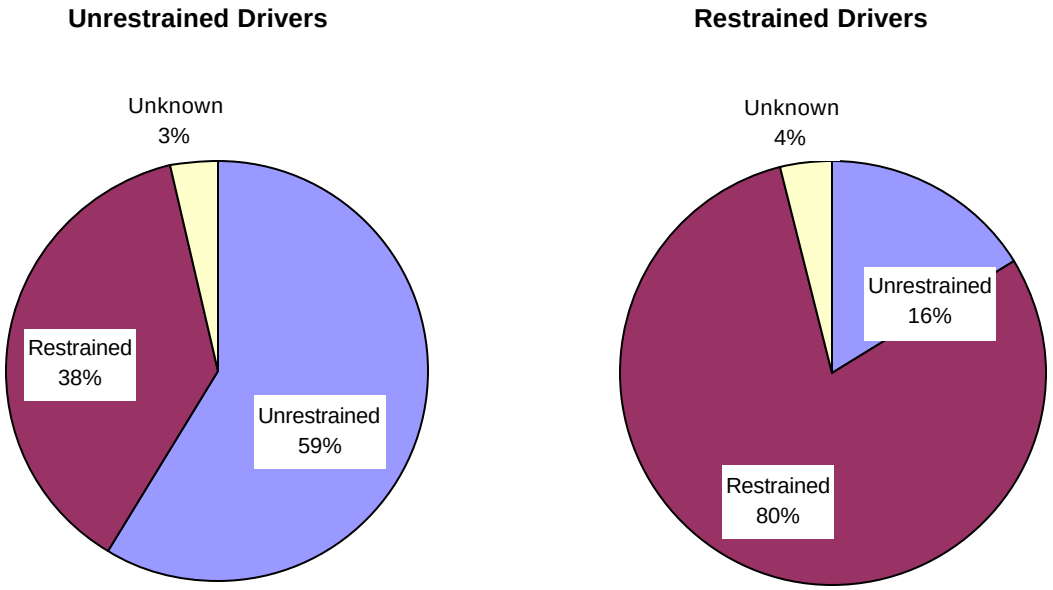
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When traveling in a passenger vehicle where the driver was unrestrained, 59 percent of children age 0 to 4 were also unrestrained, while only 38 percent were restrained (the restraint use of 3 percent was unknown). When the driver was restrained, 80 percent of children age 0 to 4 were also restrained, 16 percent were unrestrained, and restraint use was unknown for 4 percent. Thus, for children 0 to 4 years old involved in a fatal crash from 1991 through 2001, the probability of being unrestrained was 3.7 times greater when the child was with an unrestrained driver versus being with a restrained driver.

Figure 1

Restraint Use of Child Passengers Age 0-4, By Driver Restraint Use Among Vehicles Involved in Fatal Crashes 1991-2001



Source: National Center for Statistics and Analysis, NHTSA, FARS 1991-2001

Another result is that a large improvement in restraint use among child passengers, regardless of the restraint use of the driver, was seen among FARS crashes between 1991 and 2001. Table 1, as seen below, shows that when the driver of the vehicle was restrained, the percentage of children 0 to 4 years old who were restrained increased from 73 percent in 1991 to 86 percent in 2001. When the driver of the vehicle was unrestrained, the percentage of children 0 to 4 years old that were restrained rose from 26 percent in 1991 to 50 percent in 2001.

Findings from the NOPUS Controlled Intersection Study displayed below in Table 2 also show an improvement in restraint use. When traveling with an unrestrained driver, the NOPUS study found the percentage of children under five years old who were restrained climbed from 31 percent in 1996, to 54 percent in 1998, and up to 86 percent in 2000. By comparison, 87 percent of children traveling with a restrained driver were restrained in 1996, with this percentage rising to 97 percent in 1998 and 2000. This improvement may be attributable to NHTSA's Buckle Up America campaign instituted in 1996.

The NOPUS Controlled Intersection Study provides data representing a population estimate of child restraint use among children under five years old, based on observations at controlled intersections. The NOPUS data listed in Table 2 are based exclusively on observations made during the day. By comparison, the FARS data shown in Figure 1 and Table 1 refer to restraint use of children involved in fatal crashes occurring during the day or night. This difference in data collection methodology is likely to contribute to the higher restraint use observed in the NOPUS studies as compared with data collected from the FARS fatal crashes.

Observing child restraint use at randomly selected sites poses certain collection and estimation problems. Since only 8 percent of the resident population of the country are children under the age of five, observing enough children in passenger vehicles to produce reliable estimates is difficult. Consequently, the NOPUS estimates of child restraint use shown below in Table 2 are subject to large sampling errors and should be interpreted with caution.

Table 1
Percent Restraint Use of Child Passengers Under Five Years Old Among Vehicles Involved in Fatal Crashes By Year and Driver Restraint Use

Year	Percent of Child Passengers Restrained	
	When Driver Restrained	When Driver Unrestrained
1991	73	26
1992	76	32
1993	74	29
1994	76	34
1995	80	37
1996	77	42
1997	82	39
1998	82	44
1999	83	48
2000	84	49
2001	86	50

Source: NCSA, NHTSA, FARS 1991-2001

Table 2
Percent Restraint Use of Child Passengers Under Five Years Old By Driver Restraint Use and Year

Category	Year		
	1996	1998	2000
Children Under Five with Unrestrained Driver	31	54	86
Children Under Five with Restrained Driver	87	97	97

Source: NCSA, NHTSA, NOPUS 1996, 1998, 2000

Finally, as restraint use among children under age five has increased since the mid-1990s, the number of passenger vehicle fatalities within this age group has dropped. Table 3 shows how the number of passenger vehicle fatalities among children less than five years old has declined from 1996 through 2001. The number of fatalities fell each year, from 647 in 1996 to 497 in 2001, representing a total reduction of 23.2 percent. The largest drop of 8.2 percent occurred from 1996 to 1997, following the introduction of NHTSA's 1996 Buckle Up America safety campaign. The reduction of fatalities since 1996 coincides with the increase in child restraint use as measured by NOPUS during this time period.

Table 3 Passenger Vehicle Fatalities Among Children Under Five Years Old By Year						
	Year					
	1996	1997	1998	1999	2000	2001
Number of Fatalities	647	594	567	551	532	497
Percent Reduction	N/A	8.2 %	4.5 %	2.8 %	3.4 %	6.6 %
Source: NCSA, NHTSA, FARS 1996-2001						

Conclusions

Based on data collected during fatal crashes from 1991 through 2001, the following conclusions can be made regarding the relationship between the restraint use of child passengers under age five and the restraint use of their drivers.

- The restraint use of child passengers and their drivers are strongly correlated. Child passengers are far more likely to be unrestrained if their driver is unrestrained, and similarly, child passengers are far more likely to be restrained if their driver is restrained.
- The probability of a child being unrestrained is 3.7 times greater when the child is with an unrestrained driver versus being with a restrained driver.
- The probability of a child being restrained is 2.1 times greater when the child is with a restrained driver versus being with an unrestrained driver.
- As child restraint use has improved since 1996, the annual number of fatalities among children under age five has dropped 23 percent, from 647 in 1996 to 497 in 2001.

For additional copies of this research note, please call 1-800-934-8517 or fax your request to (202) 366-3189. For questions regarding the data reported in this research, contact Marc Starnes [202-366-0183]. This research note and other general information on highway traffic safety may be accessed by internet users at: http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/AvailInf.html

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