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Volume Five Child Safety Seat Report



**2000
Motor Vehicle Occupant Safety Survey**



U.S. Department of Transportation
National Highway Traffic Safety
Administration

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16. Abstract The 2000 Motor Vehicle Occupant Safety Survey was the fourth in a series of biennial national telephone surveys on occupant protection issues conducted for the National Highway Traffic Safety Administration (NHTSA). Data collection was conducted by Schulman, Ronca & Bucuvalas, Inc., a national survey research organization. The survey used two questionnaires, each administered to a randomly selected national sample of about 6,000 persons age 16 or older. Interviewing began November 8, 2000 and ended January 21, 2001. This report presents the survey findings pertaining to child restraint use. Telephone surveys provide self-reported information, which can differ from information collected through direct observation. Detailed information on the survey methodology, as well as copies of the questionnaires, are contained in a separate NHTSA report ("2000 Motor Vehicle Occupant Safety Survey. Volume 1: Methodology Report"). Among drivers who lived with children age 12 or younger, most indicated that the youngest child typically rode in the back seat. Parents/caregivers of children under the age of 9 usually said the (referent) child either used a child car seat all the time (53%) or never (40%). If the child never used a car seat, it usually was because the child had graduated to seat belt use. However, 34% of the never users who wore seat belts instead had the shoulder belt cut across their face or neck on most trips, 26% usually put the shoulder belt behind their back, and 21% put the shoulder belt under their arm. Discontinuation of car seat use (including booster seats) by most children occurred at age 4 or 5. Although booster seats are recommended for most children ages 4 through 8, the survey found only 14% of children in that age range using them and another 14% using front facing child safety seats. While most parents/caregivers (84%) had heard of booster seats, 23% of these had concerns about their safety.					
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EXECUTIVE SUMMARY

The 2000 Motor Vehicle Occupant Safety Survey (MVOSS) was the fourth in a series of biennial national telephone surveys on occupant protection issues conducted for the National Highway Traffic Safety Administration (NHTSA). Data collection was conducted by the firm Schulman, Ronca, & Bucuvalas, Inc. (SRBI), a national survey research organization. The survey employed two questionnaires, each administered to a randomly selected national sample of approximately 6,000 persons age 16 and older (with younger ages oversampled). Interviewing began November 8, 2000 and ended January 21, 2001.

This report presents the survey findings pertaining to child restraints and child occupant protection. The data are weighted to yield national estimates. Readers are cautioned that some subgroup analyses are based on small numbers of cases. Technical information on confidence intervals is presented in Appendix A so that readers may judge the precision of sample estimates. A full description of the methodology, and the questionnaires, are presented in a separate report (Volume 1).

Seating Position Of Children Age 12 And Younger

- **Usual Seating Location Of Children Age 12 And Younger.** For safety reasons, NHTSA and other organizations maintain that children age 12 and younger should ride in the back seat of the motor vehicle. Among drivers who lived with one or more children in this age range, most indicated that the youngest child typically rode in the back when riding with them, with 56% saying the child never rode in the front seat in the past 30 days and 14% claiming it occurred just a few times. Children were more likely to sit in the front seat if the child was older, if there was no passenger side air bag in the respondent's primary vehicle, and if the respondent lived in a rural area.
- **Change From A Year Ago In Youngest Child's Seating Position.** Slightly more than half (54%) of children ages 1 to 12 were reported less likely now than a year ago to ride in the front seat. Another 23% were thought to be just as likely as they were a year ago to ride in the front, while 17% were considered more likely now than a year ago to ride in the front.
- **Reasons Why Child Is More/Less Likely To Ride Up Front.** The most frequently given reasons why children were more likely to ride up front were that the child was older or bigger (31%), the child preferred the front (16%), and there was no other place for the child in the vehicle (16%). The most often given reasons why children were less likely to ride up front were that it was safer in back (40%) and the danger from air bags (20%).

Transporters of Young Children Under Age 9

- **Driving A Young Child Not In Household.** One-half (50%) of all drivers had in the

past year driven a motor vehicle with a child under the age of 9 as a passenger, but most of these (28%) did not actually live with a child in that age range. If drivers had transported children under age 9 but did not live with the children, their frequency of driving young children tended to be low: 46% said they did this only a few days a year and 34% said they did it a few days a month.

- **Relationship To Young Child Not In Household (Drivers Who Did Not Live With A Young Child That They Drove)** . Most often, the driver transporting a child not living in the household was a grandparent (44%). When asked the frequency they drove young children, grandparents tended to report a greater amount compared to other relatives.

2000 Car/Booster Seat Use

- **Parent/Caregiver Analytic Group.** The survey selected a subgroup of drivers to ask detailed questions about children's use of child car seats, designated "parents/caregivers." These were: (a) parents of children under age 9 (usually parents living with the child, but also cases of parents not living with the child but who drove the child at least on occasion in the past year), and (b) non-parents living with children under age 9 who at least on occasion drove with them.
- **Frequency Of Child Car Seat Use.** Parents/caregivers usually said either that the selected child used a car seat "all of the time" (53%) or else never used a car seat (40%). If the child never used a car seat, it usually was because the child had graduated to seat belt use. More than 85% of children under 40 pounds in weight reportedly used car seats (including booster seats) "all of the time." Discontinuation of car seat use by most children occurred when the child reached 4 or 5 years of age.
- **Type Of Car Seat By Age.** Children should ride rear facing until at least 20 pounds and one year of age. Children who reach 20 pounds before one year of age should ride rear facing in a child safety seat recommended at a higher weight. Most infants who used car seats (65%) did ride in a rear facing position. But 25% reportedly rode in front facing child safety seats, with another 9% in booster seats. Front facing child safety seats predominated among one-year-olds (82% of those using car seats), two-year-olds (92%), and three-year-olds (80%). Booster seats accounted for 19% of car seat users among three-year-olds, then doubled to 38% at age 4. After age 4, booster seats became the predominant child restraint used by children, though the percentages exaggerate booster seat use because of the far fewer children past age 4 using any type of child seat.
- **Usual Location In Vehicle Where Child's Car Seat Is Placed.** The vast majority of parents/caregivers (94%) stated that the child usually sat in the back when riding in a car seat in a vehicle that the parent/caregiver was driving. This was true regardless of whether the child used a rear facing infant seat (98%), a front facing toddler seat (94%), or a booster seat (93%). If there was a passenger side air bag in the respondent's primary vehicle, then 95% of children in car seats usually rode in the back.

- **Safest Perceived Location To Place A Child's Car Seat.** Among parents/caregivers who drove a child that used a car seat, almost all (97%) considered the back seat the safest location to place a child car seat in a vehicle. Two percent incorrectly believed the front seat was safest.
- **Child Car Seats In Vehicles With Air Bags.** Parents/caregivers who drove a child that used a car seat were asked if they thought it was safe to place a rear facing car seat in the front seat of a vehicle having a front passenger air bag. The correct answer is no, because it could place the child in the air bag's path, with the force of impact being too great for the child. Most parents/caregivers (92%) said it was unsafe while 4% considered it safe.
- **Acquisition Of Car Seat.** Most car seats (89%) were obtained new; one-in-ten (10%) were acquired used. Almost three-fourths of car seats (73%) were purchased, while 25% were acquired as a gift or loaner from a relative or friend.
- **Mailing Back Car Seat Registration Cards.** Almost three-quarters (72%) of parents/caregivers who said they obtained the car seat new also said that a registration card came with the seat. Of these, 58% mailed back the card.
- **Sources For Information.** Of several information sources read by the interviewers, parents/caregivers who drove a child that used a car seat most often said that they had heard about the need to use car seats from books or articles on child care (63%) or from TV or radio (61%).
- **Ease Of Attaching Car Seat To Vehicle.** Parents/caregivers reported that they had relatively little difficulty installing their children's car seats regardless of the type of seat. Two-thirds (66%) said it was very easy to attach the car seat to the vehicle they usually drove; 28% considered it somewhat easy. However, 27% of parents/caregivers acknowledged that they had in the past driven with the child in the car seat and later found the car seat was not securely attached. Most often, respondents said they learned how to attach the child car seat to the vehicle by reading the instructions (74%), usually from the owner's manual.
- **Ease Of Buckling Child In Car Seat.** As with installing the car seat in the vehicle, most caregivers considered it easy to properly buckle the child into the car seat. Almost all parents/caregivers answered either that it was very easy (73%) or somewhat easy (24%).
- **Use Of Safety Seat Inspection Stations.** Inspection stations are places where parents and other caregivers can go to have trained technicians check whether they are correctly installing the child seat in their vehicle and properly buckling their child into the seat. More than one-in-ten (13%) of the parents/caregivers driving a child who uses a car seat said they had gone to an inspection station. Most often, it was sponsored by local police, fire, or rescue units (54%). About one-in-five (19%) parents/caregivers who had gone to an inspection station indicated that the technician had found something wrong with how

they attached the seat or buckled in their child. Most (73%) said the technician had asked them to demonstrate how they attached the seat and buckled in their child.

- **Frequency That Persons Outside Household Drive Child Who Uses Car Seat.** Parents/caregivers who lived with a child that used a car seat were asked if the child had ridden in a vehicle driven by someone outside the household in the past month. Almost two-out-of-five (38%) answered that this had occurred. Children were transported on a far less regular basis by non-household members compared to the parent/caregiver who lived with the child. When asked the identity of the driver outside the household who transported the child in the past 30 days, parents/caregivers most often answered that it was a grandparent (42%) or a parent/step-parent (24%).

Reasons For Non-Use Of Car Seats

- **Children Who Use Car Seats, But Not All The Time.** The reasons most frequently mentioned for non-use of car seats among part time users were that they were only going to be in the car a short time (46%), the child did not like the seat (35%), and the seat was not available (32%). Most children who were part time car seat users wore a seat belt when they were not in their car seat.
- **Children Who Never Use Car Seats.** When asked the reason why the child never uses a car seat, the respondents usually answered that it was because the child was too big (90%) and was using a seat belt (93%). Yet when wearing a seat belt with a shoulder strap, 34% of the children had the belt cut across their face or neck on most trips, 26% usually put the shoulder belt behind the back, and 21% usually put the shoulder belt under the arm.
- **Age At Which Child Is Believed Ready To Begin Wearing Seat Belt.** When asked the age they think a child is ready to begin wearing a seat belt rather than use a child safety seat or booster seat, about half of parents/caregivers gave an age of 5 or younger. This was true regardless of whether the referent child always used a car seat, used a car seat but less than all the time, or never used a car seat.

Booster Seat Issues

- **Use Of Booster Seats.** Booster seats are considered the appropriate restraint for most children roughly between the ages of 4 and 8¹. However, the data collected from the parents/caregivers showed only 14% of children in that age range using booster seats, with another 14% using front facing child safety seats. Booster seat usage peaked at ages 4 (28%) and 5 (24%), and declined sharply thereafter.
- **Awareness Of Booster Seats.** Most parents/caregivers (84%) had heard of booster seats,

¹NHTSA recommends that “all children who have outgrown child safety seats should be properly restrained in booster seats until they are at least 8 years old, unless they are 4'9" tall.”

although 15% had not and 1% were unsure. Of those who were aware of booster seats, 58% said they had used them at some time when driving their child(ren). The most frequent age at which parents/caregivers started using booster seats with their child(ren) was age three (36%); the most frequent weight was 30-39 pounds (38%).

- **Concerns About Booster Seats.** Among the parents/caregivers who had seen or heard of booster seats, over one-fifth (23%) had concerns about their safety and another 6% were unsure. When asked what concerns they had, the parents/caregivers criticized them as loose fitting and unstable systems that would not adequately restrain the child in a crash.
- **Expected Restraint System After Outgrowing Current Seat.** If the referent child in the survey at least on occasion rode in a child safety seat, then the interviewers asked the respondents if they expected the child to use “a different type of car seat, a seat belt, or something else” after outgrowing the current seat. In general, children in rear facing seats were expected to move on to other safety seats, although 11% expected the child to use seat belts. Expectations became more varied with front facing safety seats, as 60% said that the child would use a different seat or booster seat while 38% either answered that the child would graduate to seat belts or else that they did not know what would happen.

Attitudes Toward Enforcement Of Child Restraint Laws

- **Support For Enforcement.** The public (age 16 and older) favors stringent enforcement of car seat laws. Almost three-in-five persons (58%) believed that the police should issue a ticket at every opportunity. Almost as many (56%) believed the fine should be \$50 or more.
- **Legal Requirements For Children Who Outgrow Car Seats.** Ninety-four percent of persons age 16 and older agreed that children should be required by law to wear seat belts once they have outgrown car seats, while 3% disagreed. Those respondents who agreed that children should be required to wear seat belts after outgrowing car seats, or said it depended on the child’s age, were asked if there was an upper age limit beyond which children should not be required to wear seat belts. The vast majority (87%) rejected the notion of an upper age limit by saying that seat belt use should be required for all children (which equated to 83% of the total population age 16 and older).

Trends (1994-2000)

- **Children In Back.** The 1998 survey introduced questions asking about the seating position of the youngest child in the household age 12 or younger. In 1998, 30% reportedly rode in the front seat on half or more of their trips with the respondent during the past 30 days. The figure dropped to 24% in 2000.
- **Change In Definition Of Parents/Caregivers.** Criteria for defining parents/caregivers were expanded for the 2000 survey in order to include all ages where booster seats are the recommended restraint system for children. Thus respondents entered the question series

for parents/caregivers if there was a referent child under the age of 9, as opposed to under the age of 6 in the earlier surveys. As a consequence, 2000 survey results came from a somewhat different subgroup than in 1994-1998, thereby affecting comparability of results. But since the majority of child restraint questions were asked only of parents or caregivers of children who used a car seat, and the 2000 survey showed few children past age 5 using a car seat, the effect on survey results of the change in definition may have been negligible for most questionnaire items. Therefore, some trend data are presented.

- **Car Seat Use.** Data collected from parents/caregivers suggested continued increase in child restraint use among children ages 3 to 5, and children weighing 30-39 pounds. But there appeared to be a drop in child restraint use among infants. It's unclear whether the decrease was an actual decrease, or an artifact of the small subsample size, or a result of error stemming from the difficulty in collecting this type of information over the telephone.
- **Placement Of Child's Car Seat.** Parents/caregivers of children using car seats were asked the seating location of the child when riding with them. The percentage who said that the child is usually in the back seat when riding in a car seat continued to increase in 2000. The number was 94% in 2000 versus 90% in 1998, 85% in 1996, and 78% in 1994.
- **Safest Perceived Location For A Car Seat.** Similar to the 1996 and 1998 surveys, almost all parents/caregivers in 2000 whose (referent) child used a car seat (97%) knew that the back seat was the safest location to place a child car seat in the vehicle.
- **Child Car Seats In Vehicles With Air Bags.** As in 1998, 92% of parents/caregivers in 2000 whose referent child used a car seat were aware of the danger of placing a rear facing infant seat in the front seat of a vehicle having a passenger side air bag. A large jump in awareness occurred between the 1994 and 1996 surveys (from 56% to 88%).
- **Support For Enforcement.** In 2000, 58% of the public believed that police should give a ticket at every opportunity for violations of car seat laws. This was little changed from 1998 (60%).
- **Legal Requirements For Children Who Outgrow Car Seats.** In each survey year, 94% of the public agreed that children who have outgrown child car seats should be required by law to wear seat belts when riding in a motor vehicle.

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INTRODUCTION

Background

The Motor Vehicle Occupant Safety Survey is conducted biennially for the National Highway Traffic Safety Administration (NHTSA). It is a national telephone survey composed of two questionnaires, each administered to several thousand randomly selected persons age 16 and older. The Version 1 Questionnaire emphasizes seat belt issues while Version 2 emphasizes child restraint issues. The questionnaires also contain smaller modules addressing such areas as air bags, motorcyclist and bicyclist helmet use, emergency medical services, and crash injury experience. For the 2000 survey, each questionnaire was administered to approximately 6,000 individuals. This represented an increase in sample size of 2,000 per questionnaire compared to the previous Motor Vehicle Occupant Safety Surveys.

NHTSA conducted the first Motor Vehicle Occupant Safety Survey in 1994. Subsequent versions of the survey have included modest revisions to reflect changes in information needs. Thus the 2000 survey contained numerous items from the earlier surveys, which allows the agency to monitor change over time in knowledge, attitudes, and reported behavior related to motor vehicle occupant safety. The survey also included new questions dealing with such areas as adjustable shoulder belts, side air bags, inspection stations for child restraints, and how seat belts fit children.

The following report presents findings from the 2000 Motor Vehicle Occupant Safety Survey (MVOSS) pertaining to child occupant protection. Specifically, it explores the following areas: 1) seating position of children age 12 and younger in motor vehicles; 2) transporters of young children; 3) car seat use by children under age 9; 4) reasons for non-use of car seats by children; 5) booster seat issues; and 6) enforcement of child restraint laws. A seventh section examines MVOSS trends between 1994 and 2000 on selected child restraint issues.

Methodology

The 2000 Motor Vehicle Occupant Safety Survey was conducted by Schulman, Ronca, & Bucuvalas, Inc. (SRBI), a national survey research organization. SRBI conducted a total of 12,121 telephone interviews among a national population sample. To reduce the burden on respondents, the survey employed two questionnaires. A total of 6,072 interviews were completed with Version 1 and 6,049 interviews were completed with Version 2. Although some questions appeared in both versions (e.g., demographics, crash injury experience, seat belt use), each questionnaire had its own set of distinct topics. Each sample was composed of approximately 6,000 persons age 16 and older, including oversamples of persons ages 16-39. The procedures used in the survey yielded national estimates of the target population within specified limits of expected sampling variability, from which valid generalizations can be made to the general public.

The survey was conducted from November 8, 2000 to January 21, 2001. This is approximately the same time period in which the previous surveys were conducted. For a complete description of the methodology and sample disposition, including computation of weights, refer to the 2000 Motor Vehicle Occupant Safety Survey. Volume 1: Methodology Report. The report includes English and Spanish language versions of the questionnaires.

The percentages presented in this report are weighted to reflect accurately the national population age 16 and older. Unweighted sample sizes (“N”s) are included so that readers know the exact number of respondents answering a given question, allowing them to estimate sampling precision (see Appendix A for related technical information).

Percentages for some items may not add to 100 percent due to rounding, or because the question allowed for more than one response. In addition, the number of cases involved in subgroup analyses may not sum to the grand total who responded to the primary questionnaire item being analyzed. Reasons for this include some form of nonresponse on the grouping variable (e.g., “Don’t Know” or Refused), or use of only selected subgroups in the analysis. Moreover, if one of the variables involved in the subgroup analysis appeared on both versions of the questionnaire but the other(s) appeared on only one questionnaire, then the subgroup analysis was restricted to data from only one version of the questionnaire.

The survey employed two questions to categorize cases for subgroup analyses involving race and ethnicity. The first asked respondents if they considered themselves to be Hispanic or Latino. Those who said “Yes” composed the Hispanic analytic subgroup in the study, those who said “No” composed a non-Hispanic comparison group. The second question was treated independently of the ethnicity question, i.e., it was asked of every respondent. The interviewers recited several different racial categories, and asked respondents which categories described them. Respondents could select more than one. For purposes of analysis, a respondent was assigned to a specific racial category if s/he selected only that category. The few respondents who selected multiple categories (fewer than 350 out of more than 12,000 cases) were analyzed as a separate multi-racial group. Because race and ethnicity were considered independently, each racial group could include both Hispanics and non-Hispanics, and the Hispanic analytic subgroup included both blacks and whites (as did the non-Hispanic analytic subgroup).

The abbreviations DK and REF are frequently listed as response categories in the report. DK stands for “Don’t Know” and REF stands for “Refused.” For most questions, the persons who answered “Don’t Know” vastly outnumbered those who refused to answer the question.

2000 SURVEY RESULTS

CHAPTER 1

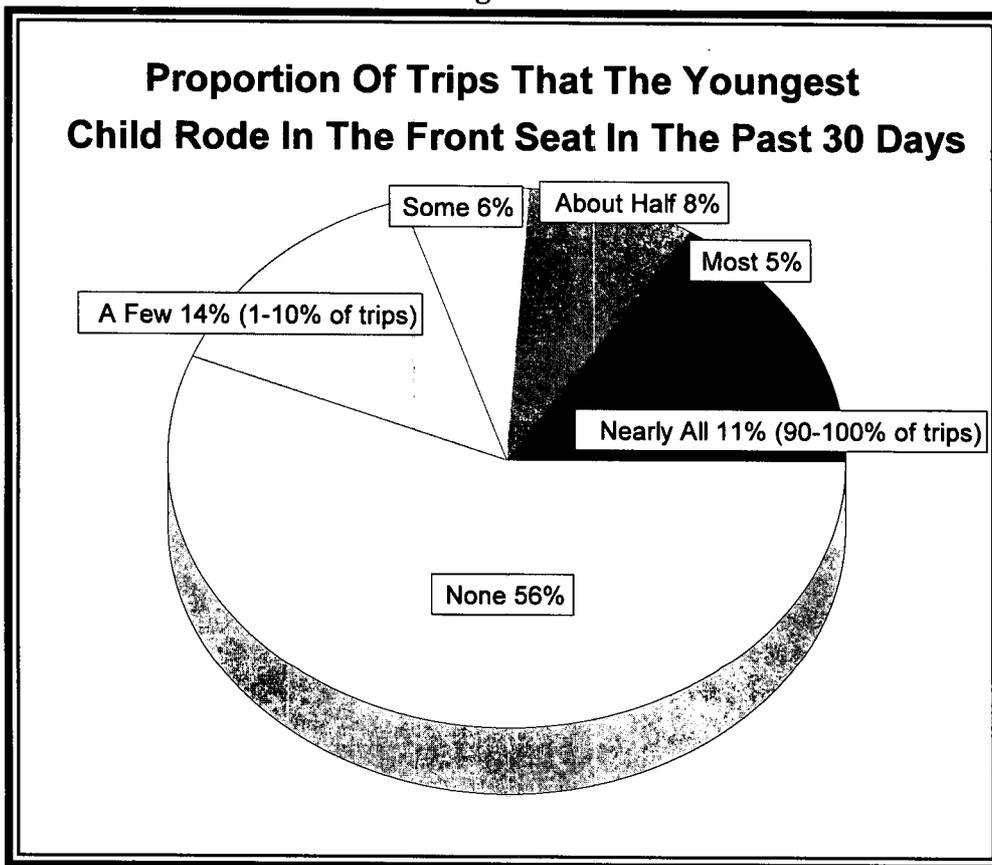
SEATING POSITION OF CHILDREN

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Proportion of Trips That Child Age 12 Or Younger Rides In Front Seat of Vehicle

For safety reasons, NHTSA and other organizations maintain that **children age 12 and younger should ride in the back seat of the motor vehicle** while using the appropriate restraint for their size. Drivers in the survey who lived with children in this age range were asked about the seating position of the youngest child, **using the front seat (the more dangerous position) as the reference point**. Fifty-six percent said the child never rode in the front seat in the past 30 days when riding with them, and 14% claimed it occurred just a few times. About one-in-six children rode in the front seat nearly all (11%) or most (5%) of the time.

Figure 1



Qx: Think about all the times this child rode with you in the past thirty days, both with and without other passengers. About what proportion of those trips would you say that the child rode in the front seat?

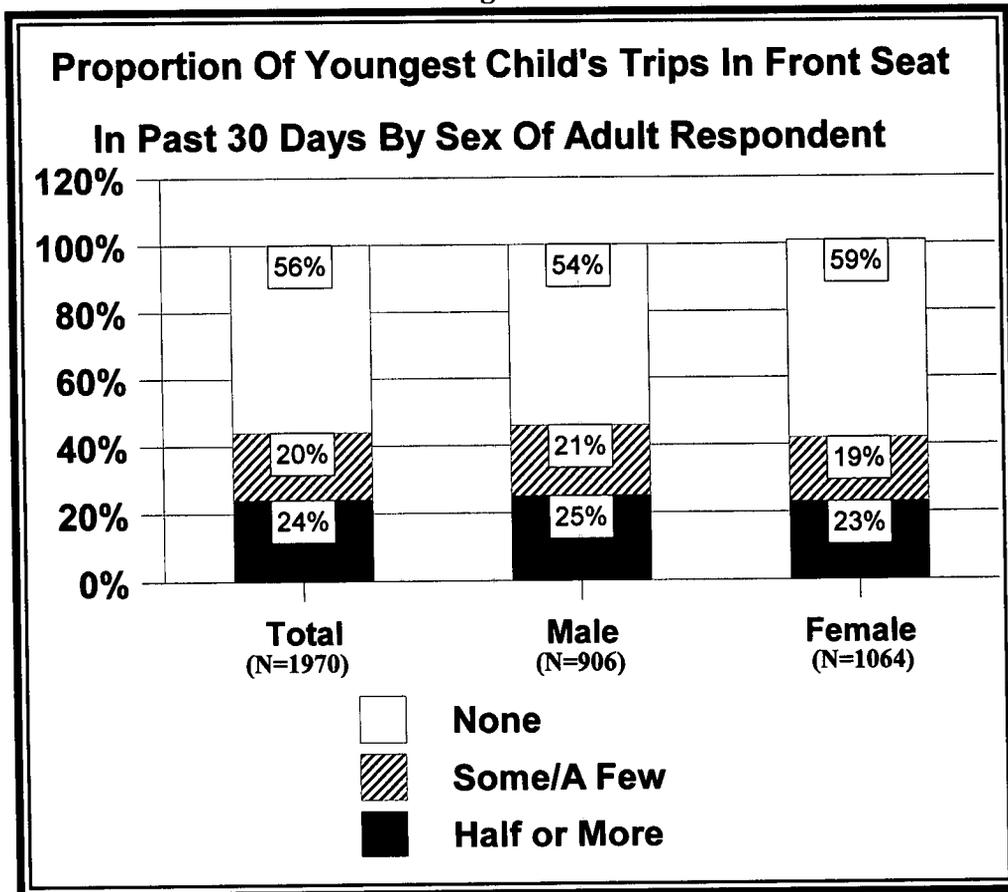
Base: Drives a motor vehicle other than a motorcycle, and lives with one or more children age 12 or younger

Unweighted N=1970

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

About one-in-four male and female drivers reported that the child rode half or more of the time in the front seat. Fifty-nine percent of female drivers said the child never rode in the front versus 54% of male drivers.

Figure 2



Qx: Think about all the times this child rode with you in the past thirty days, both with and without other passengers. About what proportion of those trips would you say that the child rode in the front seat?

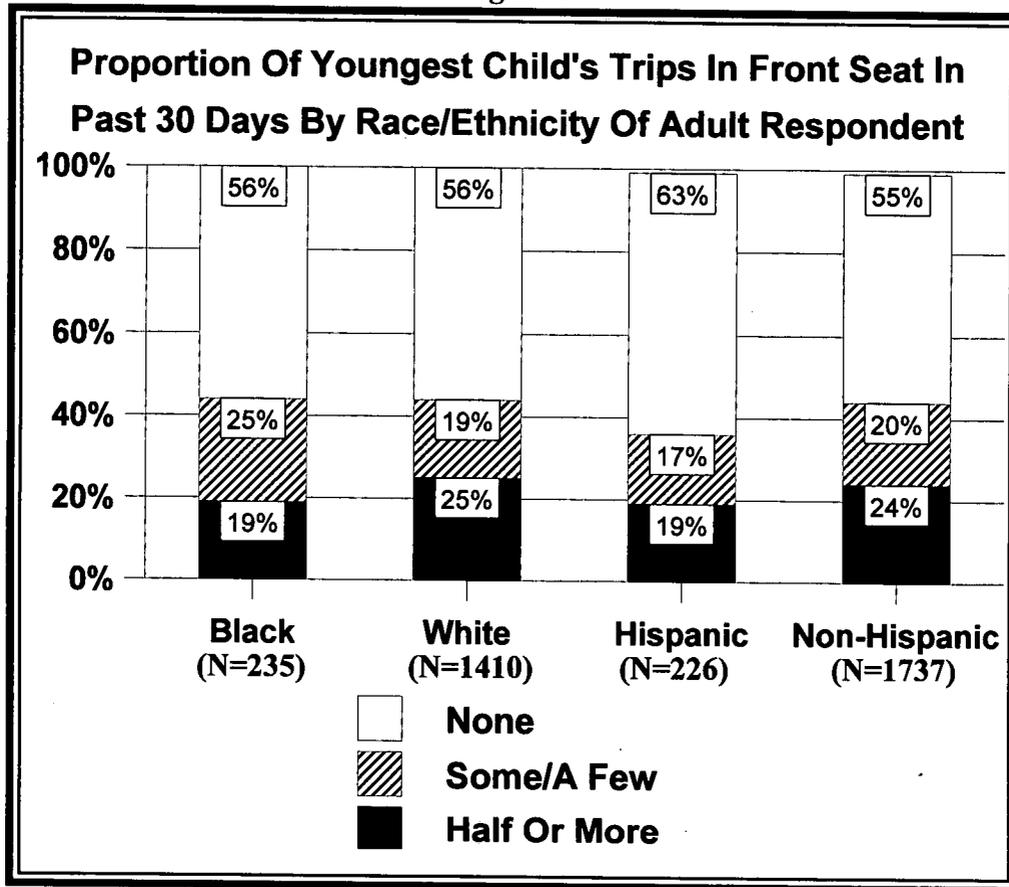
Base: Drives a motor vehicle other than a motorcycle, and lives with one or more children age 12 or younger

Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Black and Hispanic drivers who resided with children age 12 and younger comprised a relatively small number of cases in the sample. Thus readers are cautioned against over-interpreting the results. The data suggested that black children were less likely than white children to ride (most of the time) in the front seat. The same was true for Hispanic children compared to non-Hispanic children.

Figure 3



Qx: Think about all the times this child rode with you in the past thirty days, both with and without other passengers. About what proportion of those trips would you say that the child rode in the front seat?

Base: Drives a motor vehicle other than a motorcycle, and lives with one or more children age 12 or younger

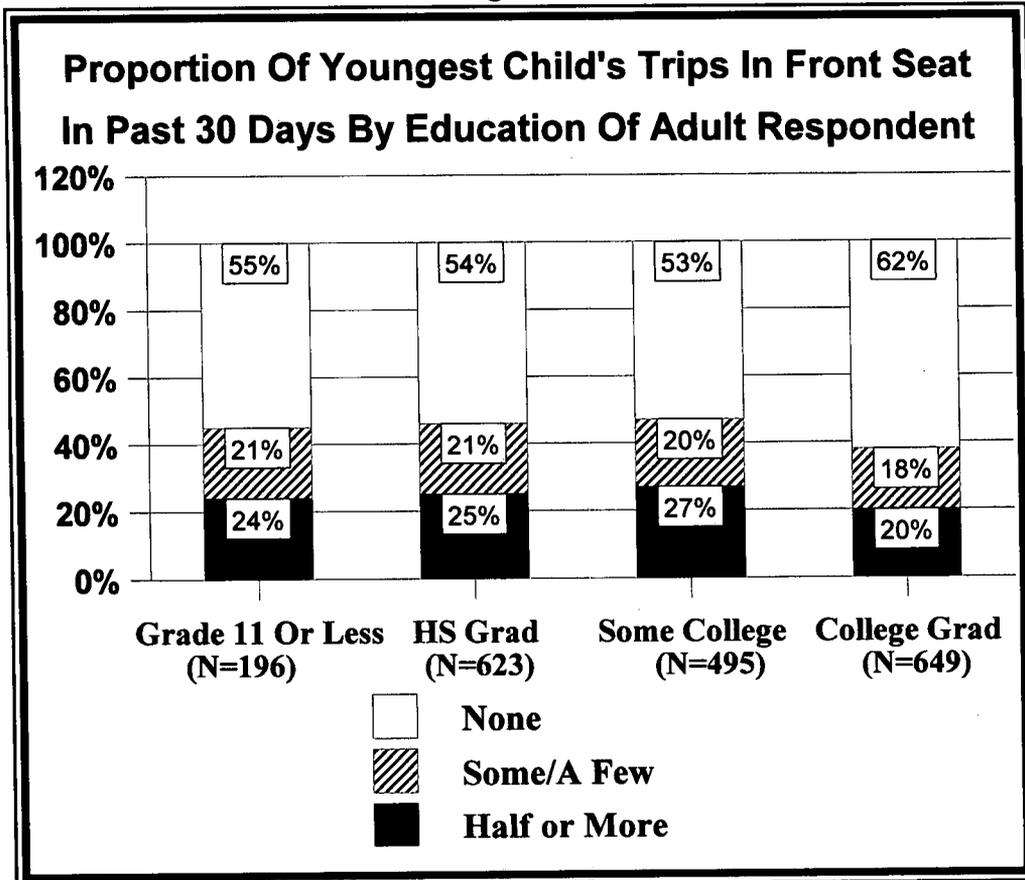
Unweighted N's listed above.

See page xviii for background information on racial and ethnic categories.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Children were least likely to sit in the front seat if the driver was a college graduate (62% said the child never rode in the front seat compared to 55% or fewer among groups with fewer years of formal schooling). There was little appreciable difference in child's seating position between drivers with some college experience versus those who completed high school but did not enter college versus those who did not graduate high school.

Figure 4



Qx: Think about all the times this child rode with you in the past thirty days, both with and without other passengers. About what proportion of those trips would you say that the child rode in the front seat?

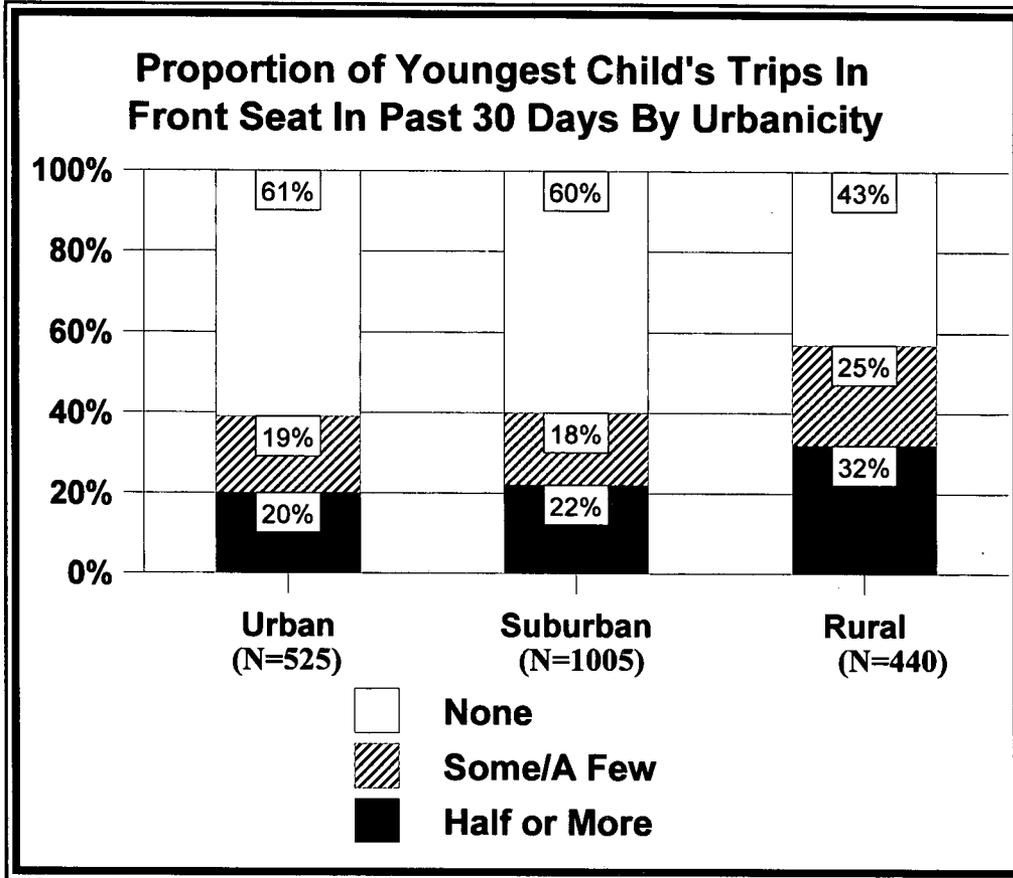
Base: Drives a motor vehicle other than a motorcycle, and lives with one or more children age 12 or younger

Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Children in rural areas were more likely to sit in the front seat than children in urban or suburban areas. Almost one-third (32%) of drivers in rural areas said the child rode in the front seat half or more of the time when riding with them compared to 20% of drivers in urban areas and 22% of those in suburban areas.

Figure 5



Qx: Think about all the times this child rode with you in the past thirty days, both with and without other passengers. About what proportion of those trips would you say that the child rode in the front seat?

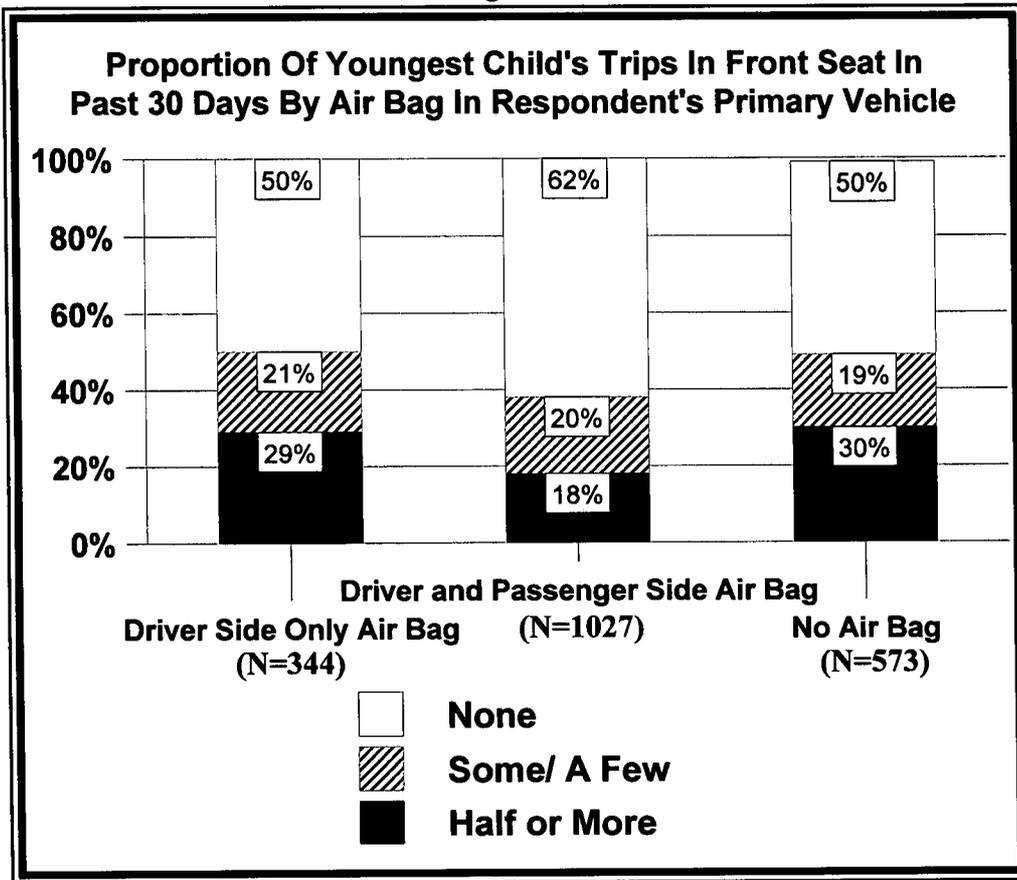
Base: Drives a motor vehicle other than a motorcycle, and lives with one or more children age 12 or younger

Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

The data suggested that public information campaigns warning about the danger of passenger side air bags to children sitting in the front seat have had an impact on the public. Among drivers whose primary vehicle had a passenger side air bag, 62% answered that the child never sat in the front during the past 30 days. This was more than 10 percentage points higher than among drivers who had no air bag in their primary vehicle (50%) or had a driver side only air bag (50%).

Figure 6



Qx: Think about all the times this child rode with you in the past thirty days, both with and without other passengers. About what proportion of those trips would you say that the child rode in the front seat?

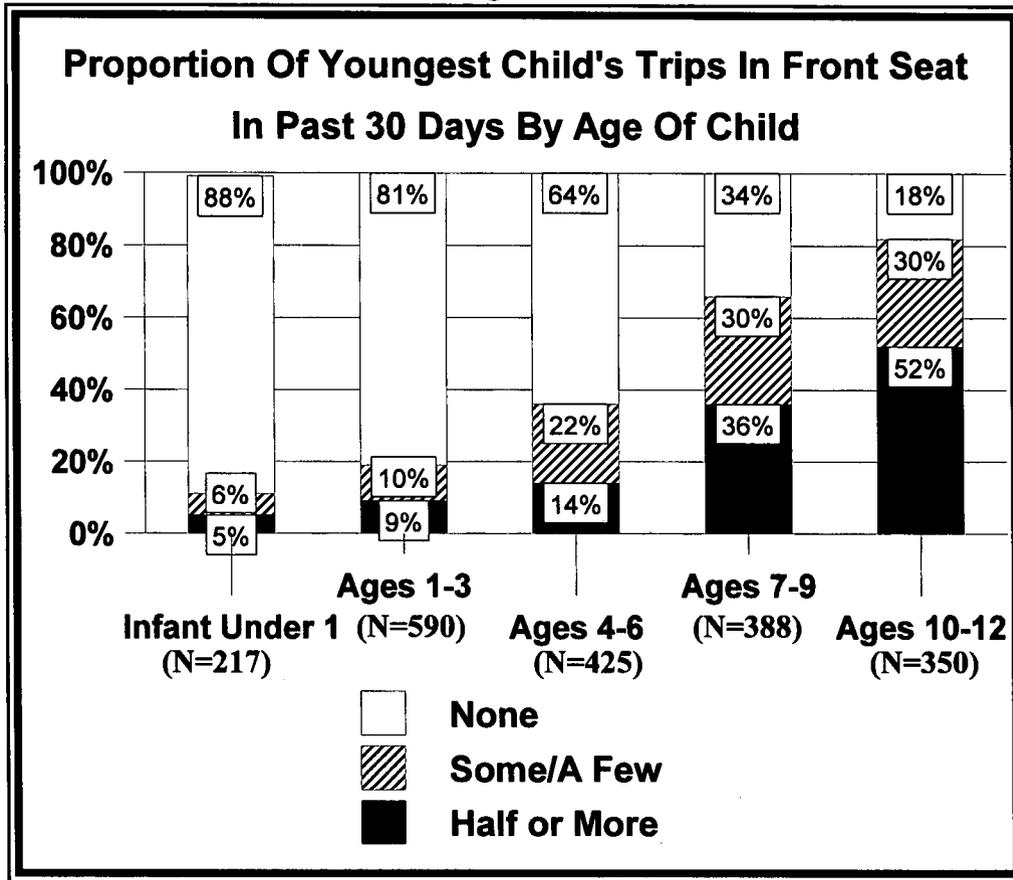
Base: Drives a motor vehicle other than a motorcycle, and lives with one or more children age 12 or younger

Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

As children became older, they became increasingly likely to ride in the front seat of the vehicle. Whereas more than four-fifths of infants and toddlers reportedly never sat at all in the front seat during the past 30 days, the percentage fell to 64% among 4-to-6-year-olds and then to 34% of 7-to-9-year-olds. Among 10-to-12-year-olds, the majority (52%) reportedly rode in the front seat half or more of the time.

Figure 7



Qx: Think about all the times this child rode with you in the past thirty days, both with and without other passengers. About what proportion of those trips would you say that the child rode in the front seat?

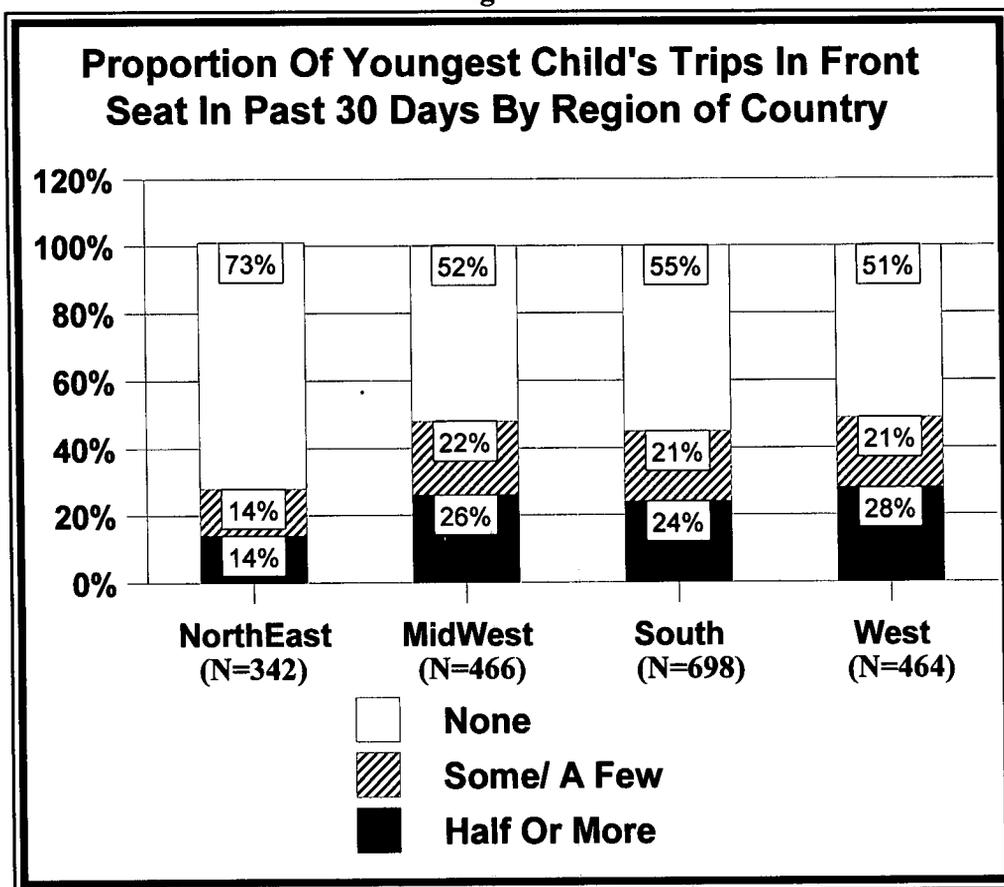
Base: Drives a motor vehicle other than a motorcycle, and lives with one or more children age 12 or younger

Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Respondents in the Northeast region of the country were most likely to report that the child never rode in the front seat during the past 30 days (73%). There was little difference between the three remaining regions of the country.

Figure 8



Qx: Think about all the times this child rode with you in the past thirty days, both with and without other passengers. About what proportion of those trips would you say that the child rode in the front seat?

Base: Drives a motor vehicle other than a motorcycle, and lives with one or more children age 12 or younger

Unweighted N's listed above.

NorthEast: CT, ME, MA, NH, NJ, NY, PA, RI, VT

MidWest: IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, WI

South: AL, AR, DE, DC, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV

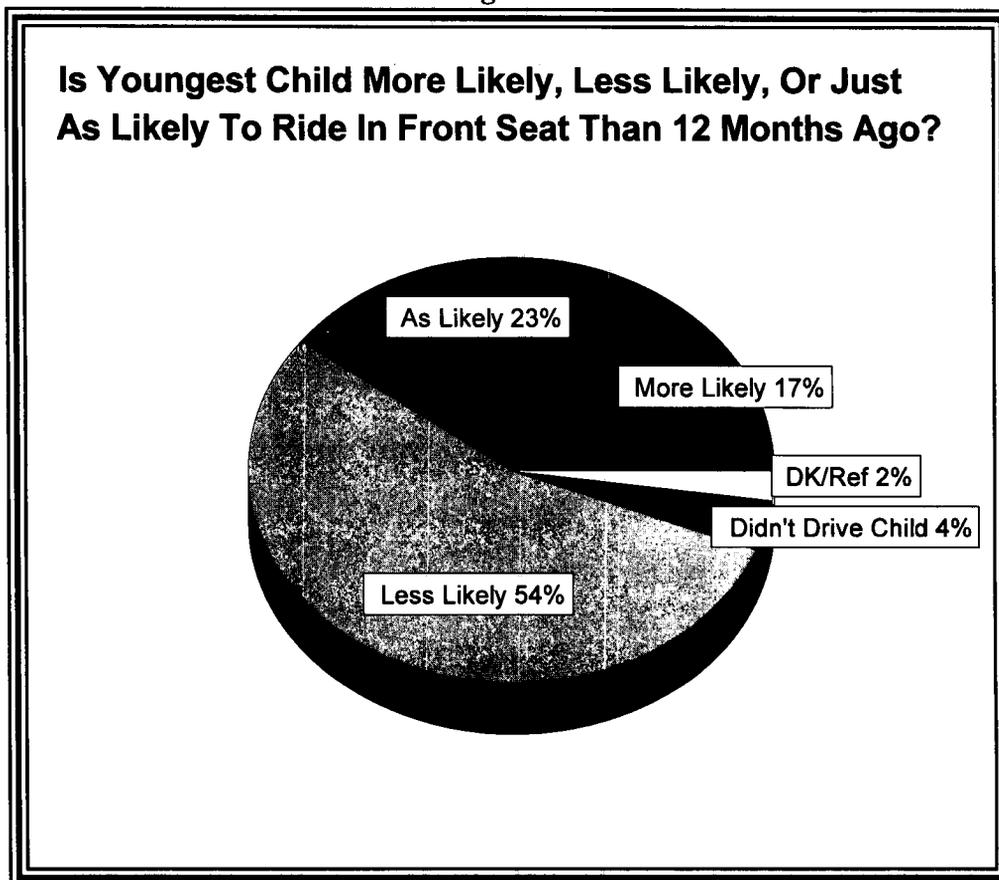
West: AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Change In Seating Position Of Child Age 12 Or Younger From 12 Months Ago

Besides asking about the youngest child's seating position during the most recent 30-day time period, the interviewers asked if the child's usual seating position when riding with the respondent had changed from a year earlier. Slightly more than half (54%) of the children reportedly were now less likely than a year ago to ride in the front seat. Another 23% were said to be just as likely to ride in the front compared to a year earlier while 17% were said to be more likely to ride in the front.

Figure 9



Qx: Compared to 12 months ago, is this child more likely to ride in the front seat when you drive, as likely to ride in the front seat, or less likely to ride in the front seat?

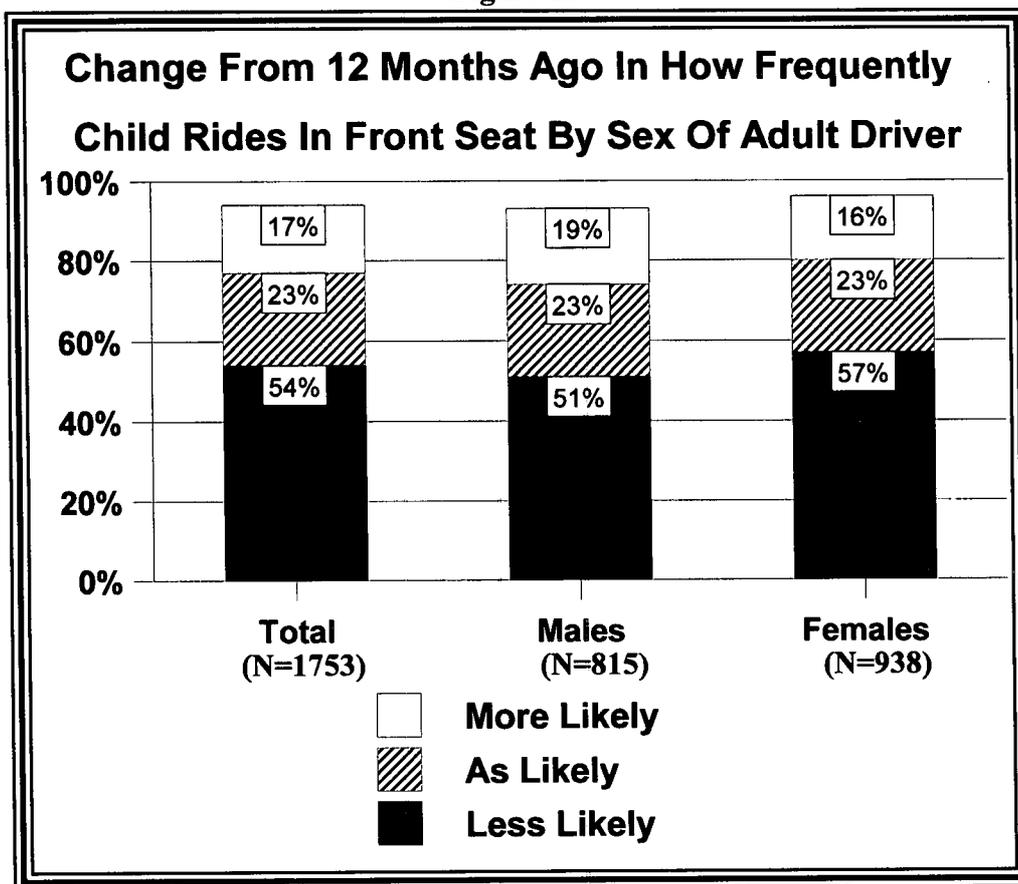
Base: Drives a motor vehicle other than a motorcycle, and lives with one or more children ages 1 to 12.

Unweighted N=1753

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Fifty-seven percent of female drivers reported that the child was now less likely to ride in the front compared to 51% of male drivers. Only part of this difference was attributable to a higher percentage of male drivers (19%) answering that the child was now more likely to ride in the front. There also was a higher percentage of male (5%) than female (3%) drivers who said that they did not drive with the child.

Figure 10



Qx: Compared to 12 months ago, is this child more likely to ride in the front seat when you drive, as likely to ride in the front seat, or less likely to ride in the front seat?

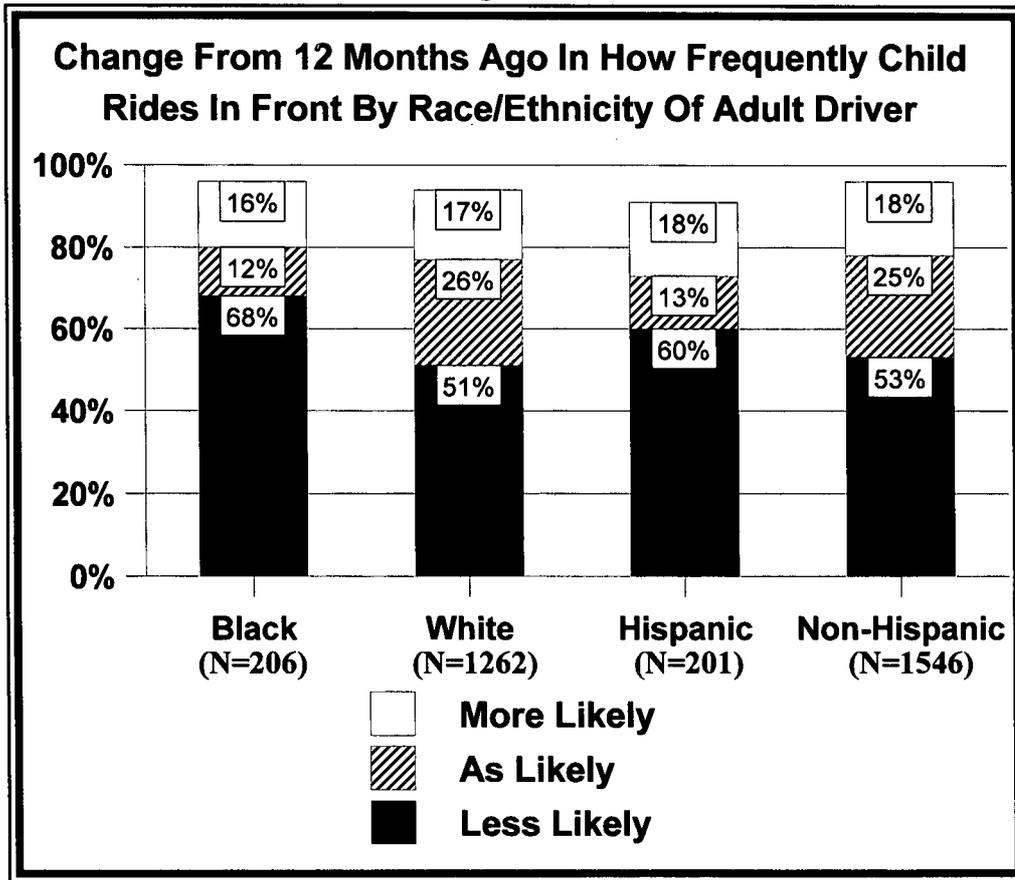
Base: Drives a motor vehicle other than a motorcycle, and lives with one or more children ages 1 to 12.

Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

As noted on page 4, the numbers of black and Hispanic drivers in the sample who resided with children age 12 and younger were relatively small. Thus readers once again are cautioned against over-interpreting the results. About two-thirds of black drivers (68%) reported that the youngest child was now less likely to ride in the front compared to about half (51%) of white drivers. The gap between Hispanic and non-Hispanic drivers was smaller: 60% to 53%.

Figure 11



Qx: Compared to 12 months ago, is this child more likely to ride in the front seat when you drive, as likely to ride in the front seat, or less likely to ride in the front seat?

Base: Drives a motor vehicle other than a motorcycle, and lives with one or more children ages 1 to 12.

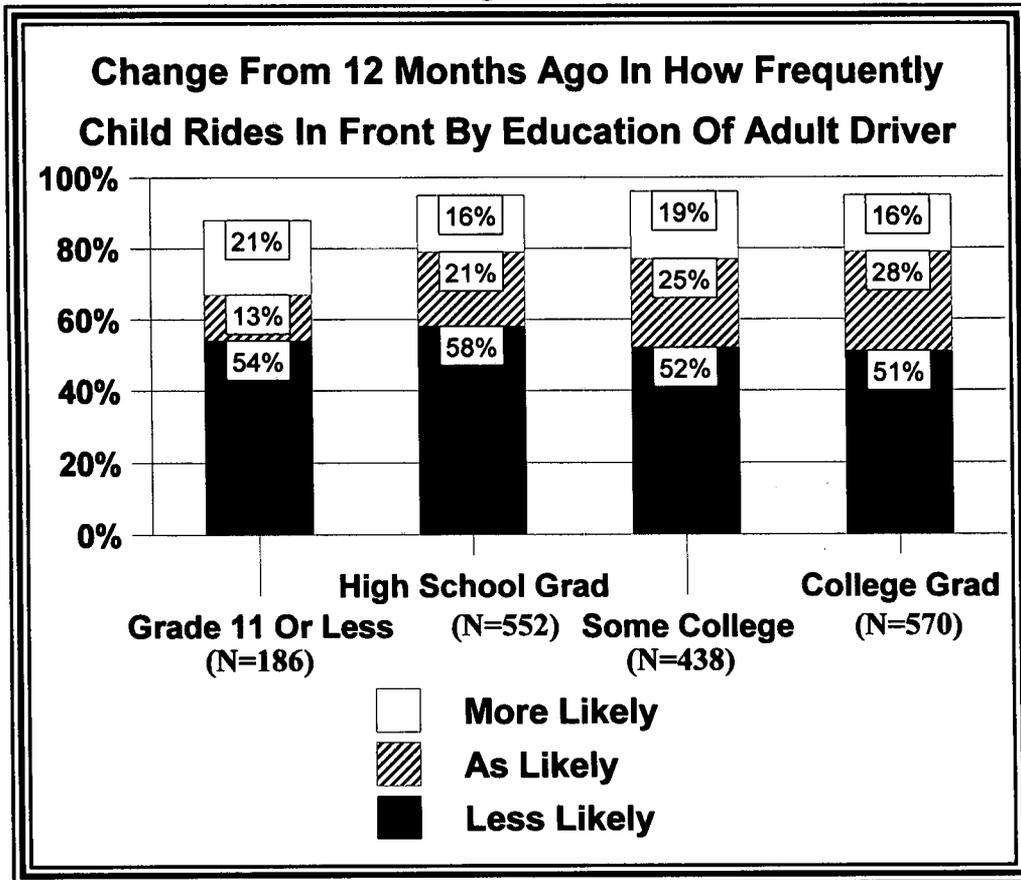
Unweighted N's listed above.

See page xviii for background information on racial and ethnic categories.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Drivers who had graduated high school, but who had not proceeded on to college, were most likely to indicate movement of the child from the front seat to the back (58%). Drivers who had 11 or fewer years of formal schooling were least likely to report that the child's seating position was unchanged (13%), but were most likely to report not driving with the child (10%).

Figure 12



Qx: Compared to 12 months ago, is this child more likely to ride in the front seat when you drive, as likely to ride in the front seat, or less likely to ride in the front seat?

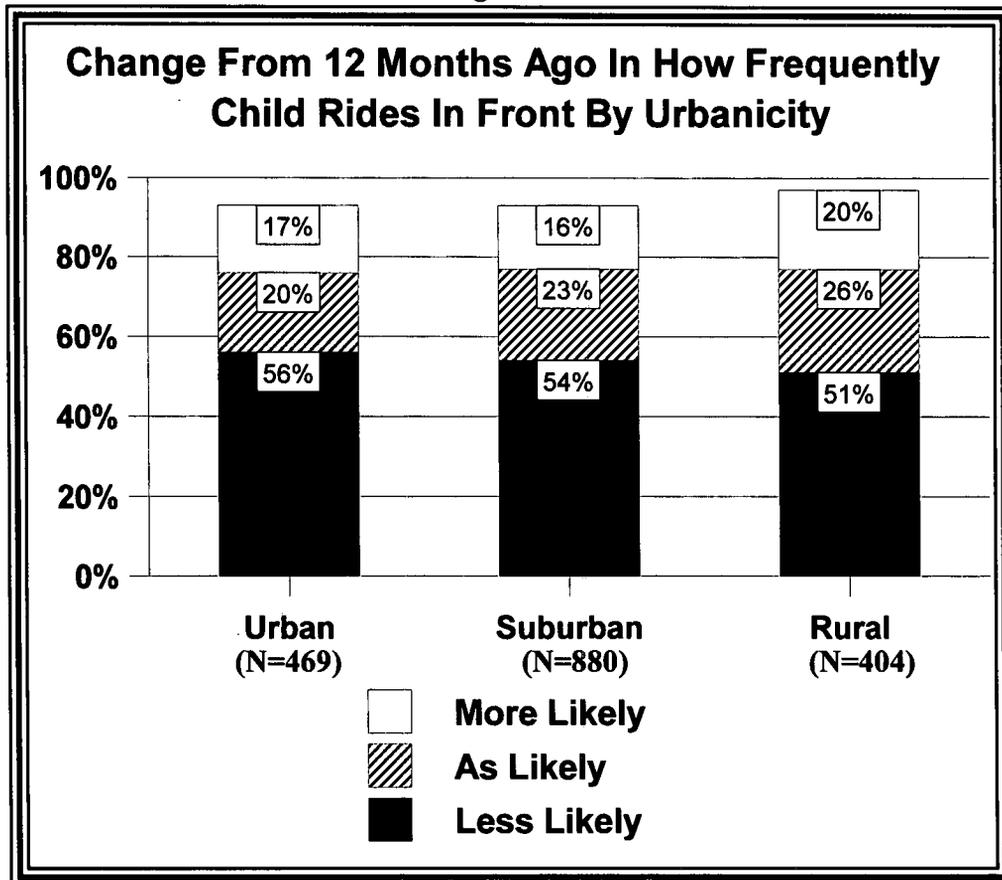
Base: Drives a motor vehicle other than a motorcycle, and lives with one or more children ages 1 to 12.

Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Slightly more than half of drivers said that the child was now less likely to ride in the front seat regardless of level of urbanicity. In urban areas, 56% of drivers said the youngest child was now less likely to ride in the front seat compared to 54% of drivers in suburban areas and 51% of drivers in rural areas.

Figure 13



Qx: Compared to 12 months ago, is this child more likely to ride in the front seat when you drive, as likely to ride in the front seat, or less likely to ride in the front seat?

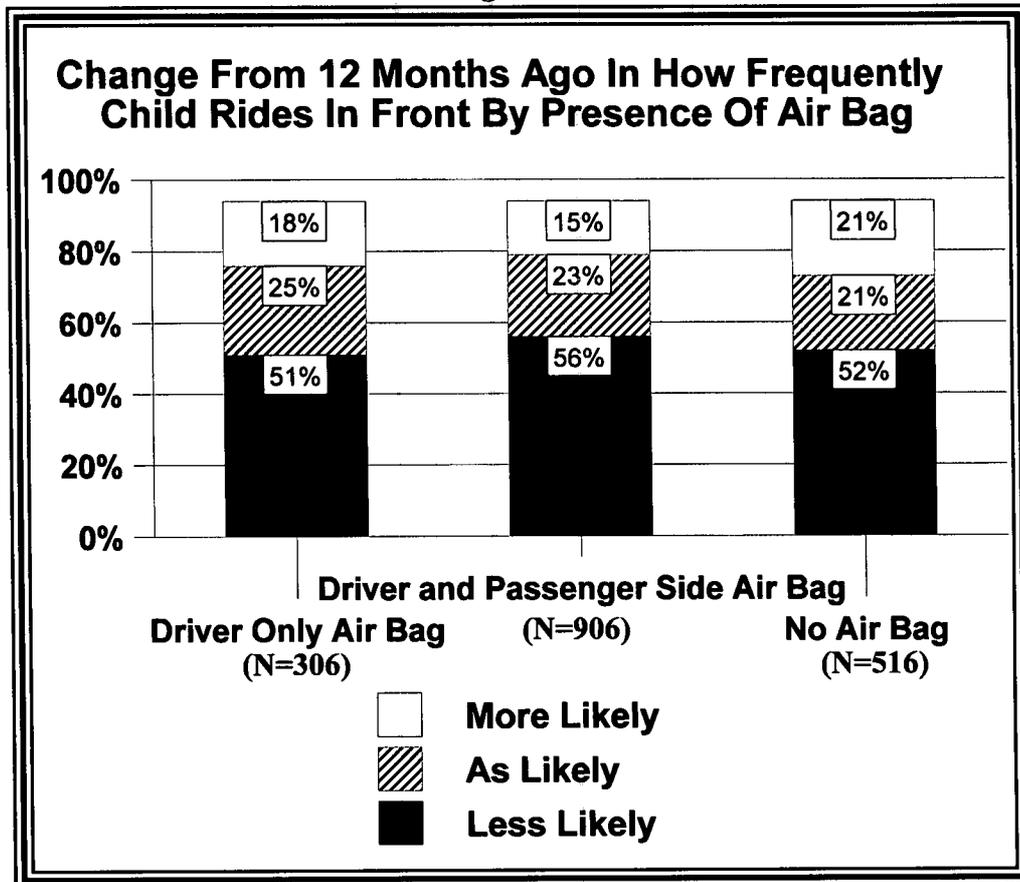
Base: Drives a motor vehicle other than a motorcycle, and lives with one or more children ages 1 to 12.

Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Respondents were slightly more likely to report movement of the youngest child from the front to the back seat if they had a passenger side air bag in their primary vehicle. Fifty-six percent said the child was less likely to sit in the front compared to 51% who had a driver side only air bag and 52% who had no air bag in their primary vehicle.

Figure 14



Qx: Compared to 12 months ago, is this child more likely to ride in the front seat when you drive, as likely to ride in the front seat, or less likely to ride in the front seat?

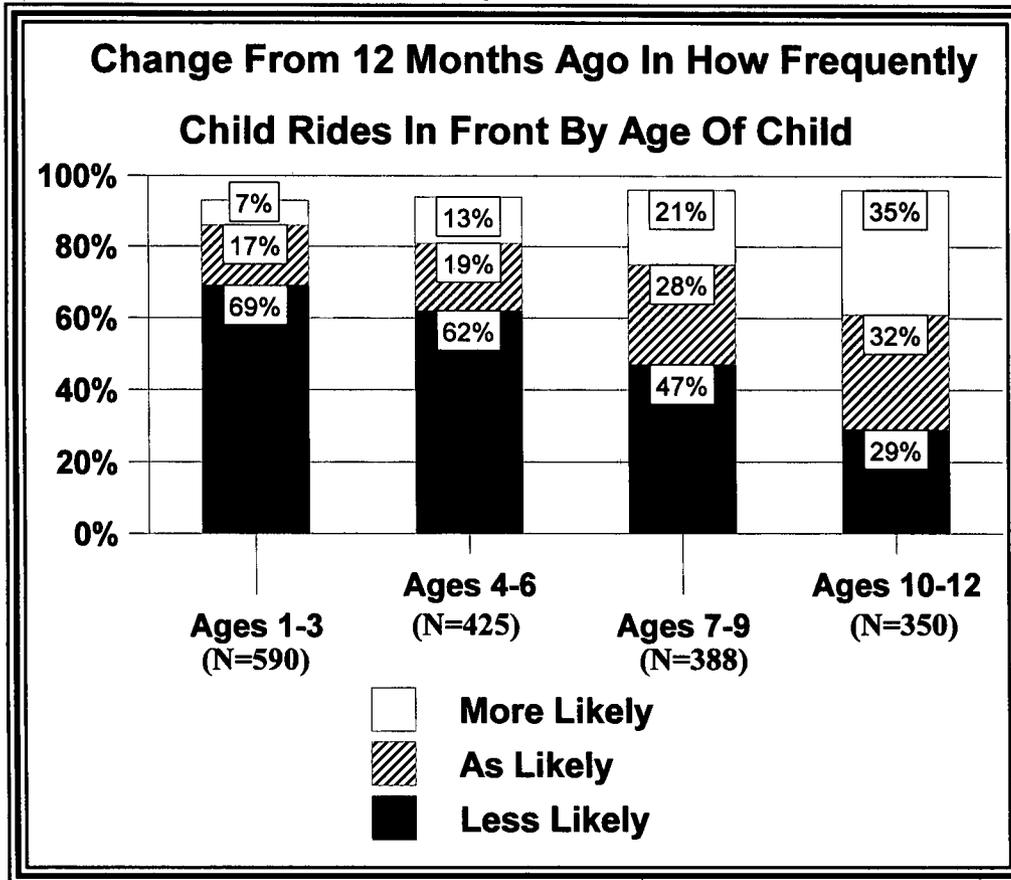
Base: Drives a motor vehicle other than a motorcycle, and lives with one or more children ages 1 to 12.

Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

As children became older, movement to the front seat increased. Only 7% of children ages 1 through 3 were more likely to sit in the front seat of the motor vehicle compared to 12 months earlier. This increased to 13% for ages 4 to 6, 21% for ages 7 to 9, and 35% for ages 10 to 12.

Figure 15



Qx: Compared to 12 months ago, is this child more likely to ride in the front seat when you drive, as likely to ride in the front seat, or less likely to ride in the front seat?

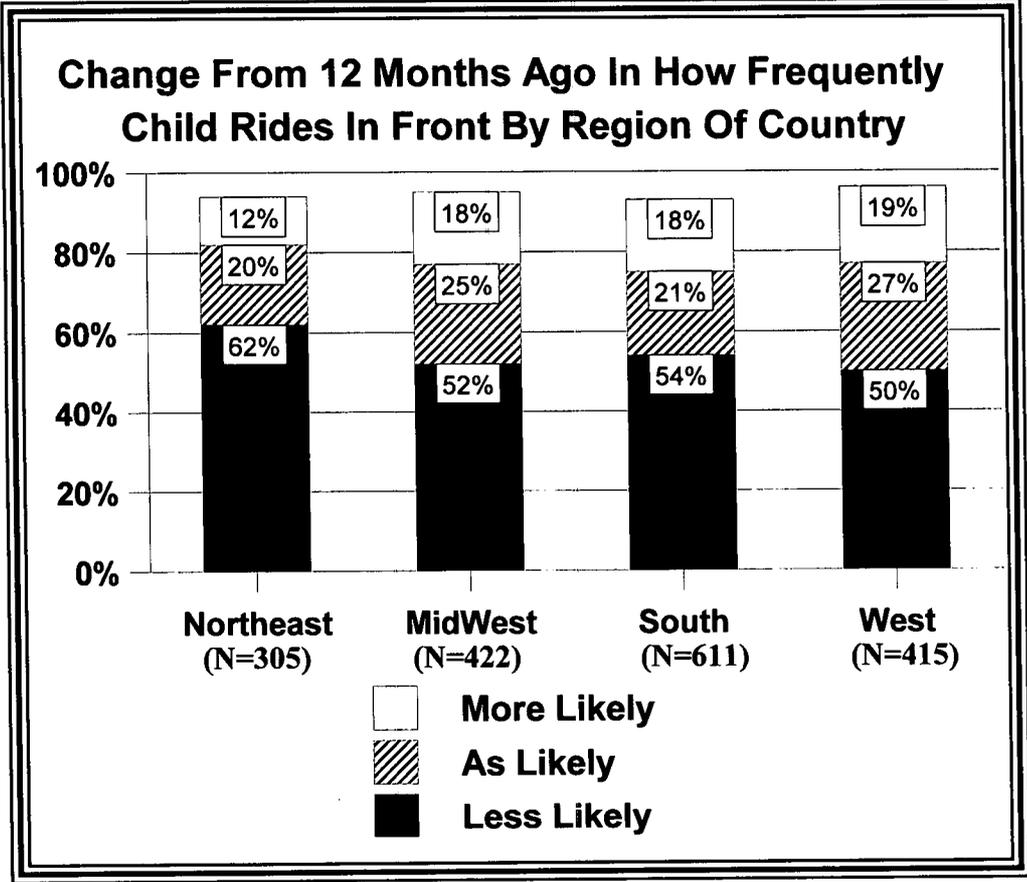
Base: Drives a motor vehicle other than a motorcycle, and lives with one or more children ages 1 to 12.

Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

More than three-fifths (62%) of drivers in the Northeast region of the country reported a lesser likelihood of the child riding in the front seat compared to a year ago. This was 8 percentage points or more greater than what was reported in the Midwest, South, and West. Those three regions did not differ appreciably in reported change in child's seating position.

Figure 16



Qx: Compared to 12 months ago, is this child more likely to ride in the front seat when you drive, as likely to ride in the front seat, or less likely to ride in the front seat?

Base: Drives a motor vehicle other than a motorcycle, and lives with one or more children ages 1 to 12.

Unweighted N's listed above.

NorthEast: CT, ME, MA, NH, NJ, NY, PA, RI, VT

MidWest: IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, WI

South: AL, AR, DE, DC, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV

West: AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

If the child was more likely to ride in the front seat than a year earlier, the interviewers asked the reason why. Most often, it was attributed to the maturation of the child; i.e., the child was now older and larger (31%). The child's preference to ride in the front seat (16%) and the absence of any other place for the child to ride (16%) ranked second and third, respectively.

Table 1
Reason Child Is More Likely To Ride In Front Than 12 Months Ago

Qx: Why is this child more likely to ride in the front seat when you drive?

Base: Said the designated child was more likely to ride in the front seat compared to 12 months ago.

Unweighted N=299

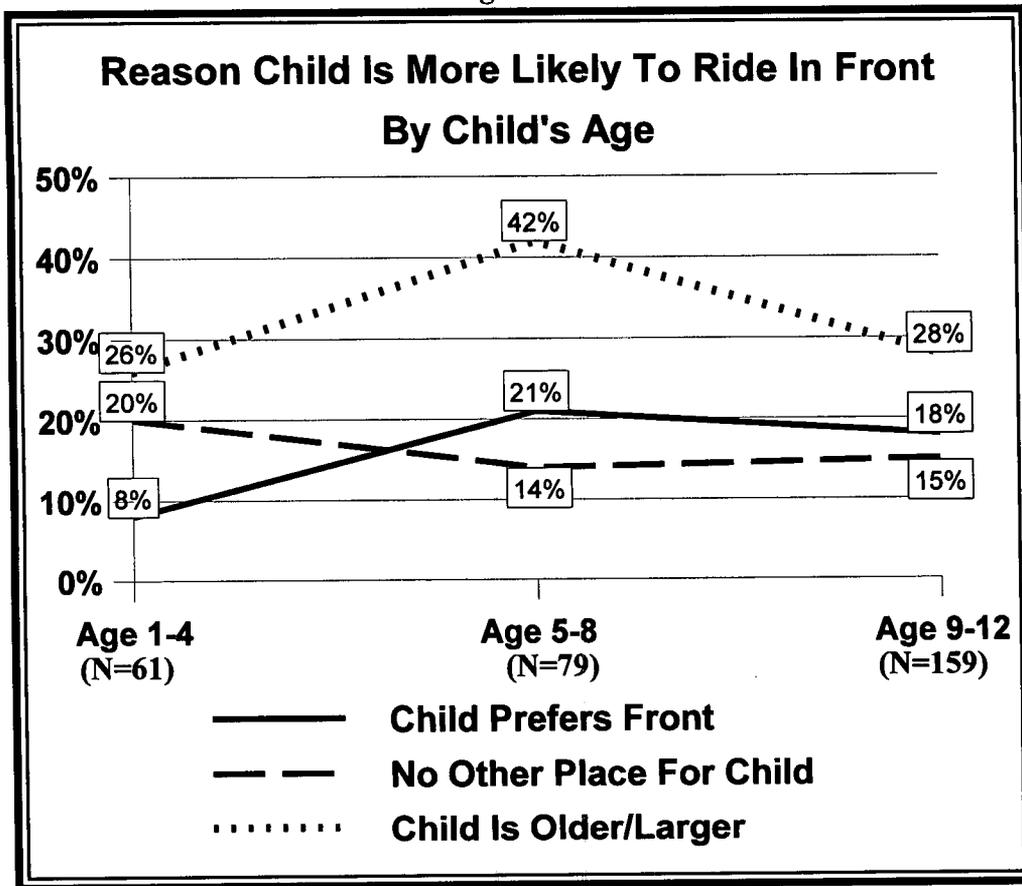
Reason	Percent
Child Is Older/Bigger	31%
Child Prefers The Front	16%
No Other Place For Child In Vehicle	16%
Child Likes To Sit By Me	14%
Child And I Are The Only Ones In Vehicle	10%
I Want To be Able To See/Reach Child	6%
Child Can Wear Seat Belt In Front	2%
Other	9%
Don't Know/Refused/No Response	5%

*Total exceeds 100% due to multiple responses.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

The sample sizes shown in Figure 17 reflect the finding on page 16 that older children were more likely to transfer to the front seat. But the major reasons given for this movement were in evidence for younger children as well. In particular, perceptions that the child was bigger and older, and the child's communicated preference for sitting up front, were the predominant reasons for children ages 5 through 8 moving to the front seat.

Figure 17



Qx: Why is this child more likely to ride in the front seat when you drive?

Base: Said the designated child was more likely to ride in the front seat compared to 12 months ago.

Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Similarly, if the child was less likely to ride in the front seat than 12 months ago, the interviewer asked the reason why. Most often, the respondents replied that it was “safer in back” (40%). They also specifically referred to danger from air bags (20%). Other reported reasons are shown in the Table below.

Table 2
Reason Child Is Less Likely To Ride In Front Than 12 Months Ago

Qx: Why is this child less likely to ride in the front seat when you drive?

Base: Said the designated child was less likely to ride in the front seat compared to 12 months ago.

Unweighted N=943

Reason	Percent
Safer In Back	40%
Danger From Air Bags	20%
Child's Car Seat Is In Back	15%
No Other Place For Child In Vehicle	10%
Child Prefers Back	5%
It's The Law	5%
Do Not Allow Children In Front Seat/Prefer That They Sit In Back	4%
Child Is Too Young/Not Old Enough	2%
Other	4%
Don't Know/Refused/No Response	4%

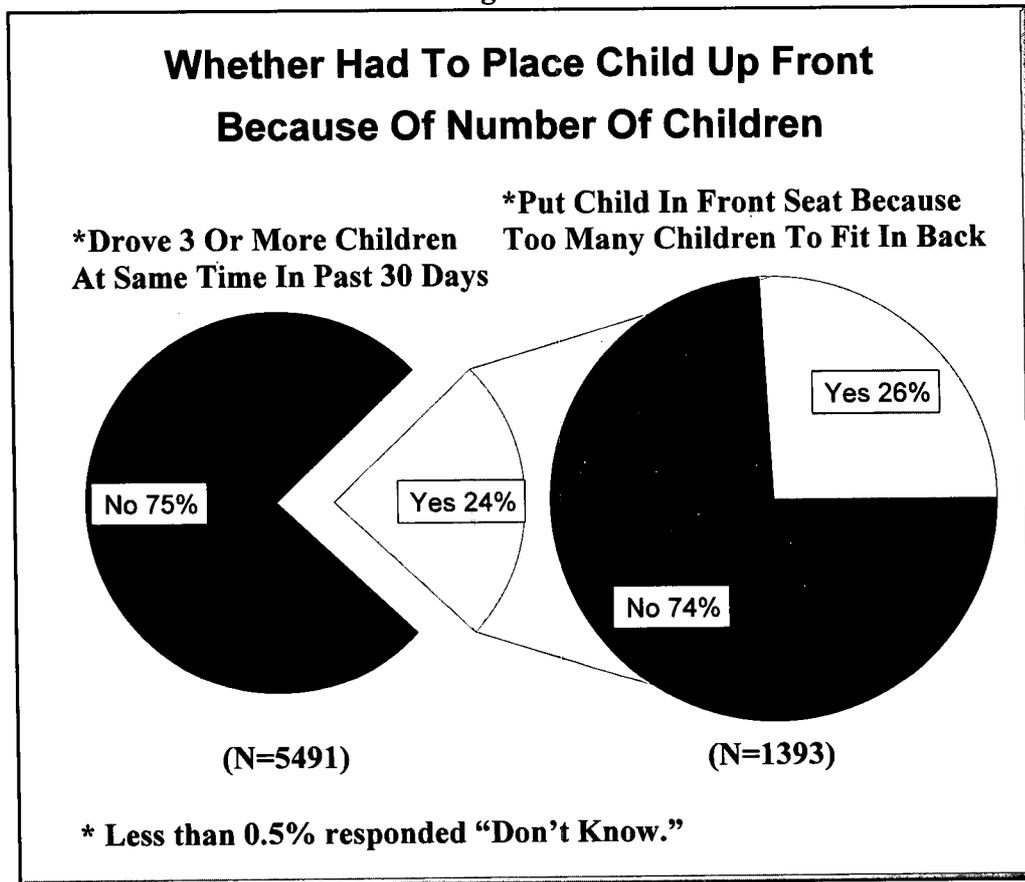
*Total exceeds 100% due to multiple responses.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Moving Children To Front Because Of Number Of Children

Drivers living with a child, and drivers not living with a child, were both asked about their recent experience in transporting multiple children. The goal was to explore the extent to which adults are forced to place children in the front because of the number of child passengers. About one-quarter (24%) of drivers had driven a motor vehicle in the past 30 days in which they had 3 or more child passengers at the same time, and 26% of these had put a child in the front seat during that time because there were too many children to fit in the back. In total, 6% of all drivers (26% of the 24%) had put a child in the front in the past 30 days due to the number of children.

Figure 18



Qx: In the past 30 days, have you driven a motor vehicle in which you had three or more child passengers at the same time?

Qx: Were there any days out of the past 30 where you had to put a child in the front seat because there were too many children to fit in the back?

Base: Drivers whose primary vehicle is not a motorcycle.

Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

2000 SURVEY RESULTS

CHAPTER 2

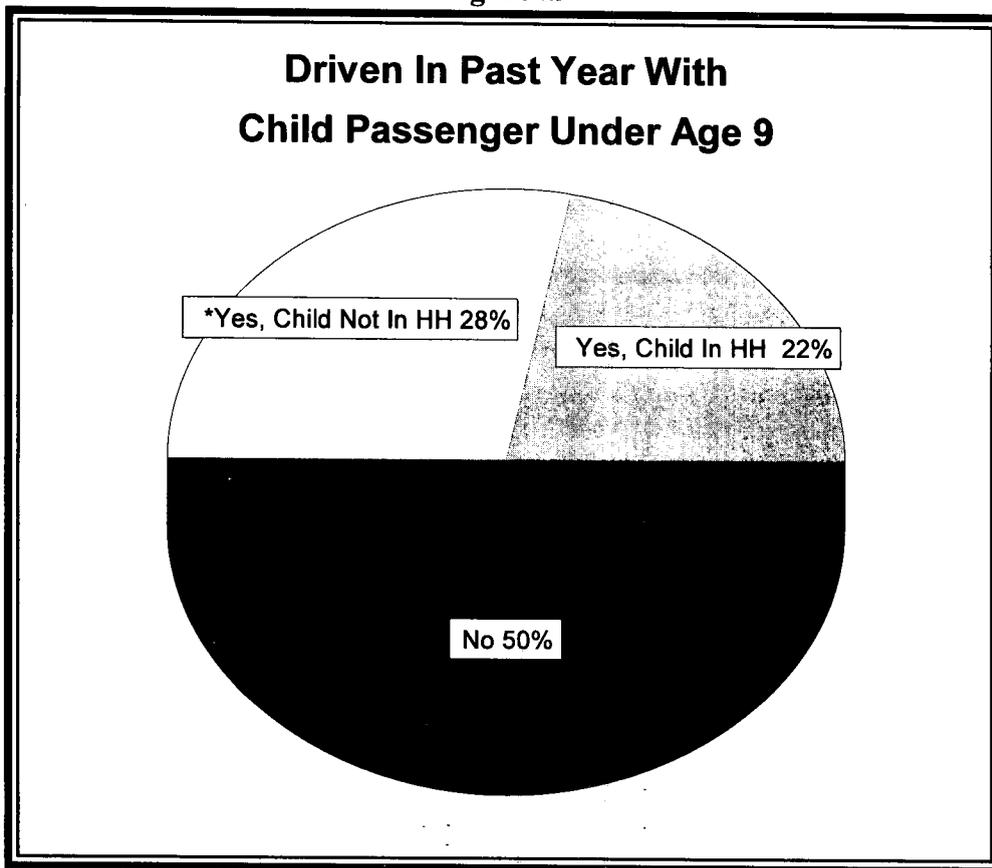
TRANSPORTERS OF YOUNG CHILDREN

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Driving With A Child Under Age 9²

One-half of drivers (50%) had in the past year driven a motor vehicle with a child under age 9 as a passenger. Twenty-two percent had driven a child in that age range who lived in their household. A larger percentage of the driver population (28%*) did not live with a child under the age of nine but nonetheless had driven a child of that age in the past year. Thus efforts to educate the public about the importance of proper restraint use by children would miss a large proportion of drivers who transport children if limited to those residing in the child's household.

Figure 19



Qx: In the past 12 months, have you driven with any children under age 9?

Base: Drives a motor vehicle. Unweighted N=5564

**Includes 14 drivers who drove children living outside household, but not children who were living in the household. The rest of this chapter treats them as drivers who do not live with a young child.*

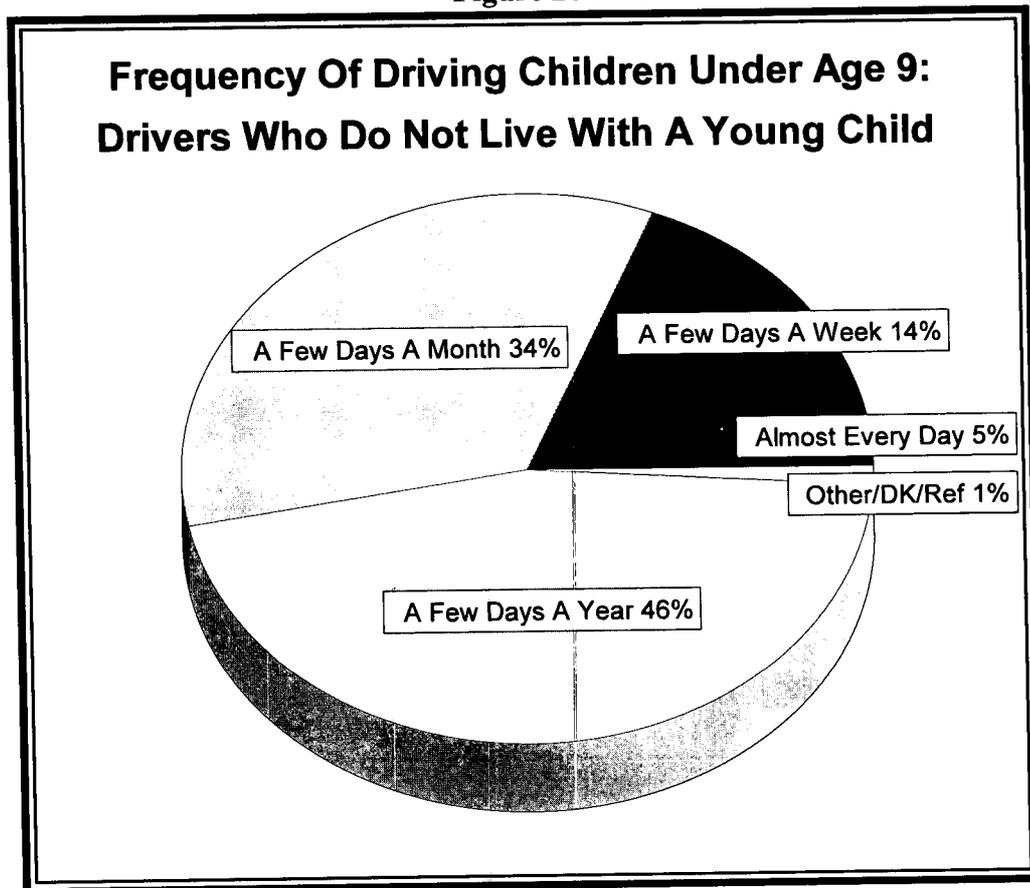
²Differs from previous MVOSS surveys, which used "under age 6" as the age range for the child.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Drivers Who Do Not Live With The Child

Whereas the majority of drivers who had transported a child under age nine in the past year did not live with a child that age, their frequency of transporting young children would be expected to be less than that of drivers who live with young children. Figure 20 suggests that is the case. Almost half (46%) of drivers who drove with a child passenger under age 9 in the past year, despite not living with a child in that age range, did so only a few days a year. Still, 19% of these drivers drove one or more young children either almost every day (5%) or a few days a week (14%). Another 34% drove one or more young children a few days a month.

Figure 20



Qx: How often do you drive with children under age nine?

Base: Does not live with a child under age nine, but has driven with child passengers in that age range in the past year.

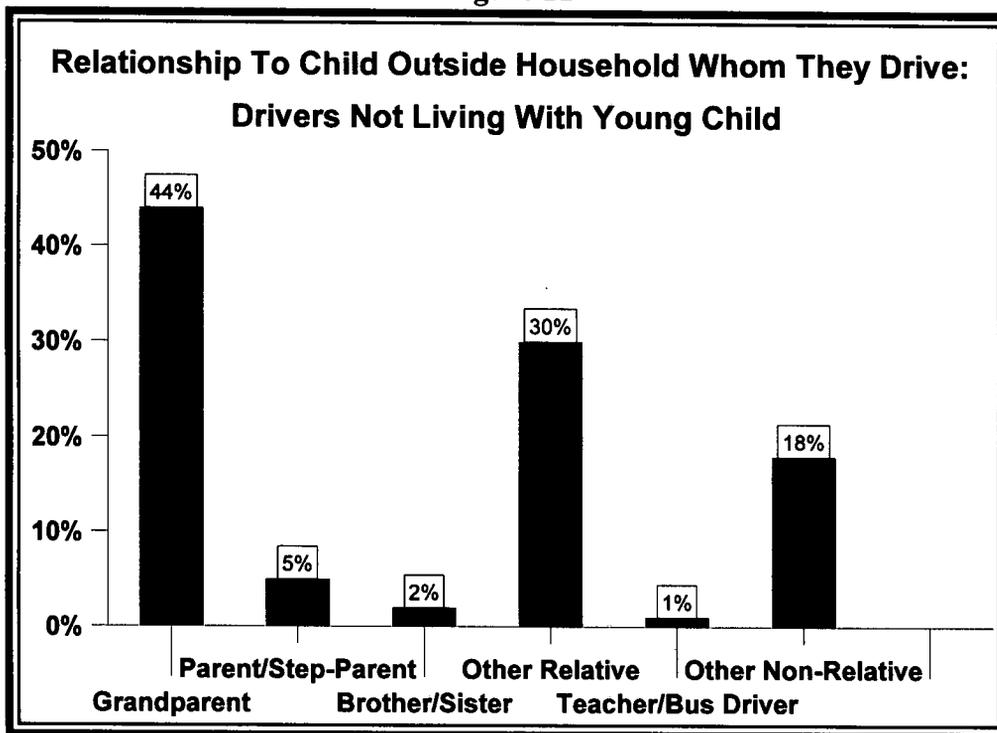
Unweighted N=1551

* DK = Don't Know Ref = Refused

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

When asked their relationship to the young child(ren) outside their household whom they drove, 44% said that they were the grandparents. Small percentages answered that they were the parents/step-parents (5%) or were siblings (2%). Far more (30%) responded that they were some "other relative" than those just mentioned. One percent said they were teachers or bus drivers and 18% said they were some other non-relative.

Figure 21



Qx: What is your relationship to the child or children under age 9 that you at least sometimes drive with?

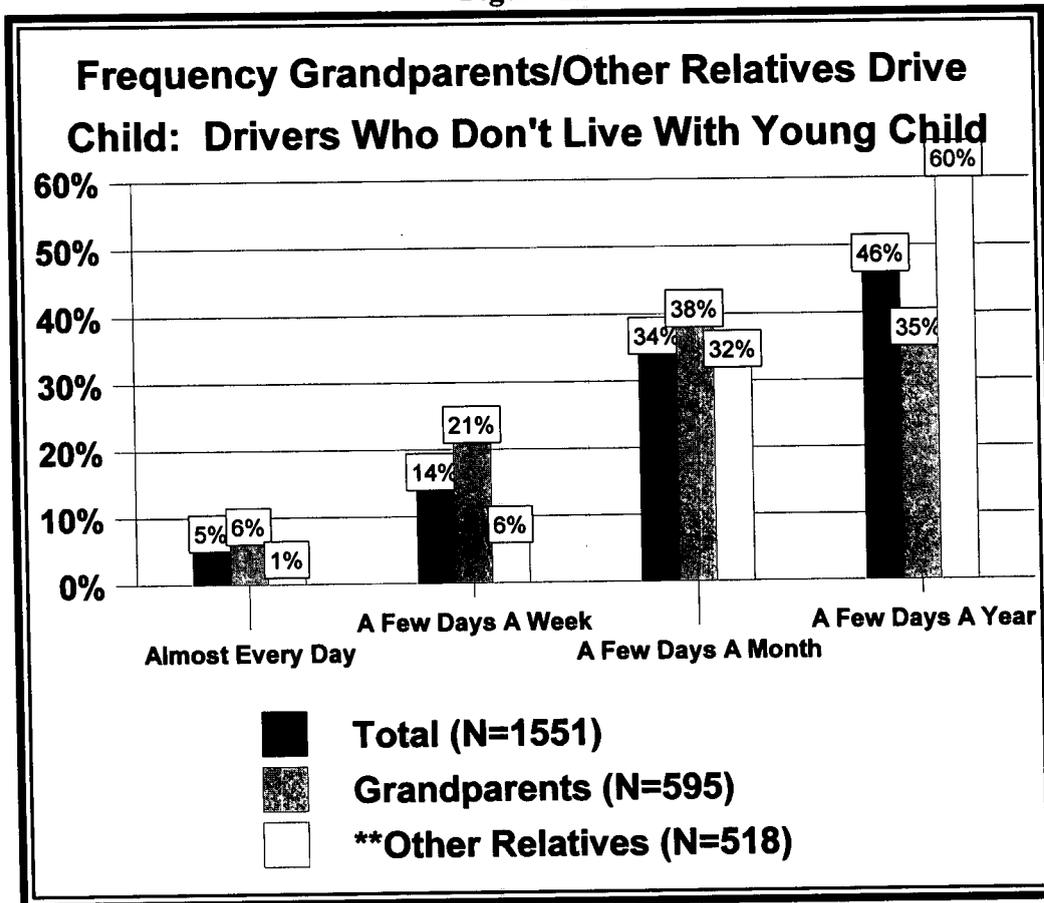
Base: Does not live with a child under age nine, but has driven with child passengers in that age range in the past year.

Unweighted N = 1551

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

As shown on page 26, persons who did not live with a young child but had driven one or more young children in the past year most often were the child(ren)'s grandparents or "other relatives." Figure 22 compares these two groups in their reported frequency of driving young children. It shows that grandparents transported children more often. Among drivers who did not live with a young child but said they drove a young grandchild in the past year, 64%* drove the grandchild at least a few days a month. The comparable figure was 40%* for "other relatives" (excluding parents and siblings), and 54%* for the total sample (relatives and non-relatives combined).

Figure 22



Qx: What is your relationship to the child or children under age 9 that you at least sometimes drive with?

Qx: How often do you drive with children under age 9?

Base: Does not live with a child under age nine, but has driven with child passengers in that age range in the past year. Unweighted N's listed above.

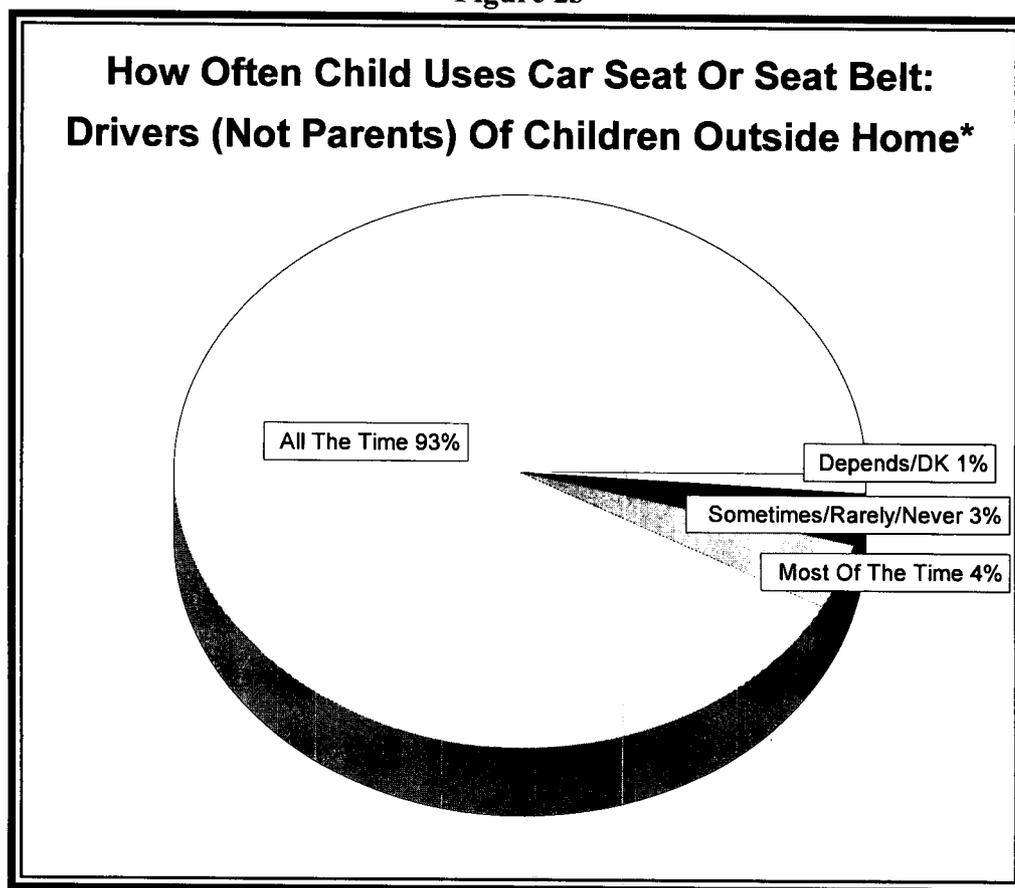
**This percentage differs slightly from the sum of the listed percentages for the component categories because it combines non-rounded numbers whereas the numbers in the Figure are rounded.*

*** Excludes parents/step-parents and siblings.*

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

At this point in the interview, those respondents who said they were the parents of the children outside the household they had driven were skipped to a section of the survey asking detailed child restraint questions. The interviewers asked the remaining respondents (the grandparents, other relatives, other non-relatives) how often the child(ren) used restraints when riding with them. Almost all said that the child was in a child car seat or else a seat belt either all the time (93%) or most of the time (4%).

Figure 23



Qx: When you are driving and children under age 9 are riding with you, would you say that they are in a child car seat, booster seat, or a seat belt all of the time, most of the time, some of the time, rarely, or never?

Base: Does not live with a child under age 9, but has driven with child passengers in that age range in the past year (who were not their own children).

Unweighted N=1460

** The sum of the percentages in the pie chart exceeds 100% because the numbers are rounded.*

2000 SURVEY RESULTS

CHAPTER 3

2000 CAR SEAT USE

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Parent/Caregiver Subgroup

The survey selected a subgroup of drivers to ask detailed questions about children's use of child car seats. These drivers were considered most likely to have significant responsibility for transporting young children ("parents/caregivers"). The respondents were chosen for questioning if they fell into one of the following categories:

Parents of children under age 9. Usually this involved a parent living with their child. Sometimes it was a parent not living with their child, but who drove the child at least on occasion during the past year.

Non-parents living with children under age 9. These were drivers who indicated that they at least sometimes drove with a child under age 9 who lives in their household.

Because the previous Motor Vehicle Occupant Safety Surveys used age 5 rather than age 8 as the upper age limit for the child, the data from the 2000 survey are derived from a somewhat different group. The age limit was raised to 8 in order to cover the age range for whom booster seats are generally recommended (ages 4 to 8, see discussion below). The interviewers asked respondents to focus on one specific child for the questions. If there was more than one child under age 9 in the household, one child was randomly selected. Respondents were asked about car seat use with the selected child. This procedure yields a national sample of drivers for whom car seat usage issues would be most applicable.

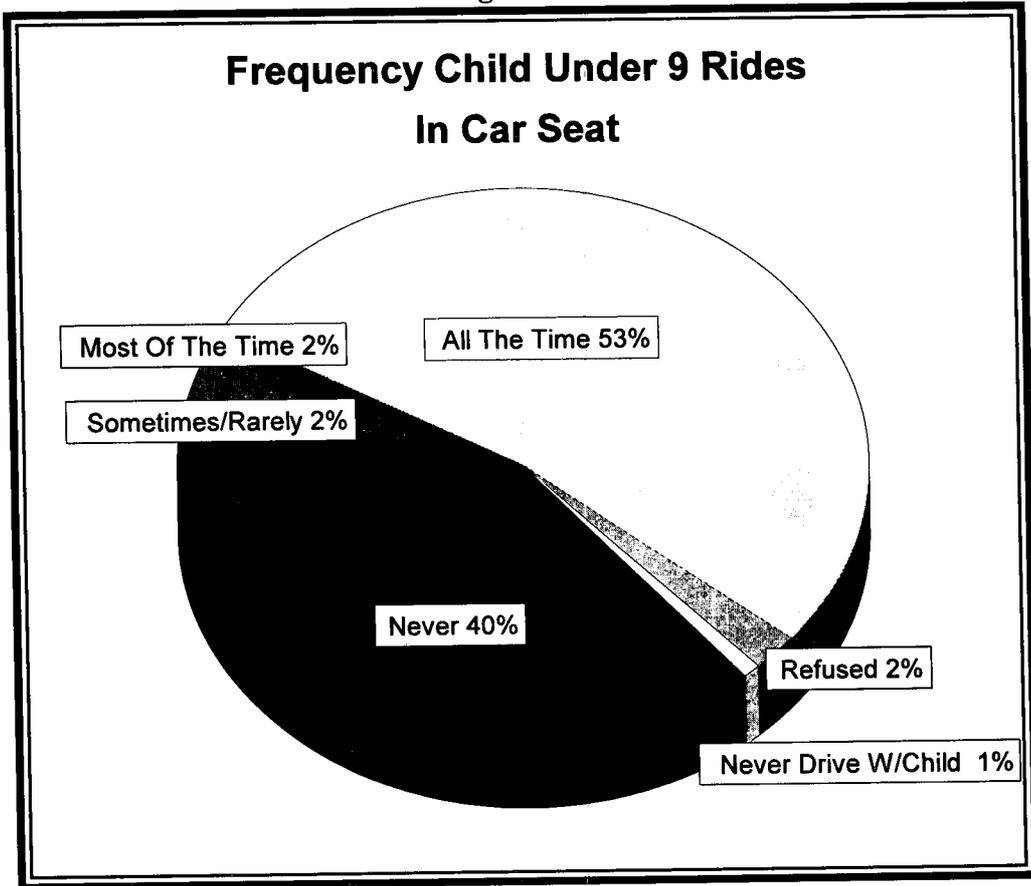
Reported Frequency of Car Seat Use

Interviewers asked the above driver subgroup how frequently the selected child uses a car seat when riding with them. They were told that car seats for purposes of the survey included infant seats, toddler seats, and booster seats. Responses to this question are to be interpreted with caution, as car seats may not be appropriate for larger children under age 9. The safety restraint system used should be the one appropriate for the child's size and development. Children should ride rear facing until at least 20 pounds and one year of age. Children who reach 20 pounds before one year of age should ride rear facing in a child safety seat recommended at a higher weight. Keeping a child rear facing as long as possible helps protect the fragile baby from spinal cord injuries (i.e., the back of the car seat supports the infant's head, neck and back and prevents spinal cord injuries in a frontal crash). Past the first year of age, children weighing about 20 to 40 pounds should ride facing forward in convertible seats or forward facing only seats. Children who have outgrown their child safety seats at 40 pounds or approximately 4 years of age should ride in booster seats until adult belts fit them properly, at least age 8 or 4'9" in height. Older children may wear vehicle seat belts when the lap belt stays low and snug across the hips without riding up over the stomach, and the shoulder belt does not cross the face or neck.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

The vast majority of the parent/caregiver subgroup reported that the selected child used a car seat either "all of the time" (53%) or "never" (40%). Only 5% said that the child was a car seat user, but not all the time (2.5% most of the time, 1.2% sometimes, and 1.0% rarely). A few either said they never drive that child (1%) or refused to respond (2%). Less than 0.5% said they did not know. If the child never used a car seat, it usually was because the child reportedly had graduated to seat belt use (see page 82).

Figure 24



Qx: When you are driving and the (AGE) rides in the vehicle with you, how often does (he/she) ride in a child car seat? Child car seats include infant seats, toddler seats and booster seats. Would you say (he/she) rides in a child car seat all of the time, most of the time, some of the time, rarely, or never?

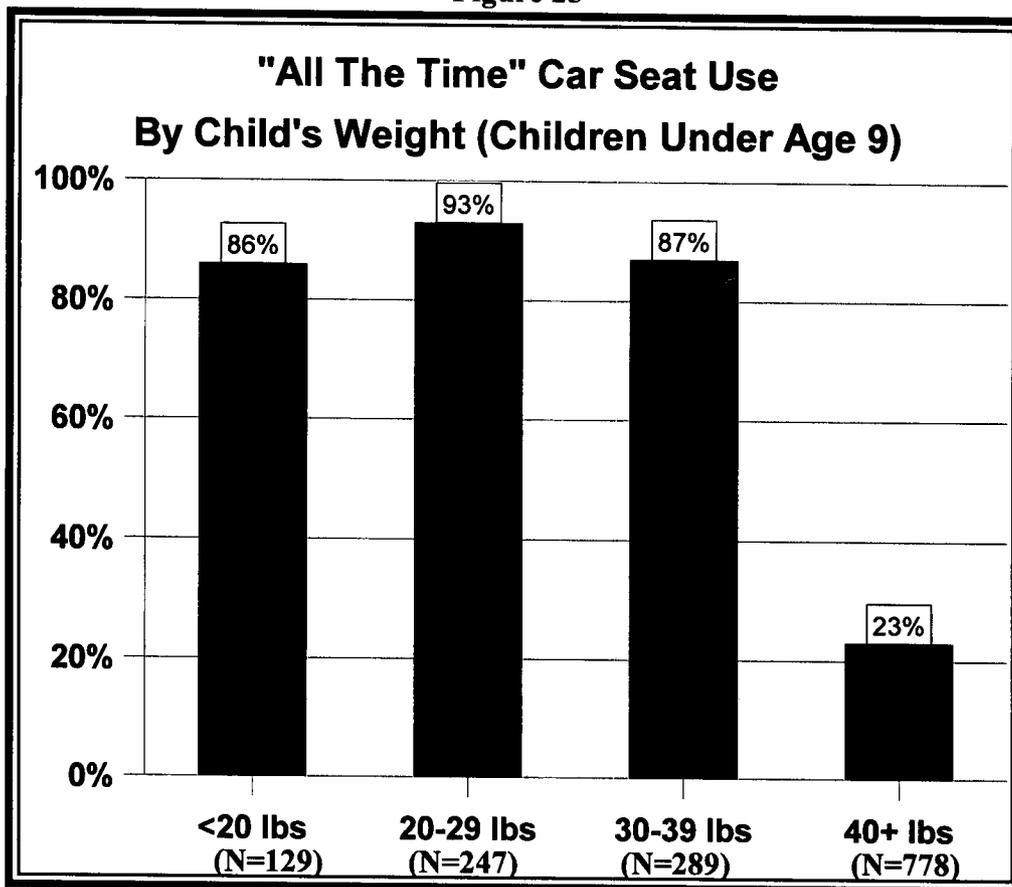
Base: Parents/caregivers as defined on page 30.

Unweighted N=1462

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Readers are cautioned that inaccuracies are common when soliciting weight information. Parents/caregivers in the survey were somewhat less likely to report that the selected child always used a car seat when riding with them if the child weighed less than 20 pounds versus 20-29 pounds. However, further analysis indicated that some of the difference stemmed from errors in recording weight as children in the under 20 weight category who "never" used car seats (8%) were all listed at ages too old for that weight. Regarding the low percentage (23%) for those weighing 40 pounds or more, this largely reflected the graduation of these children to seat belts.

Figure 25



Qx: How much does (he/she) weigh?

Qx: When you are driving and the (AGE) rides in the vehicle with you, how often does (he/she) ride in a child car seat? Child car seats include infant seats, toddler seats and booster seats. Would you say (he/she) rides in a child car seat all of the time, most of the time, some of the time, rarely, or never?

Base: Parents/caregivers as defined on page 30.

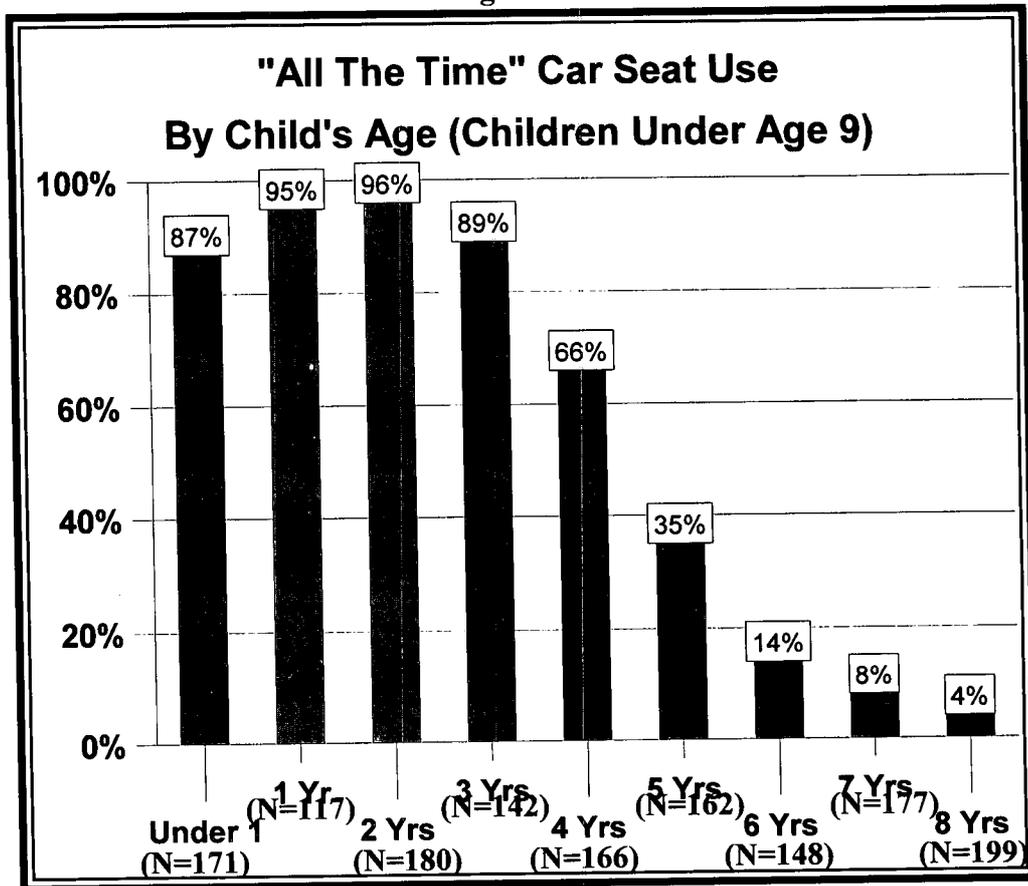
Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Although error contributed to the lower usage reported for children in the under 20 pound weight category compared to 20-29 pounds (page 32), the pattern of lesser usage among infants remained when the analysis switched to age. This time, there was a small cluster of cases for children under one year old (7%) where the respondent refused to answer the question on frequency of car seat use.

Discontinuation of car seat use by most children occurred when the child was 4 or 5 years old. Only 14% of children age 6 reportedly used a child seat all the time, and this number dropped by almost half (to 8%) by age 7.

Figure 26



Qx: What is the age of the (CHILD)?

Qx: When you are driving and the (AGE) rides in the vehicle with you, how often does (he/she) ride in a child car seat? Child car seats include infant seats, toddler seats and booster seats. Would you say (he/she) rides in a child car seat all of the time, most of the time, some of the time, rarely, or never?

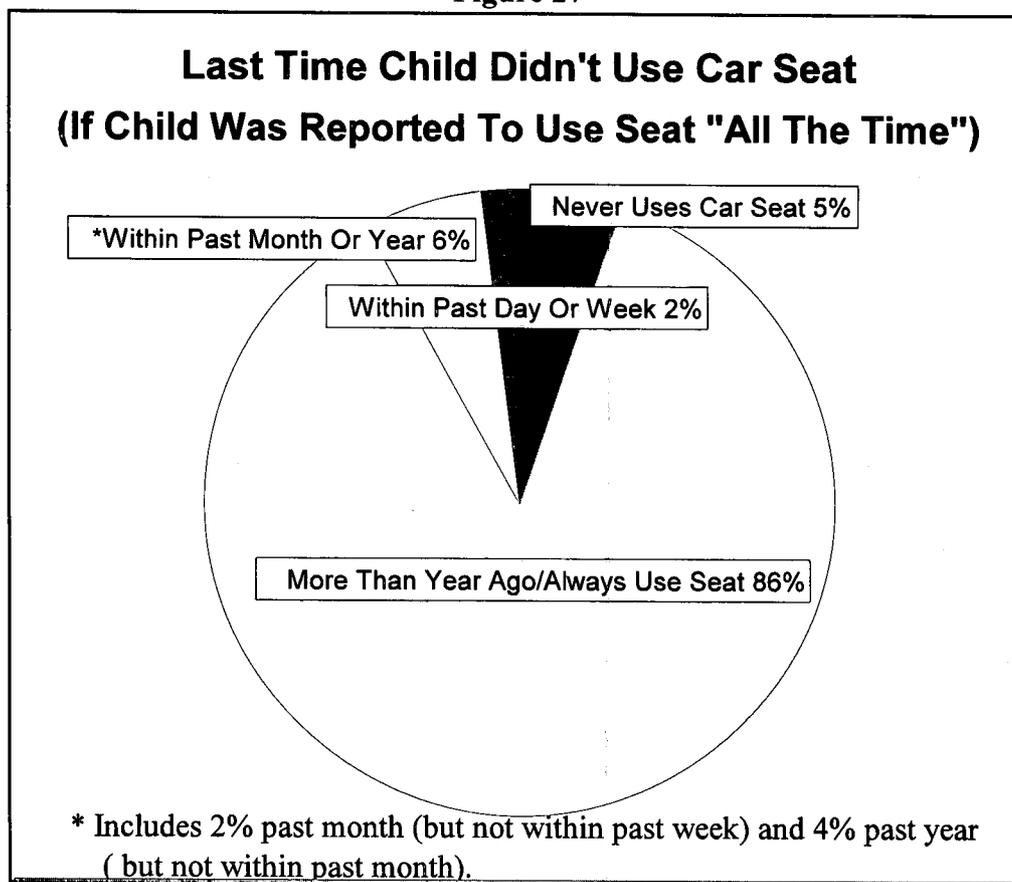
Base: Parents/caregivers as defined on page 30.

Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Research on adult seat belt use has found that some drivers will report wearing seat belts “all the time” but admit on a follow-up question that they did not use their seat belt recently (8% of drivers in 2000; see Volume 2 of this series: Seat Belt Report). Figure 27 examines whether this discrepancy also occurs for reported car seat use. Among drivers who said the child always used a car seat when riding with them, 2% also said the child had not ridden in a car seat at least once in the past day or week when the respondent was driving the child. The survey recorded another 5% as saying that the child never uses a car seat, in contradiction to the response on the previous question that the child always used a car seat.

Figure 27



Qx: When you are driving and the (AGE) rides in the vehicle with you, how often does (he/she) ride in a child car seat? Child car seats include infant seats, toddler seats and booster seats. Would you say (he/she) rides in a child car seat . . .

Qx: When was the last time the (AGE) did not ride in a child car seat when you were driving?

Qx: [If "don't know"] Has there been any occasion in the past 12 months when the (AGE) did not ride in a car seat when you were driving?

Base: Drivers who said child uses car seat "all the time" when they drive. Unweighted N=756

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Type and Location of Car Seat

The remainder of this chapter summarizes data exclusively for those children that the survey determined at least on occasion used a child restraint while riding in motor vehicles. Excluded from the analyses were children whom parents/caregivers said never used a child seat (infant seat, front facing child safety seat, or booster seat), and children whom the parents/caregivers never drove. Also excluded were cases where parents/caregivers did not respond when asked how often the child used a child seat (an entry question to the series), and cases where an initial response that the child used a child seat was subsequently contradicted (primarily during the immediate follow-up question shown on page 34).

Parents/caregivers who reported car seat use for the designated child were asked questions to identify the type of seat being used. This was a complicated matter because persons may use terms to identify their child seat that differ from terminology employed by safety professionals. Thus, for example, directly asking a respondent if the seat is a booster seat may lead to error because "booster seat" may be an unfamiliar term to the respondent or have a different meaning. To address this problem, the interviewers asked respondents about strap location over the child's shoulders. Beginning with the 1994 MVOSS, the interviewers asked "When the [CHILD] is fastened in the child car seat, are there straps over both shoulders, a strap across only one shoulder, or are there no straps over either shoulder"? Both infant seats and front facing child safety seats have straps crossing both of the child's shoulders. A strap over one shoulder is characteristic of a belt positioning booster. If neither shoulder has a strap over it, then this should be a shield booster. Thus if the parent/caregiver said there was a strap over only one shoulder, or over neither shoulder, then the survey considered that a booster seat. If the parent/caregiver said there were straps over both shoulders, then the interviewer asked if the child usually sat front facing or rear facing in the seat, with rear facing being indicative of an infant seating position.

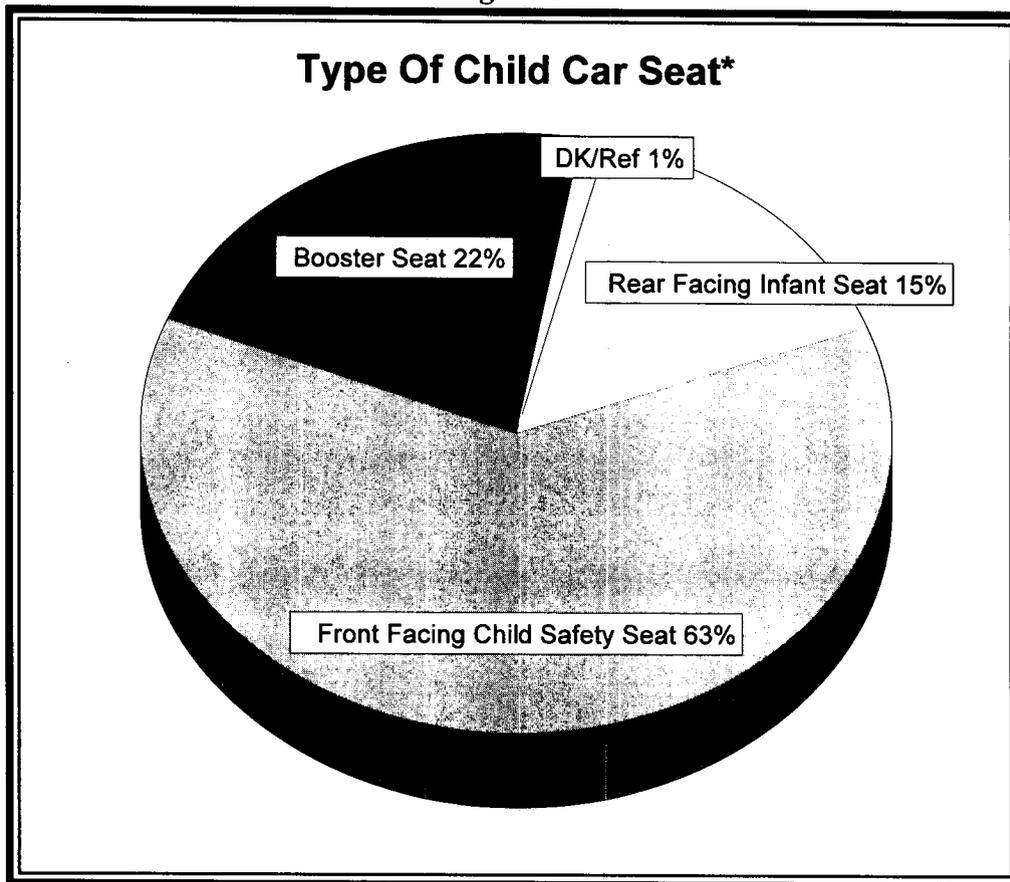
The strap location question did not resolve all problems in identifying type of child seat. For example, the 1998 survey identified one-tenth of infants as using booster seats. As a result, the 2000 survey added follow-up probes to the strap location question. These were asked only of parents/caregivers who said there was a strap over one shoulder or neither shoulder, and were intended to corroborate the "booster seat" determinations. While in many cases they did so, there were sufficient discrepancies to underscore the difficult nature of determining type of child seat over the telephone. The probes were unable to provide clear direction for making adjustments to identified seat type, therefore the 2000 survey continues the practice of past Motor Vehicle Occupant Safety Surveys of defining as booster seats all seats that met the strap definition described above (i.e., parents/caregivers reported a strap over one shoulder or neither shoulder).

The remainder of this chapter presents data only for those children using child restraints at least on occasion. Readers who wish to know the percentage of all children at a specified age or weight using a particular type of restraint can find that information on pages 89-90.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Based on the definition described on the previous page, the survey determined that about 22% of children under age 9 who at least on occasion were using child restraints were riding in booster seats. Of the remainder, 63% were riding in front facing child safety seats, 15% in rear facing infant seats, and about 1% did not provide information from which the type of child seat could be determined.

Figure 28



Qx: When the (AGE) is fastened in the child car seat, are there straps over both shoulders, a strap across only one shoulder, or are there no straps over either shoulder?

Qx: When you are driving and the (AGE) is riding in the child car seat, is he/she usually front facing or rear facing?

Base: Child at least on occasion rides in a child car seat.

Unweighted N=779

* The sum of the percentages in the pie chart exceeds 100% because the numbers are rounded.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Infants who have not reached their first birthday should always ride in a rear facing position in a car seat regardless of the child's size. Most infants who used car seats (65%) did ride in a rear facing position. But 25% rode in front facing child safety seats, with another 9% in booster seats. Front facing child safety seats predominated among one-year-olds (82%), two-year-olds (92%), and three-year-olds (80%). Booster seats accounted for 19% of car seat users among three-year-olds, then doubled to 38% at age 4. After age 4, booster seats became the predominant child restraint used by children, although the listed percentages exaggerate the extent of booster seat use because of the far fewer children past age 4 using any type of child seat (see page 89).

Some of the Table 3 numbers reflect the difficulties discussed on page 35 about collecting accurate data on type of child restraint. For example, the survey identified booster seat use by some infants, as well as some older children using rear facing infant seats (including a six-year-old). Thus readers are cautioned about error within the data.

Table 3
Type Of Child Car Seat By Child's Age

Qx: *When the (AGE) is fastened in the child car seat, are there straps over both shoulders, a strap across only one shoulder, or are there no straps over either shoulder?*

Qx: *When you are driving and the (AGE) is riding in the child car seat, is he/she usually front facing or rear facing?*

Base: *Child under age 9 at least on occasion rides in a child car seat.*

Age	<1	1	2	3	4	5	6	7	8
(Unweighted N-Size)	(147)	(105)	(167)	(127)	(122)	(59)	(28)	(16)	(8)
Rear Facing Seat	65%	12%	3%	1%	0%	0%	4%	0%	0%
Front Facing Seat	25%	82%	92%	80%	62%	38%	34%	32%	30%
Booster Seat	9%	5%	5%	19%	38%	59%	62%	68%	70%
DK/Ref	2%	0%	0%	1%	0%	3%	0%	0%	0%

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

About three-quarters (76%) of children weighing less than 20 pounds who used a child seat rode in a rear facing position. A portion (11%) appeared to be using booster seats although, as mentioned earlier, at least some respondents may have made mistakes in describing the seat. Others (14%) provided information suggesting that the child usually rode front facing in a child safety seat. Front facing child safety seats predominated at 20 to 39 pounds. Past 40 pounds, there was an even split between children in booster seats and those in front facing child safety seats. Readers are cautioned that some respondents may have been guessing at children's weights.

Table 4
Type Of Child Car Seat By Child's Weight

Qx: *When the (AGE) is fastened in the child car seat, are there straps over both shoulders, a strap across only one shoulder, or are there no straps over either shoulder?*

Qx: *When you are driving and the (AGE) is riding in the child car seat, is he/she usually front facing or rear facing?*

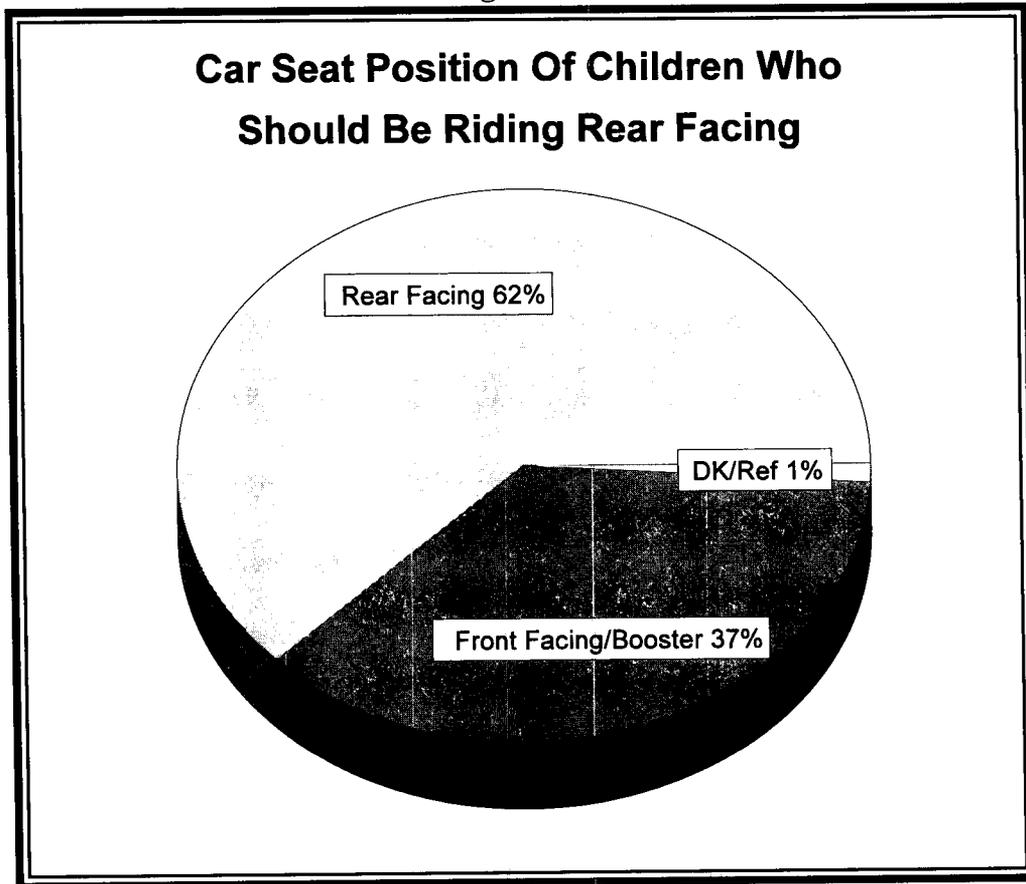
Base: *Child under age 9 at least on occasion rides in a child car seat.*

Weight (Unweighted N-Size)	Less Than 20 Pounds (102)	20-29 Pounds (223)	30-39 Pounds (241)	40 Or More Pounds (209)
Rear Facing Seat	76%	16%	2%	2%
Front Facing Seat	14%	80%	82%	49%
Booster Seat	11%	4%	16%	49%
DK/Ref	0%	0%	*	1%

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Children should ride rear facing until at least 20 pounds and one year of age. Children who reach 20 pounds before one year of age should ride rear facing in a child safety seat recommended at a higher weight. Keeping a child rear facing as long as possible helps protect the fragile baby from spinal cord injuries. Figure 29 uses the above criteria to identify what percentage of children who should be riding rear facing (those not yet one year old; those not yet 20 pounds) actually were doing so. While most (62%) were riding in the correct rear facing position, many were not.

Figure 29



Qx: When the (AGE) is fastened in the child car seat, are there straps over both shoulders, a strap across only one shoulder, or are there no straps over either shoulder?

Qx: When you are driving and the (AGE) is riding in the child car seat, is he/she usually front facing or rear facing?

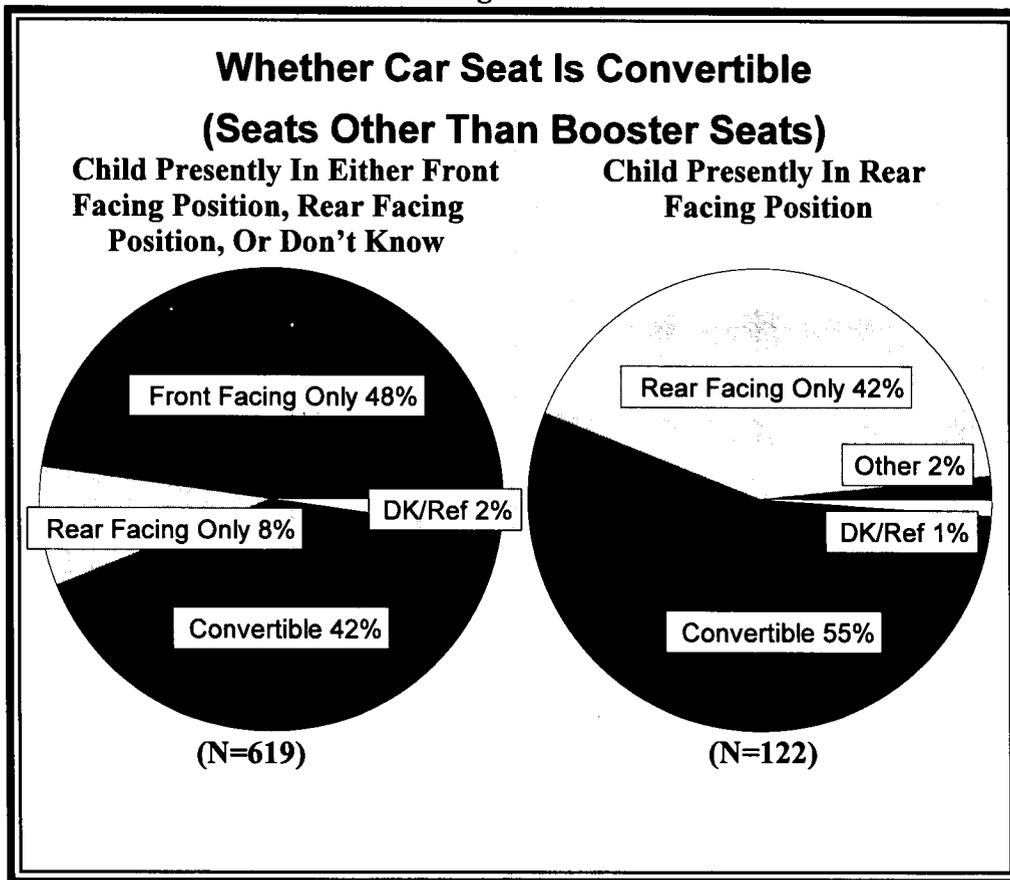
Base: Children under 1 year of age, and children under 20 pounds.

Unweighted N = 165.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Some car seats are convertible, where they can be used in both a front facing and a rear facing position. Thus the same seat could be used for a child who has grown from infant (rear facing) to toddler (front facing), or could revert back to a rear facing position for an infant when an older child has outgrown the seat, or could be used for both infants and toddlers if the driver interacts with children of multiple ages. In cases where the car seat was not a booster seat, 42% of parents/caregivers reported that the seat was convertible. Among infants riding in a rear facing position, 55% said the seat can be used in either a front facing or rear facing position.

Figure 30



Qx: Can the seat be used in a front facing position only, a rear facing position only, or can it be used in either position?

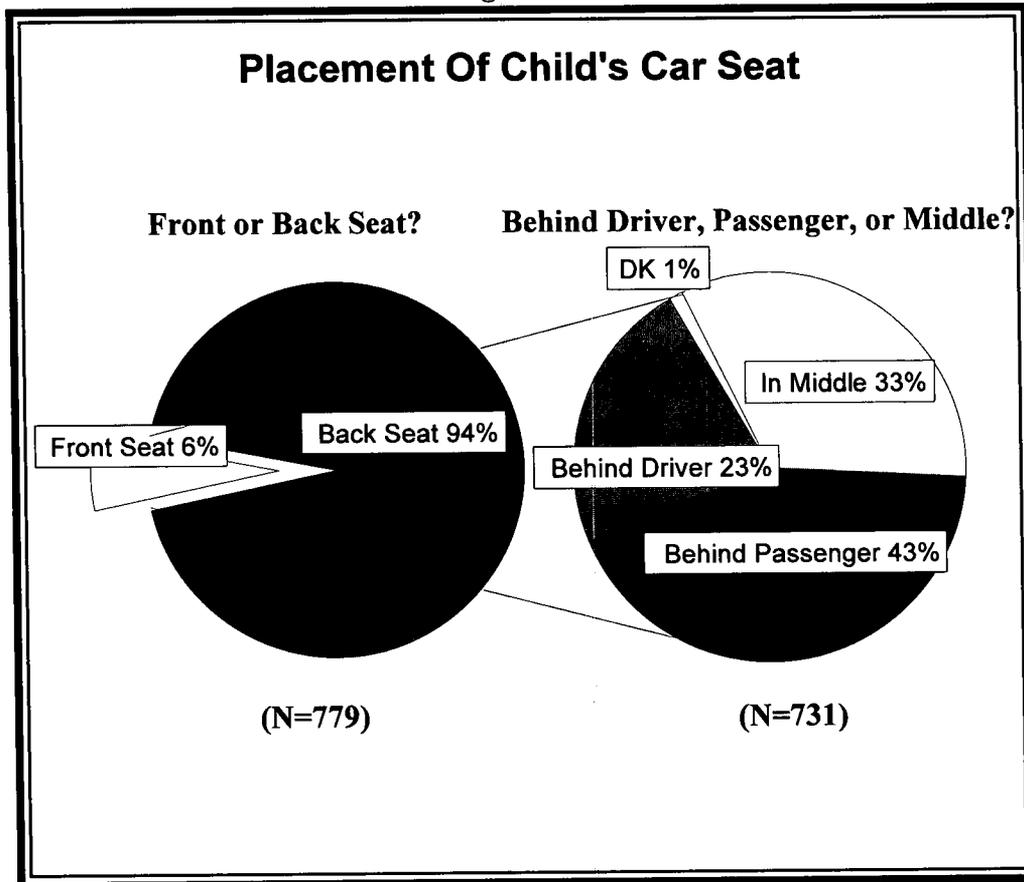
Base: Child under age 9 uses a car seat that is not a booster seat.

Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

As noted in Chapter 1, the safest seating position for a child in a motor vehicle is the back seat. The vast majority of parents/caregivers (94%) stated that the child usually sat in the back when riding in a car seat in a vehicle they were driving, typically behind the front passenger (43%) or in the middle of the back seat (33%). Six percent reported that the car seat was usually placed in the front. Fewer than 0.5% did not know or refused to answer.

Figure 31



Qx: When you are driving and the (AGE) rides in the child car seat, is he/she usually in the front seat or the back seat?

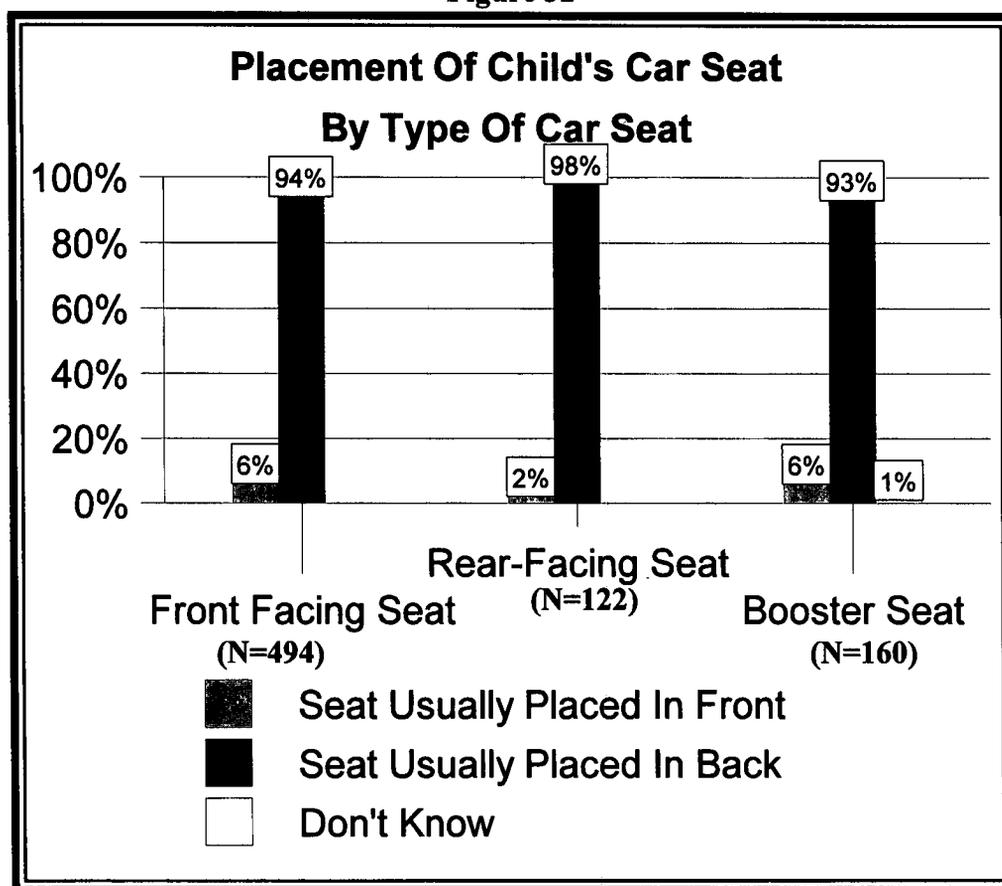
Qx: Is the child car seat usually behind the driver, behind the passenger, or in the middle of the back seat?

*Base: Child under age 9 at least on occasion rides in a child car seat.
Unweighted N's listed above.*

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

The dominant location for placement of the child car seat was the back seat of the vehicle regardless of whether the child was riding in a rear facing infant seat (98%), a front facing toddler seat (94%), or a booster seat (93%).

Figure 32



Qx: When you are driving and the (AGE) rides in the child car seat, is he/she usually in the front seat or the back seat?

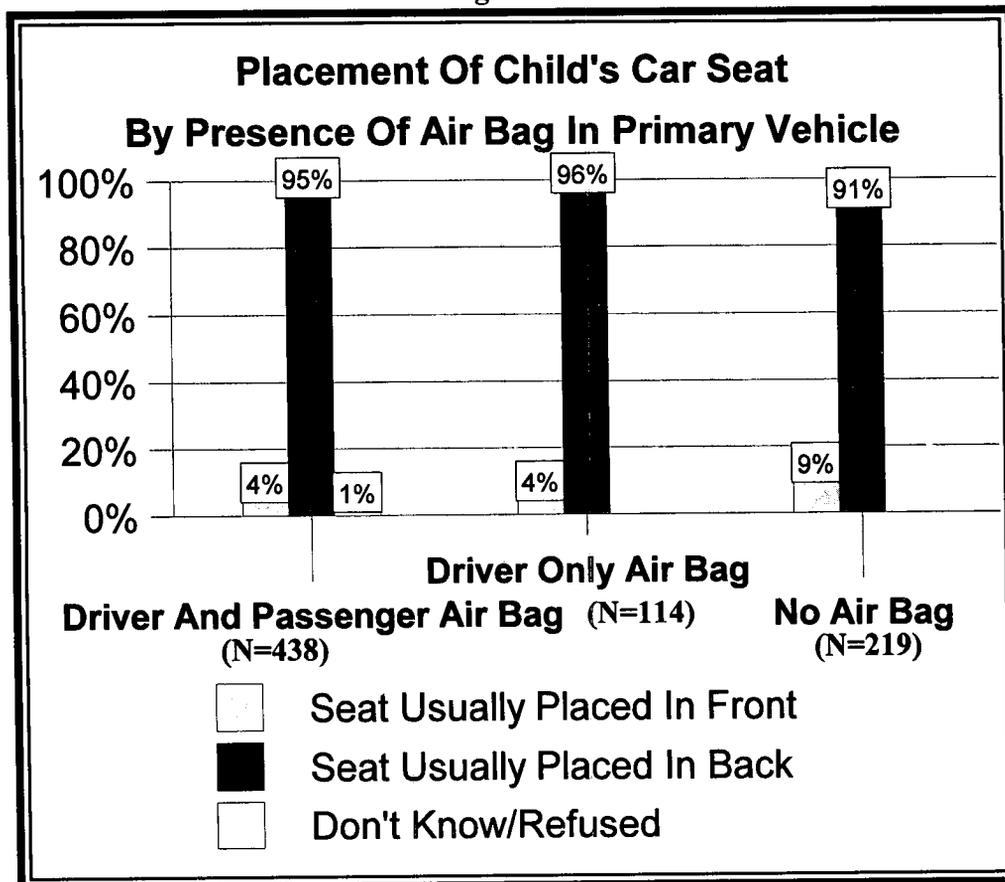
Base: Child under age 9 at least on occasion rides in a child car seat.

Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Proportionally fewer parents/caregivers permitted the child car seat to be placed in the front if there was an air bag installed in their primary vehicle. If there was no air bag in the respondent's primary vehicle, then 9% of the parents/caregivers said that the child seat was usually in the front. If the primary vehicle had an air bag, then 4% said the car seat was usually in the front.

Figure 33



Qx: Does the (car/truck/van) you normally drive have an air bag?

Qx: Is the air bag for the driver only, or is there also an air bag for the front seat passenger?

Qx: When you are driving and the (AGE) rides in the child car seat, is he/she usually in the front seat or the back seat?

Base: Child under age 9 at least on occasion rides in a child car seat.

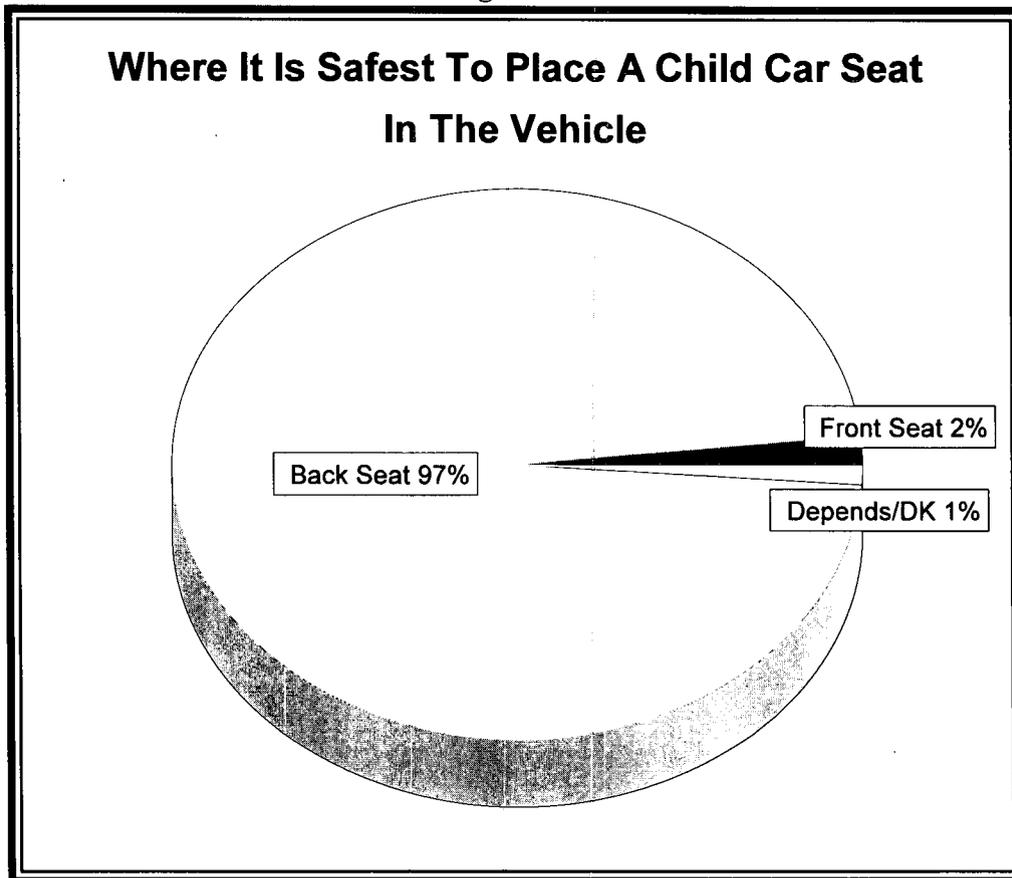
Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Where Parents/Caregivers Believe It Is Safest To Place A Child Car Seat

Almost all parents/caregivers (97%) considered the back seat the safest location to place a child car seat in a vehicle. Two percent incorrectly believed that the front seat was safest, while somewhat fewer answered that it depended on the type of child car seat (0.4%) or else that they did not know (0.7%). The 2% who thought the front seat was safest contrasts with the 6% who said that the child car seat was usually in the front seat when they drove (see page 41).

Figure 34



Qx: Where would you say it is safest to place a child car seat in the vehicle . . . in the front seat or in the back seat?

Base: Child under age 9 at least on occasion rides in a child car seat.

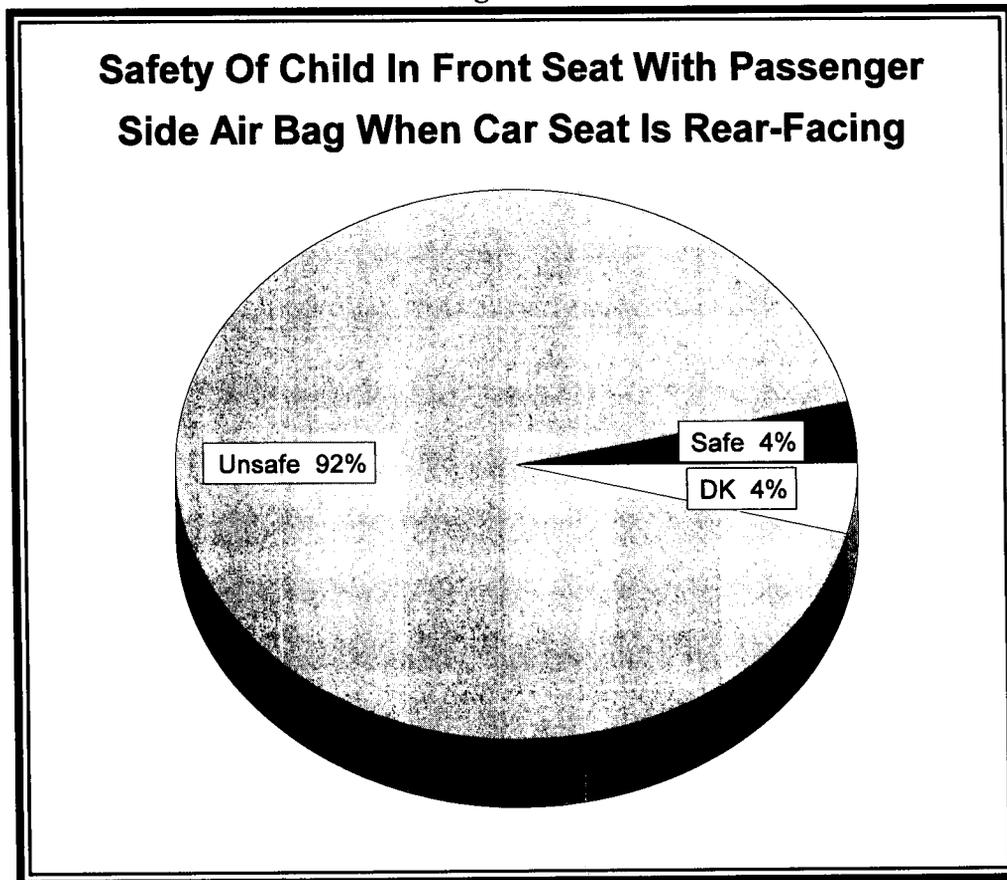
Unweighted N=779

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Child Car Seats That Face Forward In Vehicles With Air Bags

Parents/caregivers were asked if they thought it was safe to place a rear facing car seat in the front seat of a vehicle having a front passenger air bag. The correct answer is no, because it could place the child in the air bag's path, with the force of impact being too great for the child. Most parents/caregivers (92%) correctly said it was unsafe while 4% considered it safe. Another 4% responded either that they did not know how air bags worked (1.7%) or that they did not know the answer to the question (2.7%).

Figure 35



Qx: Some child car seats are designed so that the child faces backward to the rear of the motor vehicle. Suppose a child is riding in a child car seat facing backward. If the vehicle has a passenger side air bag, is it safe or unsafe to have the child car seat in the front seat?

Base: Child under age 9 at least on occasion rides in a child car seat.

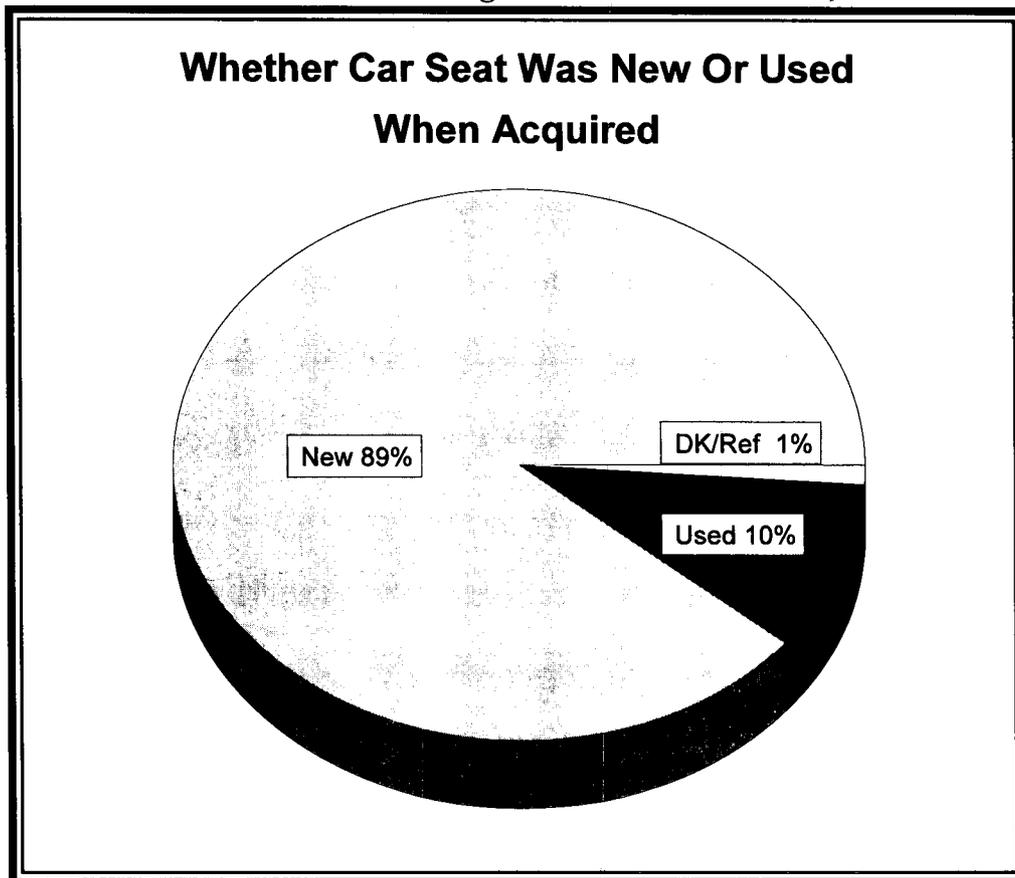
Unweighted N=779

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Acquisition of Car Seat

Most car seats (89%) were obtained new. One-in-ten (10%) were acquired used. The remainder of the sample could not say whether the seat was acquired new or used, or else refused to respond (1%).

Figure 36



Qx: Now thinking again about the child car seat the (AGE) usually rides in, did you get the child car seat new or used?

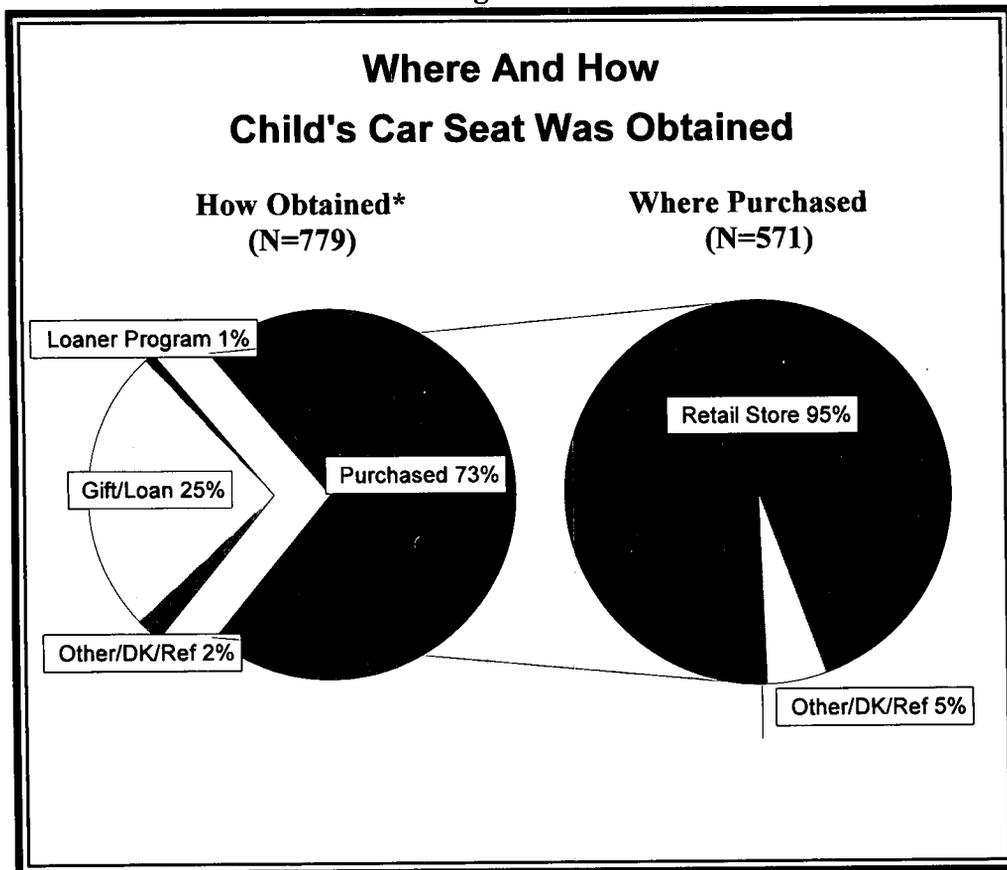
Base: Child under age 9 at least on occasion rides in a child car seat.

Unweighted N=779

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Almost three-fourths of car seats (73%) were purchased, while 25% were acquired as a gift or loaner from a relative or friend. Another 1% obtained the car seat from a loaner program. If purchased, the car seat most often was bought from a retail store (95%). About 1% said they purchased the seat at a second hand store or consignment shop, 0.4% said they purchased it at a garage or neighborhood sale, 1.5% specified some other source, and 1.8% did not know where they purchased the seat.

Figure 37



Qx: Did you purchase the child car seat, did you get it as a gift or loaner from a relative or friend, or did you get it from a loaner program?

Qx: Where did you purchase it from?

Base: Child under age 9 at least on occasion rides in a child car seat.

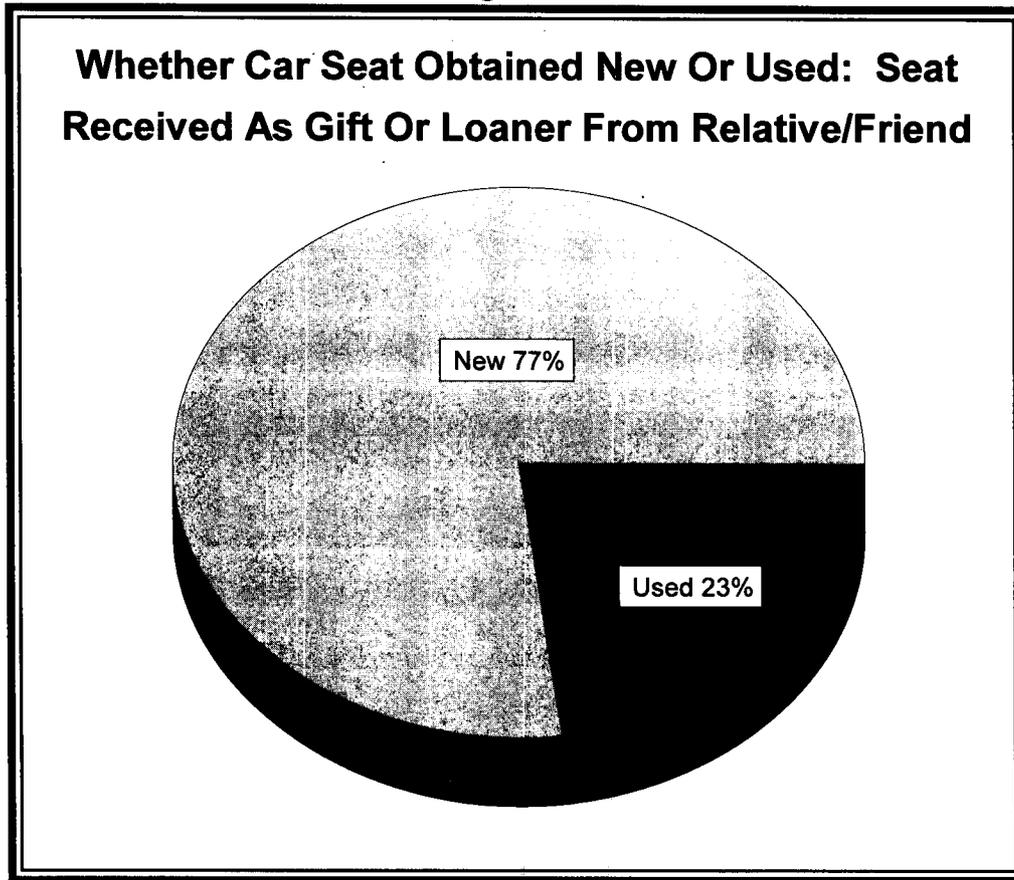
Unweighted N's listed above.

* The sum of the percentages in the pie chart exceeds 100% because the numbers are rounded.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

More than one-fifth (23%) of parents/caregivers who said that they received the seat as a gift or loaner from a relative or friend also answered that the seat was obtained used. This is a safety issue as used car seats may contain hidden damage that weaken them; for example, damage sustained from having previously been involved in a crash.

Figure 38



Qx: Now thinking again about the child car seat the (AGE) usually rides in, did you get the child car seat new or used?

Qx: Did you purchase the child car seat, did you get it as a gift or loaner from a relative or friend, or did you get it from a loaner program?

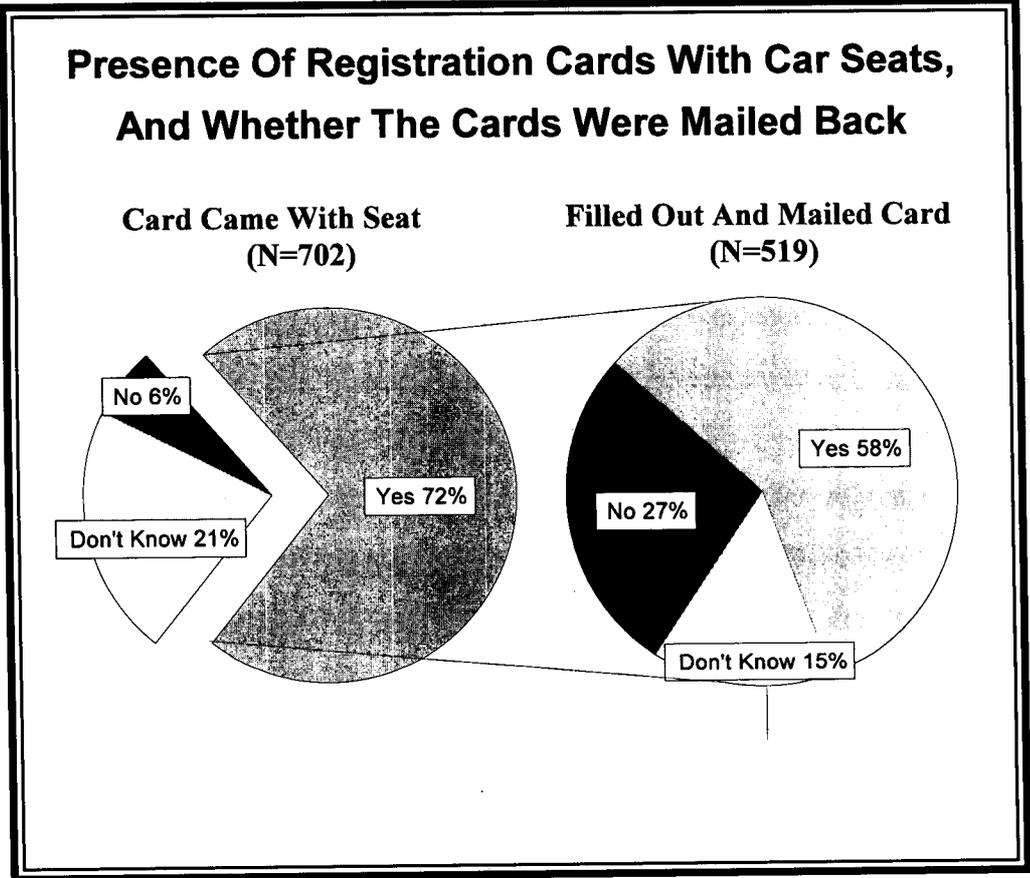
Base: Obtained the car seat as a gift or loaner from a relative or friend.

Unweighted N=190

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Occasions sometimes arise where it is important to reach consumers of specific products with safety information pertaining to those products. A means of locating persons for that purpose is to collect contact information through registration cards that accompany the products. The 2000 survey asked respondents whether a registration card came with the car seat when they got it, and if so, did they fill it out and mail it back. Only parents/caregivers who said they obtained the car seat new received the questions. Almost three-quarters (72%) said a registration card came with the seat. Of these, 58% mailed back the card. Overall, 42% of those who had obtained a child car seat new indicated that a registration card came with the seat, and that they mailed it back (58% of the 72%).

Figure 39



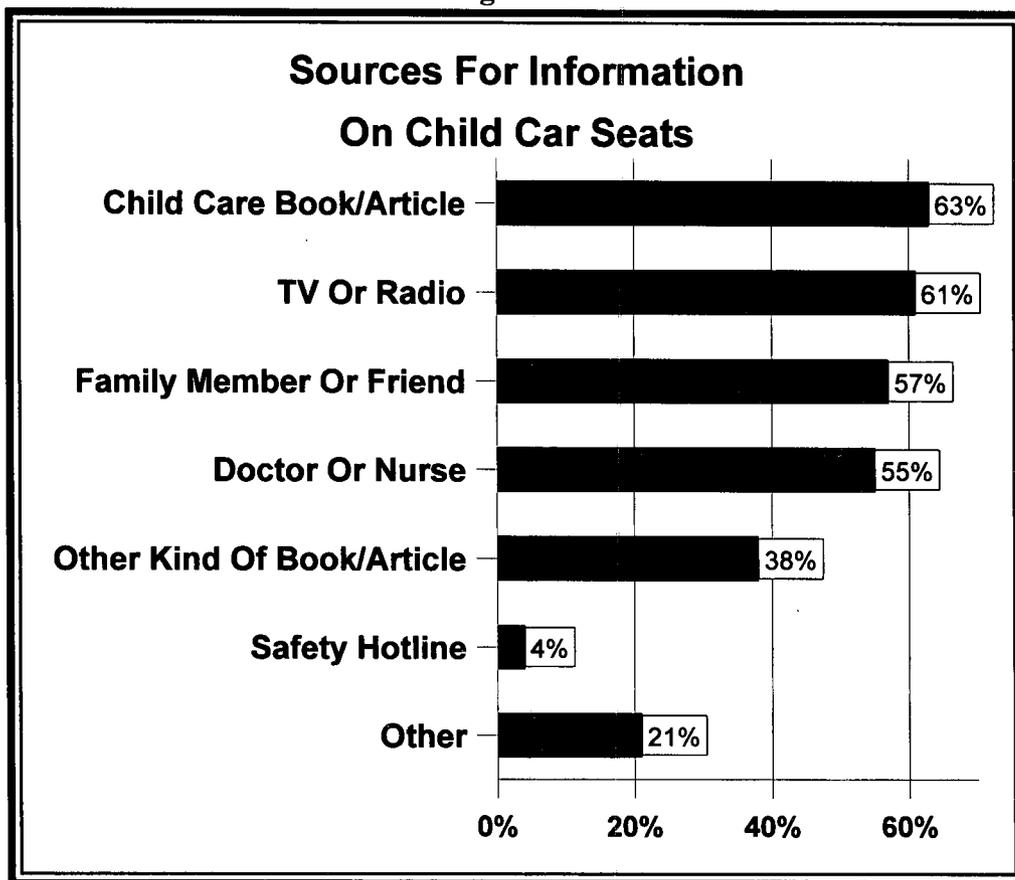
Qx: Was there a registration card that came with the car seat when you got it?
Qx: Did you fill out and mail the registration card?
Base: Obtained the car seat new.
Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Sources For Information On Car Seats

The interviewers asked the parents/caregivers of children using car seats where they had gotten their information on car seats. Six potential information sources were read, one at a time, to respondents. The respondents were asked whether they had ever read or heard of any information, or received any advice, about the need to use child car seats from that source. The respondents were then given the opportunity to volunteer additional sources where they had received car seat information. Most often, the parents/caregivers said that they had obtained information on child car seats from books or articles on child care (63%) or from TV or radio (61%).

Figure 40



Qx: Did you ever read or hear of any information or receive any advice about the need to use child car seats from any of the following sources? Did you get any information from . . .?

Base: Child under age 9 at least on occasion rides in a child car seat.

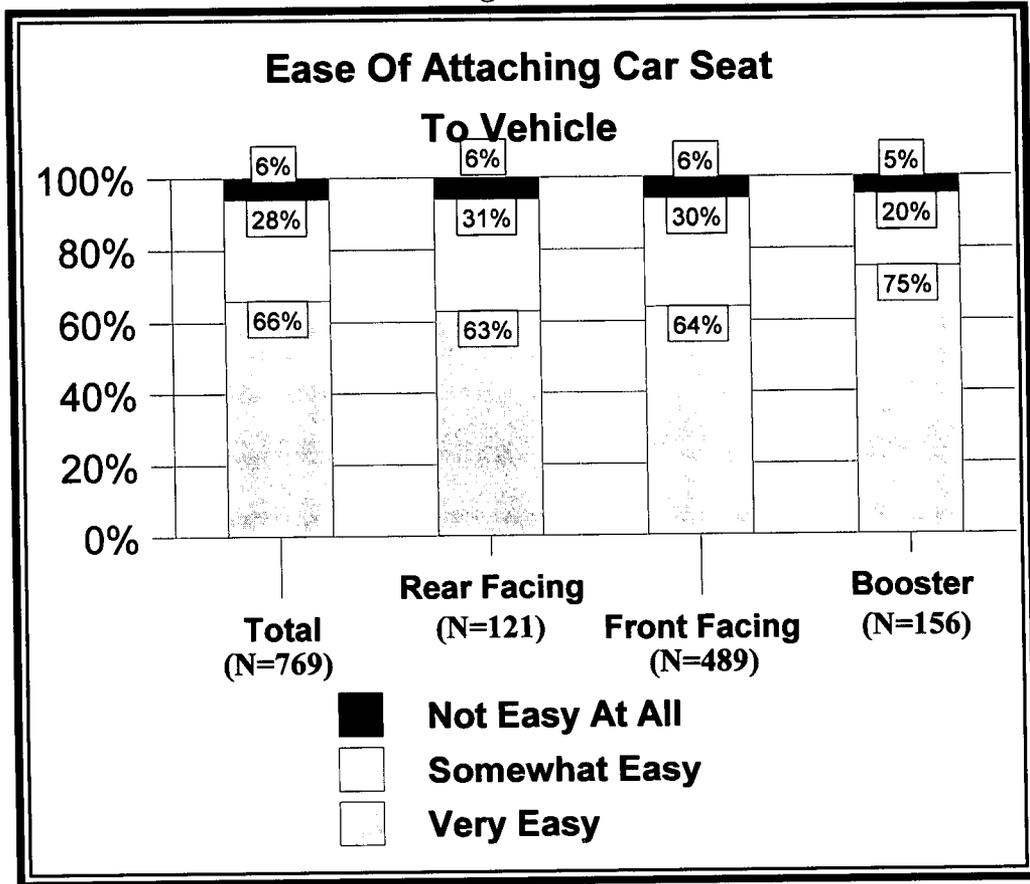
Unweighted N=779

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Ease Of Use

Most parents and caregivers reported that they had relatively little difficulty installing their children's car seats regardless of the type of seat. Overall, about two-thirds of parents/caregivers (66%) considered it very easy to attach the car seat to the vehicle they usually drove. An additional 28% considered it somewhat easy.

Figure 41



Qx: How easy is it for you to attach the child car seat to the vehicle you usually drive . . . very easy, somewhat easy, or not easy at all?

Base: Child at least on occasion rides in a child car seat, and the car seat did not come attached to the vehicle.

Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Those respondents who said that it was only somewhat easy to attach the seat to the vehicle, or not easy at all, were asked what was difficult about attaching the seat. The single most frequent response (22%) was fitting the seat belt through the car seat hole or loop.

Table 5
What Is Difficult About Attaching Car Seat To Vehicle

Qx: What is difficult about attaching the child car seat to the vehicle?

Base: Said it was somewhat easy, or not easy at all, to attach the car seat to the vehicle.

Unweighted N=266

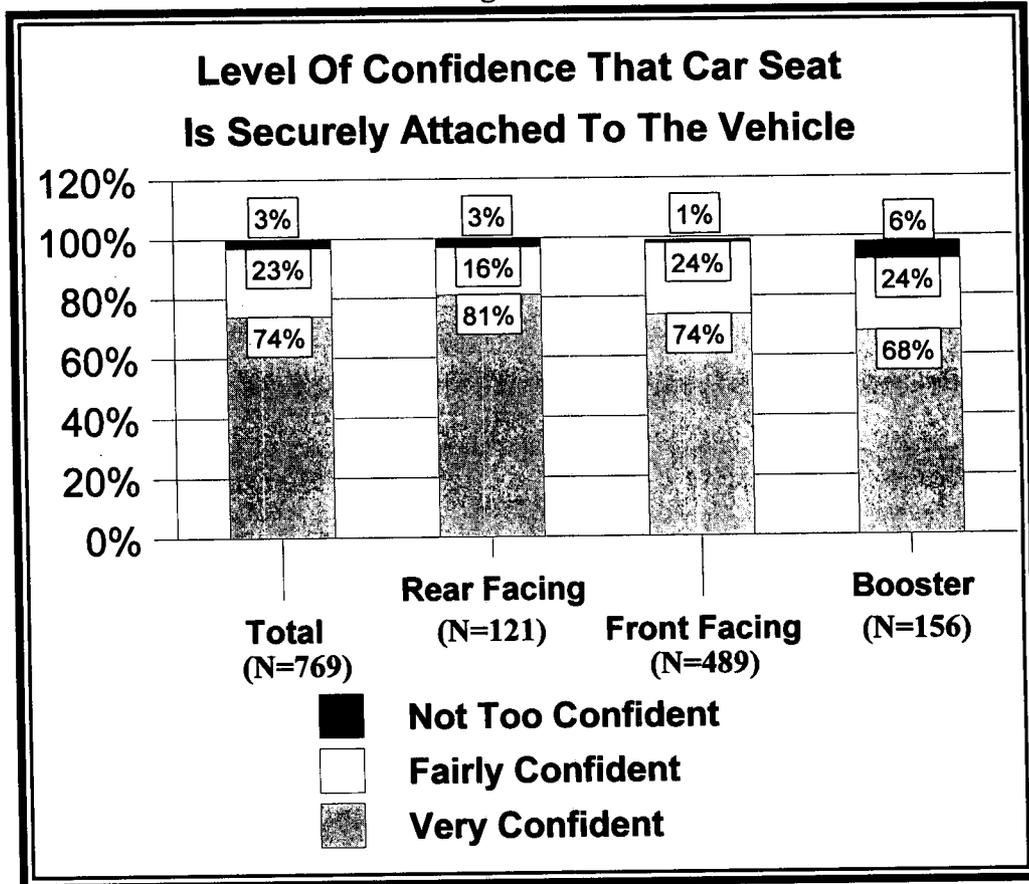
Obstacle	Percent
Fitting the seat belt through the car seat hole/loop	22%
Adjusting the seat belt/making sure it's tight enough	20%
Hooking it/attaching to the seat belt (or buckle)	15%
Hard to get hand/arm in position to insert seat belt through car seat	9%
Car seat is too big/bulky/cumbersome/heavy	4%
Any other obstacles mentioned	32%
Nothing is difficult	7%
Don't Know/Refused/No Answer	7%

*Total exceeds 100% due to multiple responses.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Besides asking how easy it was to attach the car seat to the vehicle, the interviewers also asked the respondents how confident they were that the seat was securely attached. Most (74%) said they were very confident.

Figure 42



Qx: How confident are you that the car seat is securely attached to the vehicle that you usually drive? Are you usually very confident, fairly confident, or not too confident?

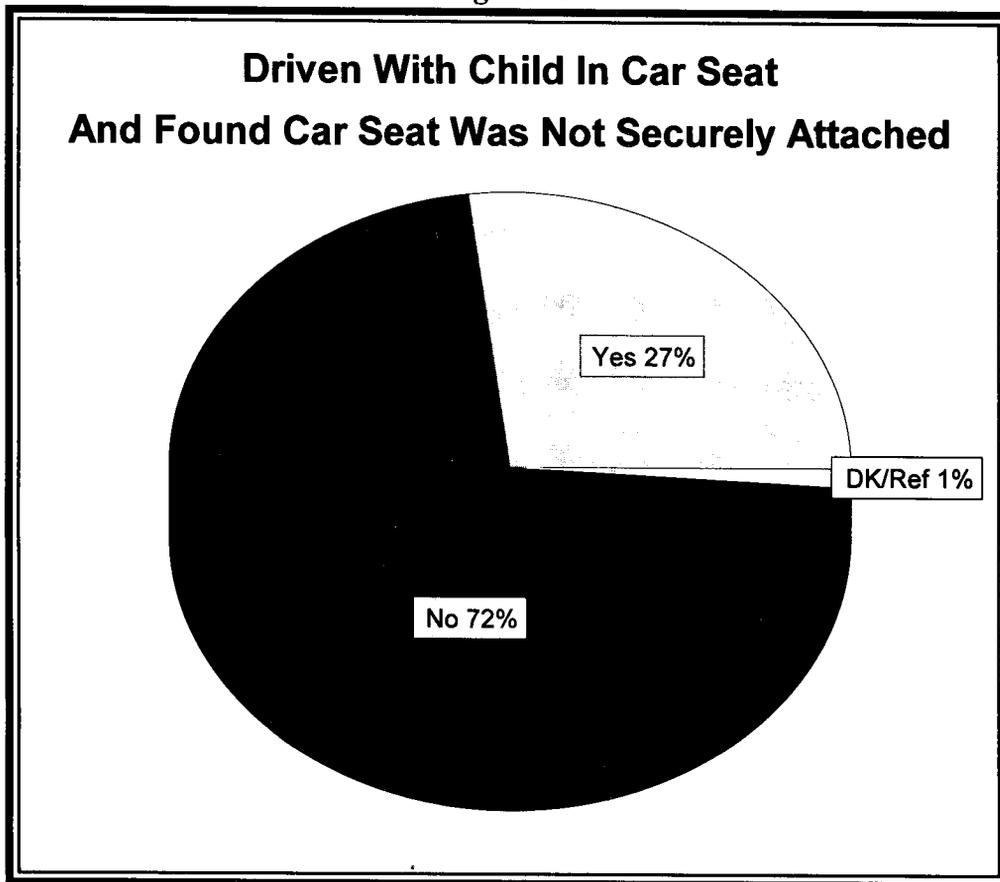
Base: Child under age 9 at least on occasion rides in a child car seat, and the car seat did not come attached to the vehicle.

Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

The results presented on the previous pages suggest that parents and other caregivers generally believe that they are installing child car seats correctly. However, observations in the field have shown some form of car seat misuse for the vast majority of children in car seats, in the form of installation and/or buckling errors. To assess the misuse issue more fully, the interviewers asked the respondents if they had ever driven with the child in the car seat and later found that the car seat was not securely attached. More than one-quarter (27%) answered “yes.”

Figure 43



Qx: Have you ever driven with the child in the car seat and later found that the car seat was not securely attached?

Base: Child under age 9 at least on occasion rides in a child car seat, and the car seat did not come attached to the vehicle.

Unweighted N=769

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Those respondents who acknowledged driving with the child and later discovering that the car seat was not securely attached were asked why this happened. The responses tended to revolve around carelessness, attachment difficulties, accidental behavior by accompanying children, mistakes by others, or movement of the seat within the vehicle or to another vehicle.

Table 6
Reasons Why Car Seat Was Not Securely Attached

Qx: Why did this happen?

Base: Drove with child and later found that car seat was not securely attached.

Unweighted N=223

Reason	Percentage
Child Seat Attachment	31%
Difficult to attach tightly enough/car's seat belt can't be tightened adequately	11%
Came undone/got unfastened/came loose	10%
Didn't understand how to attach/install it properly	5%
Seat belt did not catch/engage properly	1%
Any other responses concerning attachment	3%
Child's Movement/Behavior	17%
Other child loosened baby's car seat accidentally	10%
Child knows how to unbuckle/undo seat belt him/herself	6%
Child unbuckled seat belt	2%
Any other responses concerning child's behavior	*
Miscellaneous	51%
Forgot/wasn't paying attention/carelessness	14%
Car seat was put in by someone else who didn't attach it right	13%
Moved car seat between cars/within same car	9%
I made a mistake/I screwed up	5%
In a hurry/pressed for time/got busy	3%
Vehicle movement unfastened seat belt	2%
Car seat was defective	1%
All other miscellaneous mentions	7%
No Reason	1%
Don't Know/Refused/No Answer	4%

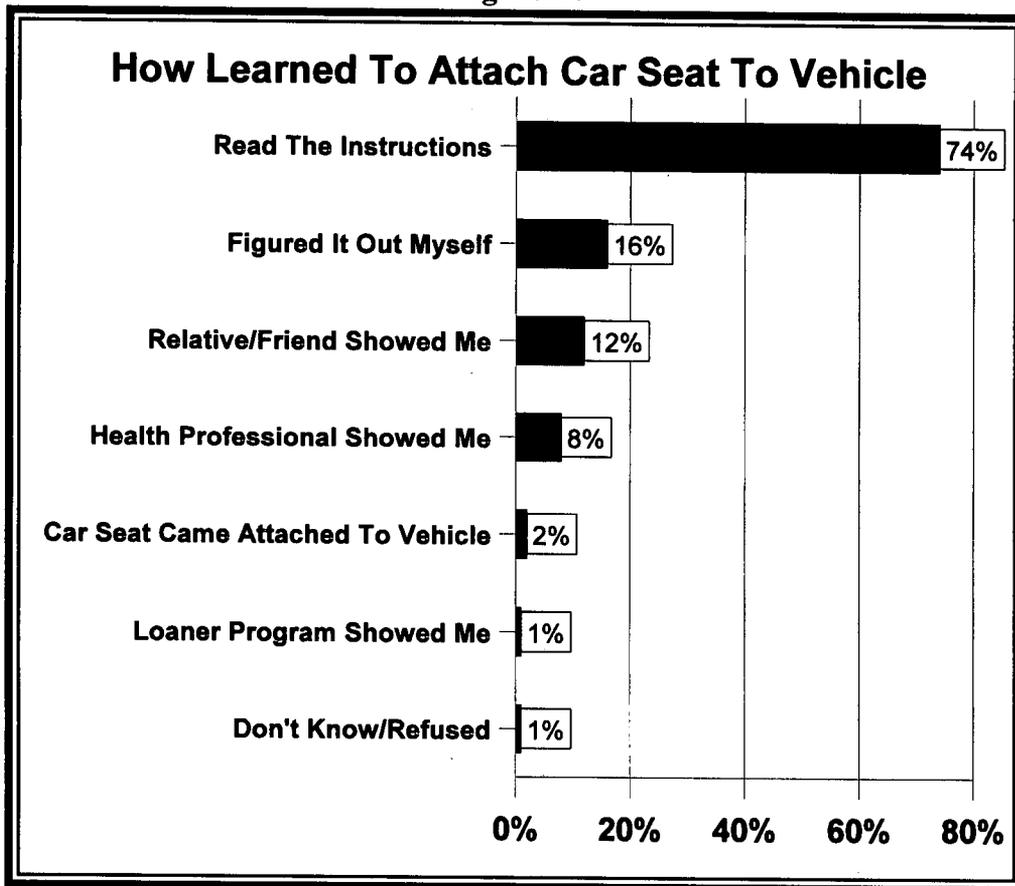
*Less than 0.5%

Total exceeds 100% due to multiple responses.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Most often, the respondents said that they learned how to attach the child car seat to the vehicle by reading the instructions (74%). About one-in-six (16%) figured it out themselves and 12% had a friend or relative show them.

Figure 44



Qx: How did you learn to attach the child car seat to the vehicle?

Base: Child under age 9 at least on occasion rides in a child car seat.

Unweighted N=779

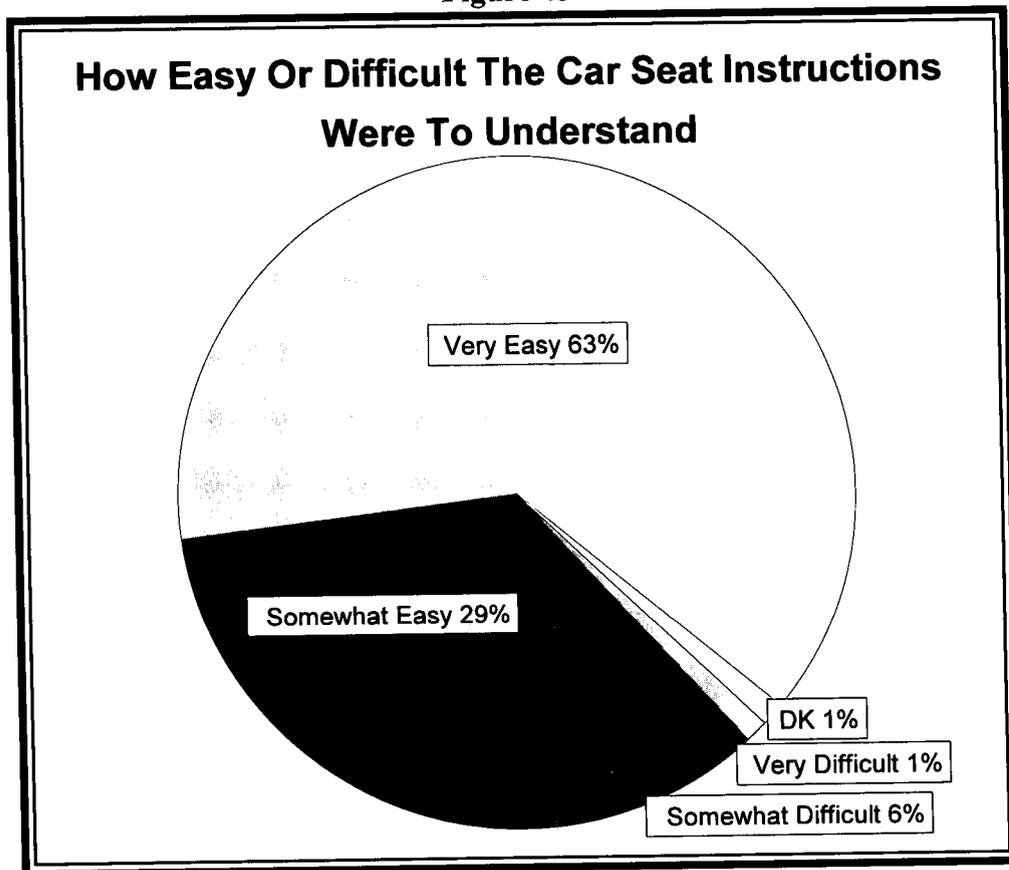
**Total exceeds 100% due to multiple responses.*

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Since the instructions were the predominant source for learning how to attach the car seat to the vehicle, it is useful to assess whether the public finds them understandable. Those respondents who did not state that they had learned to install the seat from reading the instructions, and also did not have a car seat that came attached to the vehicle, were asked if they had read the instructions. More than half (59%) said they had.

In total, 89% of parents/caregivers had read the car seat instructions. Of these, 63% said the instructions were very easy to understand; 29% said they were somewhat easy. Among those who said they did not read the instructions, 60% conceded that the instructions were available.

Figure 45



Qx: How easy or difficult were the instructions to understand? Would you say that the instructions were very easy, somewhat easy, somewhat difficult, or very difficult to understand?

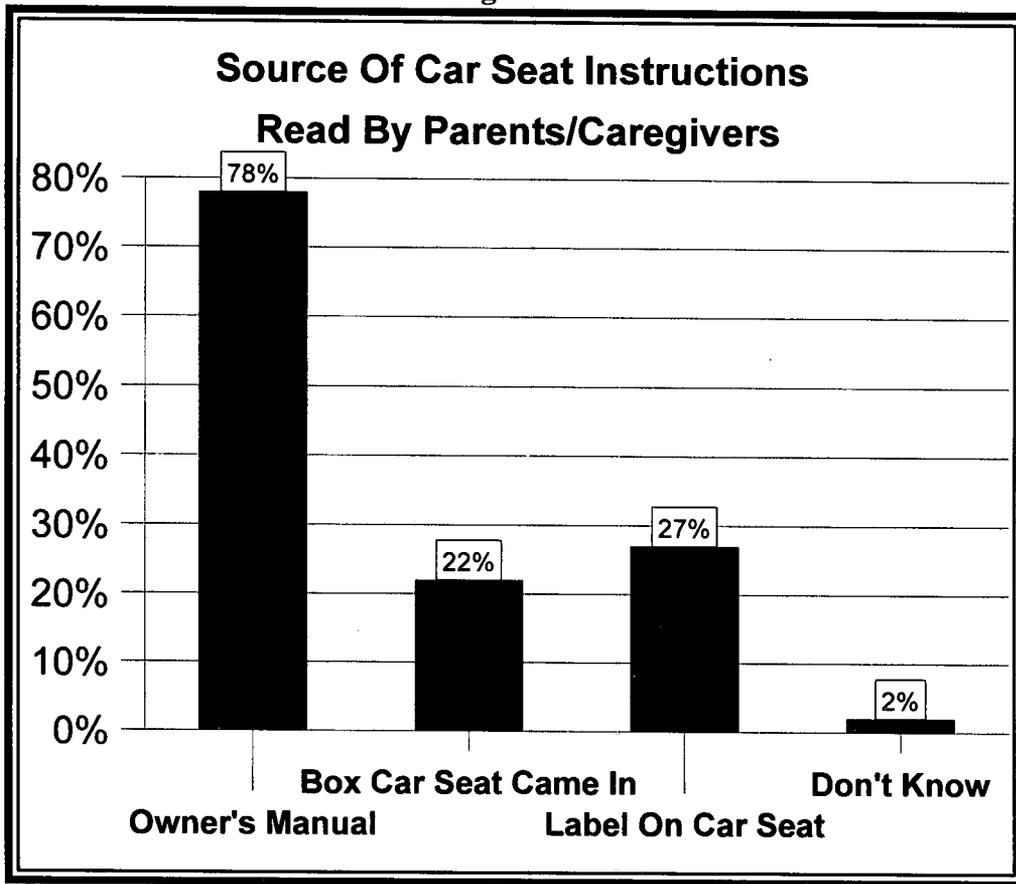
Base: Read the child car seat instructions.

Unweighted N=703

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Besides asking whether parents/caregivers found the car seat instructions difficult, the 2000 MVOSS introduced a question to determine which instructions the parents/caregivers had read. Specifically, did they read the instructions that were on the box for the car seat, the instructions that were on the label of the car seat, or the instructions that came in the owner's manual. The respondents could select more than one source, thus the sum of the percentages for the different instruction materials exceeded 100%. Most often, the respondents indicated that they had read the owner's manual (78%).

Figure 46



Qx: Which instructions did you read? Did you read the instructions that were on the box for the car seat, the instructions that were on the label of the car seat, or the instructions that came in the owner's manual?

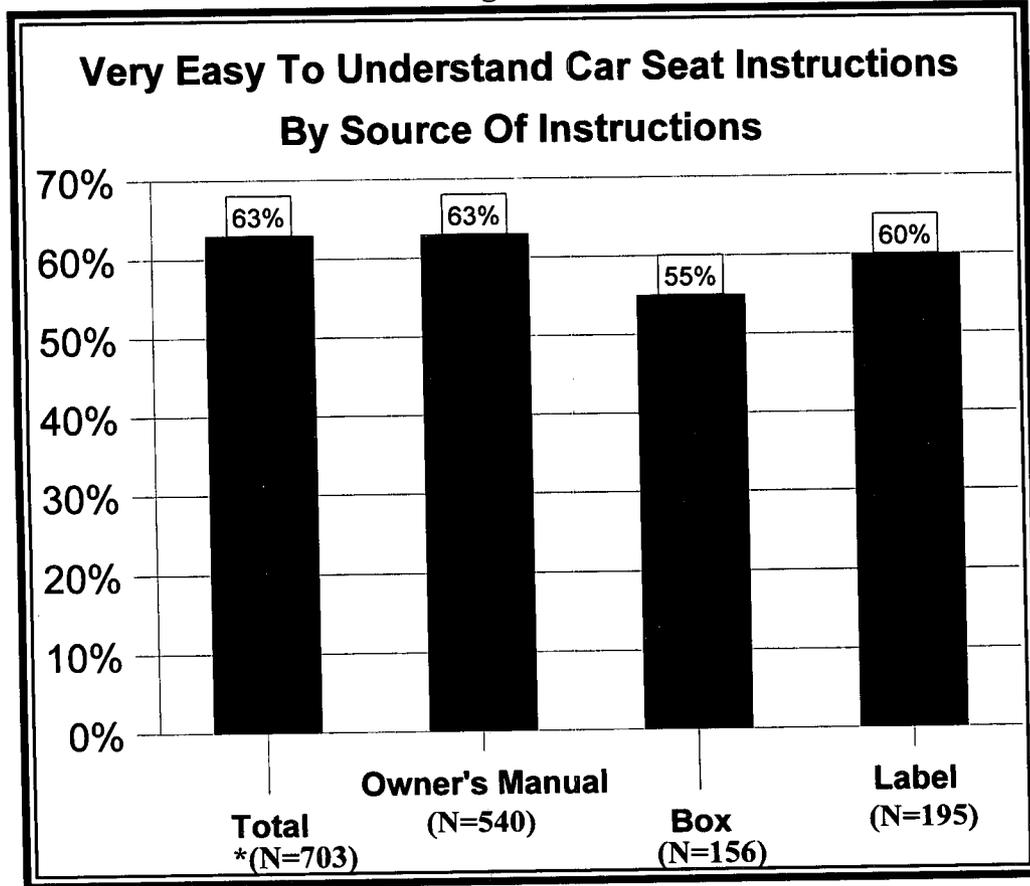
Base: Read the child car seat instructions.

Unweighted N = 703.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

As shown on page 57, 63% of all parents/caregivers who read the child car seat instructions thought they were very easy to understand. However, the survey also found some variation in this percentage according to the source of the instructions. In particular, proportionally fewer persons (55%) found the instructions very easy if they had read the instructions on the box housing the car seat.

Figure 47



Qx: Which instructions did you read? Did you read the instructions that were on the box for the car seat, the instructions that were on the label of the car seat, or the instructions that came in the owner's manual?

Qx: How easy or difficult were the instructions to understand? Would you say that the instructions were very easy, somewhat easy, somewhat difficult, or very difficult to understand?

Base: Read the child car seat instructions.

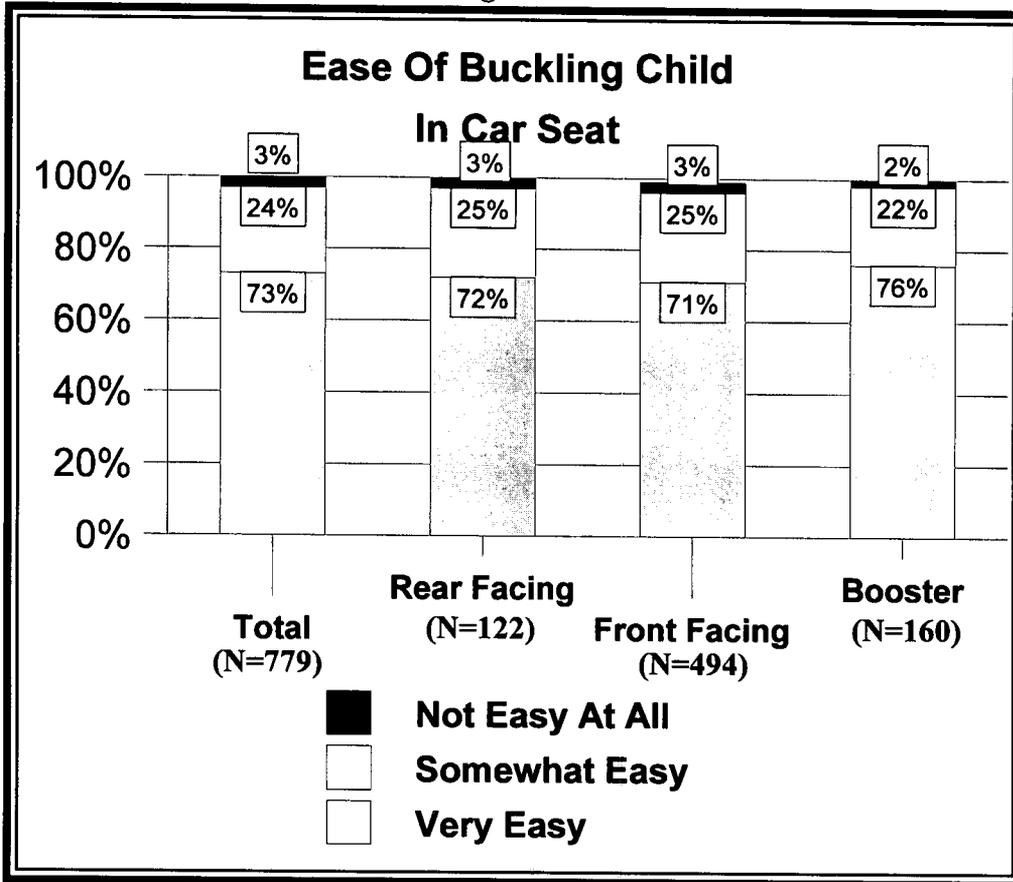
Unweighted N's listed above.

**The sum of the N-sizes for Manual/Box/Label exceeds the N-size for Total because respondents could select more than one source of instructions that they read.*

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

As with installing the car seat in the vehicle, most parents/caregivers considered it easy to properly buckle the child into the car seat. Almost all parents/caregivers answered either that it was very easy (73%) or somewhat easy (24%).

Figure 48



Qx: How easy is it for you to properly buckle your child into the child car seat?

Base: Child under age 9 at least on occasion rides in a child car seat.

Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Those respondents who said that it was only somewhat easy to buckle the child in, or not easy at all, were asked what was difficult about it. Most often they said that bulky clothing (15%) and lack of cooperation from the child (13%) created difficulties.

Table 7
What Is Difficult About Buckling Child Into Car Seat

Qx: What is difficult about buckling your child into the child car seat?

Base: Said it was somewhat easy, or not easy at all, to properly buckle child into the child car seat.

Unweighted N=206

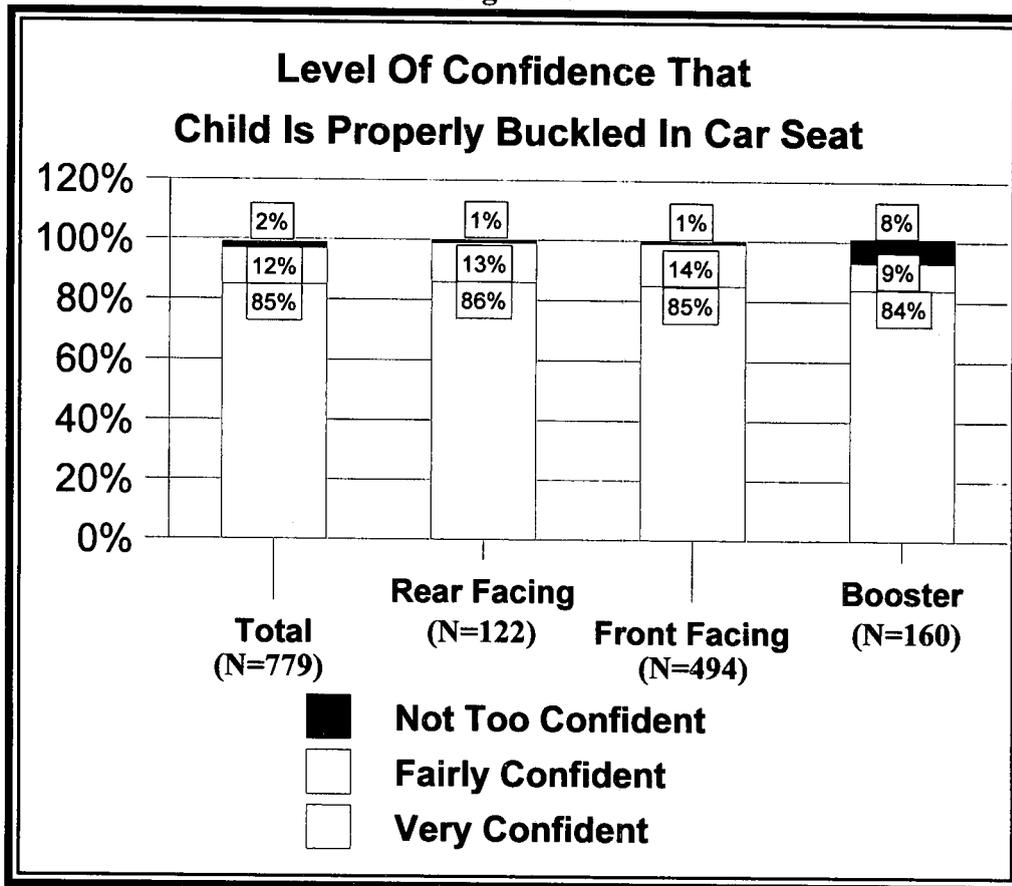
Obstacle	Percent
Child Seat Attachment/Adjustments	57%
Heavy/bulky/winter clothing makes it difficult to buckle child in or adjust straps	15%
Adjusting shoulder straps to fit properly/tightness of seat belt.	11%
Hard to snap buckle/seat belt.	7%
Buckle hits the child in the head/can't get it over the head.	2%
Any other responses related to adjustments	8%
Any other responses related to seat attachment	18%
Child Movement/Behavior	21%
Child doesn't sit still/down/uncooperative/squirms.	13%
Child doesn't like car seat.	5%
Any other responses related to child's movement or behavior	5%
Miscellaneous	17%
Difficult for adult to crawl/squeeze into rear of vehicle to buckle in child	4%
Any other miscellaneous responses	14%
Nothing	7%
Don't know/refused/no answer.	6%

*Total exceeds 100% due to multiple responses.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Nearly all parents/caregivers felt either very confident (85%) or fairly confident (12%) that their child was properly buckled into the car seat. There was little difference across type of seat in the percentage of those who were very confident. However, 8% of booster seat users answered they were not too confident compared to only 1% of users of other types of child seats.

Figure 49



Qx: How confident are you that the child is properly buckled into the seat. Are you usually very confident, fairly confident, or not too confident?

Base: Child under age 9 at least on occasion rides in a child car seat.

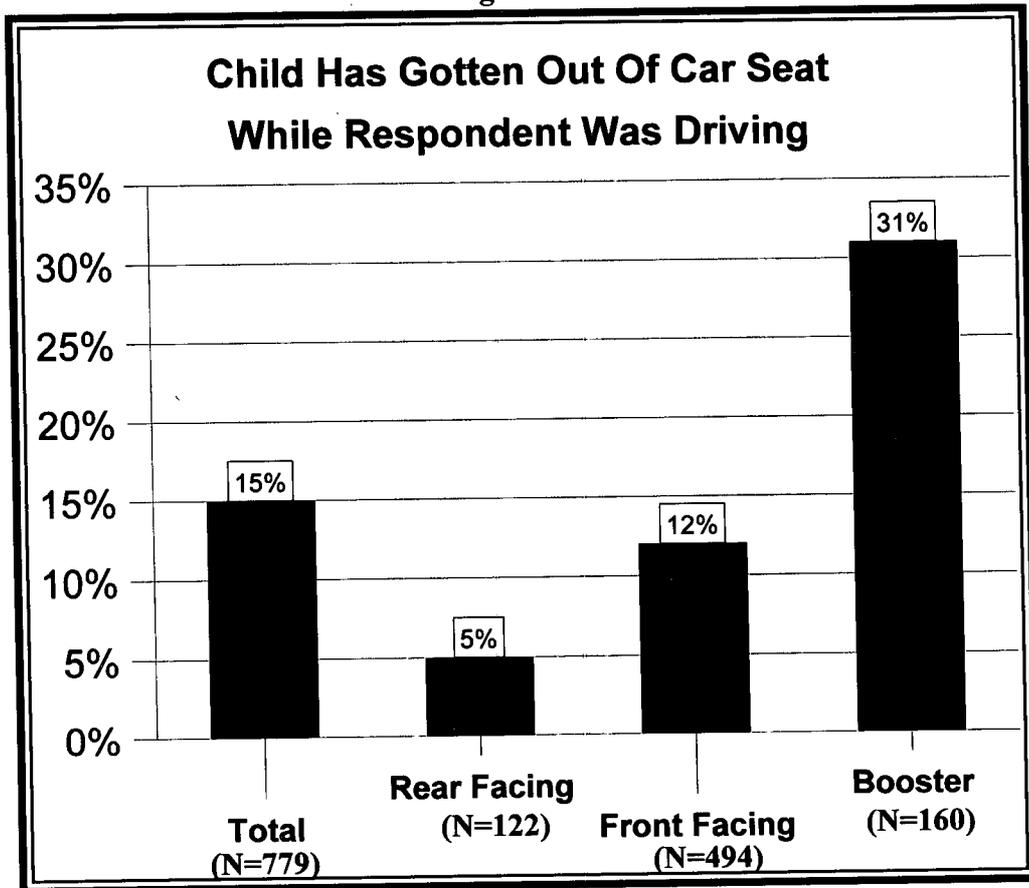
Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Children Getting Out Of Car Seats

Fifteen percent of parents/caregivers reported that the child had gotten himself or herself out of the car seat while they were driving. As expected, this was highest among older children who were riding in booster seats (31%). The 5% for children in rear facing infant seats likely reflects error in describing the type of seat, or misinterpretation of this "child escape" question.

Figure 50



Qx: Has the (AGE) ever gotten himself/herself out of the child car seat while you were driving?

Base: Child under age 9 at least on occasion rides in a child car seat.

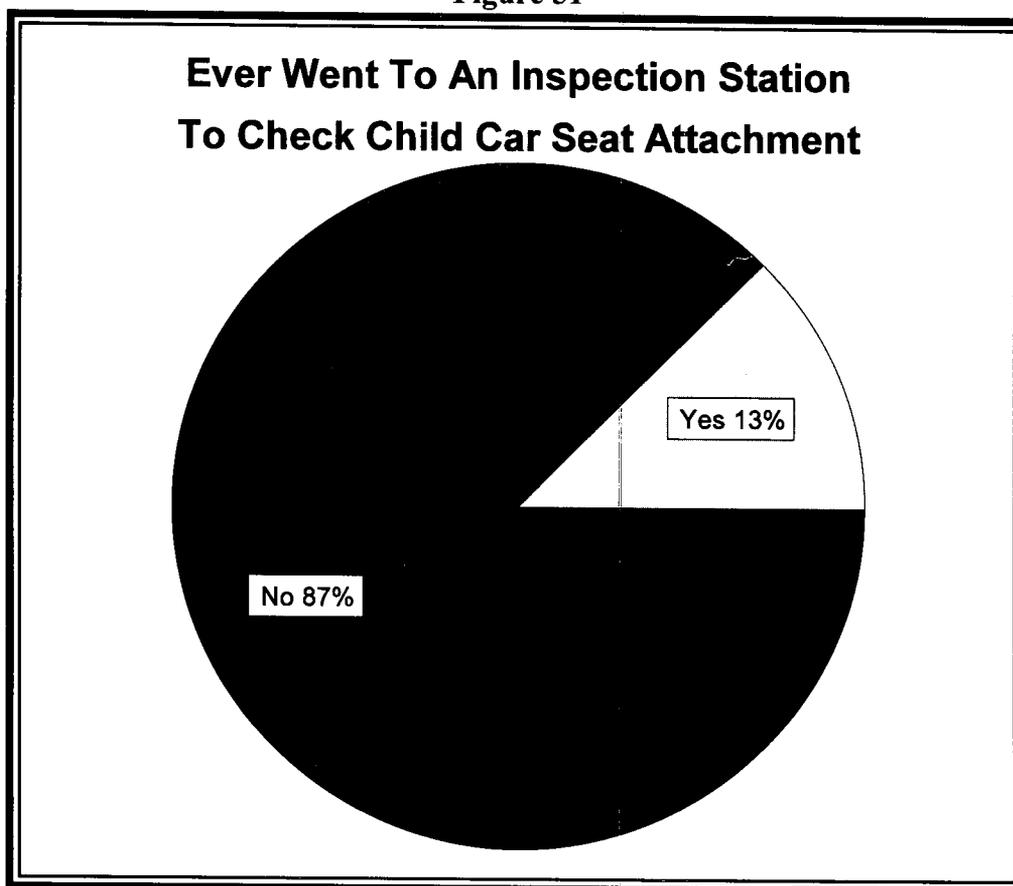
Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Use Of Inspection Stations To Check Whether Child Seat Is Being Installed Correctly

Inspection stations are places where parents and other caregivers can go to have trained technicians check whether they are correctly installing the child seat in their vehicle and properly buckling their child into the seat. These stations have been rapidly increasing in number, which prompted introduction of a question in the 2000 survey asking parents/caregivers who had a child using a car seat whether they had ever gone to an inspection station. More than 10% said "yes."

Figure 51



Qx: In many communities, there are places where people can go to have someone check whether they are correctly attaching their car seat and buckling in their children. Did you ever go to a place like this to have someone check how you were attaching the car seat?

*Base: Child under age 9 at least on occasion rides in a child car seat.
Unweighted N=779*

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Parents/caregivers who said that they had at some time gone to an inspection station were then asked what type of organization or company sponsored the car seat check. Most often, they indicated that local police, or fire or rescue units, were the sponsors (54%). Health organizations such as hospitals, medical or health centers, and clinics ranked a distant second (13%).

Table 8
Sponsor Of The Inspection Station Attended

Qx: Could you tell me what type of organization or company sponsored the car seat check you went to?

Base: Said they had gone to an inspection station to have someone check how they were attaching the car seat.

Unweighted N=110

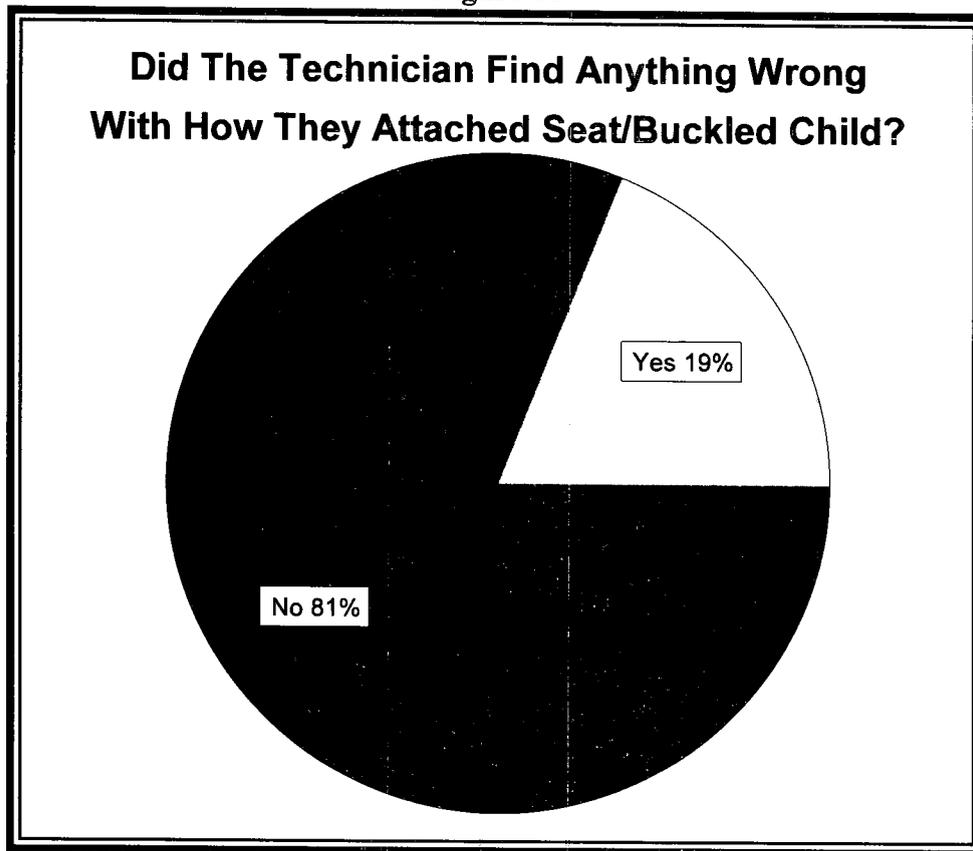
Sponsor	Percent
Local police, fire, or rescue units	54%
Hospital/medical/health center/clinic	13%
Car dealership	7%
State or county	7%
Charitable/community service organizations	2%
Auto manufacturer	1%
Other	16%
Don't Know	4%

*Total exceeds 100% due to multiple responses.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

It is not unusual for child safety seat technicians to report a high proportion of cases at inspection stations where there was something wrong with how the seat was installed or the child buckled in, even surpassing 80% or 90%.³ The 2000 survey introduced a question to determine if the extensive misuse reported by technicians would also be reported by the public when asked the results of their car seat check. It was not, as only 19% said the technician found something wrong with how they attached the seat or buckled in their child.

Figure 52



Qx: Did the person who was checking the car seat for you find anything that was wrong in how you attached the seat or buckled in your child?

Base: Said they had gone to an inspection station to have someone check how they were attaching the car seat.

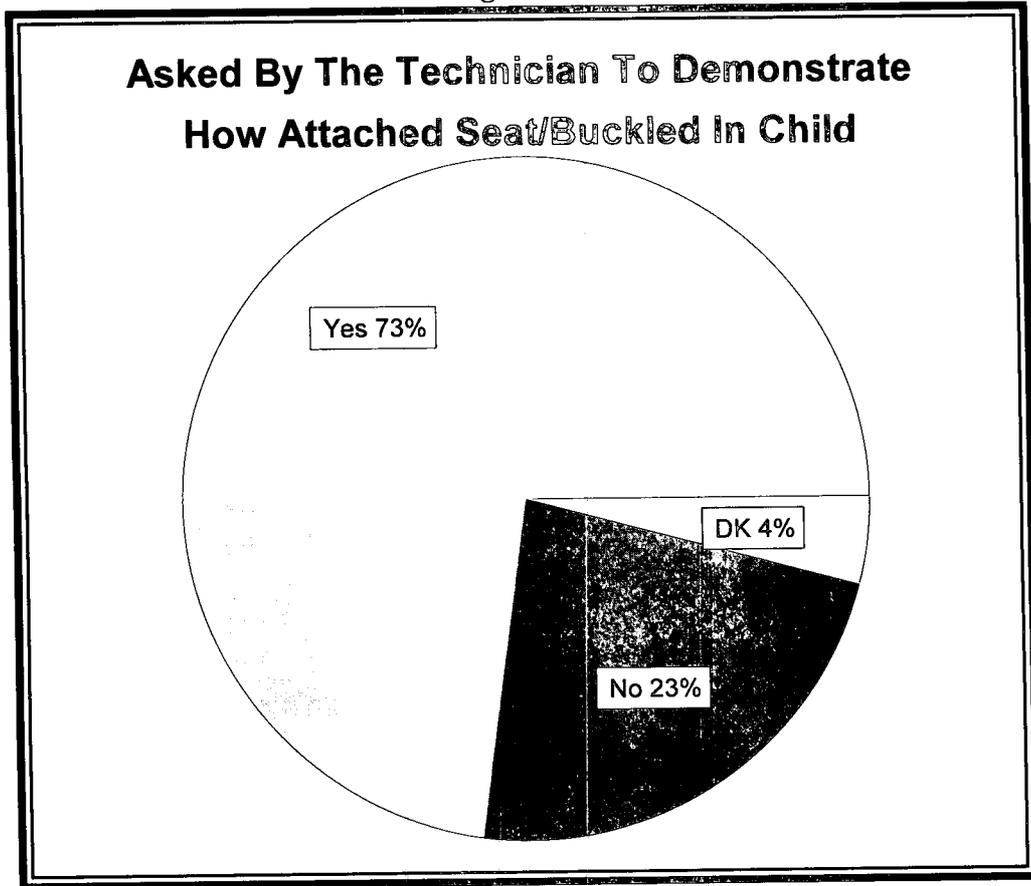
Unweighted N=110

³Results of a NHTSA study agreed there was something incorrect in how most people installed the seats or buckled in their children, finding 80% misuse of child safety seats: Decina, L.E. and K.Y. Knoebel. Patterns of Misuse of Child Safety Seats. DOT-HS-808-440. January 1996.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

According to the survey results, 73% of the parents and other caregivers who went to an inspection station were asked by the child safety seat technician to demonstrate how they attached the seat and buckled in their child.

Figure 53



Qx: Did the person who was checking the car seat for you ask you to demonstrate how you attached the seat and buckled in your child?

Base: Said they had gone to an inspection station to have someone check how they were attaching the car seat.

Unweighted N=110

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

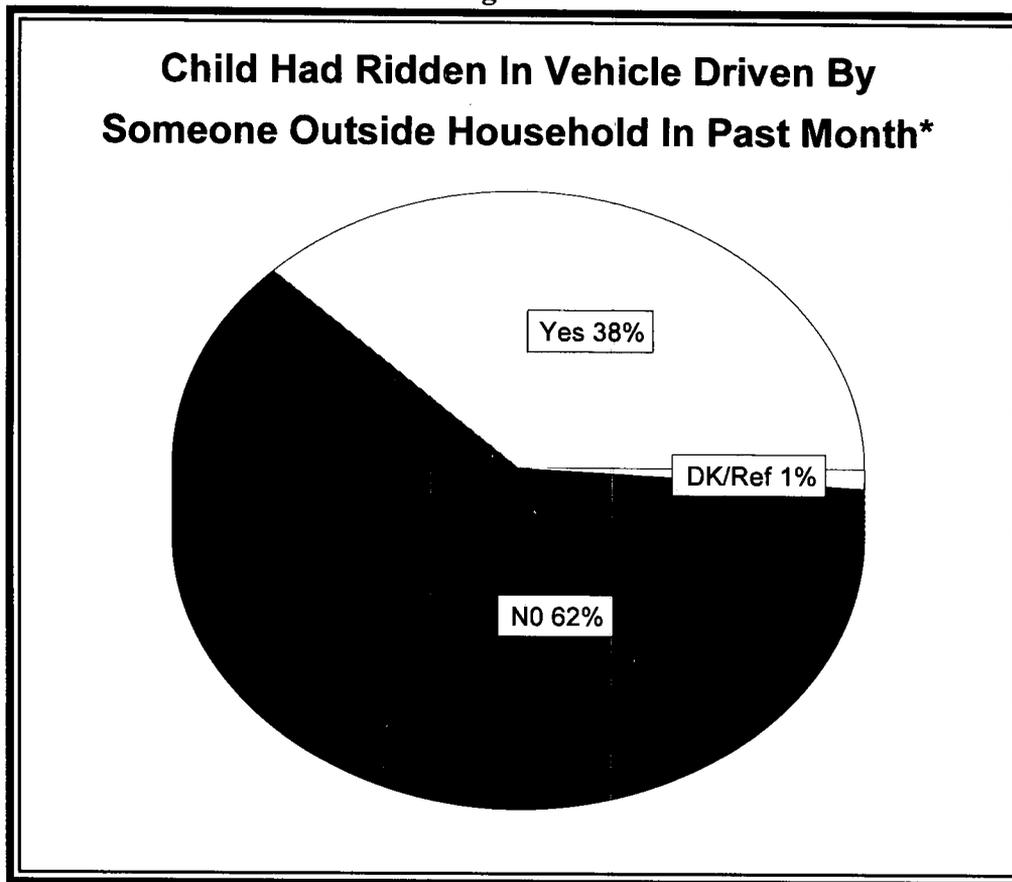
Frequency That Persons Outside Household Drive Child Who Uses Car Seat

Parents/caregivers of children who at least on occasion used car seats were asked if the child had ridden in a vehicle in the past 30 days where someone outside of the household was driving.

Figure 54 restricts the analysis only to those parents/caregivers who lived with the child.

Almost two-out-of-five (38%) answered that this had occurred.

Figure 54



Qx: During the past thirty days, has the (AGE) ridden in a vehicle where someone outside of your household was driving (includes school buses, taxis, and other private vehicles)?

Base: Child at least on occasion uses a car seat, and parent/caregiver lives with the child.

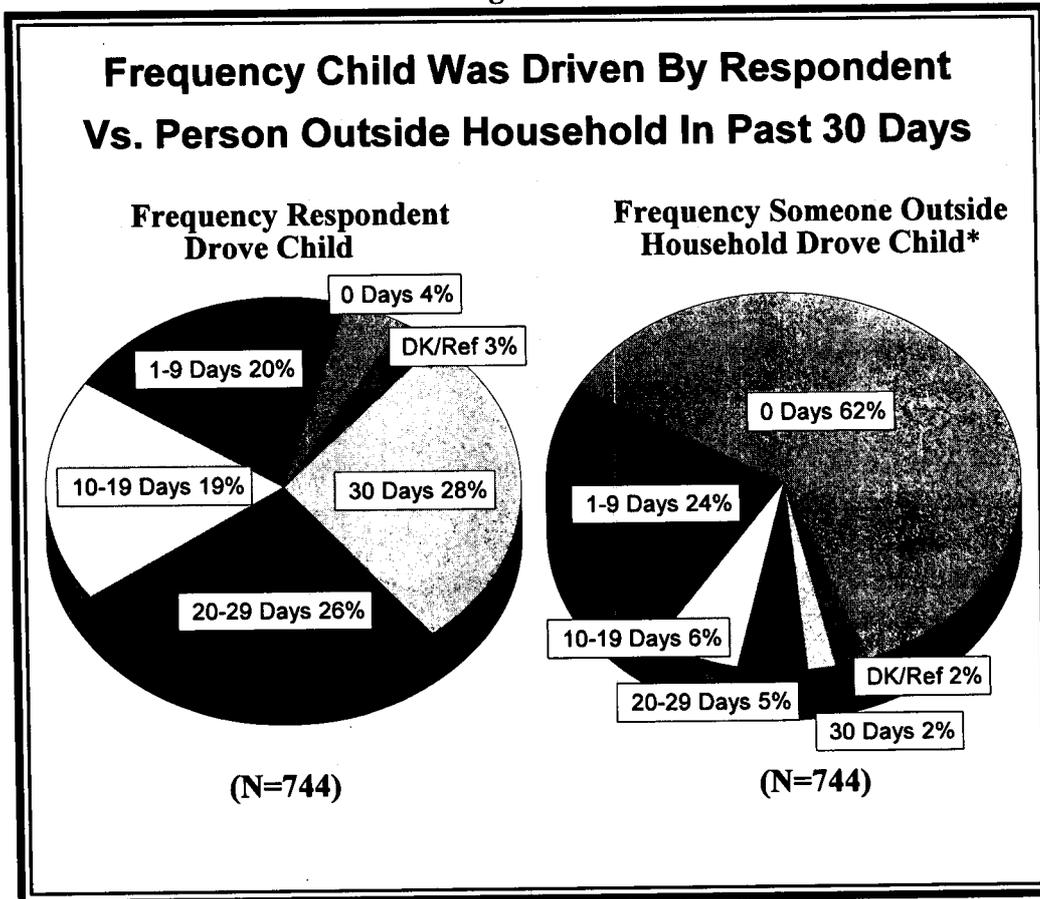
Unweighted N=744.

** The sum of the percentages in the pie chart exceeds 100% because the numbers are rounded.*

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Figure 55 compares the frequency that the selected children were driven by persons outside the household to the frequency that the same children were driven by the responding parents/caregivers (this analysis again was restricted to parents/caregivers who lived in the same household as the child). As expected, the children were transported on a far less regular basis by the non-household members, which is consistent with the findings in Chapter 2 (see page 25). For example, 54% of parents/caregivers said they drove the child 20 or more days in the past 30, whereas only 7% said the child was driven by a non-household member that number of days.

Figure 55



Qx: How many days out of the past thirty days did the (AGE) ride in a vehicle that you drove?

Qx: How many days out of the past thirty days did the (AGE) ride in a vehicle driven by someone outside of your household?

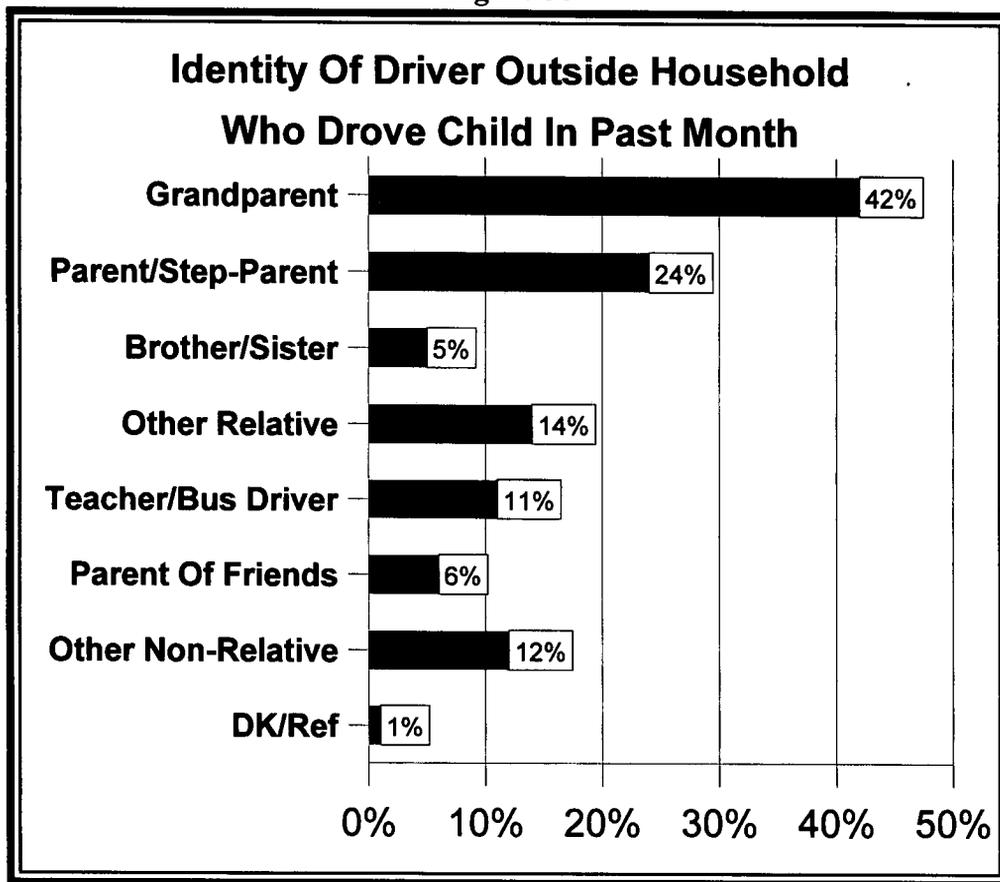
Base: Child under age 9 at least on occasion uses a car seat, and parent/caregiver lives with the child. Unweighted N's listed above.

** The sum of the percentages in the pie chart exceeds 100% because the numbers are rounded.*

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

When asked the identity of the driver outside the household who transported the child in the past 30 days, the parents/caregivers most often answered that it was a grandparent (42%), followed by a parent or step-parent (24%). Fewer reported that it was a brother/sister (5%) or some “other relative”(14%). The relatively high percentage for parents/step-parents when looking from the vantage of the child contrasts with the low percentage obtained from the vantage of the outside driver (see page 26). At least part of the difference may reflect aspects of custody arrangements and related perceptions. The differing time frames specified in the two questions (past month versus past year) may also be playing a role.

Figure 56



Qx: Who were those drivers? (What is their relationship to the child?)

Base: Child under age 9 at least on occasion uses a car seat, parent/caregiver lives with the child, and someone outside the household drove the child in the past 30 days.

Unweighted N=294

2000 SURVEY RESULTS

CHAPTER 4

REASONS FOR NON-USE OF CAR SEATS

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

The survey asked a series of questions to identify reasons why children under age 9 were not riding in car seats. Respondents were selected from the parent/caregiver subgroup defined on page 30. If respondents said that the designated child used a car seat, but less than all the time, then the survey termed them “part time users.” This includes cases where the respondent said that the child used the car seat all the time, but admitted occasions of non-use within the past year on a follow-up question. The first part of this Chapter focuses exclusively on findings concerning part time car seat users. Readers are cautioned that these results are based on a small number of cases. This is because parents and other caregivers will generally claim that the car seat is used “all the time” if the child still uses this type of restraint at all.

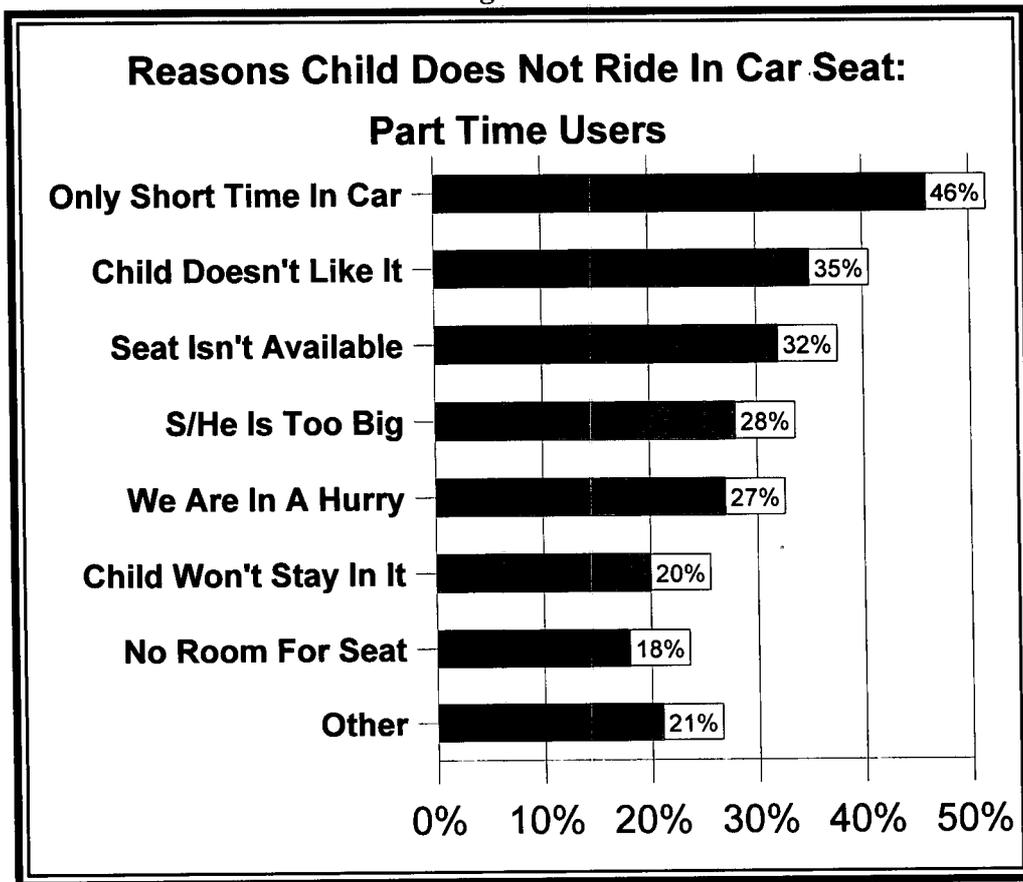
The second part of this Chapter examines reasons for non-use of car seats by children under the age of 9 who reportedly do not use car seats at all. Besides reasons for non-use among these “non-users,” the Chapter explores their seat belt use, the fit of the seat belt, and their usual seating location.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Part Time Car Seat Users

Questionnaire testing plus input from experts had identified a number of likely reasons for non-use of car seats. The interviewers read each of these reasons to respondents, asking whether or not it was a factor in the child not using a car seat. The interviewers then gave the respondents the opportunity to volunteer "other" reasons. The reasons most frequently mentioned for non-use of car seats among part time users were that they were only going to be in the car a short time (46%) and the child did not like the seat (35%).

Figure 57



Qx: Please answer yes or no to each of the following statements. When my (AGE) doesn't ride in a child car seat, it is sometimes because. . . .

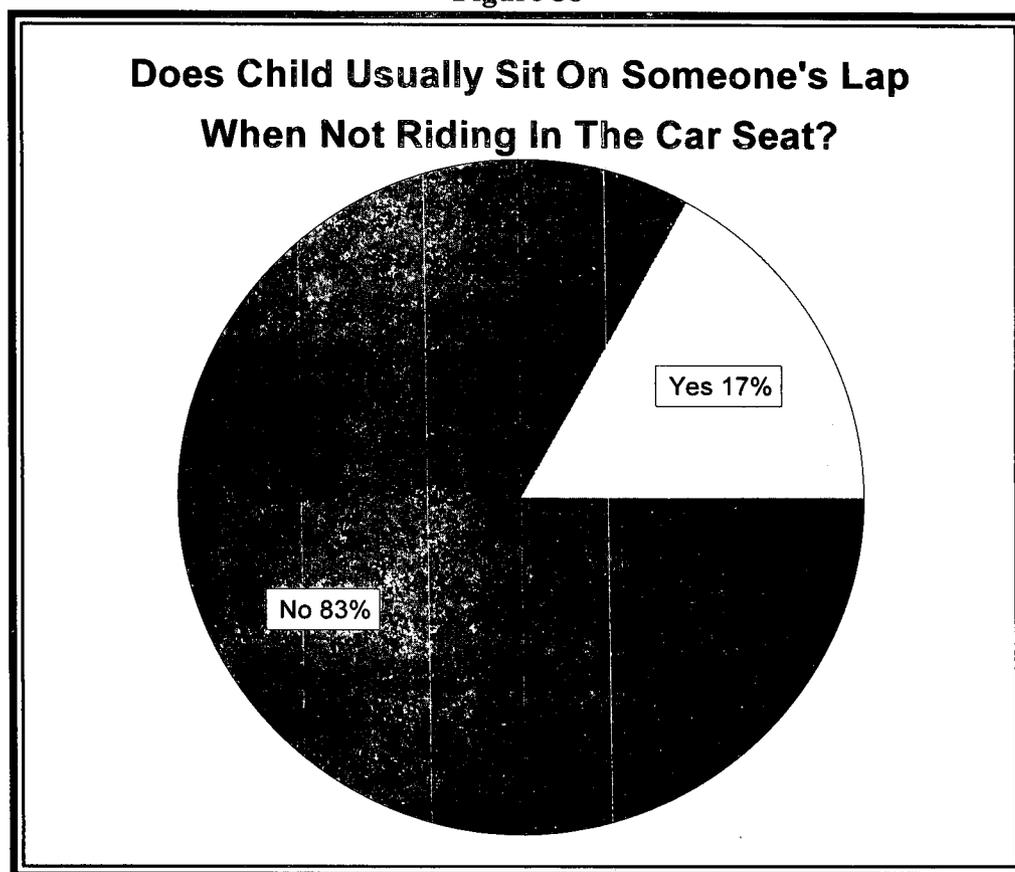
Base: Child under age 9 uses a car seat, but not all of the time.

Unweighted N=122

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

The survey sought to identify where the child usually sat when not using the car seat. The results showed that about one-out-of-six (17%) children who used car seats on a part time basis usually sat on someone's lap when not riding in the seat.

Figure 58



Qx: When the (AGE) doesn't ride in the child car seat when riding with you, does (he/she) usually sit on someone's lap?

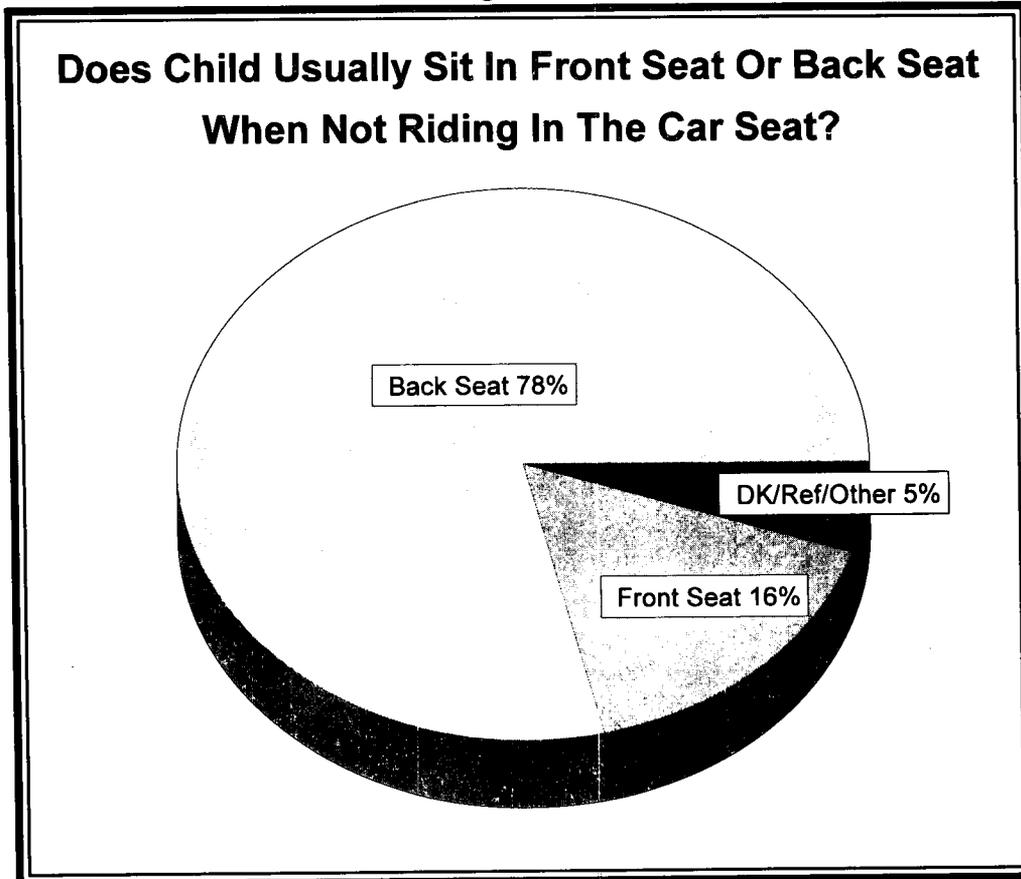
Base: Child under age 9 uses a car seat, but not all of the time.

Unweighted N=122

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

When asked if the child usually sat in the front seat or the back seat when not riding in the car seat, more than three-quarters (78%) said the back seat. Another 16% said the child usually rode in the front: while the remainder did not know (3.4%), refused to respond (1.5%), or volunteered that the child rode in the back of a station wagon or truck (0.4%).

Figure 59



Qx: When the (AGE) doesn't ride in the child car seat when riding with you, does (he/she) usually sit in the front seat or in the back seat?

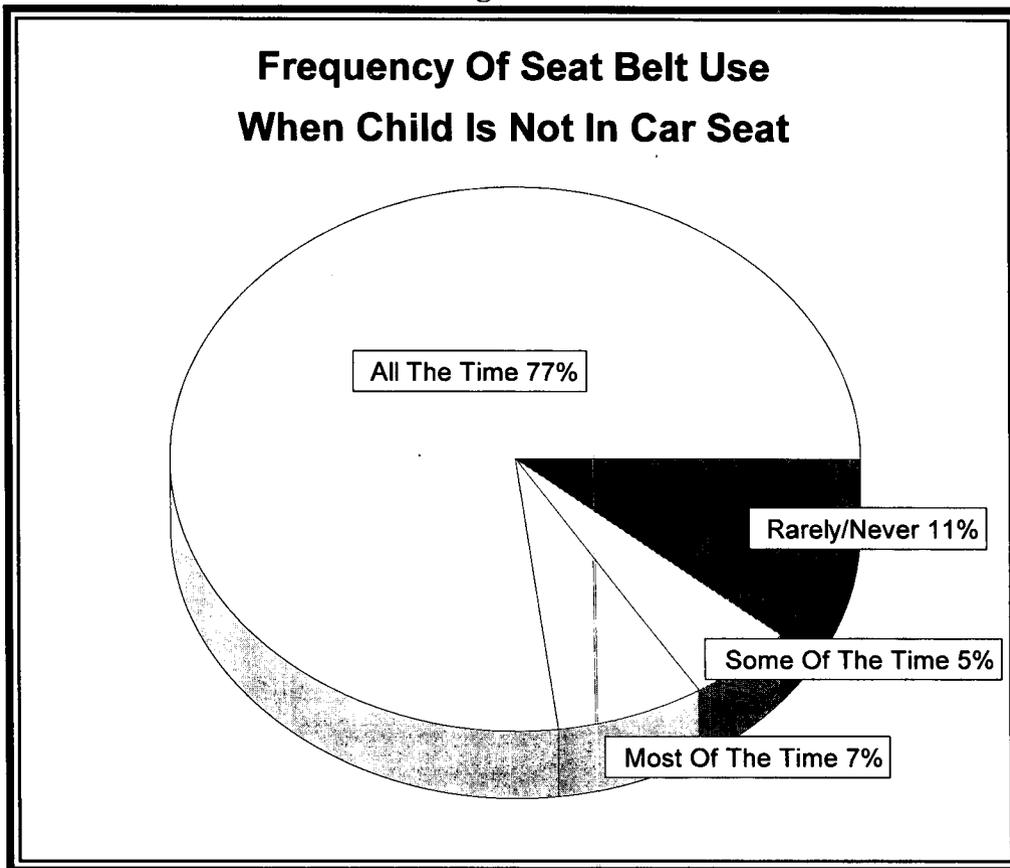
Base: Child under age 9 uses a car seat, but not all of the time.

Unweighted N=122

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Most children who were part time car seat users wore a seat belt when they were not in their car seat. Seventy-seven percent reportedly used the seat belt all of the time when not in the car seat, and 7% used it most of the time.

Figure 60



Qx: When the (AGE) doesn't ride in the child car seat when riding with you, how often is (he/she) buckled in a seat belt?

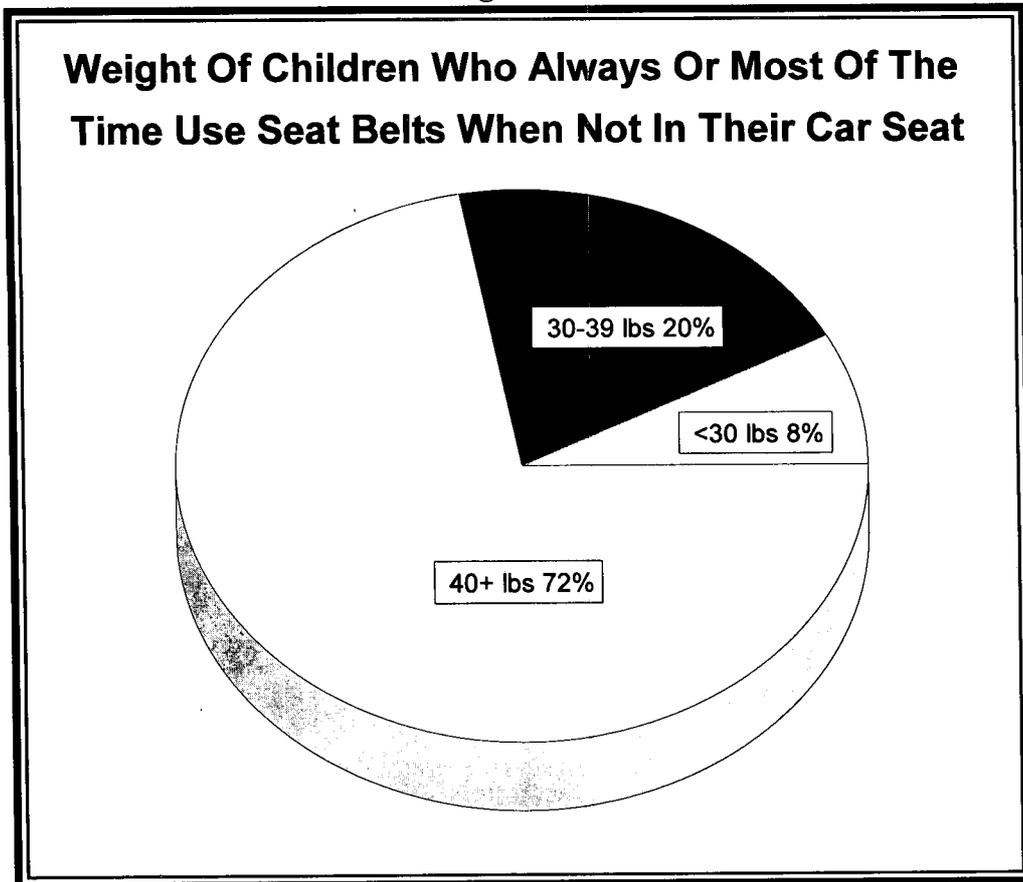
Base: Child under age 9 uses a car seat, but not all of the time.

Unweighted N=122

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Most children (72%) who always or most of the time wore a seat belt when not using a car seat weighed 40 pounds or more. However, more than one-fourth (28%) weighed under 40 pounds, and almost one-tenth (8%) reportedly weighed less than 30 pounds.

Figure 61



Qx: How much does (he/she) weigh?

Qx: When the (AGE) doesn't ride in the child car seat when riding with you, how often is (he/she) buckled in a seat belt?

Base: Child under age 9 is a part time car seat user who uses a seat belt all or most of the time when not riding in the car seat.

Unweighted N=102

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

The 2000 survey introduced a series of questions to determine how well seat belts fit children who still used a car seat at least on occasion. Correct lap belt fit would entail the lap belt going across the child's upper thighs or hips. This was reported to be the case for a majority of the children (57%), although many (48%) reportedly had the seat belt going across the child's stomach. Problems with shoulder belt fit also appeared, such as the belt cutting across the child's neck or face (41%), or the child placing the shoulder belt behind his/her back (41%) or under his/her arm (41%).

Table 9
How Seat Belt Fits The Child:
Part Time Users Of Car Seats

***Qx:** Please tell me, yes or no, if the following things usually happen when the (AGE) wears a seat belt while riding in a motor vehicle. On most trips, does . . . ?*

***Base:** Child under age 9 is a part time car seat user who at least on occasion uses a seat belt.*

On most trips,	Percent	*Unweighted N-Size
The lap belt goes across the child's upper thighs or hips.	57%	(102)
The lap belt goes across the child's stomach.	48%	(102)
The child's legs bend over the edge of the seat.	45%	(110)
The shoulder belt goes across the child's neck or face.	41%	(88)
The child puts the shoulder belt behind (his/her) back.	41%	(88)
The child puts the shoulder belt under (his/her) arm.	41%	(88)

*Respondents were asked only those questions concerning fit appropriate for the type of seat belt usually worn by the child (i.e. shoulder only, lap only, or shoulder and lap belt systems), resulting in the different N-Sizes.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

The 2000 survey also introduced a question asking the age at which a child was generally ready to wear a seat belt. Table 10 compares the responses provided by parents/caregivers who said the child used a car seat, but not every time, with those who claimed that the child was always in a car seat when riding with them. The modal response for both groups was 5 years of age, with almost half (49%) of either group believing a child was generally ready by age 5 or younger. Another 7% of the part time user group and 11% of the full time user group were unsure of the age or refused to respond.

Table 10
Age At Which Parent/Caregiver Believes A Child Is Ready to
Begin Wearing A Seat Belt:
Part Time Versus Full Time Car Seat Users

Qx: In general, at what age do you think a child is ready to begin wearing a seat belt rather than use a child safety seat or a booster seat?

Base: Child under age 9 uses a car seat.

Age	Part Time Users (N=122)	Full Time Users (N=657)
1 Year	**	1%
2 Years	3%	1%
3 Years	3%	5%
4 Years	14%	16%
5 Years	29%	26%
6 Years	12%	17%
7 Years	8%	7%
8 Years	14%	7%
9 Years	1%	1%
10 Years	3%	2%
11 Years	**	**
12 Years	1%	2%
Other	5%	5%
DK/Refused	7%	11%

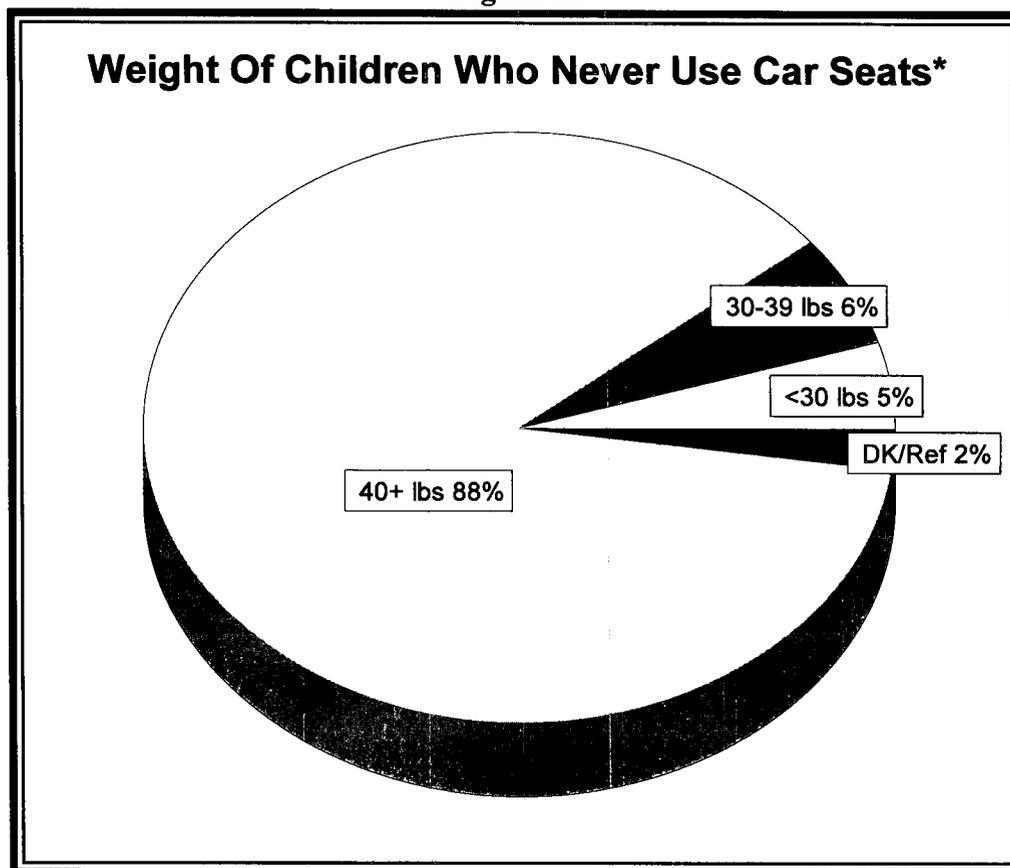
**Less than 0.5%.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Never Users of Car Seats

The children who never used car seats were mostly larger children. Almost nine-out-of-ten (88%) were 40 pounds or heavier.

Figure 62



Qx: How much does (he/she) weigh?

Qx: When you are driving and the (AGE) rides in the vehicle with you, how often does (he/she) ride in a child car seat? Child car seats include infant seats, toddler seats, and booster seats. Would you say (he/she) rides in a child car seat. . . .

Base: Child under age 9 never uses a car seat.

Unweighted N=642

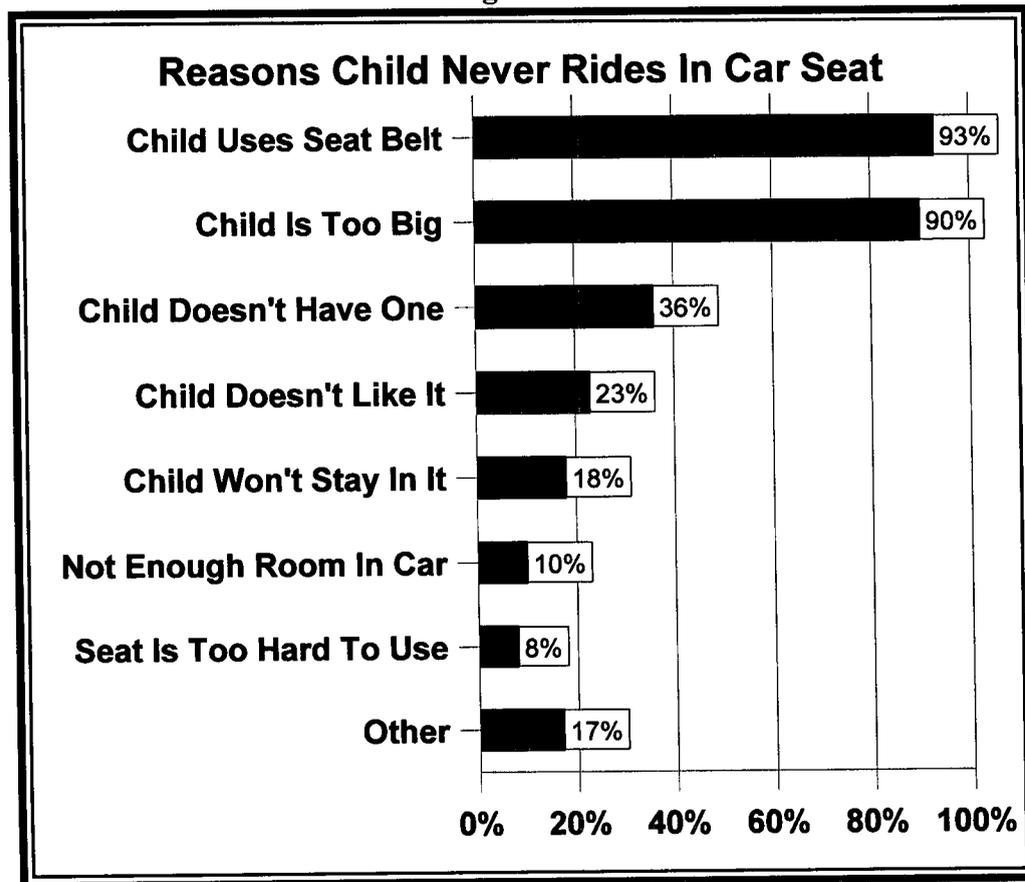
* The sum of the percentages in the pie chart exceeds 100% because the numbers are rounded.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

When asked the reason why the child never uses a car seat, the respondents usually answered that it was because the child was too big (90%) and was using a seat belt (93%). Other reasons given for not using a car seat included the child did not have one (36%), the child did not like it (23%), and the child won't stay in it (18%).

If the respondent said that the child did not have a car seat, the interviewer asked if there was a particular reason why. More than four-in-ten (44%) answered "no" while 2% said they did not know. Those who gave a reason most frequently indicated that it was because the child was too old or too big for the seat.

Figure 63



Qx: Please answer yes or no to each of the following statements to indicate if this is a reason why the (AGE) does not ride in a child car seat. My (AGE) doesn't ride in a child car seat because. . . .

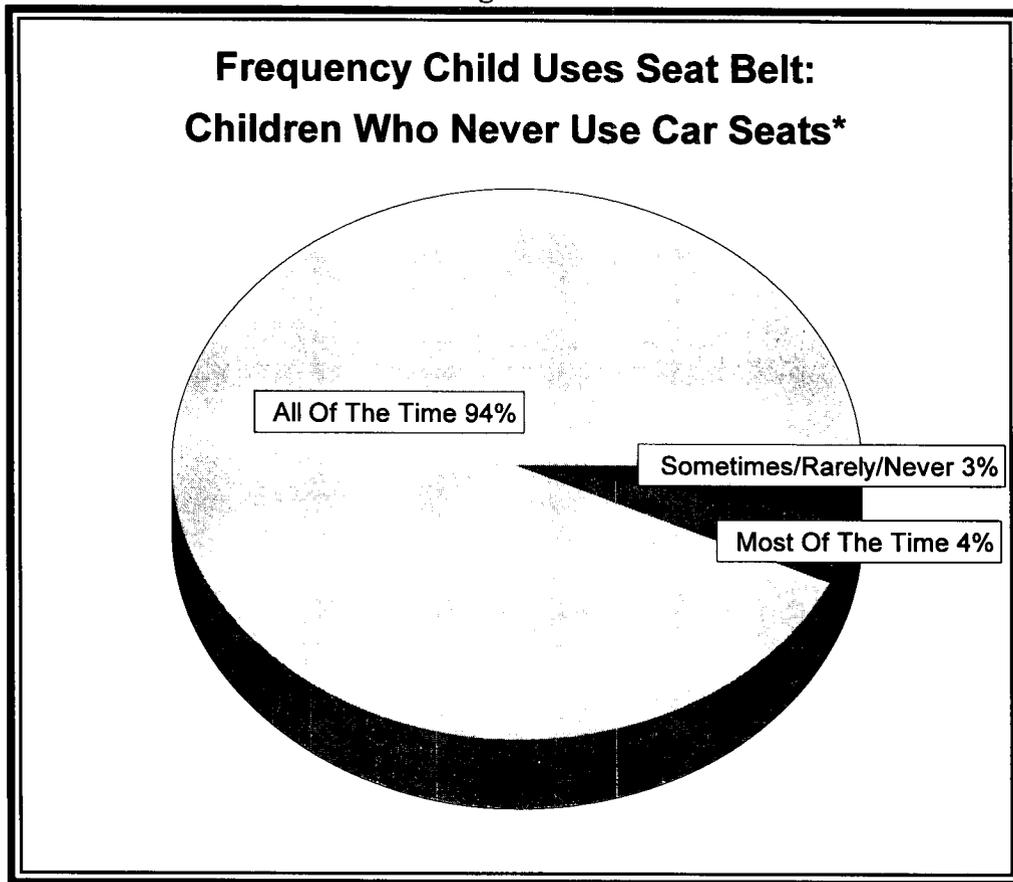
Base: Child under age 9 never uses a car seat.

Unweighted N=642

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

The vast majority of children who never use car seats reportedly wear a seat belt all (94%) or most (4%) of the time when riding in motor vehicles.

Figure 64



Qx: How often does he/she use a seat belt?

Base: Child under age 9 never uses a car seat.

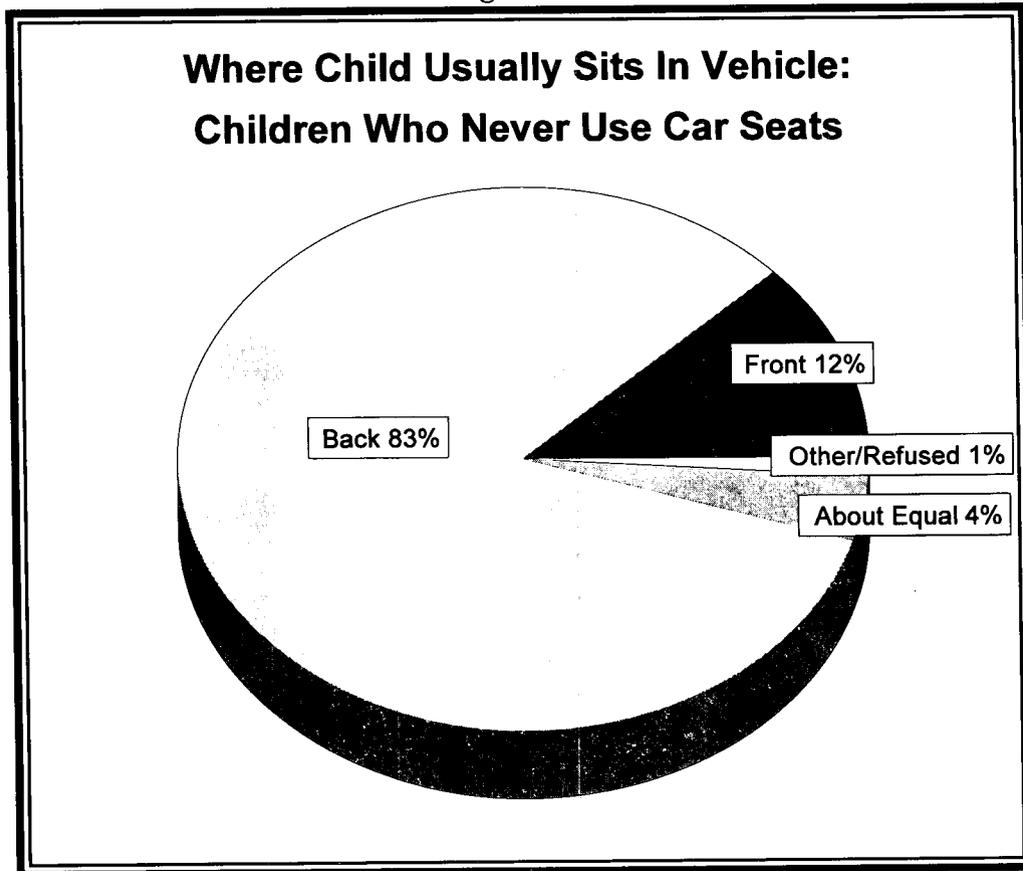
Unweighted N=642

** The sum of the percentages in the pie chart exceeds 100% because the numbers are rounded.*

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

The vast majority (83%) of children under age 9 who never use car seats tended to sit in the back seat, while 12% usually sat in the front seat. Another 4% sat about equally between the front and the back.

Figure 65



Qx: Where does the (AGE) usually sit in the vehicle when you are driving - - the front seat or the back seat?

Base: Child under age 9 never uses a car seat.

Unweighted N=642

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

As with parents/caregivers of part time car seat users, the parents/caregivers of children who never used car seats but used seat belts instead were asked about the fit of the belt. As shown in Table 11, the two groups did not appreciably differ in their aggregate response to the lap belt questions. Problems with the fit of the shoulder belt were more likely among children who used car seats part time, although improper fit still was in evidence among a segment of the non-users.

Table 11
How Seat Belt Fits The Child:
Non-Users Of Car Seats Versus Part Time Users Of Car Seats

Qx: Please tell me, yes or no, if the following things usually occur when the (AGE) wears a seat belt while riding in a motor vehicle. On most trips, does . . . ?

Base: Child under age 9 never uses a car seat but uses a seat belt, or is a part time car seat user who at least on occasion uses a seat belt.

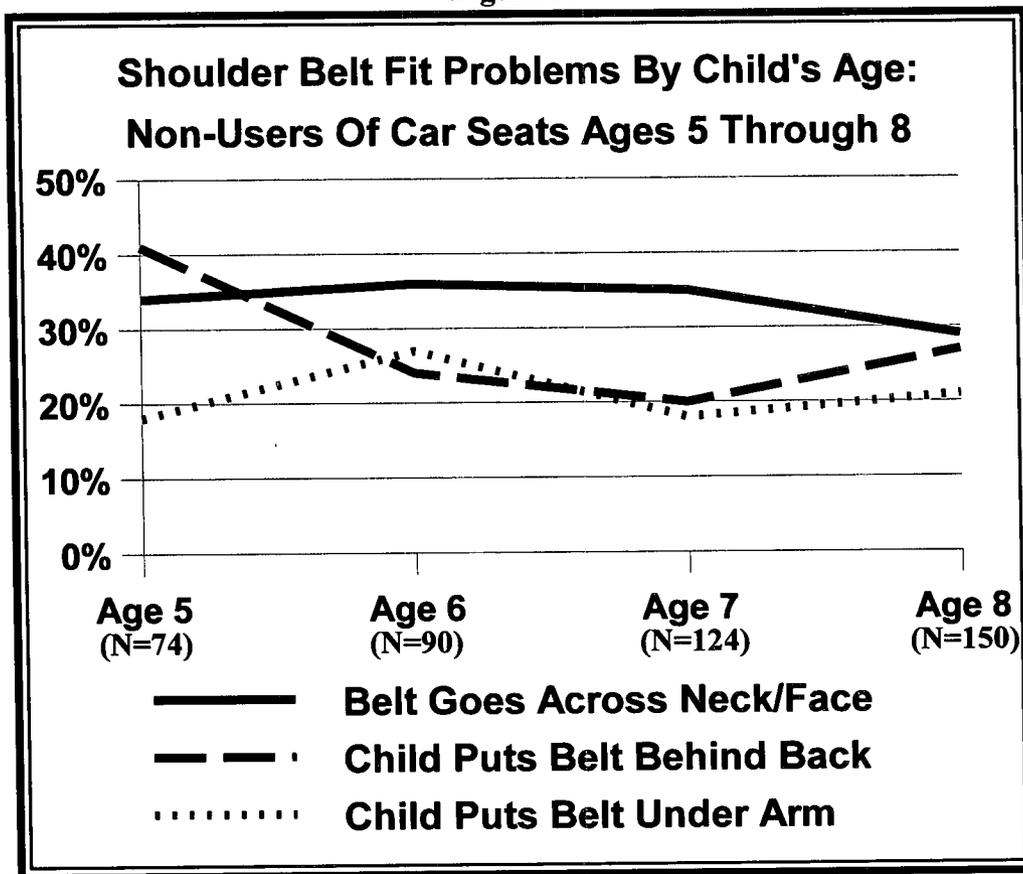
On most trips,	Non-Users of Car Seats	Part Time Car Seat Users
The lap belt goes across the child's upper thighs or hips.	59% (N=610)	57% (N=102)
The lap belt goes across the child's stomach.	49% (N=610)	48% (N=102)
The child's legs bend over the edge of the seat.	70% (N=630)	45% (N=110)
The shoulder belt goes across the child's neck or face.	34% (N=492)	41% (N=88)
The child puts the shoulder belt behind (his/her) back.	26% (N=492)	41% (N=88)
The child puts the shoulder belt under (his/her) arm.	21% (N=492)	41% (N=88)

*Respondents were asked only those questions concerning fit appropriate for the type of seat belt usually worn by the child (i.e. shoulder only, lap only, or shoulder and lap belt systems), resulting in the different N-Sizes.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

The responses to the questions on shoulder belt fit were analyzed by child's age to determine if there was a "break point" at which juncture problems with fit steeply declined. The analyses included only those ages for which there were more than 50 cases. No break point was identified as the percentages, with some exceptions, were fairly consistent across age in terms of parents and caregivers saying that the belt cut across the child's neck/face (34%, 36%, 35%, 29%), the child put the belt behind the back (41%, 24%, 20%, 27%), or put the belt under the arm (18%, 27%, 18%, 21%). The differences that did appear may have resulted from small subsample sizes.

Figure 66



Qx: Please tell me, yes or no, if the following things usually occur when the (AGE) wears a seat belt while riding in a motor vehicle. On most trips does. . . the shoulder belt go across the child's neck or face. . . the child put the shoulder belt behind (his/her) back. . . the child put the shoulder belt under (his/her) arm?

Base: Child age 5-8 never rides in a car seat and uses a seat belt having a shoulder strap. Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Parents/caregivers of non-users of car seats were twice as likely as full time and part time user groups not to give an age when asked the appropriate transition point but instead provide "other" criteria (10% versus 5%). Nonetheless, they were similar to the other groups in that about half (52%*) said a child was ready to wear seat belts at age 5 or younger (versus 49% for the other groups).

Table 12
Age At Which Parent/Caregiver Believes A Child Is Ready to
Begin Wearing A Seat Belt:
Non-Users Versus Users Of Car Seats

***Qx:** In general, at what age do you think a child is ready to begin wearing a seat belt rather than use a child safety seat or a booster seat?*

***Base:** Child under age 9 identified as either a full time user, part time user, or non-user of car seats.*

Age	Non-Users (N=642)	Part Time Users (N=122)	Full Time Users (N=657)
1 Year	**	**	1%
2 Years	1%	3%	1%
3 Years	3%	3%	5%
4 Years	17%	14%	16%
5 Years	32%	29%	26%
6 Years	16%	12%	17%
7 Years	5%	8%	7%
8 Years	4%	14%	7%
9 Years	1%	1%	1%
10 Years	0%	3%	2%
11 Years	**	**	**
12 Years	1%	1%	2%
Other	10%	5%	5%
DK/Refused	12%	7%	11%

*This percentage differs slightly from the sum of the listed percentages for the component categories because it combines non-rounded numbers whereas the numbers in the Table are rounded .

**Less than 0.5%.

2000 SURVEY RESULTS

CHAPTER 5

BOOSTER SEAT ISSUES

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Type of Restraint Used By Children Under Age 9

Chapter 3 presented data on the type of car seat used by children, but only as a percentage of car seat users (e.g., 63% of children who used car seats were using front facing child safety seats). Tables 13 and 14 show the percentage of all children who use infant seats, front facing child safety seats, and booster seats based on responses provided by the parents/caregivers defined on page 30. Readers are cautioned about the small subsample sizes at each age and weight range.

A discussion on how the type of child restraint was determined, and the difficulties in attempting to make this determination over the telephone, was presented on page 35. As occurred in Chapter 3, Tables 13 and 14 include some degree of error resulting from these difficulties. In addition, the percentage of “all the time” car seat users on pages 32 and 33 is sometimes less than the combined percentage of booster seat, front facing child seat, and infant seat users on pages 89 and 90. This is because the Figures on pages 32-33 present parents’/caregivers’ response to the introductory car seat question which asked frequency of use. As indicated on pages 34 and 35, the survey subsequently recorded some contradictions to that response. The Tables on the following two pages move those cases to a separate category, thereby occasionally producing lower overall figures for use of child restraints than appear on pages 32 and 33.

Only 56% of the infants who had not reached the age of 1 were identified as using a rear facing infant seat, at least on occasion. Another 21% appeared to be using front facing child safety seats. Seven percent were using booster seats as determined by the question on strap location (see page 35). While all the parents/caregivers of the infant booster seat users affirmed the strap location on a first follow-up probe, none identified the seat as a booster seat when directly asked on a second follow-up probe. The percentage of “Don’t Know/Refused” responses was higher for infants than for any other age. These largely were cases where the parent/caregiver refused to respond when asked the question of how frequently the child used a car seat.

Front facing child safety seats predominated among children ages 1 (74%), 2 (86%), and 3 (73%). By age 3, there was a shift of some children to booster seats. Booster seat use peaked at age 4 (28%), but by age 5 most children no longer used a child restraint. For most children, an adult seat belt will not properly fit the child until at least age 8. NHTSA and other safety organizations consider a booster seat to be the appropriate restraint for most children between the ages of 4 to 8 (although front facing child safety seats would be appropriate for small children at the younger end of that age range while large children at the older end may be adequate size for seat belts to fit them properly). Yet only 14% of children ages 4 through 8 were using booster seats according to the data while another 14% were using front facing child safety seats. About 70% in the 4 through 8 age range were not using a child restraint according to the parents and caregivers. The remaining 2% fell in the “Never Drive Child” and “DK/Refused” categories.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

**TABLE 13
Percentage Of Children Who At Least On Occasion
Use A Child Restraint By Age**

Qx: *When you are driving and the (AGE) rides in the vehicle with you, how often does (he/she) ride in a child car seat? Child car seats include infant seats, toddler seats, and booster seats.*

Qx: *When the (AGE) is fastened in the child car seat, are there straps over both shoulders, a strap across only one shoulder, or are there no straps over either shoulder?*

Qx: *When you are driving and the (AGE) is riding in the child car seat, is he/she usually front facing or rear facing?*

Base: *Parents/caregivers as defined on page 30.*

Age	<1	1	2	3	4	5	6	7	8	4-8
N-Size	(171)	(117)	(180)	(142)	(166)	(162)	(148)	(177)	(199)	(852)
Booster Seat	7%	5%	5%	17%	28%	24%	12%	6%	4%	14%
Front Facing Child Seat	21%	74%	86%	73%	46%	15%	7%	3%	2%	14%
Infant Seat	56%	11%	3%	1%	--	--	1%	--	--	**
Use Seat, DK/Ref Strap Location	1%	--	--	1%	--	1%	--	--	--	**
Never Uses Seat	1%	**	1%	4%	20%	55%	78%	87%	92%	68%
Changed From Uses To Never Uses Seat	3%	7%	3%	3%	2%	3%	2%	2%	2%	2%
Never Drive Child	2%	2%	**	--	**	1%	**	1%	1%	1%
*DK/Refused	8%	1%	1%	2%	3%	**	--	**	1%	1%

*These mostly are cases where parents/caregivers refused to respond when administered the introductory question asking how often the child rides in a child restraint when they drive. The rest answered "Don't Know" to that question.

**Less than 0.5% -Zero cases

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Table 14 shows the type of child restraint used at different weight ranges. Among children under age nine who weighed 40 or more pounds, about 7-out-of-10 were not using a child restraint.

TABLE 14
Percentage Of Children Who At Least On Occasion
Use A Child Restraint By Weight

Qx: *When you are driving and the (AGE) rides in the vehicle with you, how often does (he/she) ride in a child car seat? Child car seats include infant seats, toddler seats, and booster seats.*

Qx: *When the (AGE) is fastened in the child car seat, are there straps over both shoulders, a strap across only one shoulder, or are there no straps over either shoulder?*

Qx: *When you are driving and the (AGE) is riding in the child car seat, is he/she usually front facing or rear facing?*

Base: *Parents/caregivers as defined on page 30.*

Weight In Pounds	<20	20-29	30-39	40+
N-Size	(129)	(247)	(289)	(778)
Booster Seat	9%	4%	14%	14%
Front Facing Child Seat	11%	72%	71%	14%
Infant Seat	62%	14%	1%	1%
Use Seat, DK/Ref Strap Location	--	--	**	**
Never Uses Seat	8%	1%	9%	68%
Changed From Uses To Never Uses Seat	6%	4%	3%	2%
Never Drive Child	1%	2%	--	1%
*DK/Refused	3%	3%	2%	1%

*These mostly are cases where parents/caregivers refused to respond when administered the introductory question asking how often the child rides in a child restraint when they drive. The rest answered "Don't Know" to that question.

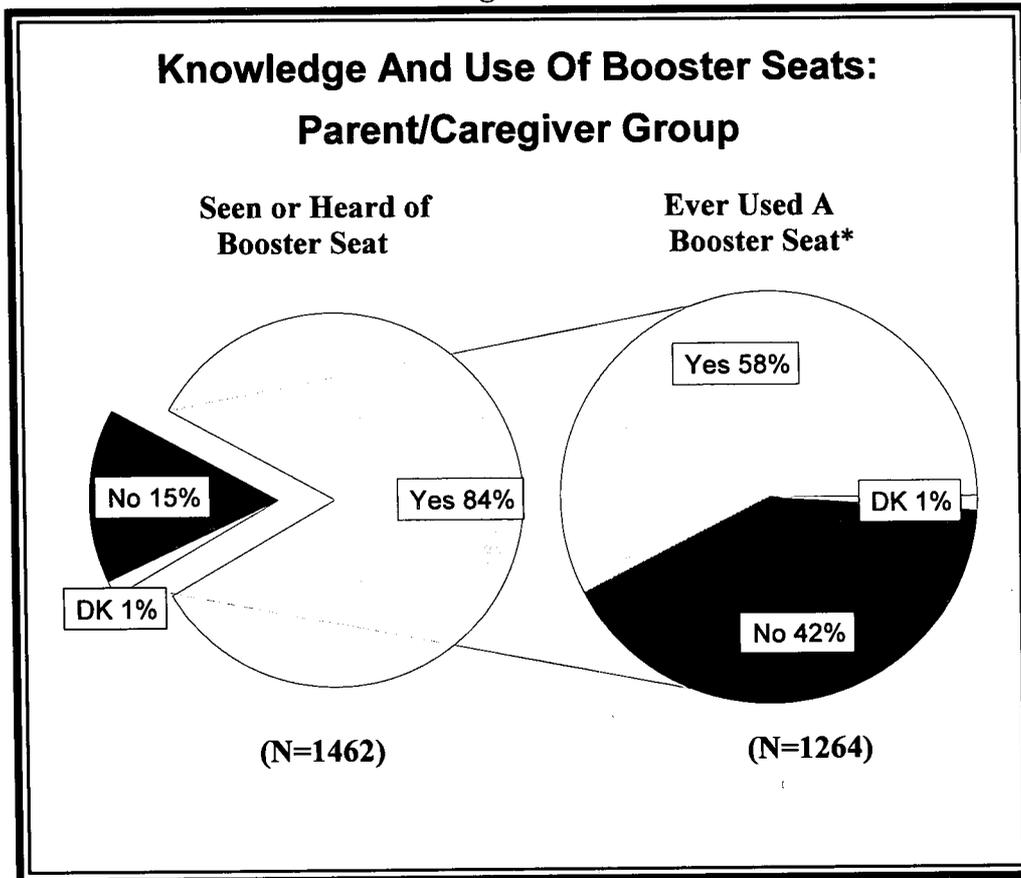
** Less than 0.5% -Zero cases

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Awareness Of Booster Seats

Children's use of restraint systems that don't properly fit them can lead to injuries. Booster seats are intended to bridge the gap between the time the child outgrows a front facing toddler seat to the time when the seat belt properly fits the child. As stated on page 88, a booster seat is the appropriate restraint for most children between the ages of roughly 4 through 8. Yet these children usually use seat belts instead (see pages 82 and 89). One question is whether people are aware of booster seats. Those considered most likely to have heard of them would be the parent/caregiver group. Figure 67 shows that about 5-out-of-6 were aware of booster seats. Among those aware of booster seats, 58% said they had used them with their child(ren).

Figure 67



Qx: Before today, had you ever seen or heard of a type of car seat called a booster seat?

Qx: Have you ever used a booster seat when driving with your (child/children)?

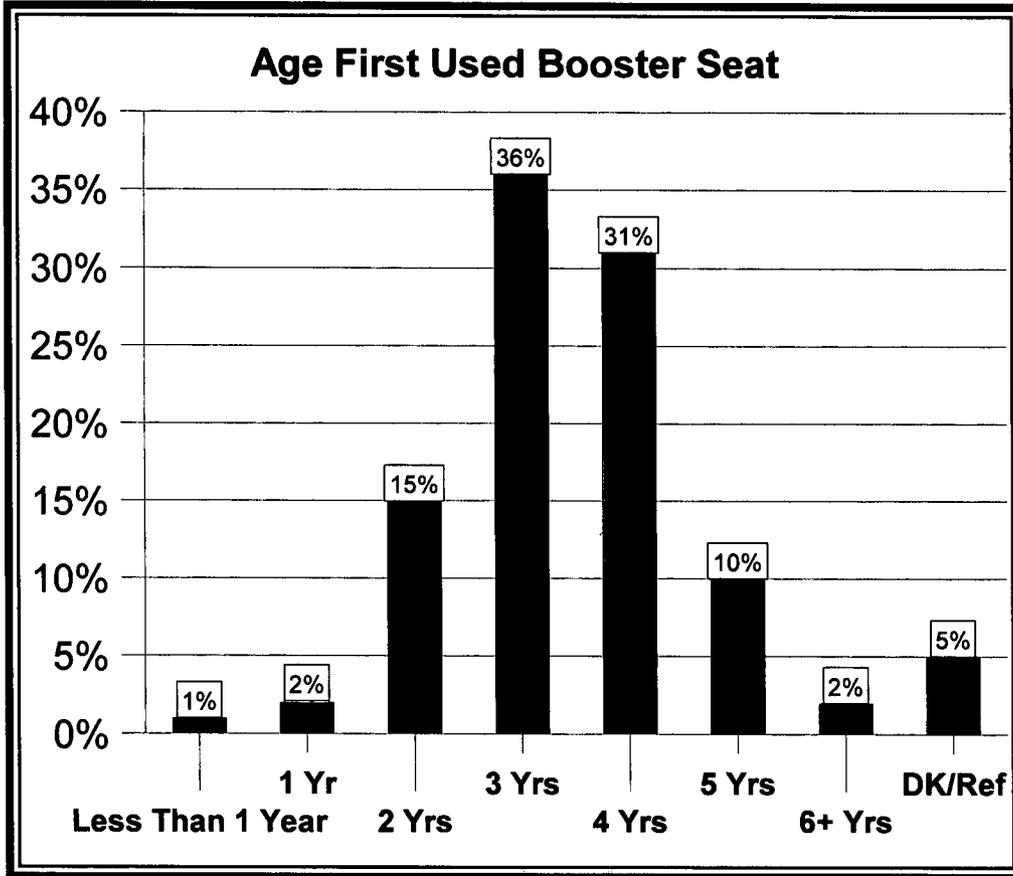
Base: Parents/caregivers as defined on page 30 Unweighted N's listed above.

* The sum of the percentages in the pie chart exceeds 100% because the numbers are rounded.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

The most frequent age at which parents/caregivers started using booster seats with their child(ren) was age three (36%). More than one-half (53%*) reported an age younger than age 4, while another 5% were unsure or refused to say at what age they began using the booster seat with the child(ren).

Figure 68



Qx: At what age did you begin using a booster seat for your (child/children)?

Base: Parents/caregivers who said they had used a booster seat when driving their child(ren).

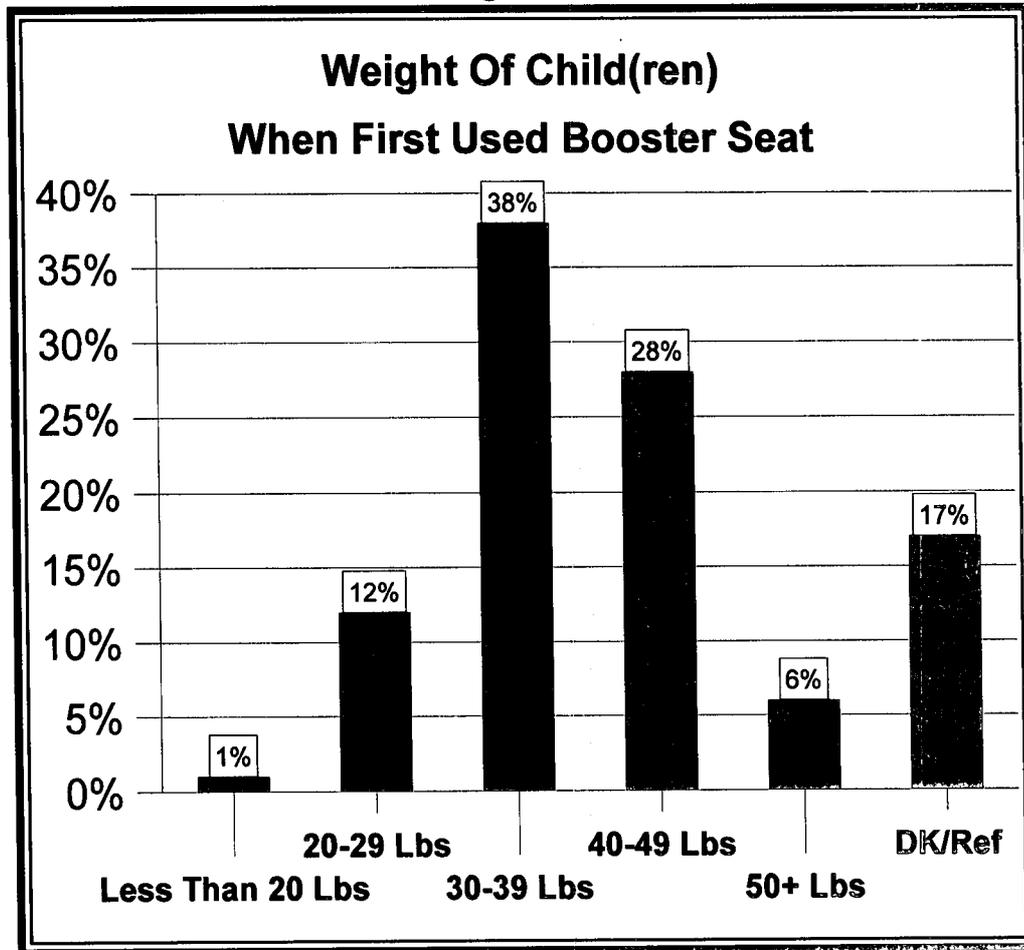
Unweighted N=737

**This percentage differs slightly from the sum of the listed percentages for the component categories because it combines non-rounded numbers whereas the numbers in the Figure are rounded.*

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Forty pounds is generally touted as the approximate threshold weight for transitioning a child to a booster seat. However, one-half (50%*) of the parents/caregivers who had used booster seats with their child(ren) indicated that they had started using the restraint before the child reached 40 pounds, while another 17% were unsure about the starting weight or else refused to respond.

Figure 69



Qx: About how much did the (child/children) weigh at the time you began using a booster seat?

Base: Parents/caregivers who said they had used a booster seat when driving their child(ren).

Unweighted N=737

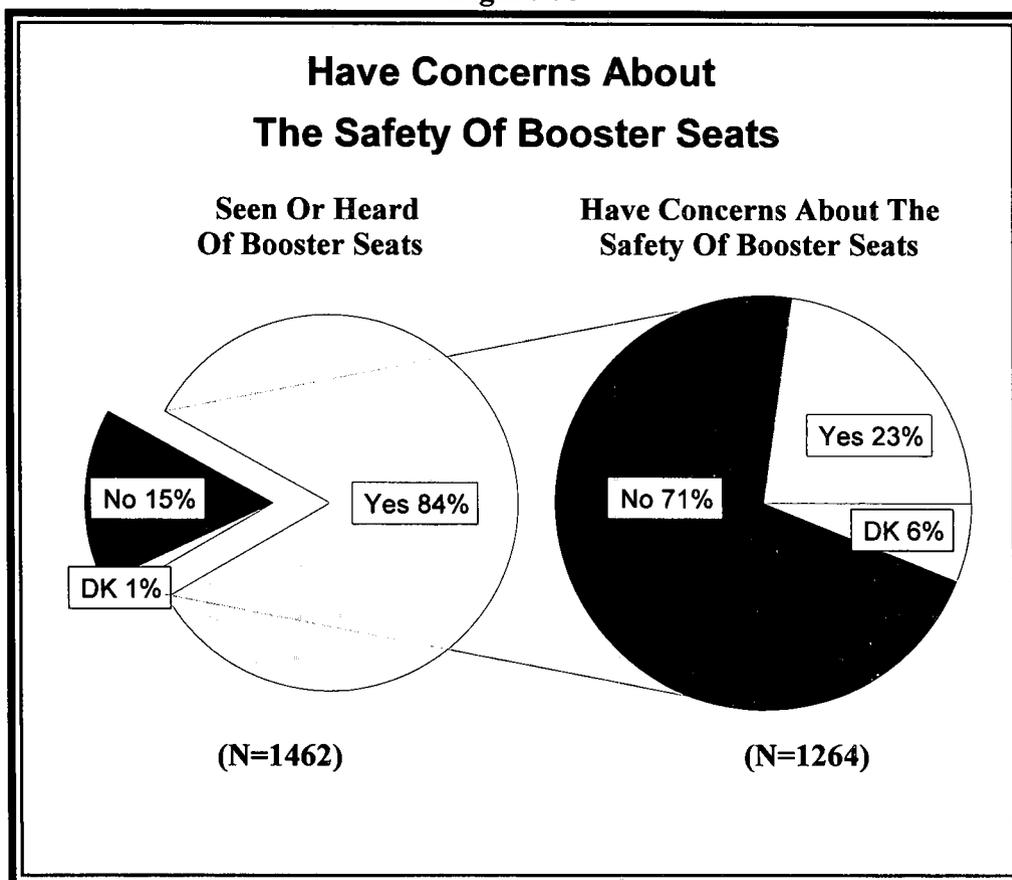
**This percentage differs slightly from the sum of the listed percentages for the component categories because it combines non-rounded numbers whereas the numbers in the Figure are rounded.*

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Concerns About The Safety Of Booster Seats

During testing of the questionnaire prior to the 1998 MVOSS, subjects participating in the testing expressed concern about the safety of booster seats. As a consequence, the 1998 survey added a question asking if the respondent had any concerns about the safety of booster seats. This question was asked only of parents/caregivers who had said they were aware of booster seats. Among the 84% of parents/caregivers who had seen or heard of booster seats, almost one-fourth (23%) had concerns about their safety and another 6% were unsure.

Figure 70



Qx: Before today, had you ever seen or heard of a type of car seat called a booster seat?

Qx: Do you have any concerns about the safety of booster seats?

Base: Parents/caregivers as defined on page 30

Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

When asked what concerns they had about the safety of booster seats, the parents/caregivers criticized them as loose fitting and unstable systems that would not adequately restrain the child in a crash.

Table 15	
Concerns About Booster Seats	
<i>Qx: What are those concerns (about the safety of booster seats)?</i>	
<i>Base: Parents/caregivers who said they had concerns about the safety of booster seats.</i>	
<i>Unweighted N=292</i>	
Concern	Percent
Security of Attachment (Net)	31%
Seat isn't securely attached to car's seat/not stable/seat slides/shifts/rocks/moves around	24%
Seat is not secure	3%
Seat doesn't have it's own straps/attached by using seat belt straps	2%
Straps can't secure seat tightly enough	2%
Any other security of attachment mentions	2%
Inadequate Restraint (Net)	26%
Child/infant could slip/slide out/nothing to keep infant from sliding out of seat	7%
No shoulder straps/restraints	4%
Easy for child to unlock/unbuckle/undo booster seat	4%
Inadequate restraint/does not fully restrain child (unspecified)	3%
Easy for child to climb/wiggle/escape out of seat	2%
Child could be ejected/thrown/fly out of seat in a sudden stop	2%
All other inadequate restraint capability mentions	5%
Other	51%
Safety concerns/don't know how safe they are (unspecified)	16%
How safe they are compared to regular infant/child safety seats	5%
How safe they would be in an accident	3%
Uncomfortable for child/not as comfortable as regular car seat	3%
My child is too small/young to use it	2%
Poorly/improperly designed	1%
Know of a child who was injured	*
Any other type of response	22%
Don't know/NA	3%

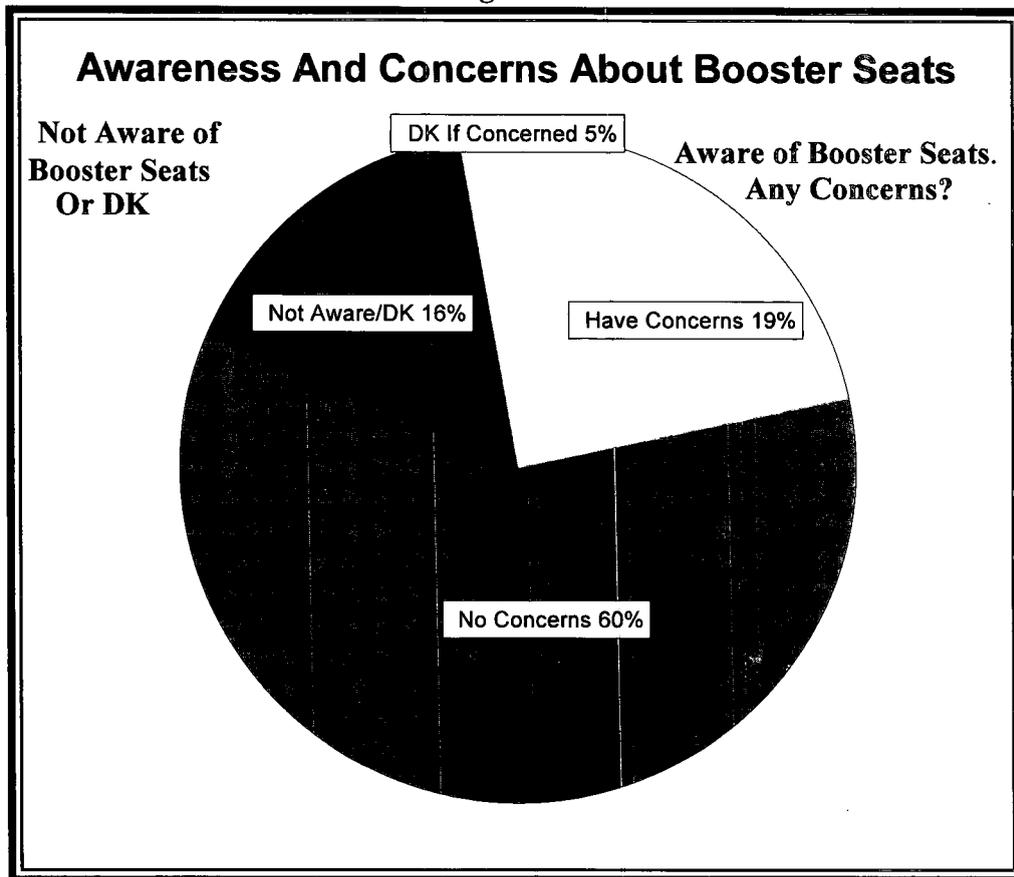
*Less than 0.5%

Total exceeds 100% due to multiple responses.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

In total, 16% of parents/caregivers either said they were not aware of booster seats or else were unsure if they had seen or heard about them (see page 91). Almost one-fifth of parents/caregivers (19%) had heard of booster seats and had concerns about them (i.e., 23% of the 84% who were aware of booster seats). Five percent were aware of booster seats, but unsure whether they had concerns about their safety. The remaining 60% of parents/caregivers said they were aware of booster seats, and had no concerns about their safety.

Figure 71



Qx: Before today, had you ever seen or heard of a type of car seat called a booster seat?

Qx: Do you have any concerns about the safety of booster seats?

Base: Parents/caregivers as defined on page 30

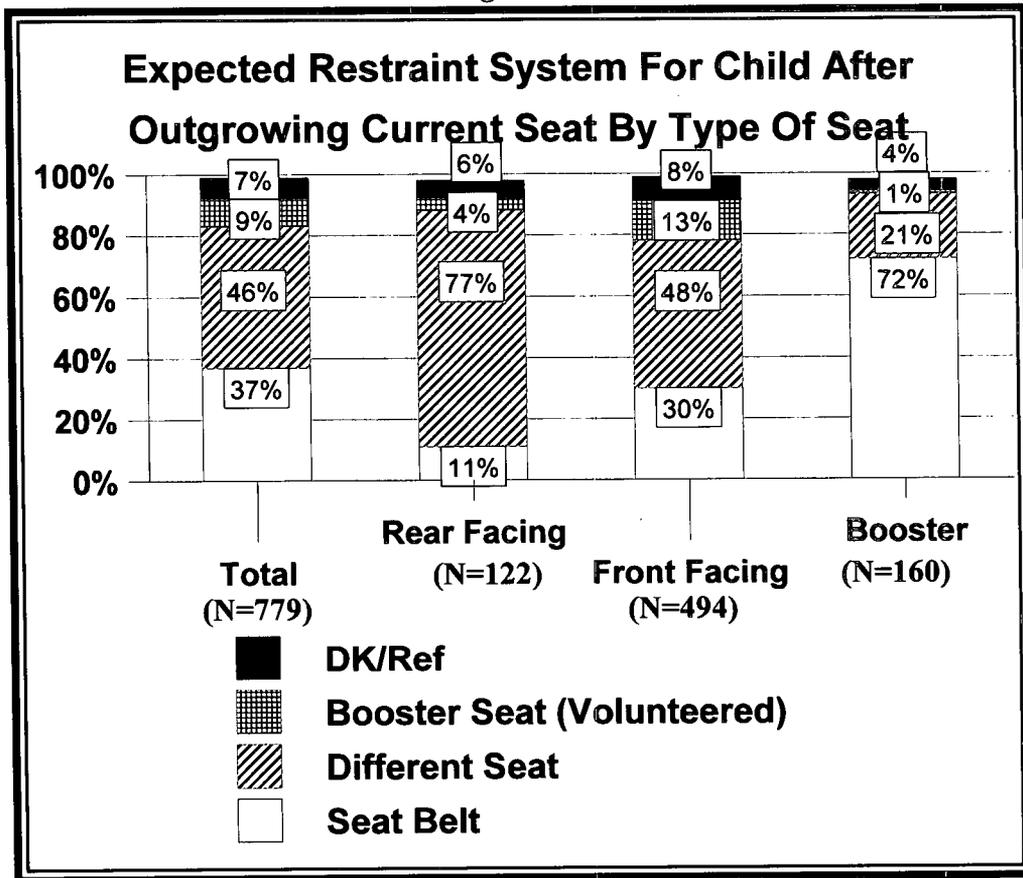
Unweighted N=1462

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Expected Restraint System After Outgrowing Current Seat

The interviewers asked parents/caregivers if they expected the child to use “a different type of car seat, a seat belt, or something else” after outgrowing the current seat. In general, children in rear facing seats were expected to move on to other safety seats, although 11% expected the child to use seat belts and 2% volunteered “nothing.” Expectations became more varied with front facing safety seats as 60%* said that the child would use a different seat or booster seat while 38% either answered that the child would graduate to seat belts or else that they did not know what would happen.

Figure 72



Qx: When your (AGE) outgrows his/her current child car seat, do you expect him/her to use a different type of car seat, a seat belt, or something else?

Base: Child at least on occasion rides in a child car seat. Unweighted N's listed above.

**This percentage differs slightly from the sum of the listed percentages for the component categories because it combines non-rounded numbers whereas the numbers in the Figure are rounded.*

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

2000 SURVEY RESULTS

CHAPTER 6

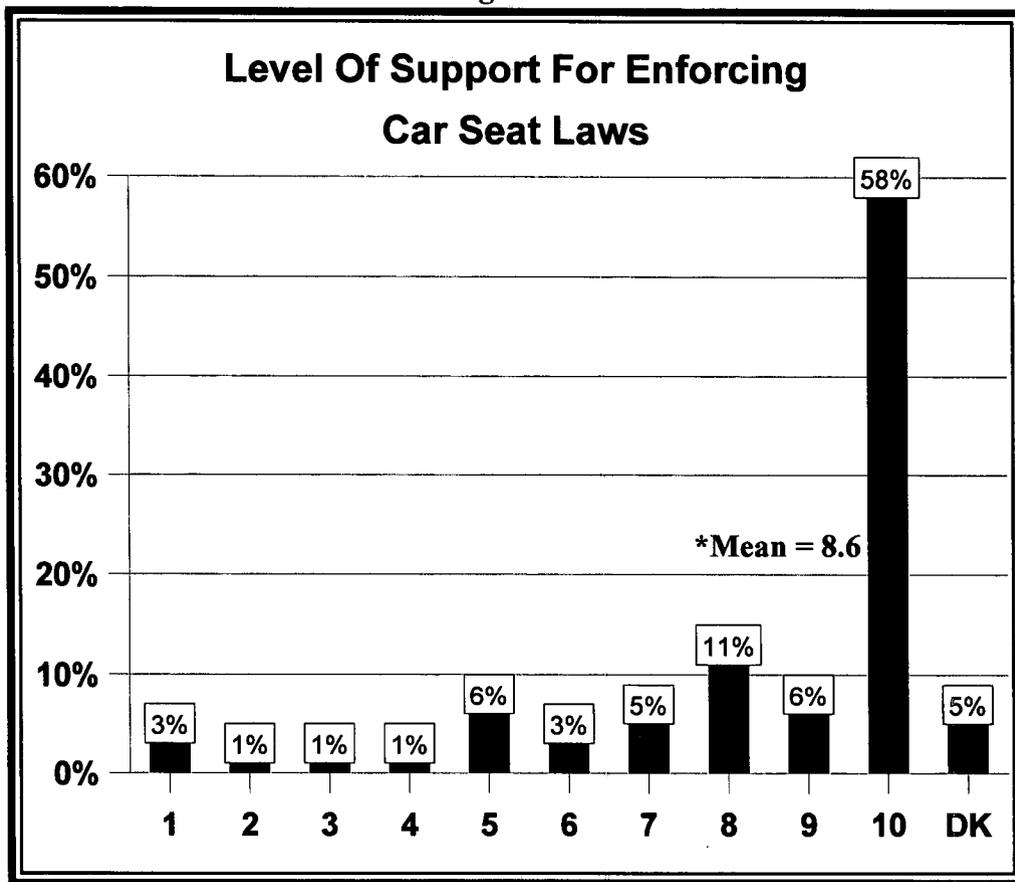
**ATTITUDES TOWARD ENFORCEMENT OF
CHILD RESTRAINT LAWS**

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Support For Enforcement Of Car Seat Laws

The public age 16 and older favors stringent enforcement of car seat laws. Interviewers asked respondents their opinion of how strict police enforcement of child car seat laws should be. Respondents were asked to answer on a scale of 1 to 10, where 1 meant that police should hardly ever give a ticket for a car seat violation and 10 meant that police should give a ticket at every opportunity. Almost three-in-five persons (58%) believed that the police should issue a ticket at every opportunity. The mean score on the 10-point scale was 8.6.

Figure 73



Qx: How do you personally feel about the police enforcement of child car seat laws? On a scale of 1 to 10, where 1 means police should hardly ever give tickets and 10 means police should give a ticket at every opportunity for violations of child car seat laws, how strict should police enforcement be?

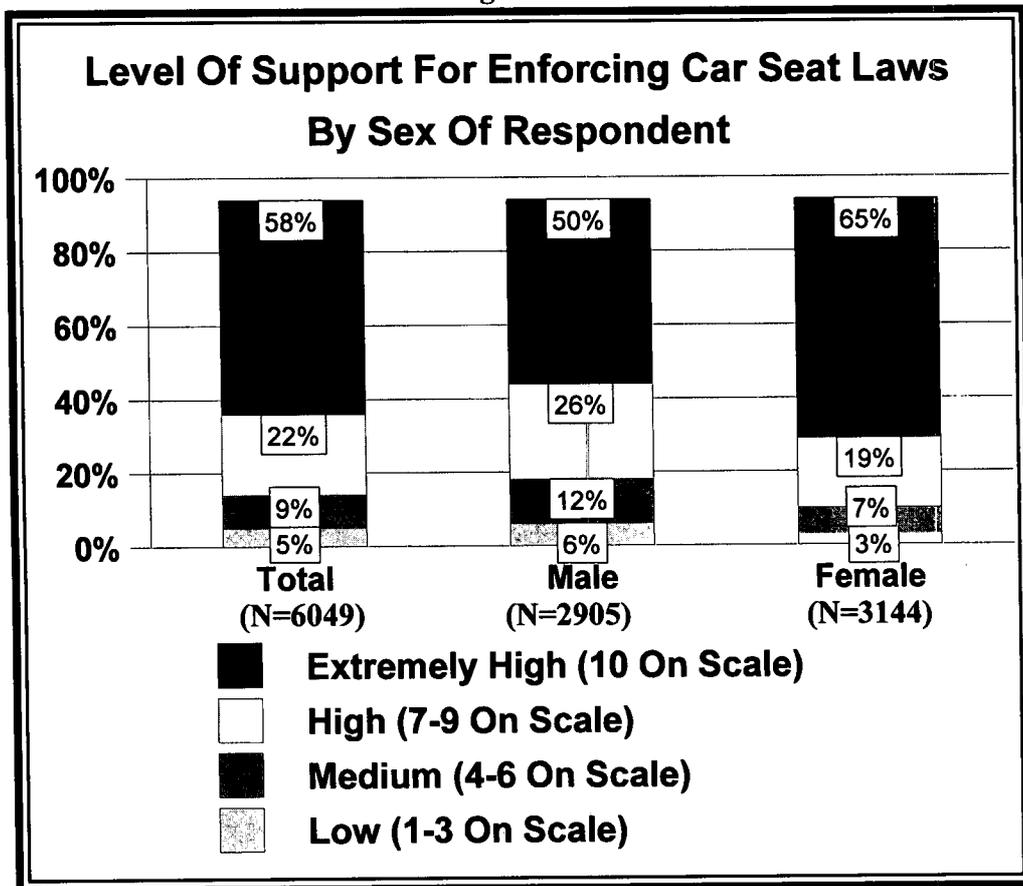
Base: Total population age 16+.

*Unweighted N=6049 * The mean excludes respondents in the Don't Know/Refused category.*

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Females were more likely to call for strict enforcement of the car seat laws than males: 65% of females believed that police should ticket at every opportunity versus 50% of males.

Figure 74



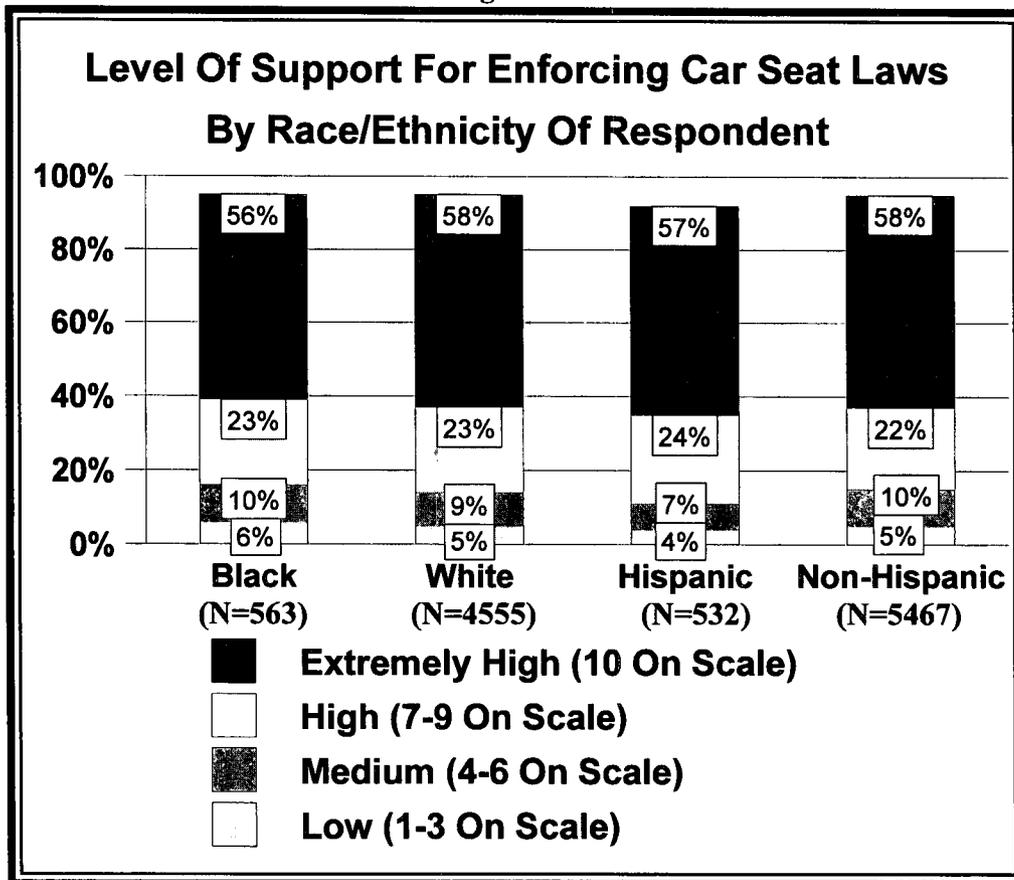
Qx: How do you personally feel about the police enforcement of child car seat laws? On a scale of 1 to 10, where 1 means police should hardly ever give tickets and 10 means police should give a ticket at every opportunity for violations of child car seat laws, how strict should police enforcement be?

*Base: Total population age 16+.
Unweighted N's listed above.*

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

There was little difference in preferred level of police enforcement of child restraint laws between blacks and whites, and between Hispanics and non-Hispanics.

Figure 75



Qx: How do you personally feel about the police enforcement of child car seat laws? On a scale of 1 to 10, where 1 means police should hardly ever give tickets and 10 means police should give a ticket at every opportunity for violations of child car seat laws, how strict should police enforcement be?

Base: Total population age 16+.

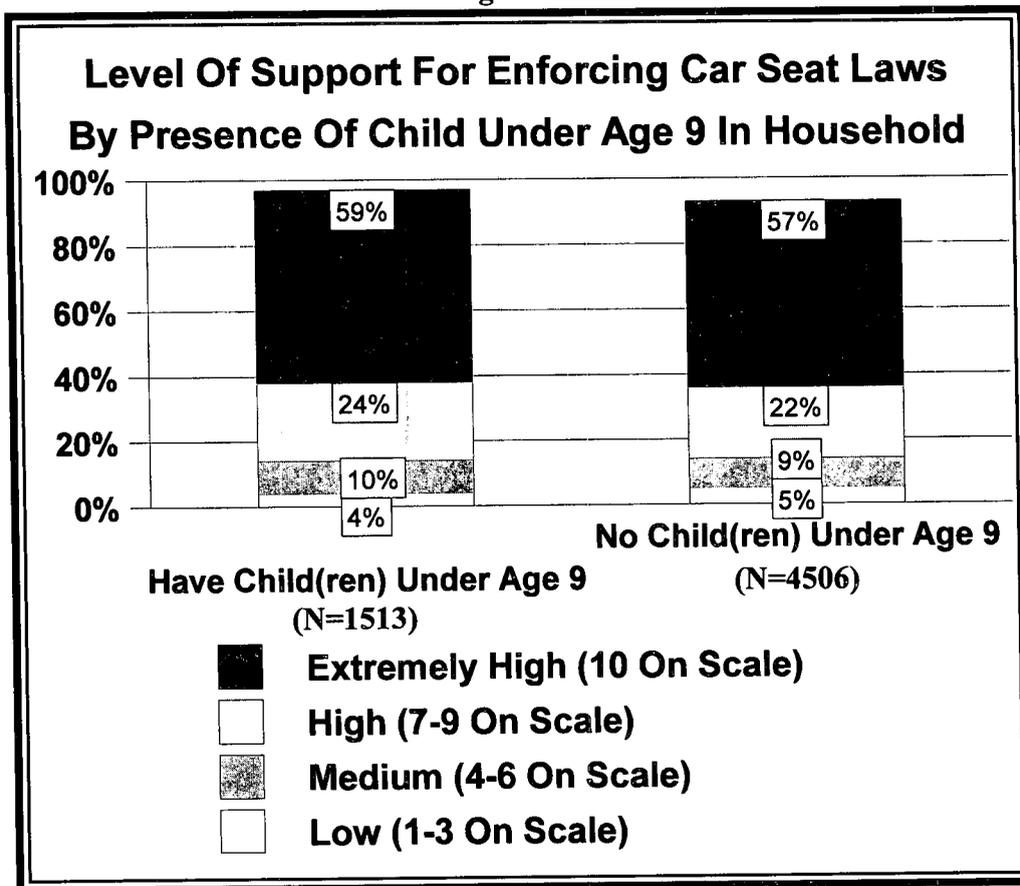
Unweighted N's listed above.

See page xviii for background information on racial and ethnic categories.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

The level of support for enforcing car seat laws was similar regardless of whether there were children under age 9 living in the household. Fifty-nine percent of persons who had a child under the age of 9 in the household favored ticketing at every opportunity, as opposed to 57% who did not have a child in that age range living in their household.

Figure 76



Qx: How do you personally feel about the police enforcement of child car seat laws? On a scale of 1 to 10, where 1 means police should hardly ever give tickets and 10 means police should give a ticket at every opportunity for violations of child car seat laws, how strict should police enforcement be?

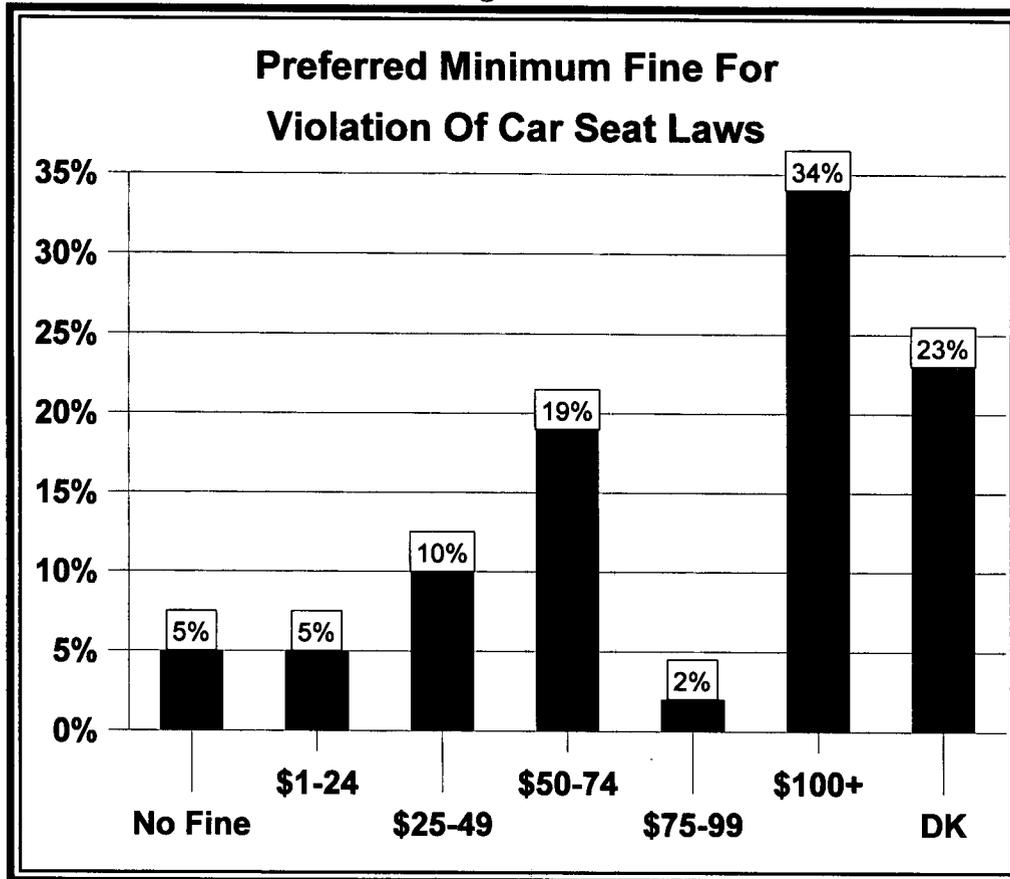
Base: Total population age 16+.

Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Regardless of their attitude about police enforcement of child car seat laws, respondents age 16 and older were asked what they thought the minimum fine should be for violation of the laws. A majority (56%*) believed the fine should be \$50 or more, with about one-third of the public (34%) favoring a fine of \$100 or more.

Figure 77



Qx: What do you think the minimum fine should be for violation of child car seat laws?

Base: Total population age 16+

Unweighted N=6049

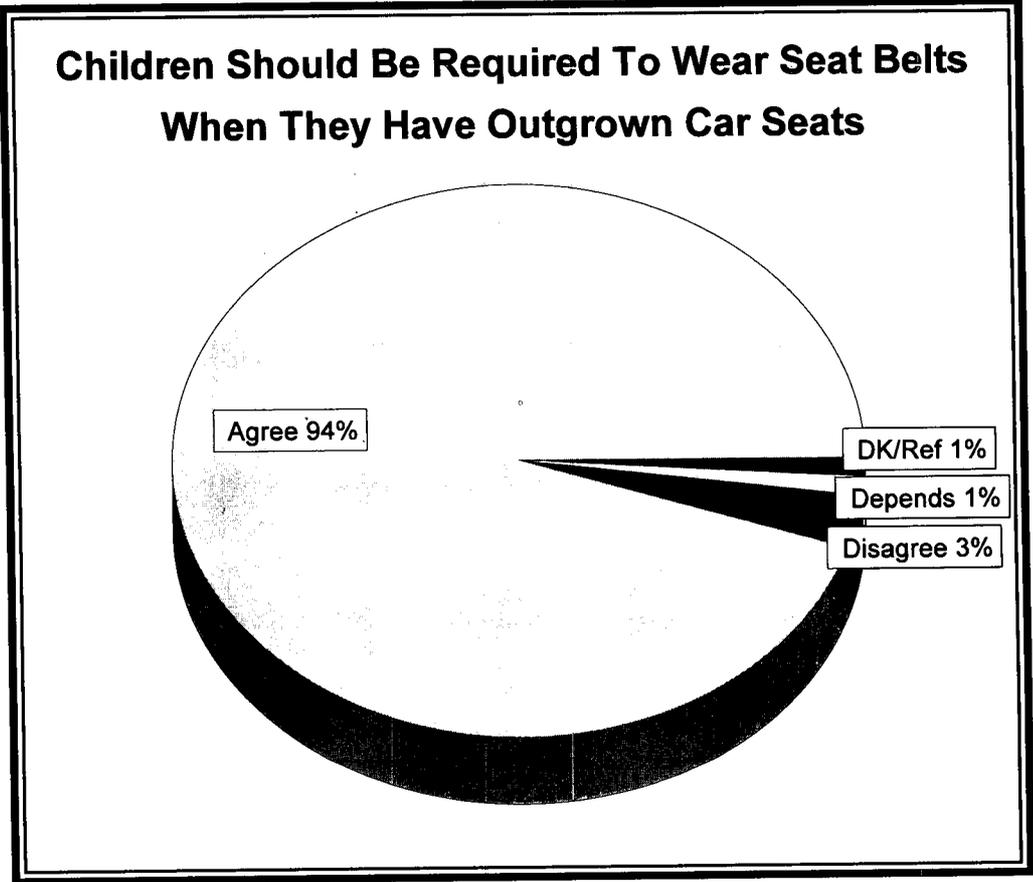
**This percentage differs slightly from the sum of the listed percentages for the component categories because it combines non-rounded numbers whereas the numbers in the Figure are rounded.*

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Attitudes About Occupant Restraint Requirements For Children Who Outgrow Car Seats

Ninety-four percent of persons age 16 and older agreed that children should be required by law to wear seat belts once they have outgrown car seats, while 3% disagreed. One percent believed that it depended on the age of the child, while 1% said they did not know if there should be a seat belt requirement or else refused to respond.

Figure 78



Qx: What about when children outgrow a child car seat? Do you agree or disagree that they should be required by law to wear seat belts when riding in a vehicle?

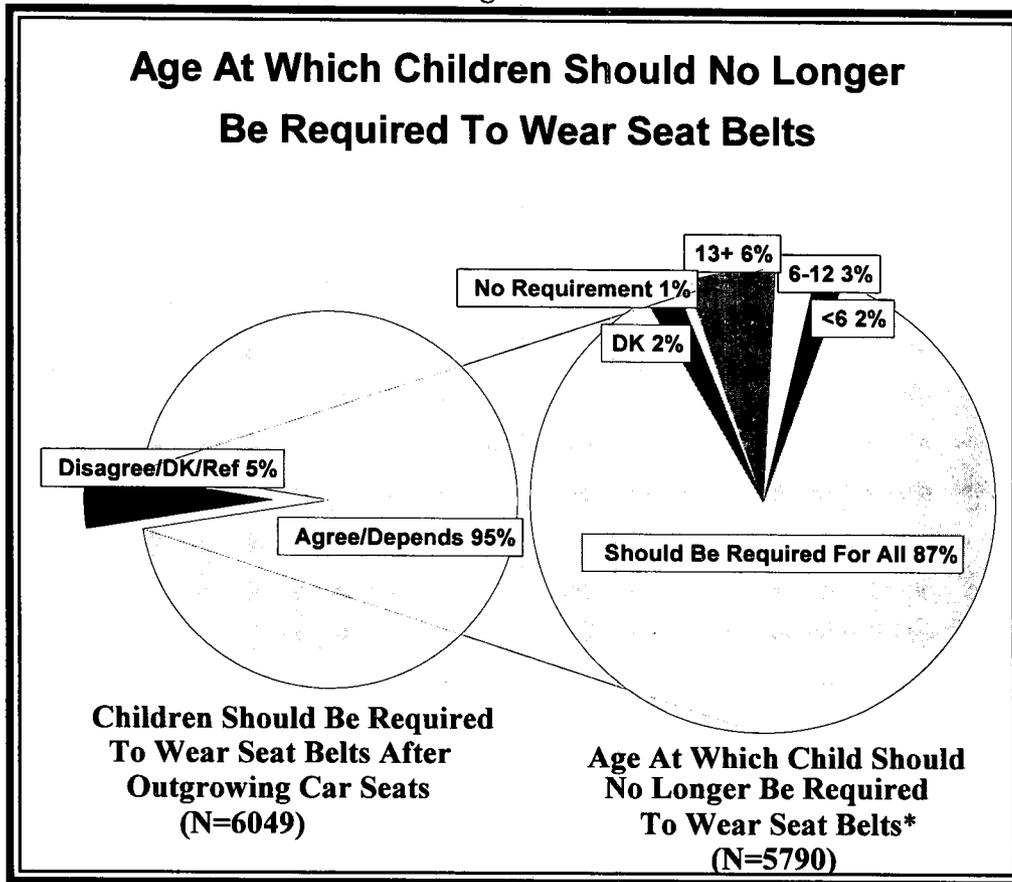
Base: Total population age 16+

Unweighted N=6049

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Those who agreed that children should be required to wear seat belts after outgrowing car seats, or said it depended on the child's age, were asked if there was an upper age limit beyond which children should not be required to wear seat belts. The vast majority (87%) rejected the notion of an upper age limit by saying that seat belt use should be required for all children (which equated to 83% of the total population age 16 and older). The remaining respondents either offered a specific age as an age limit, reversed their previously stated support for the seat belt requirement, or said they did not know if there should be an age limit.

Figure 79



Qx: What about when children outgrow a child car seat? Do you agree or disagree that they should be required by law to wear seat belts when riding in a vehicle?

Qx: How old do you think children should be before they are not required by law to wear seat belts or do you think all children should be required to wear them?

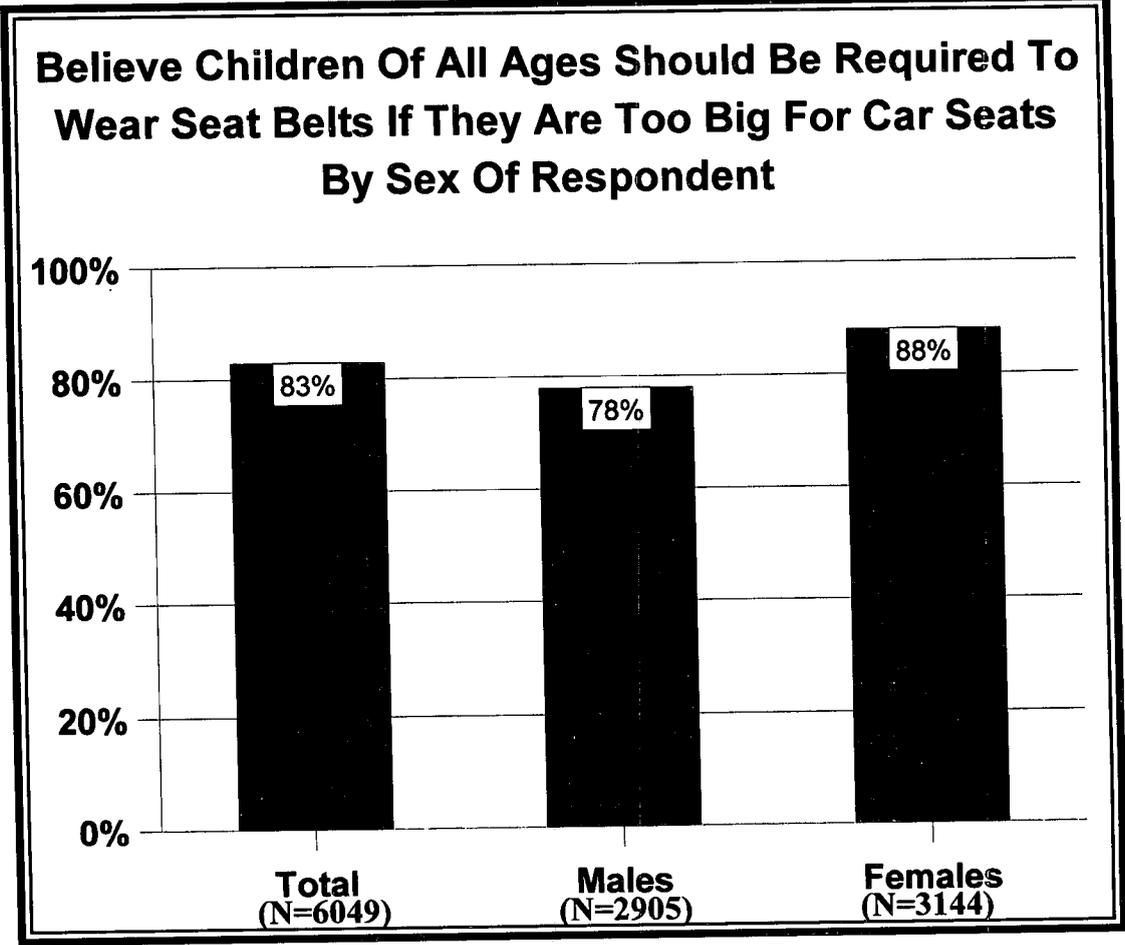
Base: Total population age 16+ Unweighted N's listed above.

** The sum of the percentages in the pie chart exceeds 100% because the numbers are rounded.*

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

As stated on the previous page, 83% of the public age 16 and older believed that all children should be required to wear seat belts after outgrowing car seats (87% of the 95% who agreed there should be a requirement or said it depended on the child's age). Females (88%) were more likely to favor the requirement for all children than were males (78%).

Figure 80



Qx: What about when children outgrow a child car seat? Do you agree or disagree that they should be required by law to wear seat belts when riding in a vehicle?

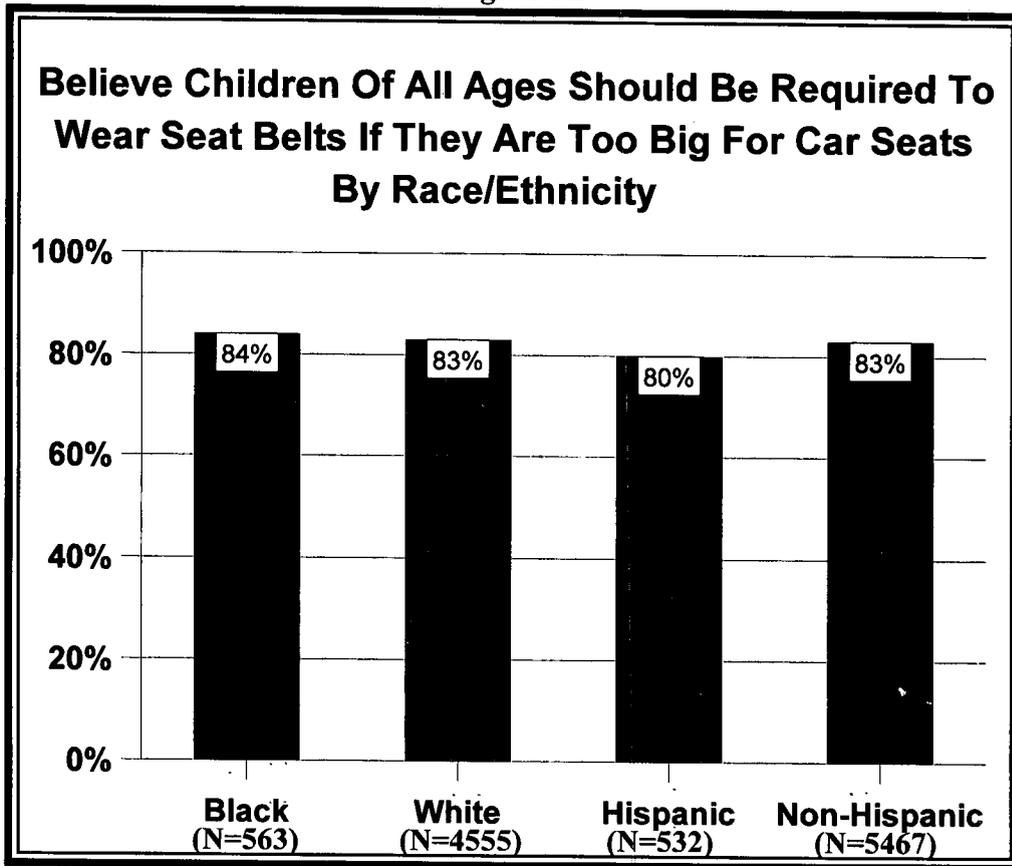
Qx: How old do you think children should be before they are not required by law to wear seat belts or do you think all children should be required to wear them?

*Base: Total population age 16+
Unweighted N's listed above.*

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Eighty percent or more of persons in each racial/ethnic group listed in Figure 81 believed that all children should be required by law to wear seat belts after outgrowing car seats.

Figure 81



Qx: What about when children outgrow a child car seat? Do you agree or disagree that they should be required by law to wear seat belts when riding in a vehicle?

Qx: How old do you think children should be before they are not required by law to wear seat belts or do you think all children should be required to wear them?

Base: Total population age 16+

Unweighted N's listed above.

See page xviii for background information on racial and ethnic categories.

2000 SURVEY RESULTS

CHAPTER 7

TRENDS

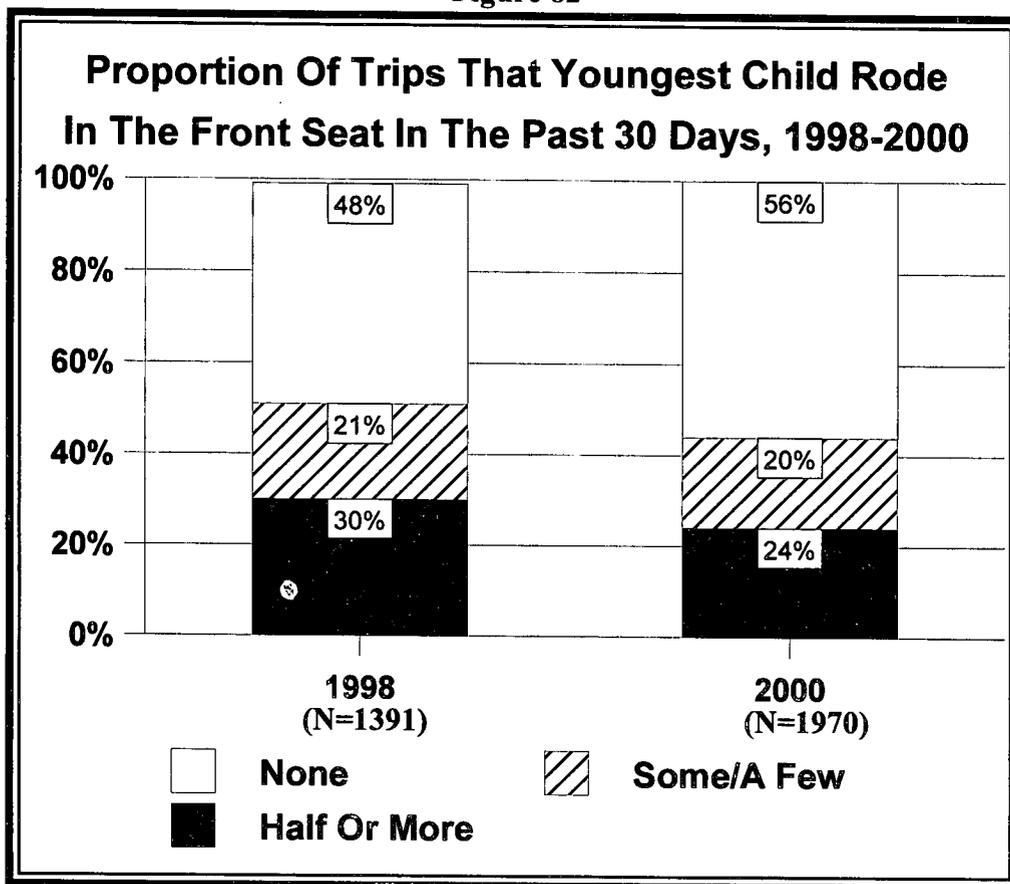
1994-2000

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Proportion of Trips That Child Age 12 or Younger Rides in Front Seat, 1998-2000

The 1998 survey introduced questions asking the seating position of children age 12 and younger. Drivers who lived with one or more children in this age range were asked the proportion of trips that the youngest child rode in the front seat during the past 30 days when traveling with the respondent. In 1998, 30% said that the child rode in the front seat on half or more trips. The number decreased to 24% two years later.

Figure 82



Qx: Think about all the times this child rode with you in the past thirty days, both with and without other passengers. About what proportion of those trips would you say that the child rode in the front seat?

Base: Drives a motor vehicle other than a motorcycle, and lives with one or more children age 12 or younger

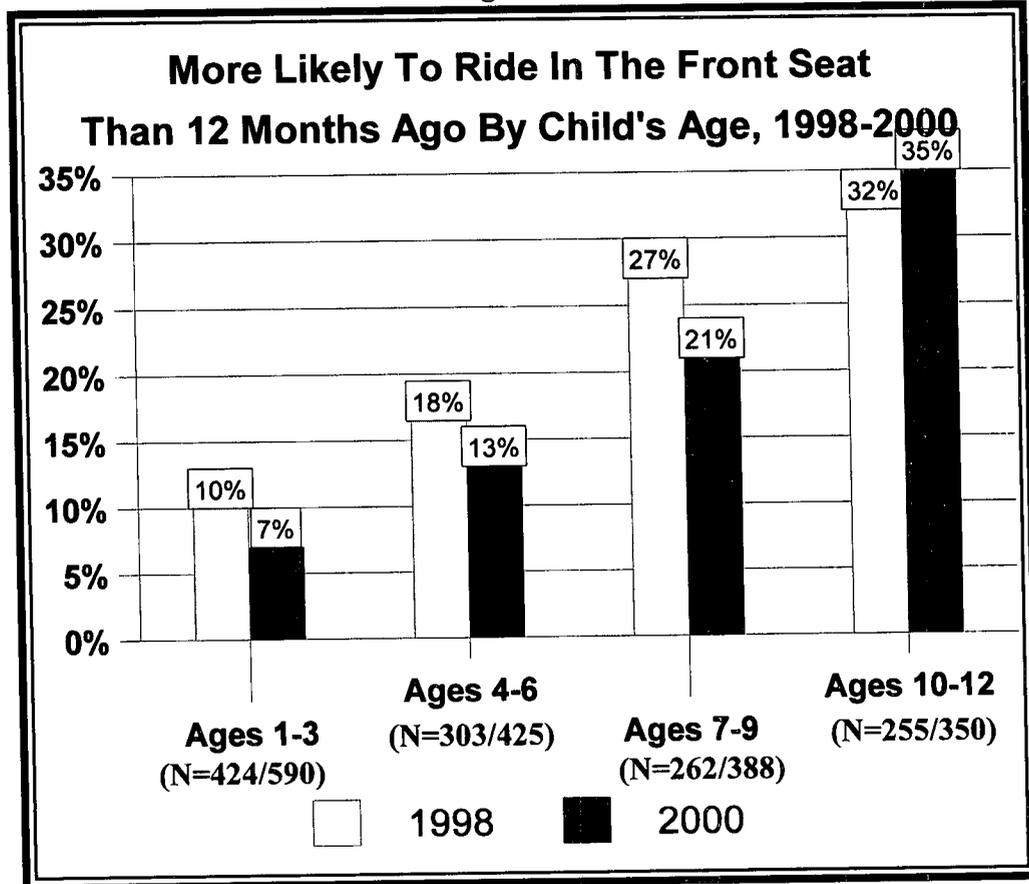
Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Change In Seating Position Of Child Age 12 Or Younger From 12 Months Ago, 1998-2000

Figure 83 shows less movement to the front seat among younger children compared to the survey findings two years earlier. This pattern reversed for children ages 10 through 12, although the difference was small while based on n-sizes of just a few hundred cases.

Figure 83



Qx: Compared to 12 months ago, is this child more likely to ride in the front seat when you drive, as likely to ride in the front seat, or less likely to ride in the front seat?

Base: Drives a motor vehicle other than a motorcycle, and lives with 1 or more children ages 1 to 12.

Unweighted N's listed above.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Differences Between 2000 MVOSS Data and Previous MVOSS Data Concerning Child Restraint Use

Most of the detailed information in the MVOSS concerning attitudes, knowledge, and behavior regarding use of child restraints comes from a subgroup of the survey sample labeled parents/caregivers. Page 30 provides the definition of the group for the 2000 survey. This definition differs from that used in previous years in that the age range for the children was expanded for the 2000 survey. In 2000, drivers entered the parents/caregivers subgroup if they were parents/caregivers of children under age 9. In the surveys conducted from 1994 through 1998, they entered the subgroup if they were parents/caregivers of children under age 6. The 2000 survey extended the age range in order to fully cover the generally recommended ages for booster seat use (ages 4 through 8).

Because the definition of parents/caregivers changed, this means that the 2000 survey results were derived from a somewhat different subgroup than in 1994-1998, thereby affecting comparability of results. The expanded age range not only resulted in inclusion in the 2000 survey of drivers who would have been ineligible for the parents/caregivers subgroup in previous years (i.e., respondents whose youngest child was in the 6-8 age range), but also changed the referent child who would have been selected for some respondents (i.e., if respondents had children both in the 0-5 and 6-8 age ranges, the referent child no longer was restricted to the 0-5 age range in the 2000 survey).

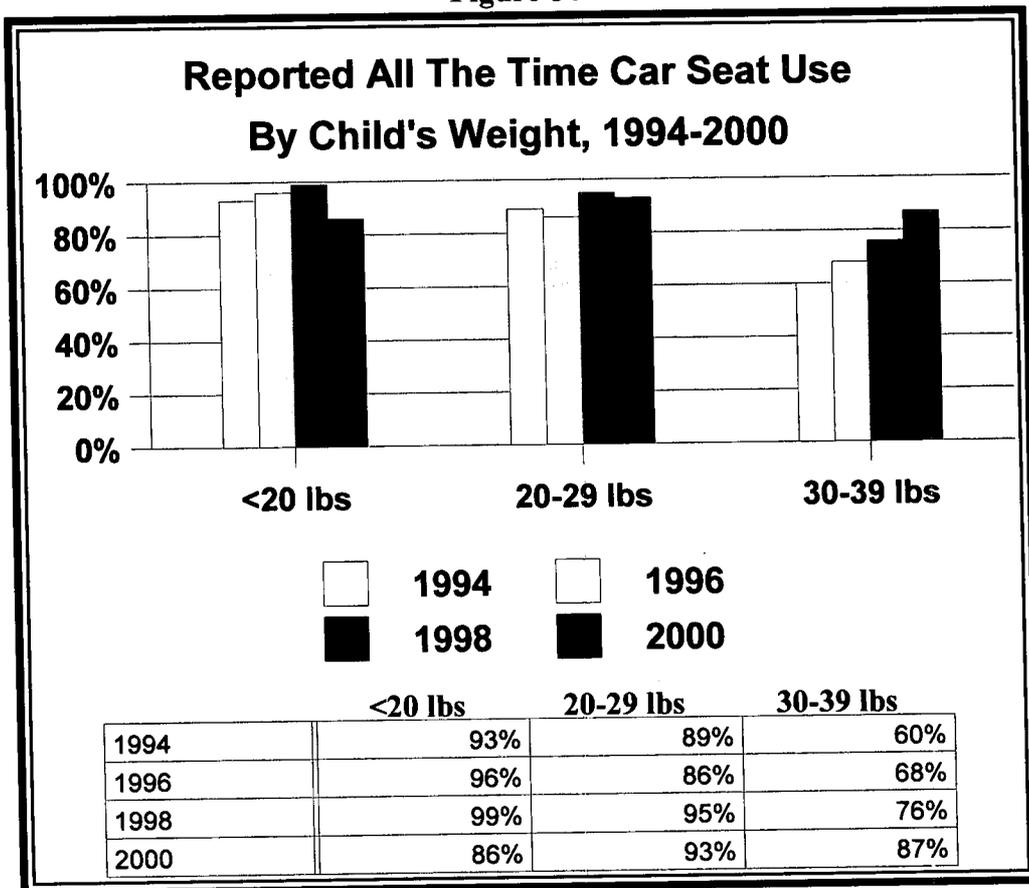
The vast majority of the child restraint questions were asked only of parents/caregivers whose child used a child car seat at least on occasion. Since the 2000 survey showed few children past the age of 5 using a car seat, the effect on survey results of the change in parent/caregiver definition may have been negligible for most questionnaire items. Therefore, this report presents on the following pages trend data from parents/caregivers for the entire 1994-2000 period so that readers have the opportunity to compare results across years. **However, readers should exercise caution in interpreting the trends due to the above-stated issues of comparability of data.**

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Reported All The Time Car Seat Use By Child's Weight, 1994-2000

Figure 84 suggests a continued increase in 2000 of use of child restraints by children weighing 30-39 pounds, but also shows a decrease in "all the time" car seat use by infants under 20 pounds. As indicated on page 32, at least some of the slippage in the lowest weight category stemmed from errors in recording weight. The survey results presented in Figure 84 exclude the 40+ weight category because of the change in definition of the parent/caregiver group described on the previous page (i.e., the expanded definition added older/heavier children).

Figure 84



Qx: How much does (he/she) weigh?
 Qx: When you are driving and the (AGE) rides in the vehicle with you, how often does (he/she) ride in a child car seat? Child car seats include infant seats, toddler seats and booster seats. Would you say (he/she) rides in a child car seat all of the time, most of the time, some of the time, rarely, or never?

Base 1994-1998: Parents/caregivers of children under age 6.

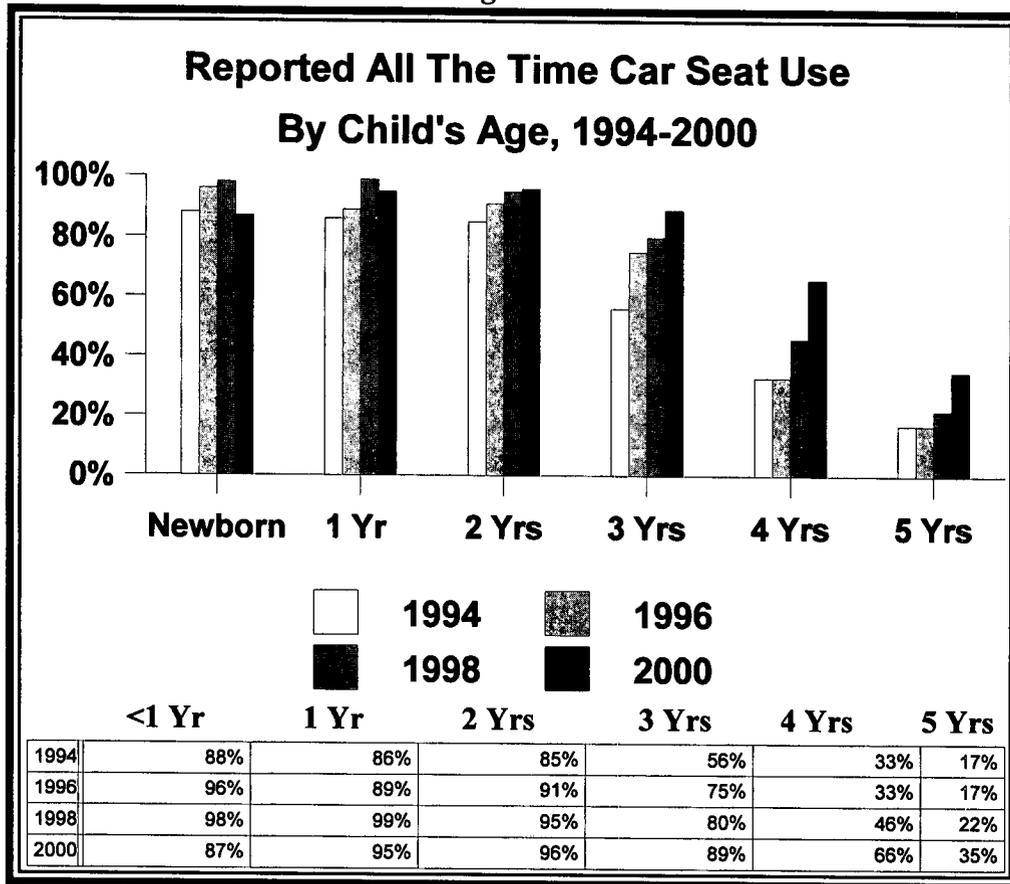
Base 2000: Parents/caregivers of children under age 9 (see page 30 for definition).

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Reported All The Time Car Seat Use By Child's Age, 1994-2000

Figure 85 shows continued increase in 2000 of child restraint use by children in the 3-to-5-year range. The Figure also shows some decrease in "all the time" car seat use by infants. As indicated on page 33, much of that decrease stemmed from respondents who refused to report frequency of car seat use by the child.

Figure 85



Qx: What is the age of the (CHILD)?

Qx: When you are driving and the (AGE) rides in the vehicle with you, how often does (he/she) ride in a child car seat? Child car seats include infant seats, toddler seats and booster seats. Would you say (he/she) rides in a child car seat all of the time, most of the time, some of the time, rarely, or never?

Base 1994-1998: Parents/caregivers of children under age 6.

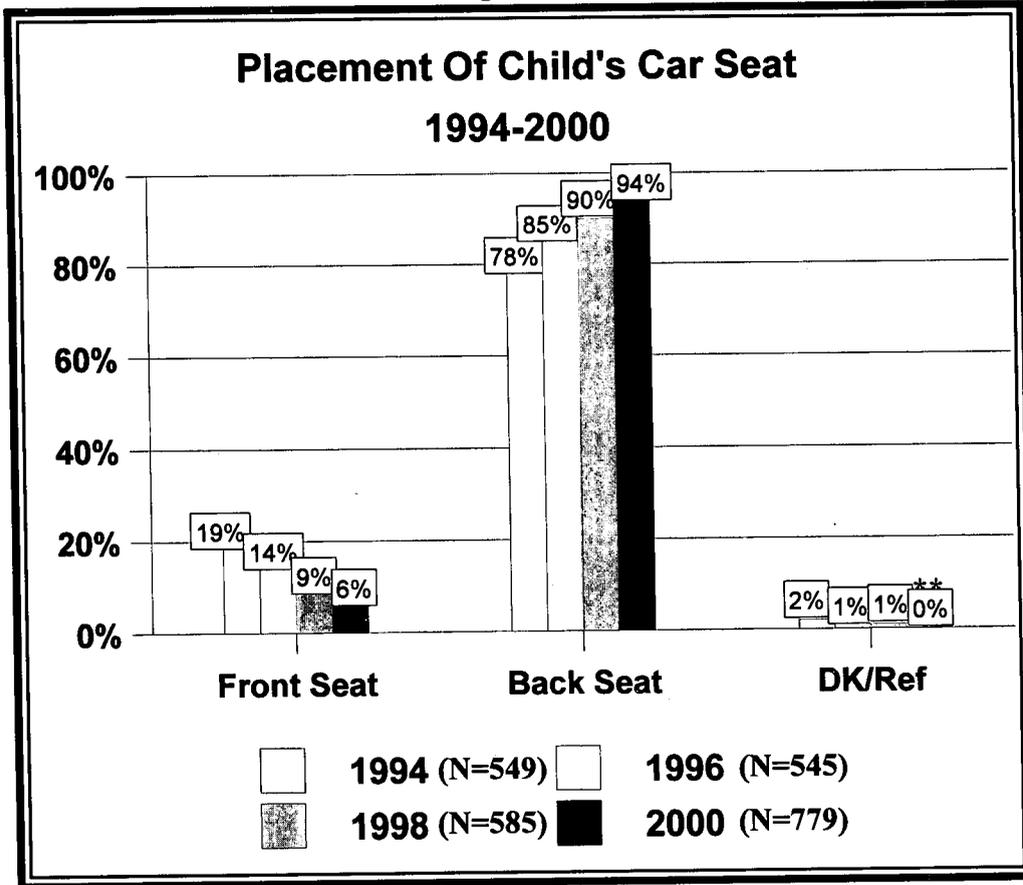
Base 2000: Parents/caregivers of children under age 9 (see page 30 for definition).

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Location Of Car Seat, 1994-2000

Children riding in car seats increasingly are being placed in the back. Whereas 78% reportedly rode in the back seat in 1994, the figure rose to 94% in 2000.

Figure 86



Qx: When you are driving and the (AGE) rides in the child car seat, is he/she usually in the front seat or the back seat?

Base: Child at least on occasion rides in a child car seat.

1994-1998: Parents/caregivers of children under age 6.

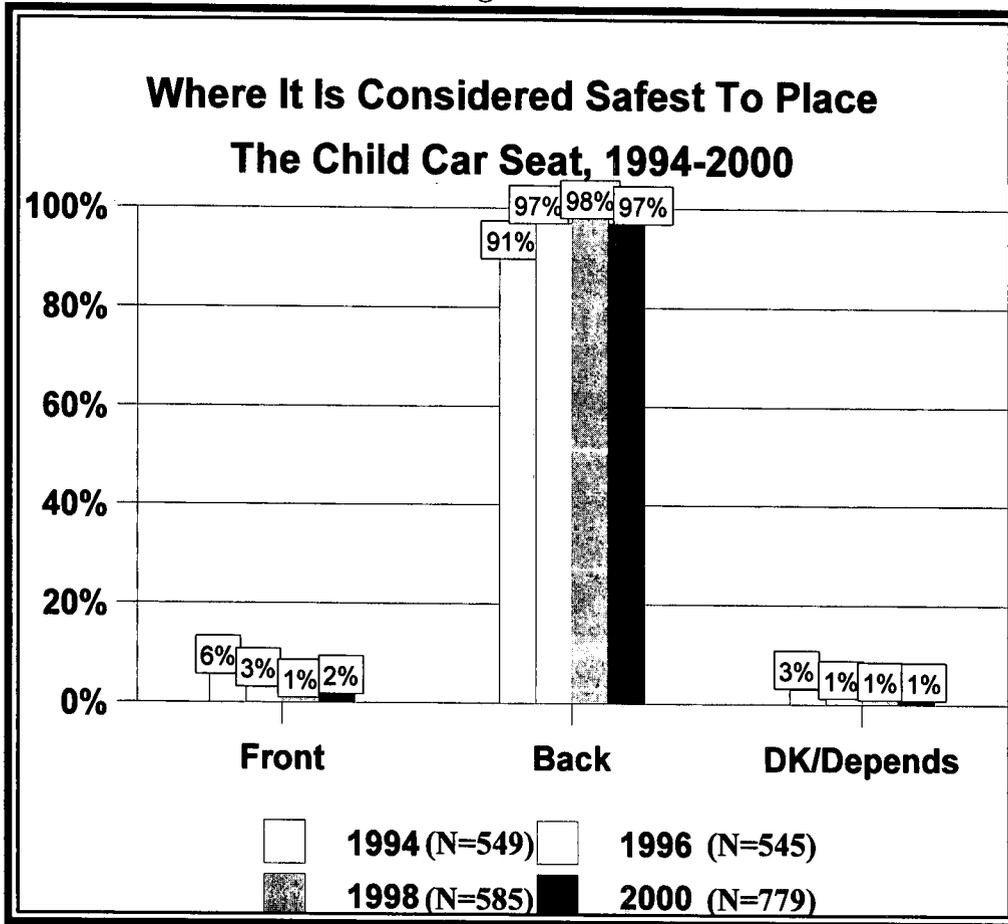
2000: Parents/caregivers of children under age 9 (see page 30 for definition).

** There were 0.4% DK/Ref in 2000, which was rounded to 0%.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Ninety-seven percent of parents/caregivers of children who used car seats in 2000 knew that the back seat was the safest location to place a child car seat in the vehicle, which was similar to findings from the previous two surveys.

Figure 87



Qx: Where would you say it is safest to place a child car seat in the vehicle . . . in the front seat or the back seat?

Base: Child at least on occasion rides in a child car seat.

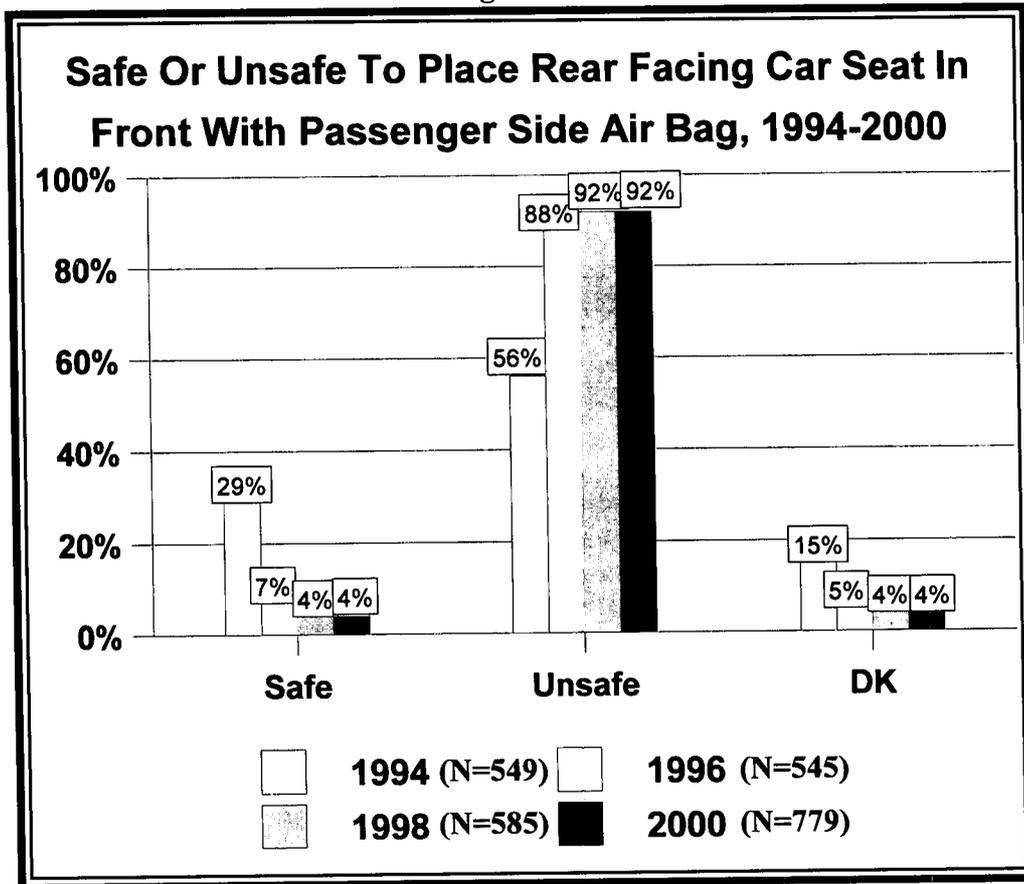
1994-1998: Parents/caregivers of children under age 6.

2000: Parents/caregivers of children under age 9 (see page 30 for definition).

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

There was no difference between 1998 and 2000 in the percentage (92%) of parents/caregivers who were aware of the danger of placing a rear facing infant seat in the front seat of a vehicle having a passenger side air bag. Figure 88 shows that knowledge of the danger has remained high since a large jump in public awareness between 1994 and 1996.

Figure 88



Qx: Some child car seats are designed so that the child faces backward to the rear of the motor vehicle. Suppose a child is riding in a child car seat facing backward. If the vehicle has a passenger side air bag, is it safe or unsafe to have the child car seat in the front seat?

Base: Child at least on occasion rides in a child car seat.

1994-1998: Parents/caregivers of children under age 6.

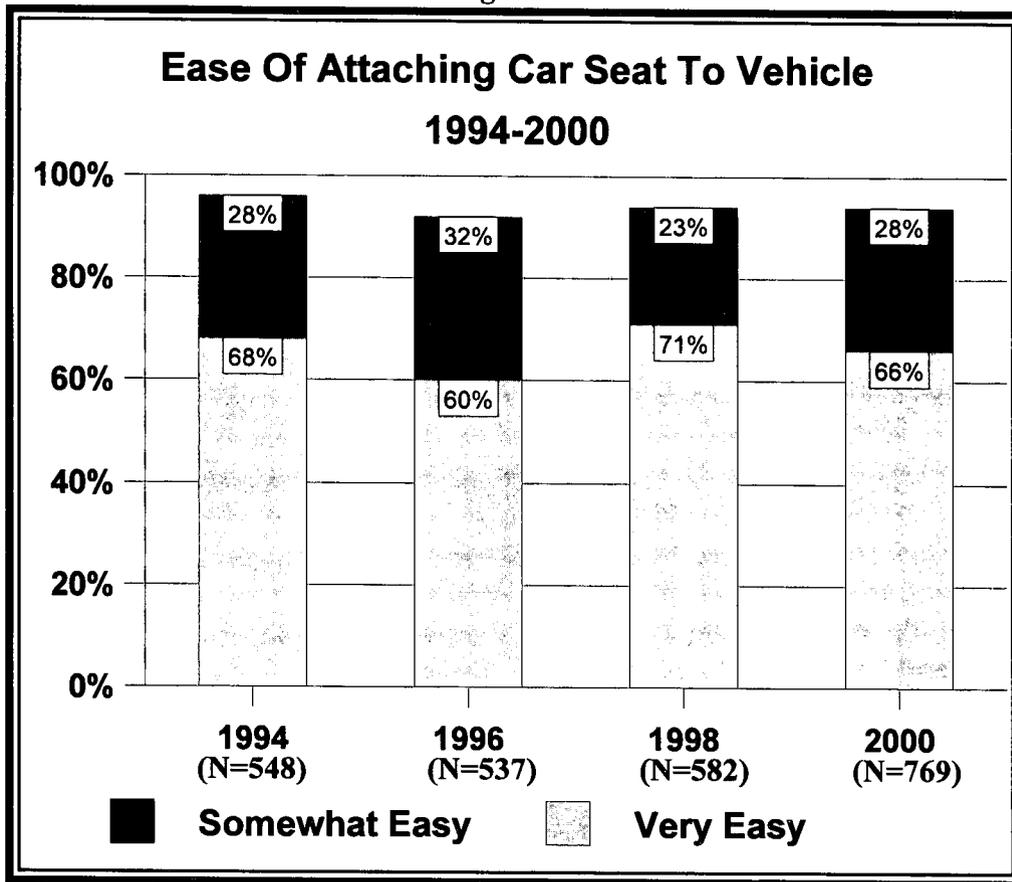
2000: Parents/caregivers of children under age 9 (see page 30 for definition).

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Ease of Use, 1994-2000

In 2000, 66% of the parents/caregivers said that it was very easy to attach the child car seat to the vehicle, compared to 71% two years earlier.

Figure 89



Qx: How easy is it for you to attach the child car seat to the vehicle you usually drive . . . very easy, somewhat easy, or not easy at all?

Base: Child at least on occasion rides in a child car seat, and the car seat did not come attached to the vehicle.

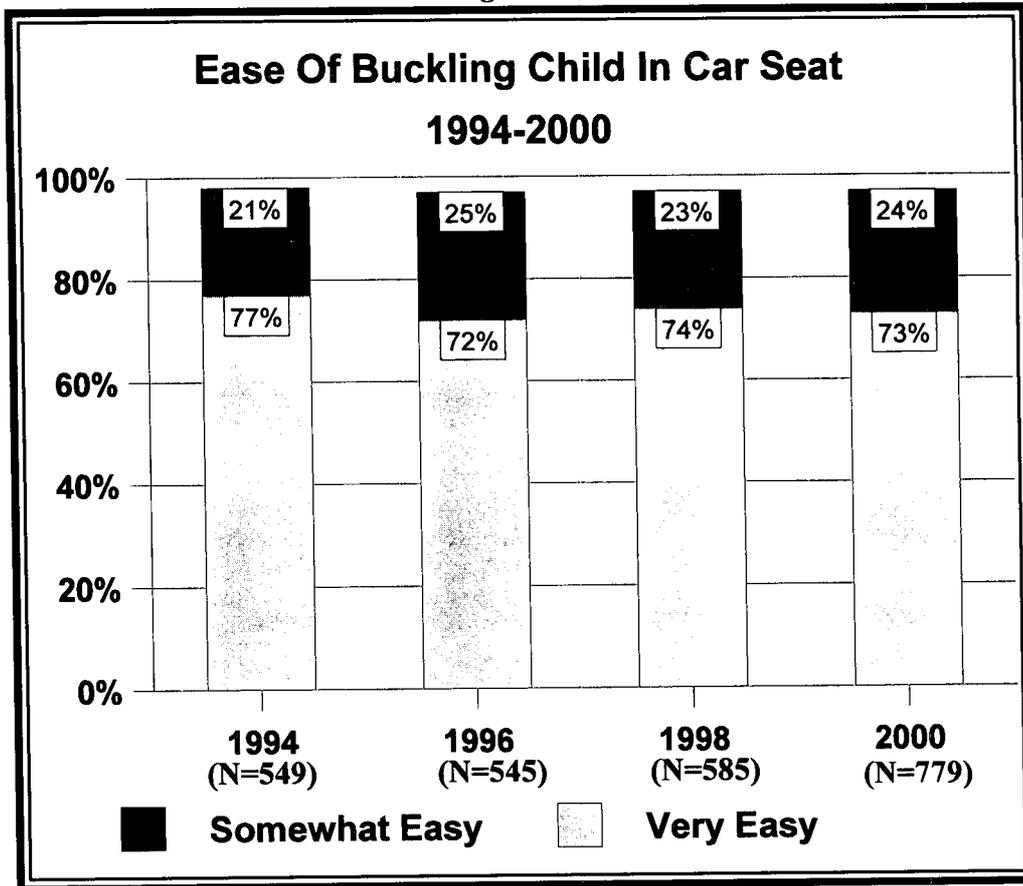
1994-1998: Parents/caregivers of children under age 6.

2000: Parents/caregivers of children under age 9 (see page 30 for definition).

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

More than seven-in-ten parents/caregivers considered it very easy to properly buckle their child into the car seat regardless of the survey year.

Figure 90



Qx: How easy is it for you to properly buckle your child into the child car seat?

Base: Child at least on occasion rides in a child car seat.

1994-1998: Parents/caregivers of children under age 6.

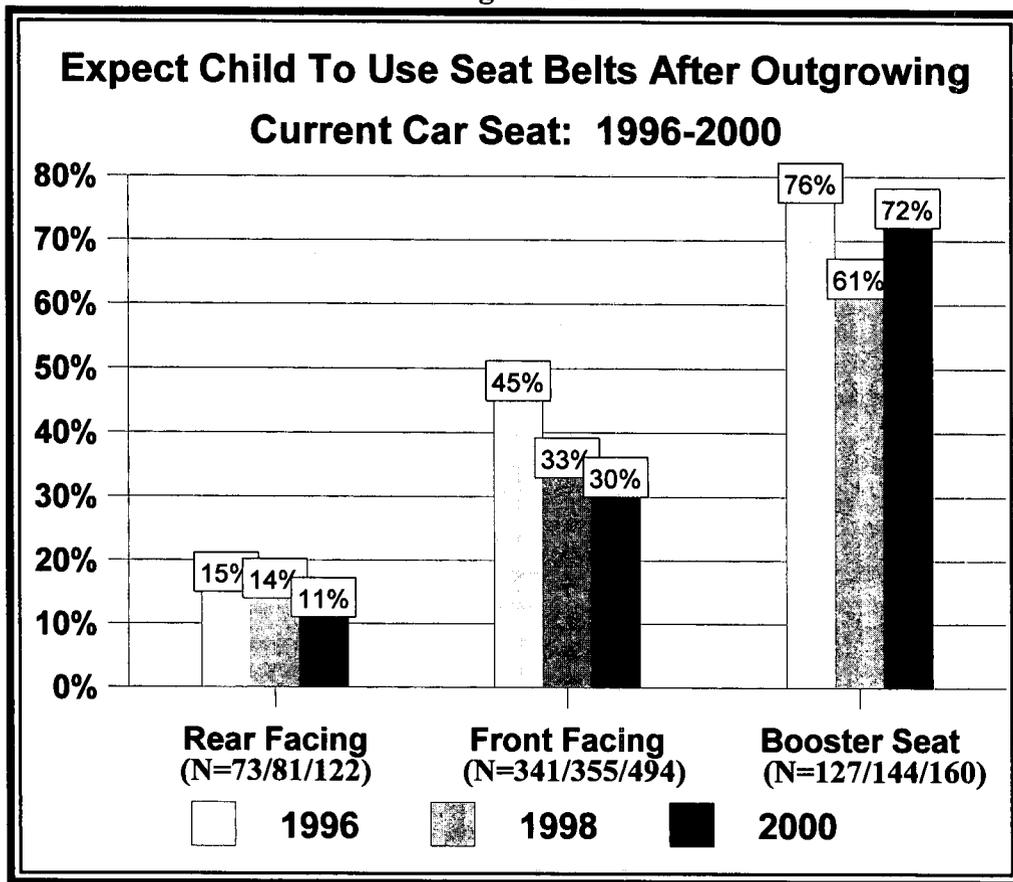
2000: Parents/caregivers of children under age 9 (see page 30 for definition).

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Expected Restraint System For Child After Outgrowing Current Seat, 1996-2000

There was little difference between the 2000 and 1998 survey results in the percentage of children expected to graduate directly to seat belts from rear facing or front facing child safety seats.

Figure 91



Qx: When your (AGE) outgrows his/her current child car seat, do you expect him/her to use a different type of car seat, a seat belt or something else?

Base: Child at least on occasion rides in a child car seat.

1994-1998: Parents/caregivers of children under age 6.

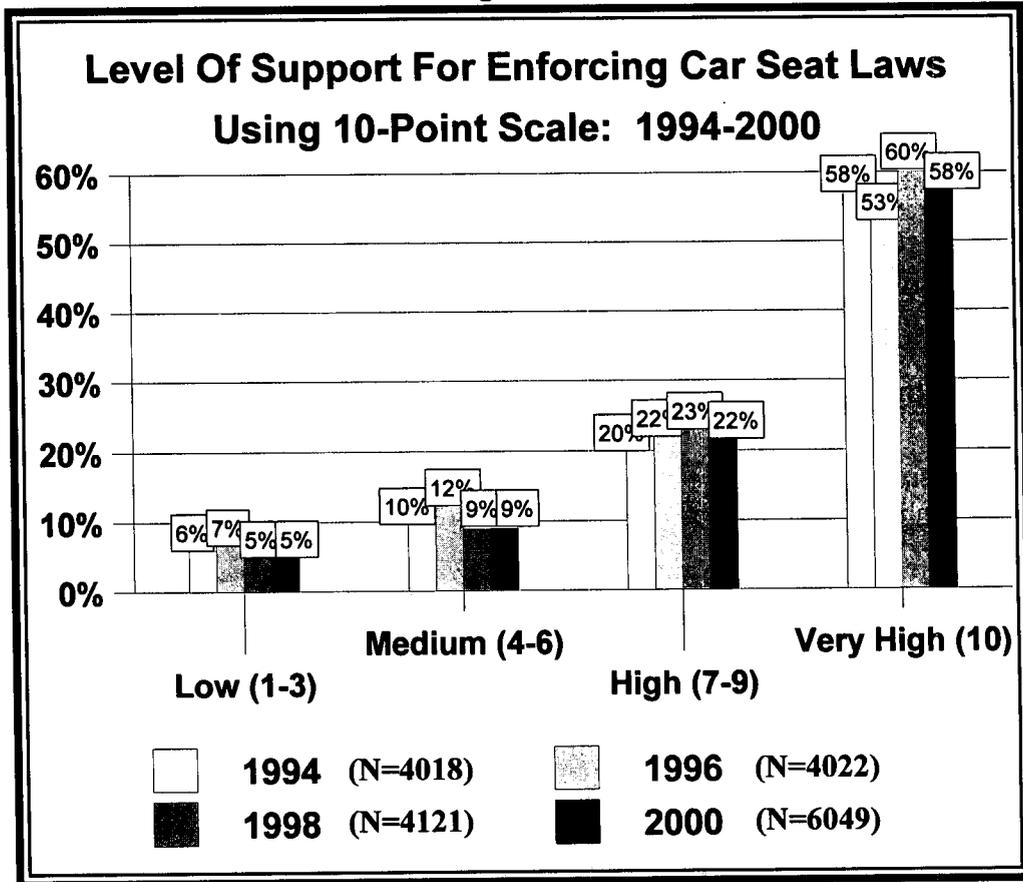
2000: Parents/caregivers of children under age 9 (see page 30 for definition).

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Support For Enforcing Car Seat Laws, 1994-2000

In 2000, 58% of the public believed that police should give a ticket at every opportunity for violations of car seat laws. This was little changed from 1998 (60%).

Figure 92



Qx: How do you personally feel about the police enforcement of child car seat laws? On a scale of 1 to 10, where 1 means police should hardly ever give tickets and 10 means police should give a ticket at every opportunity for violations of child car seat laws, how strict should police enforcement be?

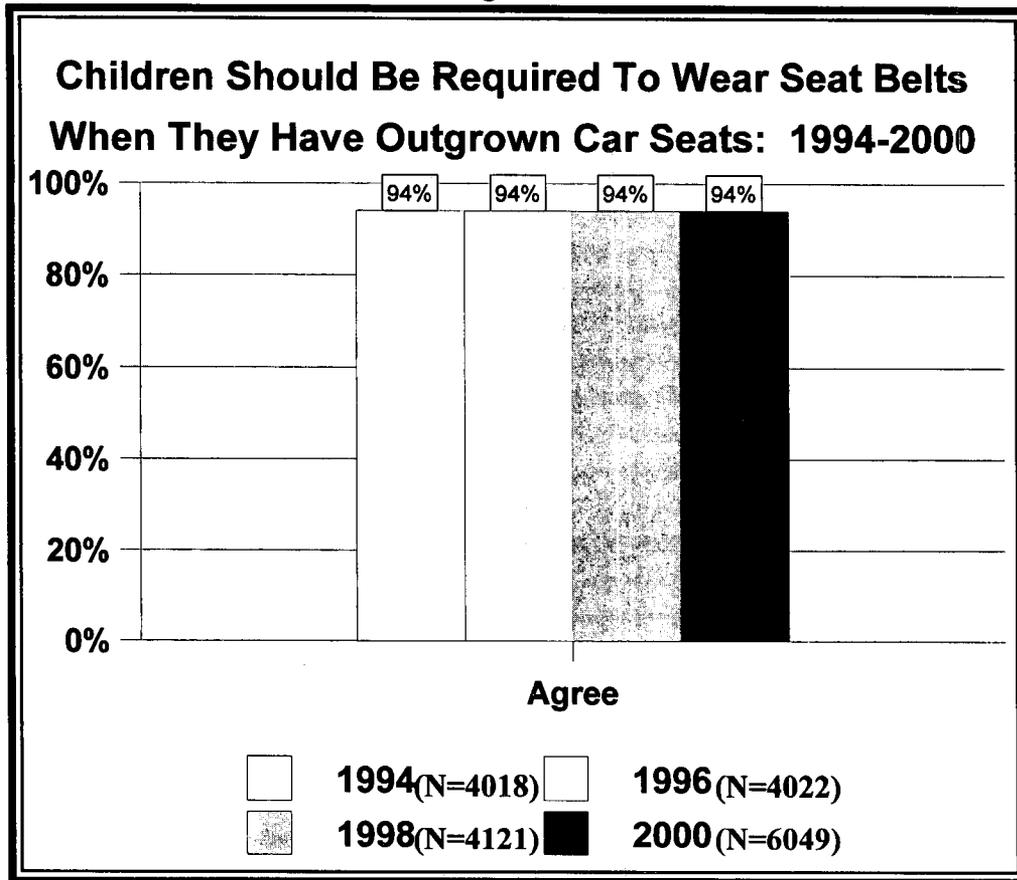
Base: Total population age 16+.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Support For Laws Requiring Seat Belt Use After Child Has Outgrown Car Seat, 1994-2000

In each of the survey years, 94% of the public agreed that children who have outgrown child car seats should be required by law to wear seat belts when riding in a vehicle.

Figure 93



Qx(1994/1996): What about when children under the age of 6 outgrow a child car seat? Do you agree or disagree that they should be required by law to wear seat belts when riding in a vehicle?

Base: Total population age 16+.

Qx(1998/2000): What about when children outgrow a child car seat? Do you agree or disagree that they should be required by law to wear seat belts when riding in a vehicle?

Base: Total population age 16+.

2000 SURVEY RESULTS

APPENDIX A

***PRECISION OF SAMPLE ESTIMATES**

*Reprinted from:

Boyle, J. and P. Vanderwolf. 2000 Motor Vehicle Occupant Safety Survey. Volume 1. Methodology Report. DOT-HS-809-388. Washington DC: U.S. Department of Transportation, National Highway Traffic Safety Administration.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Precision of Sample Estimates

The objective of the sampling procedures used on this study was to produce a random sample of the target population. A random sample shares the same properties and characteristics of the total population from which it is drawn, subject to a certain level of sampling error. This means that with a properly drawn sample we can make statements about the properties and characteristics of the total population within certain specified limits of certainty and sampling variability.

The confidence interval for sample estimates of population proportions, using simple random sampling without replacement, is calculated by the following formula:

$$\text{var}(x) = z \sqrt{[(p*q)/(n-1)]}$$

Where:

- var (x) = the expected sampling error of the mean of some variable, expressed as a proportion
- p = some proportion of the sample displaying a certain characteristic or attribute
- q = (1 - p)
- z = the standardized normal variable, given a specified confidence level (1.96 for samples of this size).
- n = the size of the sample

The sample sizes for the surveys are large enough to permit estimates for subsamples of particular interest. Table 5, on the next page, presents the expected size of the sampling error for specified sample sizes of 8,000 and less, at different response distributions on a categorical variable. As the table shows, larger samples produce smaller expected sampling variances, but there is a constantly declining marginal utility of variance reduction per sample size increase.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

TABLE 5
Expected Sampling Error (Plus or Minus)
At the 95% Confidence Level
(Simple Random Sample)

Percentage of the Sample or Subsample Giving
 A Certain Response or Displaying a Certain
 Characteristic for Percentages Near:

Size of Sample or Subsample	<u>10 or 90</u>	<u>20 or 80</u>	<u>30 or 70</u>	<u>40 or 60</u>	<u>50</u>
8,000	0.7	0.9	1.0	1.1	1.1
6,000	0.8	1.0	1.2	1.2	1.3
4,500	0.9	1.2	1.3	1.4	1.5
4,000	0.9	1.2	1.4	1.5	1.5
3,000	1.1	1.4	1.6	1.8	1.8
2,000	1.3	1.8	2.0	2.1	2.2
1,500	1.5	2.0	2.3	2.5	2.5
1,300	1.6	2.2	2.5	2.7	2.7
1,200	1.7	2.3	2.6	2.8	2.8
1,100	1.8	2.4	2.7	2.9	3.0
1,000	1.9	2.5	2.8	3.0	3.1
900	2.0	2.6	3.0	3.2	3.3
800	2.1	2.8	3.2	3.4	3.5
700	2.2	3.0	3.4	3.6	3.7
600	2.4	3.2	3.7	3.9	4.0
500	2.6	3.5	4.0	4.3	4.4
400	2.9	3.9	4.5	4.8	4.9
300	3.4	4.5	5.2	5.6	5.7
200	4.2	5.6	6.4	6.8	6.9
150	4.8	6.4	7.4	7.9	8.0
100	5.9	7.9	9.0	9.7	9.8
75	6.8	9.1	10.4	11.2	11.4
50	8.4	11.2	12.8	13.7	14.0

NOTE: Entries are expressed as percentage points (+ or -)

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

However, the sampling design for this study included a separate, concurrently administered oversample of youth and young adults (age 16-39). Both the cross-sectional sample and the oversample of the youth/younger adult population were drawn as simple random samples; however, the disproportionate sampling of the age 16-39 population introduces a design effect that makes it inappropriate to assume that the sampling error for total sample estimates will be identical to those of a simple random sample.

In order to calculate a specific interval for estimates from a sample, the appropriate statistical formula for calculating the allowance for sampling error (at a 95% confidence interval) in a stratified sample with a disproportionate design is:

$$ASE=1.96 \sqrt{\sum_{h=1}^g [W_h^2 \{(1-f_h) (s_h^2/n_h-1)\}]}$$

where:

ASE	=	allowance for sampling error at the 95% confidence level;
h	=	a sample stratum;
g	=	number of sample strata;
W_h	=	stratum h as a proportion of total population;
f_h	=	the sampling fraction for group h -- the number in the sample divided by the number in the universe;
s_h^2	=	the variance in the stratum h -- for proportions this is equal to $p_h (1.0 - p_h)$;
n_h	=	the sample size for the stratum h.

Although Table 5 above provides a useful approximation of the magnitude of expected sampling error, precise calculation of allowances for sampling error requires the use of this formula. To assess the design effect for sample estimates, we calculated sampling errors for the disproportionate sample for a number of key variables using the above formula. These estimates were then compared to the sampling errors for the same variables, assuming a simple random sample of the same size. The two strata (h^1 and h^2) in the disproportionate sample were all respondents age 16-39 and all respondents age 40 and over respectively. The proportion for the 16-39 year old stratum (w^1) was 44.3 percent while the proportion for the 40 and over stratum (w^2) was 55.7 percent.

As shown in Table 6, the disproportionate sampling decreases the confidence interval by 1.3 percent, compared to a simple random sample of the same size. This means the sample design slightly increases the sampling precision for total population estimates, while also increasing the precision of sampling estimates for the target population aged 16-39 years old.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Since the difference in sampling precision between the stratified disproportion sample and a simple random sample is less than one tenth of a percentage point in each case, the sampling error table for a simple random sample will provide a reasonable approximation of the precision of sampling estimates in the survey.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

TABLE 6
Design Effect on Confidence Intervals for Sample Estimates
Between Disproportionate Sample Used in Occupant Protection Survey
And a Proportionate Sample of Same Size

----- CONFIDENCE INTERVALS -----				
PERCENTAGE POINTS \pm AT 95% CONFIDENCE LEVEL				
	p=	HYPOTHETICAL PROPORTIONATE SAMPLING*	CURRENT DIS- PROPORTIONATE SAMPLING	DIFFERENCE IN CONFIDENCE INTERVALS ABOUT ESTIMATES
<i>USE NEW VARIABLES</i>				
<i>Driven in the past year</i>	90.1%	0.53	0.49	-8.2%
<i>Drunk alcohol in past year</i>	61.3%	0.87	0.85	-2.4%
<i>Always use safety belt</i>	83.5%	0.70	0.68	-2.9%
<i>Dislike seat belts</i>	34.9%	1.27	1.34	+5.2%
<i>Always use passenger belt (front)</i>	80.3%	1.04	1.02	-2.0%
<i>Favor (a lot) seat belt laws</i>	67.4%	1.18	1.18	0.0%
<i>Primary enforcement</i>	63.1%	1.25	1.27	+1.6%
<i>Ever ticketed by police for seatbelt</i>	8.4%	0.70	0.68	-2.9%
<i>Ever injured in vehicle accident</i>	24.5%	0.76	0.78	+2.6%
<i>Drives a car for work almost every day</i> ..	52.0%	2.23	2.25	+0.9%
<i>Set a good example for others</i> <i>(reason for using seat belts)</i>	76.4%	1.14	1.16	+1.7%
<i>Driver-side only Air Bag in vehicle</i>	24.0%	0.96	0.95	-1.1%
<i>Race: Black/African American</i>	9.6%	0.52	0.52	0.0%
<i>Ethnicity: Hispanic</i>	9.9%	0.53	0.48	-10.4%
<i>Gender: Male</i>	48.2%	0.89	0.88	-1.1%
<i>AVERAGE DIFFERENCE IN CONFIDENCE INTERVALS</i>				-1.3%

* Total sample proportions using SRS formula

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

Estimating Statistical Significance

The estimates of sampling precision presented in the previous section yield confidence bands around the sample estimates, within which the true population value should lie. This type of sampling estimate is appropriate when the goal of the research is to estimate a population distribution parameter. However, the purpose of some surveys is to provide a comparison of population parameters estimated from independent samples (e.g. annual tracking surveys) or between subsets of the same sample. In such instances, the question is not simply whether or not there is any difference in the sample statistics that estimate the population parameter, but rather is the difference between the sample estimates statistically significant (i.e., beyond the expected limits of sampling error for both sample estimates).

To test whether or not a difference between two sample proportions is statistically significant, a rather simple calculation can be made. Call the total sampling error (i.e., var (x) in the previous formula) of the first sample s_1 and the total sampling error of the second sample s_2 . Then, the sampling error of the difference between these estimates is sd that is calculated as:

$$sd = \sqrt{(s_1^2 + s_2^2)}$$

Any difference between observed proportions that exceeds sd is a statistically significant difference at the specified confidence interval. Note that this technique is mathematically equivalent to generating standardized tests of the difference between proportions.

An illustration of the pooled sampling error between subsamples for various sizes is presented in Table 7. This table can be used to indicate the size of difference in proportions between drivers and non-drivers or other subsamples that would be statistically significant.

2000 MOTOR VEHICLE OCCUPANT SAFETY SURVEY

TABLE 7. Pooled Sampling Error Expressed as Percentages For Given Sample Sizes (Assuming P=Q)

Sample Size																		
4000	14.1	10.0	7.1	5.9	5.1	4.7	4.3	4.0	3.8	3.6	3.5	3.0	2.7	2.5	2.4	2.3	2.2	
3500	14.1	10.0	7.1	5.9	5.2	4.7	4.3	4.1	3.8	3.7	3.5	3.0	2.7	2.6	2.4	2.3		
3000	14.1	10.0	7.2	5.9	5.2	4.7	4.4	4.1	3.9	3.7	3.6	3.1	2.8	2.7	2.5			
2500	14.1	10.0	7.2	6.0	5.3	4.8	4.5	4.2	4.0	3.8	3.7	3.2	2.9	2.8				
2000	14.2	10.1	7.3	6.1	5.4	4.9	4.6	4.3	4.1	3.9	3.8	3.3	3.1					
1500	14.2	10.2	7.4	6.2	5.5	5.1	4.7	4.5	4.3	4.1	4.0	3.6						
1000	14.3	10.3	7.6	6.5	5.8	5.4	5.1	4.8	4.7	4.5	4.4							
900	14.4	10.4	7.7	6.5	5.9	5.5	5.2	4.9	4.8	4.6								
800	14.4	10.4	7.8	6.6	6.0	5.6	5.3	5.1	4.9									
700	14.5	10.5	7.9	6.8	6.1	5.7	5.5	5.2										
600	14.6	10.6	8.0	6.9	6.3	5.9	5.7											
500	14.7	10.8	8.2	7.2	6.6	6.2												
400	14.8	11.0	8.5	7.5	6.9													
300	15.1	11.4	9.0	8.0														
200	15.6	12.1	9.8															
100	17.1	13.9																
50	19.8																	
	50	100	200	300	400	500	600	700	800	900	1000	1500	2000	2500	3000	3500	4000	

Sample Size

