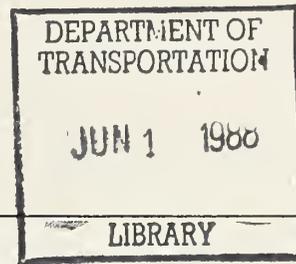


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DOT HS 806 972
Final Report

February 1986

EVALUATION OF NEW YORK STATE'S MANDATORY OCCUPANT RESTRAINT LAW:

Volume III Observational Surveys of Safety Restraint Use by Children in New York State

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16. Abstract <p>This is the final report on the results of three observational surveys of safety restraint use by children conducted as part of the evaluation of New York's Mandatory Occupant Restraint Law. The law mandates restraint use for all front seat occupants and children under the age of ten, regardless of seating position. The law was implemented on December 1, 1984 and enforcement began on January 1, 1985.</p> <p>Observations were conducted at shopping centers throughout New York State. A baseline survey was conducted in October 1984 followed by post-law surveys in April 1985 and September 1985. Statewide and regional (Upstate, New York City, Long Island) results are presented.</p> <p>After implementation of the Mandatory Occupant Restraint Law, restraint use among children increased. In all surveys, however, restraint use decreased as age increased. In the post-law surveys, restraint use in the front seat was higher than in the back. Drivers' restraint use also increased after the new law. Children were more likely to be restrained if they were riding with drivers who were buckled up.</p> <p>The extension of mandatory restraint use to all front seat occupants and older children resulted in higher usage rates for the younger children covered by earlier legislation as well. The children most at risk were those in the two older age groups (4-6, 7-9 years) riding in the back seat or riding with unrestrained drivers.</p>					
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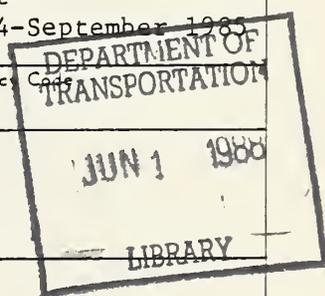


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EXECUTIVE SUMMARY

New York State's Mandatory Occupant Restraint Law was implemented on December 1, 1984 and full enforcement of the law began on January 1, 1985. This law extended mandatory restraint use to all front seat occupants, as well as to all children under ten years of age, regardless of seating position in the vehicle. Earlier legislation already required restraint use for children under seven years of age.

This is the final report on three observational surveys conducted at shopping centers across the State to determine the effects of the Mandatory Occupant Restraint Law on children's safety restraint use. A baseline survey was conducted in October 1984 and post-law surveys were conducted in April 1985 and September 1985.

The usage rates of the children in the three surveys were analyzed by age, seating position and region of the State (Upstate, New York City, Long Island). In addition, children's restraint use was compared to the restraint use of the drivers of the vehicles. Comparisons were made among the three surveys and changes in the use of restraints are discussed. The results are presented for the total samples of children observed and for three age groups (0-3 years, 4-6 years, 7-9 years).

STATEWIDE RESULTS

In October 1984, prior to the implementation of the Mandatory Occupant Restraint Law, 42 percent of all children observed at shopping centers across the State were wearing safety restraints. In the first post-law survey in April 1985, the usage rate increased to 61 percent. In the second post-law survey in September 1985, usage decreased slightly to 57 percent.

In all three surveys, the highest usage rates were observed for children three years of age and under. Restraint use for this group increased from 71 percent in October 1984 to 82 percent in April 1985 and remained at that level in September 1985. The usage rate for children four to six years of age was 27 percent before implementation of the Mandatory Occupant Restraint Law. Usage for this age group increased to 54 percent in April 1985 before declining to 46 percent in September 1985. The baseline usage rate for children seven, eight and nine years of age was 20 percent. In April 1985, usage in this age group rose to 48 percent and then dropped to 34 percent in September 1985.

When restraint use was analyzed by seating position, children in the back seat were restrained more frequently than children in the front seat in October 1984. After implementation of the Mandatory Occupant Restraint Law, restraint use increased in both seating positions. In both post-law surveys, however, restraint use was higher in the front seat than in the back. In September 1985, the level of restraint use in the front seat was sustained, while restraint use in the back seat declined somewhat.

In October 1984, children three years of age and under were more likely to be restrained in the back seat than in the front, although restraint use was high in both seating positions. The front and back seat usage rates for the two older age groups were similar in October 1984 and much lower than those of the youngest children. After implementation of the Mandatory Occupant Restraint Law, the older children were much more likely to be restrained in the front seat than in the back seat. In fact, for children seven to nine years of age, front seat restraint use was more than twice the usage measured in the back seat.

In October 1984, 21 percent of the drivers transporting children under the age of ten were restrained. Usage among drivers more than tripled to 68 percent in April 1985, before declining to 51 percent in September 1985. Men and women had the same baseline usage rate, but in both post-law surveys, women were more likely to buckle up than men. Although usage among drivers was not consistent across the three surveys, the relationship between the restraint use of drivers and the children in their vehicles did not change over time. In all three surveys, 78 percent of the children riding with drivers who buckled up were also restrained. Children were much less likely to be restrained if they were riding with drivers who were not buckled up. The lowest usage rates were found among children in the two older age groups riding with unrestrained drivers.

REGIONAL RESULTS

In all three regions, there were large increases in children's restraint use between October 1984 and April 1985. Usage increased from 44 percent to 72 percent in the Upstate region, from 34 percent to 60 percent in the New York City region, and from 50 percent to 60 percent on Long Island. Usage rates in the Upstate and New York City regions changed slightly over time, while the usage rate on Long Island dropped nearly 20 percentage points in September 1985.

In each region, the restraint use of children three years of age and under was the highest of the three age groups, and varied the least over time. For the two older groups of children in each region, there were large initial increases in restraint use in April 1985. These levels of usage, however, were generally not sustained over time. The greatest decline in usage was observed in the two older age groups on Long Island.

In October 1984, restraint use in all three regions was higher in the back seat than in the front seat. In both post-law surveys, however, children in each region were more likely to be restrained in the front seat than in the back.

Finally, in each region there was a large initial increase in usage among the drivers transporting children, followed by a decline in restraint use over time. The largest decrease in restraint use was measured on Long Island where usage dropped from 60 percent to 32 percent. Upstate drivers had the highest usage rates in all three surveys.

DISCUSSION

Following implementation of the Mandatory Occupant Restraint Law, there was a significant increase in children's use of safety restraints. This was true even among children under the age of seven who were covered by earlier restraint use legislation. In addition, several variables were found to be related to children's restraint use in each survey.

Restraint use was inversely related to the age of the child, even in the surveys conducted after the extension of mandatory use to all children under the age of ten.

Seating position was also an important factor. The new law had a greater impact on restraint use among children in the front seat than in the back seat, especially children in the two older age groups. In both post-law surveys, restraint use for the older children was much lower in the back seat. It appears that the extension of restraint use to all front seat occupants, regardless of age, was the critical factor in the increase in restraint use among children in the front seat. Another contributing factor may be a lack of awareness that restraint use is also required for children riding in the back seat.

The restraint use of drivers was also found to be important to children's restraint use. Children riding with drivers who were buckled up were much more likely to be restrained.

A fourth important variable was region. The greatest changes over time were found in the Long Island region where the restraint use of children in the two older age groups and the usage rate of the drivers dropped dramatically in September 1985.

The results of the three surveys indicate that New York State's Mandatory Occupant Restraint Law has had a positive effect on children's restraint use. Because of the strong relationship between the restraint use of drivers and children, the decline over time in the restraint use of drivers has adversely affected the usage rate of children, especially those over three years of age. Increased awareness of the back seat provision of the law and increased compliance among drivers should result in higher usage rates among children as well.

1. INTRODUCTION

BACKGROUND OF THE LAW

For many years New York State has been a leader in promoting the use of safety restraints as an important measure to improve highway safety. In the early 1960s, ahead of the 1966 federal mandate, New York required that all new automobiles sold in the State be equipped with safety belts.

In its 1982 report, a principal recommendation of the New York State Governor's Task Force on Alcohol and Highway Safety was the implementation of mandatory occupant restraint legislation. Mandated safety restraint use was recognized to be the most cost-effective means of protecting all vehicle occupants involved in traffic accidents.

In April 1982, New York State implemented one of the strictest child restraint laws in the nation. Since that time, restraint use has been required for all children under the age of five. Children under four years of age must be restrained in federally-approved child restraint devices. The law allows for the substitution of safety belts for children between the ages of four and five. In April 1984, New York State enacted legislation that extended mandatory restraint use to children up to the age of seven and provided for the extension of the requirement to all children under ten years of age by 1987.

New York State had also begun to extend mandatory use to other categories of vehicle occupants, beginning with new drivers. In March 1983, drivers with learner permits were required to use safety restraints by the Commissioner of Motor Vehicles. Early in the 1984 New York State Legislative session, a law was passed that required new drivers with probationary licenses to buckle up beginning in September 1984.

In the early summer of 1984, this incremental approach culminated in New York becoming the first state to pass a general mandatory occupant restraint law covering adults as well as children. Since December 1, 1984, all front seat occupants and children under the age of ten, regardless of seating position, have been required to use safety restraints. Occupants of trucks over 18,000 pounds, emergency vehicles, taxis, buses, and vehicles which pre-date the safety belt installation requirement are exempted. After a one-month warning period, full enforcement of the law began. Since January 1, 1985, fines of up to fifty dollars have been imposed for violations of the law.

EVALUATION OF THE LAW

Both federal and state officials recognized the importance of a comprehensive evaluation of the effectiveness of the nation's first Mandatory Occupant Restraint Law. The Institute for Traffic Safety Management and Research, in cooperation with the National Highway Traffic Safety Administration and the New York State Governor's Traffic Safety Committee, developed a four-part evaluation plan that would assess the effects of the law on:

- 1) safety restraint use by front seat occupants and children under ten years of age;
- 2) behaviors, attitudes and perceptions of licensed drivers;
- 3) fatalities and injuries to occupants of vehicles involved in traffic accidents;
- 4) enforcement and convictions for violations.

OBSERVATIONAL SURVEYS OF CHILDREN UNDER AGE TEN

This is the final report on a series of observational surveys of restraint use by children under ten years of age. In order to measure the effects of New York's Mandatory Occupant Restraint Law on children's usage rates, three observational surveys were conducted at shopping centers across the State. A baseline survey was conducted in October 1984 and post-law surveys were conducted in April 1985 and September 1985. The results of the first post-law survey were compared to those of the baseline survey to determine changes in usage after implementation of the law. The results of the second post-law survey were then compared to those of the first post-law survey to determine if further changes in usage had occurred over time.

In all three statewide surveys, children were observed in vehicles exiting shopping centers and each child's age was confirmed with the driver. The age, restraint use and seating position of each child under ten and the sex and restraint use of the driver were recorded. Chapter 2 describes the survey methodology and procedures used to collect the data. Chapter 3 presents the statewide and regional results from the three surveys and a final discussion of the results is found in Chapter 4.

2. SURVEY METHODOLOGY

SITE SELECTION AND SCHEDULING

Three statewide observational surveys were conducted to assess the effect of New York's Mandatory Occupant Restraint Law on restraint use by children under the age of ten. The survey methodology and data collection procedures used were patterned after a study conducted in Canada.¹ Shopping center exits were selected as observation sites in order to maximize the number of children observed. Prior to the first survey, shopping centers were selected and scheduled for observation according to the methodology described below.

The data collection methodology required that the shopping centers have an exit that was controlled by a traffic signal and a median dividing the lanes of traffic. A diagram of the required shopping center exit design appears in Appendix A. In addition to meeting the exit design criteria, the observation sites selected were limited to those shopping centers whose management would grant permission to conduct surveys on their property. These criteria precluded the random selection of the shopping centers. Fifteen shopping centers meeting the criteria were selected across the State. Where practical, the same shopping centers were visited in each survey. A list of all sampled shopping centers and their locations appears in Appendix B.

For each survey, observations were conducted between 11:00 a.m. and 5:00 p.m. on four consecutive Saturdays. A baseline survey was conducted in October 1984, prior to implementation of the Mandatory Occupant Restraint Law, and post-law observational surveys were conducted in April 1985 and September 1985.

1

Brian A. Jonah and Pamela Brett, Development and Evaluation of a Methodology for Measuring Child Restraint Use (Ottawa: Road Safety Directorate, Transport Canada, July 1984).

DATA COLLECTION PROCEDURES

Since restraint use was already required for some of the children in the target group (those under age seven) but not for others at the time of the October 1984 survey, it was important to have accurate age information for the children observed. In order to achieve this, an observer was positioned on the center median of a controlled exit so that contact with the drivers of the vehicles leaving the shopping center was possible. All passenger vehicles stopped for the red light in the lane nearest the observer were observed and those which appeared to contain children under the age of ten were approached. The observer informed the driver that a traffic safety study was in progress and asked for the ages of the children in the vehicle. If the driver was willing to participate in the study, the observer recorded the age, restraint use and seating position of each child, and the sex and restraint use of the driver. A copy of the data collection form can be found in Appendix C. The age distribution of the children observed in each survey appears in Appendix D.

DATA ANALYSIS

SPSSX was used to analyze the survey data. Since the type of restraint use required and the date mandated use began differed by age, the results from the total samples of children were further analyzed for the following age groups:

- 0-3 years - use of child restraints required prior to the Mandatory Occupant Restraint Law
- 4-6 years - use of safety belts required prior to the Mandatory Occupant Restraint Law
- 7-9 years - use of safety belts required since Mandatory Occupant Restraint Law's implementation on December 1, 1984

Restraint use by children riding in the front and back seats of vehicles was also compared. In addition, the information collected on each driver was analyzed and the relationship between the restraint use of the driver and the restraint use of the children in each vehicle was examined.

Finally, some limited analyses were conducted to identify regional differences in the restraint use of children under ten and the drivers responsible for their safety. For these analyses the statewide samples were divided into the Upstate, New York City, and Long Island regions.

As previously mentioned, the random selection of observation sites was not possible. Therefore, it cannot be assumed that these samples of children are representative of the total population of children under ten in the State. Nevertheless, the results presented in this report do provide an indication of how the restraint use of children under ten was affected by the implementation of New York's Mandatory Occupant Restraint Law.

3. RESULTS OF STATEWIDE OBSERVATIONAL SURVEYS OF
RESTRAINT USE BY CHILDREN UNDER THE AGE OF TEN

INTRODUCTION

Three observational surveys of safety restraint use by children under ten years of age were conducted. The first survey was conducted in October 1984 and measured children's usage rates prior to implementation of New York State's Mandatory Occupant Restraint Law. At that time restraint use was already required for all children under the age of seven, and children under the age of four were required to be restrained in federally-approved child safety seats. Post-law surveys were conducted in April 1985 and September 1985, after implementation of the new law which extended mandatory use to all front seat occupants, as well as to all children seven, eight and nine years of age, regardless of seating position. This chapter summarizes the findings of the three surveys and reports on the changes in the use of safety restraints in the three samples of children and their drivers.

The usage rates for the total samples of children and for three age groups (0-3 years, 4-6 years, 7-9 years) were compared across the three surveys. Analyses were conducted on the restraint use of children riding in the front and back seats of vehicles. In addition, the restraint use of the drivers in the vehicles and the relationship between the restraint use of the drivers and their young passengers were also examined. Finally, comparisons were made to identify regional differences in restraint use by children and their drivers, as well as changes that occurred within the Upstate, New York City, and Long Island regions over time.

STATEWIDE RESULTS

The usage rates for children measured in the three surveys and the types of restraints used are presented in Table 3.1. In October 1984, 42 percent of all the children observed at shopping centers across the State

were using safety restraints. In the first survey after the Mandatory Occupant Restraint Law was implemented (April 1985), the usage rate for all children increased to 61 percent. In the second post-law survey (September 1985), a somewhat lower usage rate of 57 percent was measured. In each survey the majority of children restrained were in child safety seats. Detailed information on the usage rates and types of restraints used by children of each age are presented in Appendix E.

TABLE 3.1			
RESTRAINT USE OF CHILDREN UNDER TEN			
	Baseline Oct.1984 N=1009 <u>%</u>	First Post-Law Apr.1985 N=1548 <u>%</u>	Second Post-Law Sept.1985 N=1899 <u>%</u>
TOTAL RESTRAINED	42.3	61.3	56.9
Child Restraint	26.5	29.1	34.0
Lap Belt	11.9	16.7	14.3
Shoulder/Lap Belt	3.9	15.5	8.6

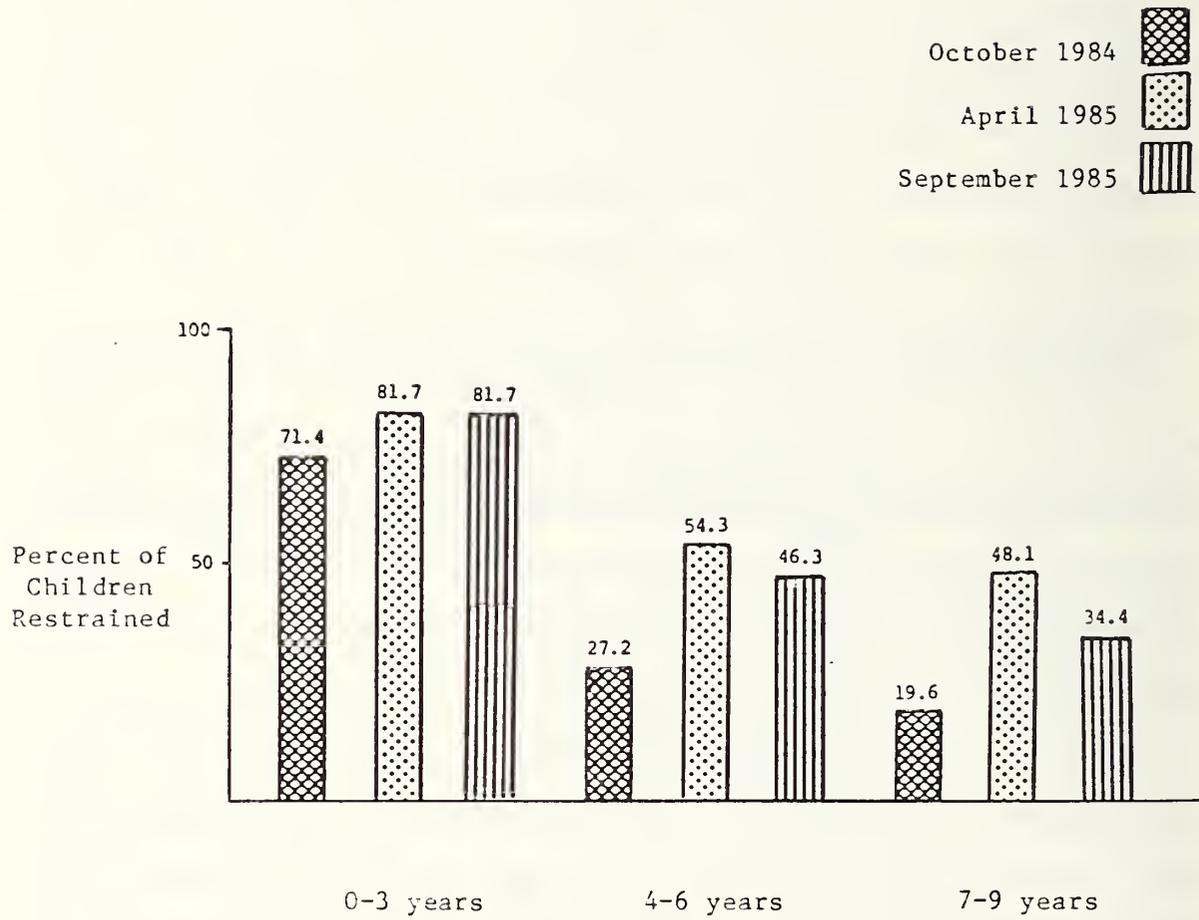
The total samples of children under ten were divided into three age groups (0-3 years, 4-6 years, 7-9 years) for additional analyses by age. Figure 3.1 shows the usage rates for each of the three age groups at the three points in time. In all three surveys, the highest usage rates were observed for children three years of age and under. Although restraint use was required for these children prior to 1984, the restraint use for this age group was higher after the implementation of the Mandatory Occupant Restraint Law (71% in October 1984 compared to 82% in April 1985). An eighty-two percent usage rate was again measured in September 1985.

Restraint use was also required for children four to six years of age at the time of the October 1984 survey. In this survey, however, only 27 percent of the children in this age group were observed using safety restraints. In April 1985, after the Mandatory Occupant Restraint Law was implemented, usage for these children doubled to 54 percent. In September 1985, the usage rate for this age group declined to 46 percent.

Under the Mandatory Occupant Restraint Law, mandatory restraint use was extended to children seven to nine years of age. In October 1984, prior to required use, 20 percent of the children in this age group were observed using safety belts. In April 1985, the first post-law usage rate for children in the oldest age group was 48 percent. In September 1985, a lower usage rate of 34 percent was measured among children seven, eight and nine years of age.

Figure 3.1

RESTRAINT USE OF CHILDREN
IN THREE AGE GROUPS



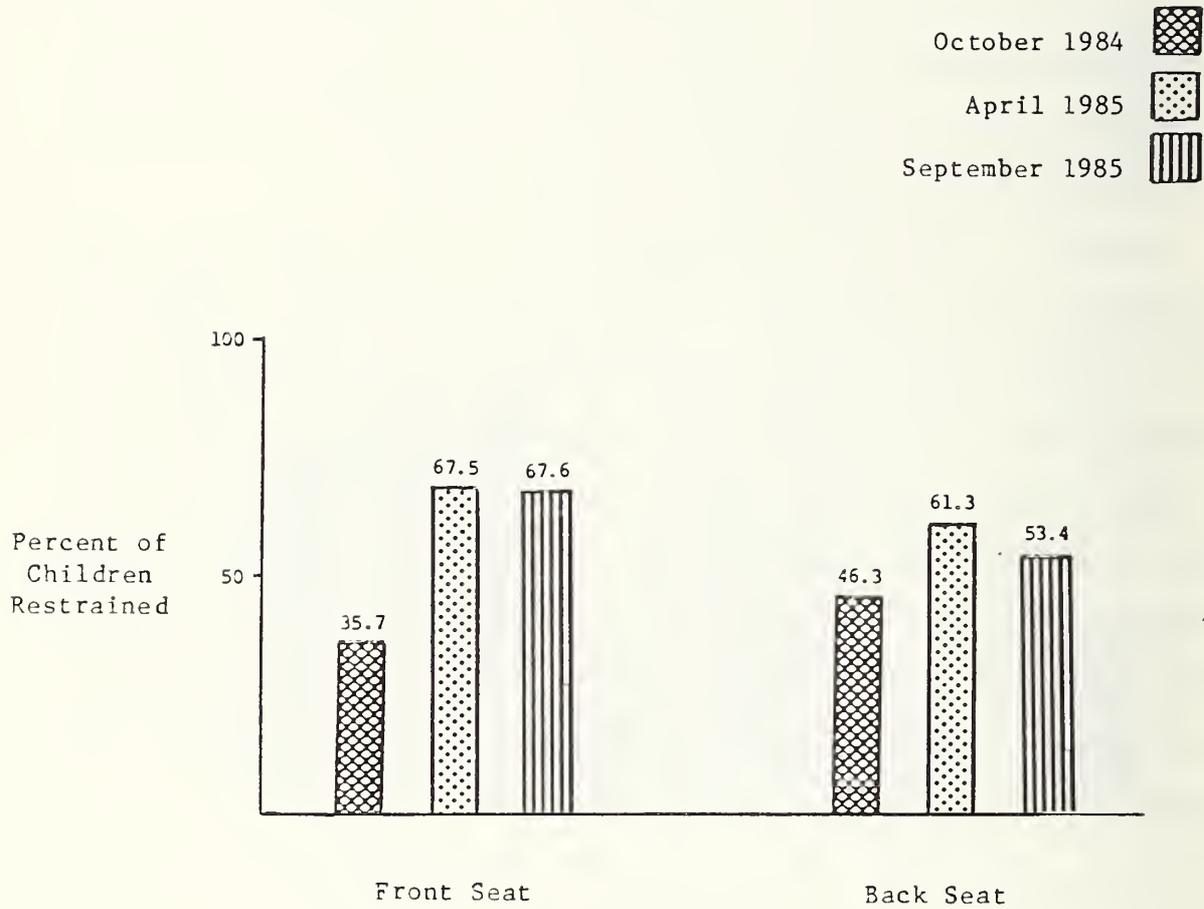
Children's Seating Position Within Vehicle

In addition to restraint use, the seating position of each child in the three samples was examined. Information on where the children were seated in the vehicles appears in Appendix F. Approximately one-third of the children observed in each survey were riding in the front seat and two-thirds were seated in the back. Fewer than three percent of the children were riding in the rear cargo areas of station wagons.

Figure 3.2 shows the seating position of the children who were restrained in all three surveys. In the October 1984 survey, restraints were used more often in the back seat (46%) than in the front seat (36%). Although restraint use in both seating positions was higher in April 1985, a larger increase in usage was measured among children riding in the front seat (from 36% to 68% in the front and from 46% to 61% in the back). In September 1985, back seat restraint use decreased (53%), while use in the front seat remained the same (68%). In both post-law surveys, however, restraint use in the front seat was higher than restraint use in the back seat.

Figure 3.2

RESTRAINT USE OF CHILDREN
BY SEATING POSITION



Restraint use and seating position were further analyzed to determine differences among the three age groups of children (Figure 3.3). In October 1984, front seat restraint use for children three years of age and under was more than double the restraint use measured for the older children riding in the front seat (56% compared to 25% for 4-6 years and 23% for 7-9 years). Restraint use among the youngest children in the front seat steadily increased across the three surveys (56% in October 1984, 61% in April 1985, and 79% in September 1985). However, for children in the two older groups, there were large initial increases in front seat usage followed by declines in usage in September 1985.

For the children four to six years of age riding in the front seat, usage was 25 percent in October 1984 and increased to 69 percent in April 1985. In September 1985, the restraint use measured for this age group was lower (62%). A front seat usage rate of 23 percent was measured for children seven to nine years of age in October 1984. The rate for this age group more than tripled in April 1985 (72%), but declined to 57 percent in September 1985.

Finally, as a result of large initial increases in restraint use after implementation of the Mandatory Occupant Restraint Law, front seat usage for the two older age groups was higher than for the children in the youngest age group in April 1985. By September 1985, however, children three years of age and under once again had the highest usage rate in the front seat.

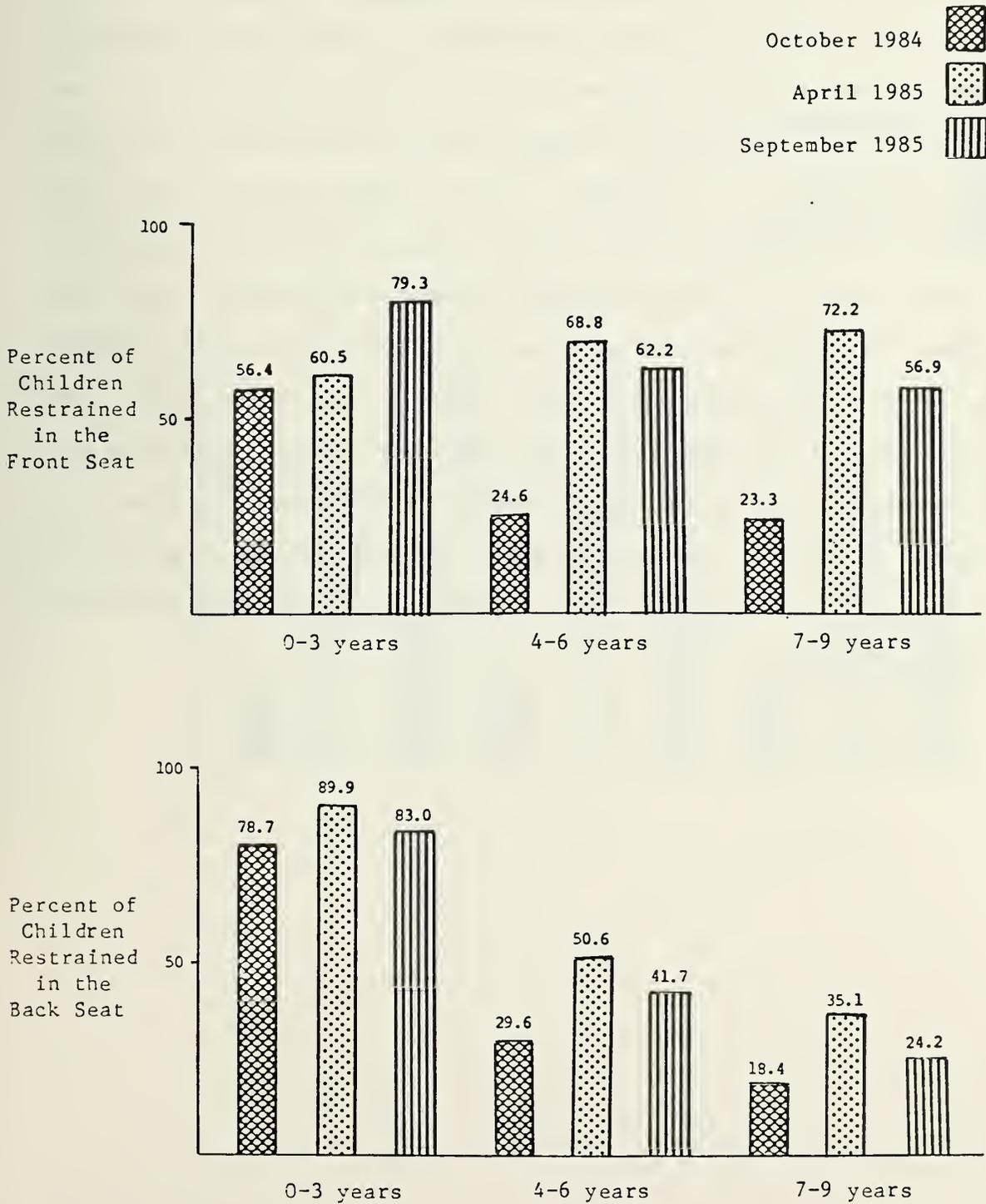
In October 1984, restraint use in the back seat was also high for the youngest age group of children (79%). For these children, restraint use in this seating position increased to 90 percent in April 1985. Although usage for the youngest age group was somewhat lower in September 1985,

their usage rate still remained high at 83 percent. Back seat restraint use for children four to six years of age was also higher after implementation of the Mandatory Occupant Restraint Law (30% in October 1984 compared to 51% in April 1985) and then declined over time (to 42% in September 1985). In addition, restraint use for children seven to nine years of age followed a similar pattern but started at a lower baseline level of 18 percent, and increased to only 35 percent in April 1985, before dropping to 24 percent in September 1985.

Finally, in all three surveys, children three years of age and under were more likely to be restrained in the back seat than in the front seat. In the October 1984 survey, children in the two older age groups had similar front and back seat usage rates. However, after implementation of the Mandatory Occupant Restraint Law, children in these two age groups were much more likely to be restrained in the front seat. In fact, in both post-law surveys, the front seat usage rates for children seven to nine years of age were more than double the rates measured in the back seat.

Figure 3.3

RESTRAINT USE AND SEATING POSITION
OF CHILDREN IN THREE AGE GROUPS



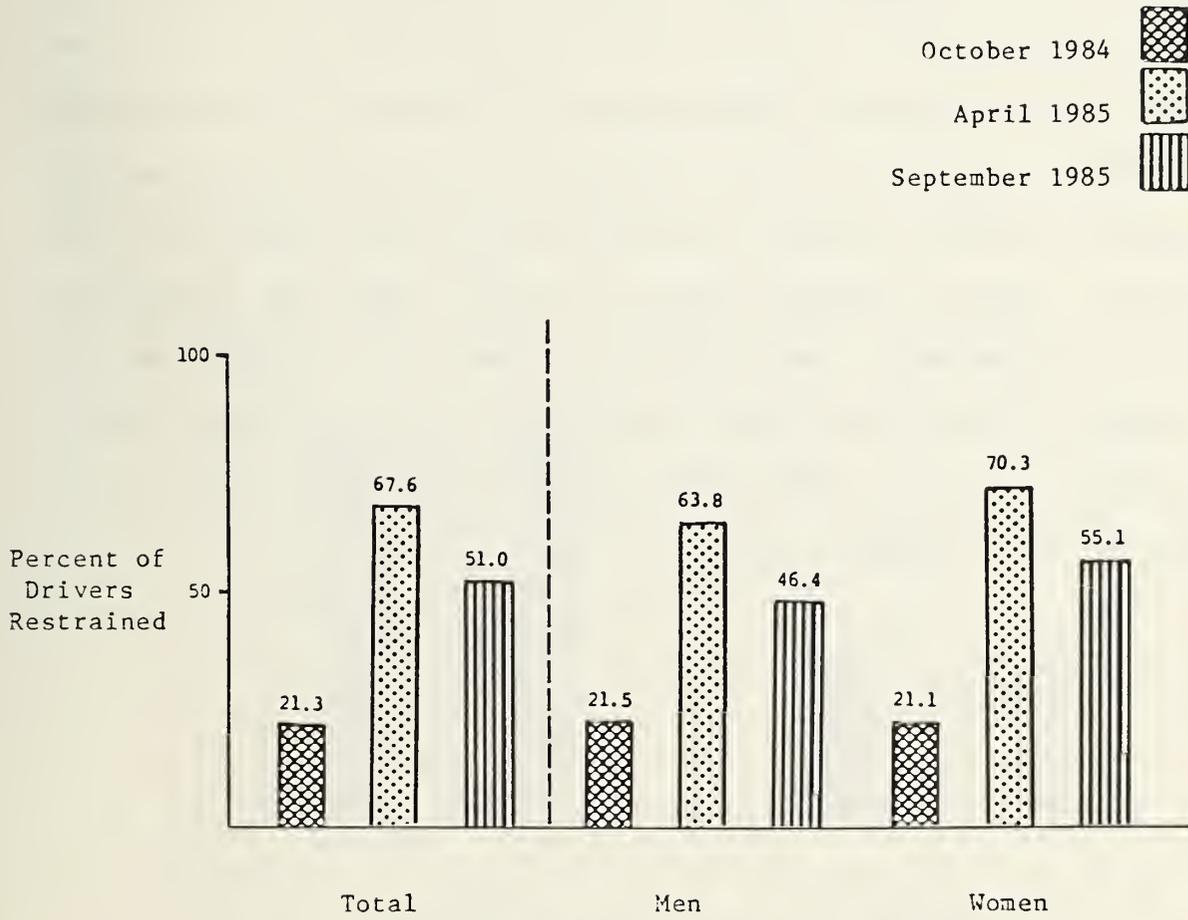
Restraint Use Of Drivers

In addition to the restraint use of the children, the restraint use and sex of the drivers in each survey were examined. In October 1984, a baseline usage rate of 21 percent was measured for the drivers transporting children under age ten (Figure 3.4). In April 1985, after the implementation of the Mandatory Occupant Restraint Law, restraint use among drivers increased to 68 percent. In the second post-law survey in September 1985, however, the usage rate for drivers declined to 51 percent.

The usage rates of male and female drivers in each survey were also analyzed. Although men and women had comparable usage rates in October 1984 (21%), usage among the women observed was higher after the implementation of the Mandatory Occupant Restraint Law than usage among men (70% compared to 64% for men in April 1985). In September 1985, there were decreases in restraint use among both male and female drivers (to 46% for men and to 55% for women). Women, however, were still more likely to buckle up than men.

Figure 3.4

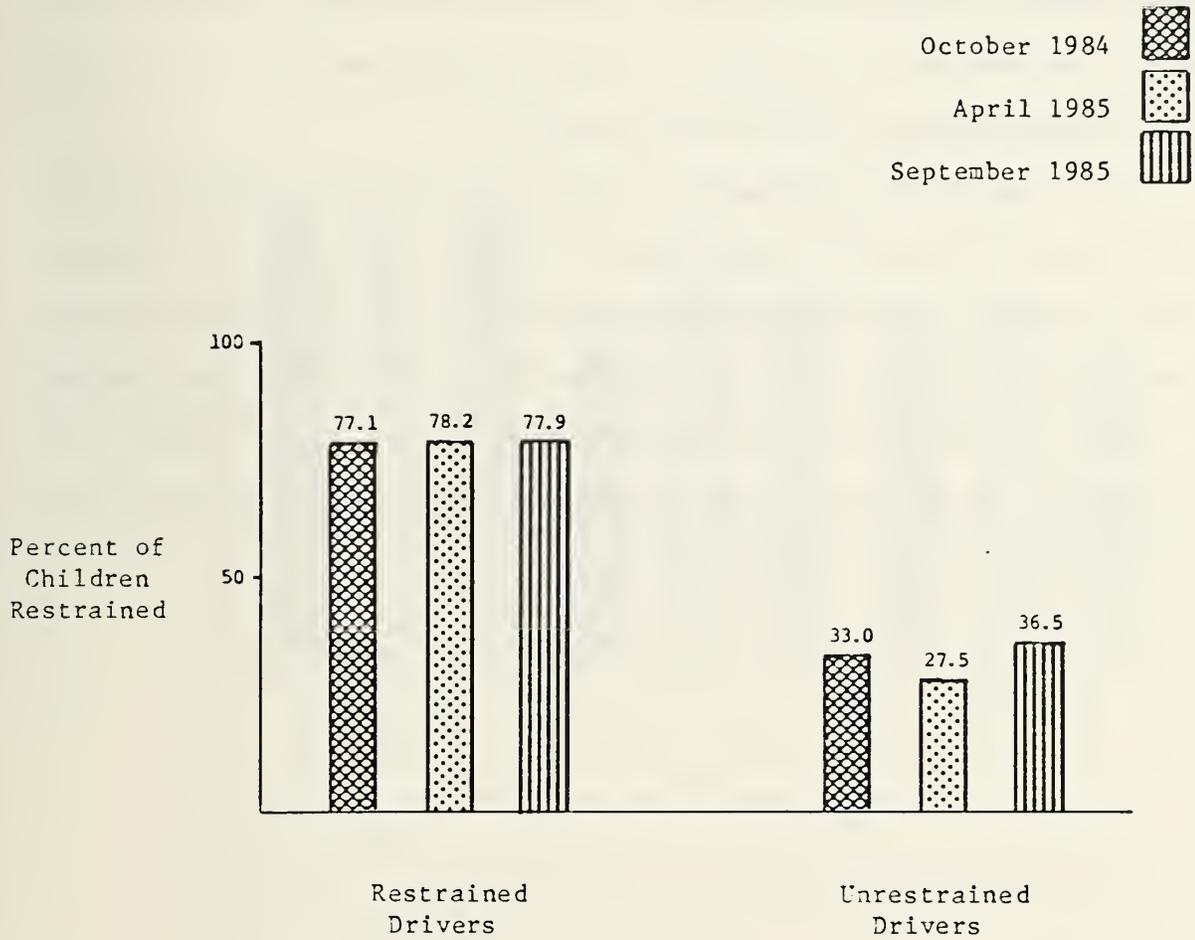
RESTRAINT USE OF DRIVERS
FOR TOTAL SAMPLE AND BY SEX



When the restraint use of the drivers was compared to the restraint use of the children in their vehicles, a consistent relationship was found in all three surveys. This was true even though the level of restraint use among drivers differed in each survey (21% in October 1984, 68% in April 1985, and 51% in September 1985). As Figure 3.5 indicates, children riding with drivers who were buckled up were much more likely to be restrained than children riding with drivers who were not buckled up. The proportion of children under ten who were restrained while with a driver who was also restrained remained constant at approximately 78 percent across all three surveys. When the restraint use of the children riding with unrestrained drivers was examined, it was found that the proportion of children who were restrained while riding with unrestrained drivers was also fairly consistent across the three surveys (33% in October 1984, 28% in April 1985, and 37% in September 1985).

Figure 3.5

RESTRAINT USE OF CHILDREN
RIDING WITH RESTRAINED
AND UNRESTRAINED DRIVERS



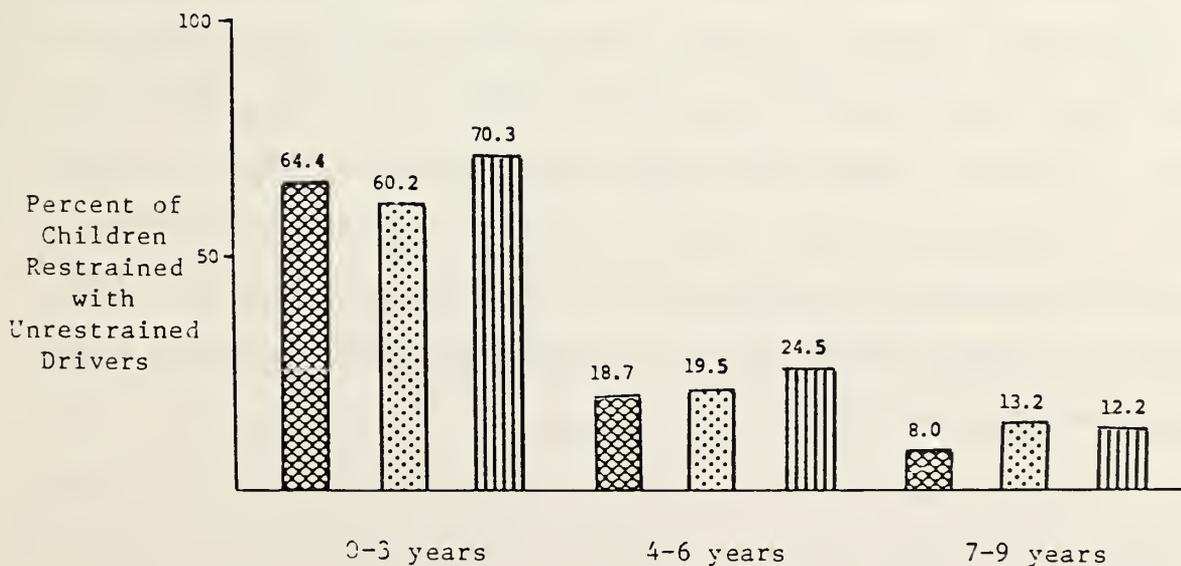
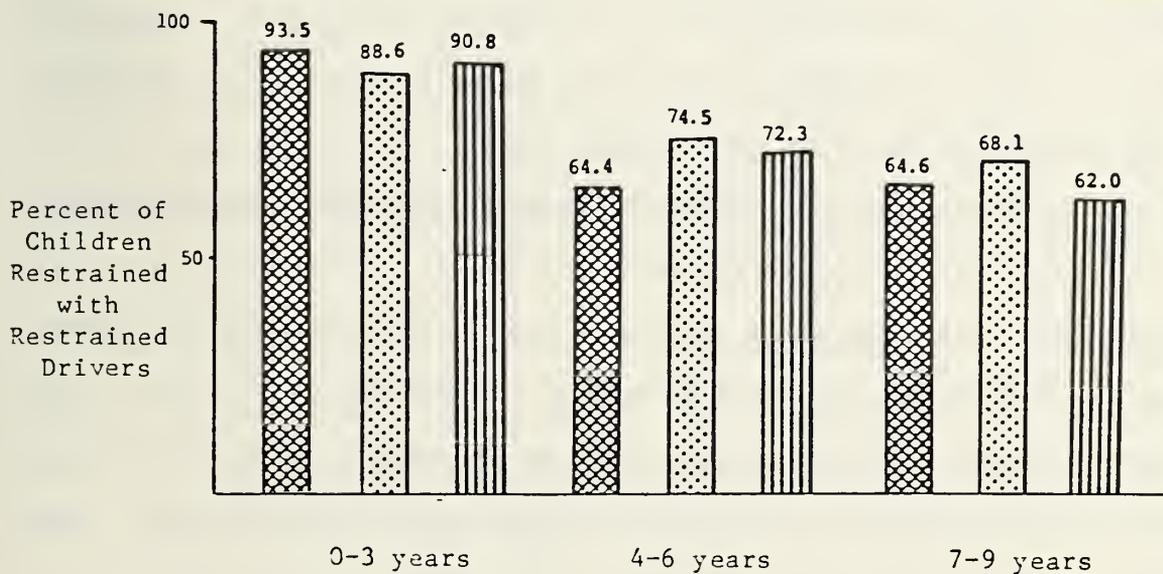
This relationship between drivers' and children's usage was also found for each of the three age groups of children. As Figure 3.6 shows, children in all three age groups were much more likely to be restrained when riding with drivers who were restrained. Children in the youngest age group had the highest restraint use in all three surveys, but over 60 percent of the children in the two older age groups were also restrained while riding with drivers who were buckled up.

For those children riding with unrestrained drivers, however, there were greater differences in usage among the three age groups. Although fairly high usage rates were measured among children three years of age and under in all three surveys, less than one-quarter of the children four to six years of age were restrained with drivers who were not buckled up. Furthermore, safety belt use was even lower among the oldest children (7-9 years) riding with unrestrained drivers.

Figure 3.6

RESTRAINT USE OF CHILDREN RIDING
WITH RESTRAINED AND UNRESTRAINED DRIVERS
IN THREE AGE GROUPS

October 1984 
April 1985 
September 1985 



REGIONAL RESULTS

Analyses were also conducted to identify any regional differences in restraint use by children under ten and their drivers. In each survey, observations were conducted at shopping centers in all three regions of the State (Upstate, New York City, and Long Island). The regional usage rates for the total samples of children observed in each of the surveys are reported in Table 3.2. As previously mentioned, it cannot be assumed that these rates are representative of all children in those regions. However, they do provide an indication of how the law may have affected restraint use by children in different parts of the State.

In all three regions of the State, children's restraint use was higher in the first post-law survey in April 1985 than in the baseline survey in October 1984. Usage increased from 44 percent to 66 percent in the Upstate region, from 34 percent to 50 percent in the New York City region, and from 50 percent to 64 percent in the Long Island region. In both of these surveys, children observed in the New York City region had the lowest usage rates.

In the September 1985 survey, the usage rate measured for children at the Long Island shopping centers was almost 20 percentage points lower than that measured on Long Island in the April 1985 survey (45% compared to 64%). Children's usage in the Upstate region increased slightly between April 1985 and September 1985 (from 66% to 69%), while children's usage in New York City declined slightly (from 50% to 46%). In September 1985, usage in the Upstate region was over 20 percentage points higher than usage in the two downstate regions.

TABLE 3.2

REGIONAL DIFFERENCES IN RESTRAINT USE OF CHILDREN

<u>REGION</u>	<u>Baseline Oct.1984 %</u>	<u>First Post-Law Apr.1985 %</u>	<u>Second Post-Law Sept.1985 %</u>
Upstate	43.6	65.7	69.3
New York City	33.7	50.1	46.2
Long Island	50.0	64.3	45.0

These regional differences in children's restraint use were further analyzed by age (Figure 3.7). In all three regions, restraint use was highest among the youngest children (0-3 years) and varied the least over time. The greatest change among children in this age group was the increase in usage in New York City between October 1984 and April 1985 (from 61% to 81%).

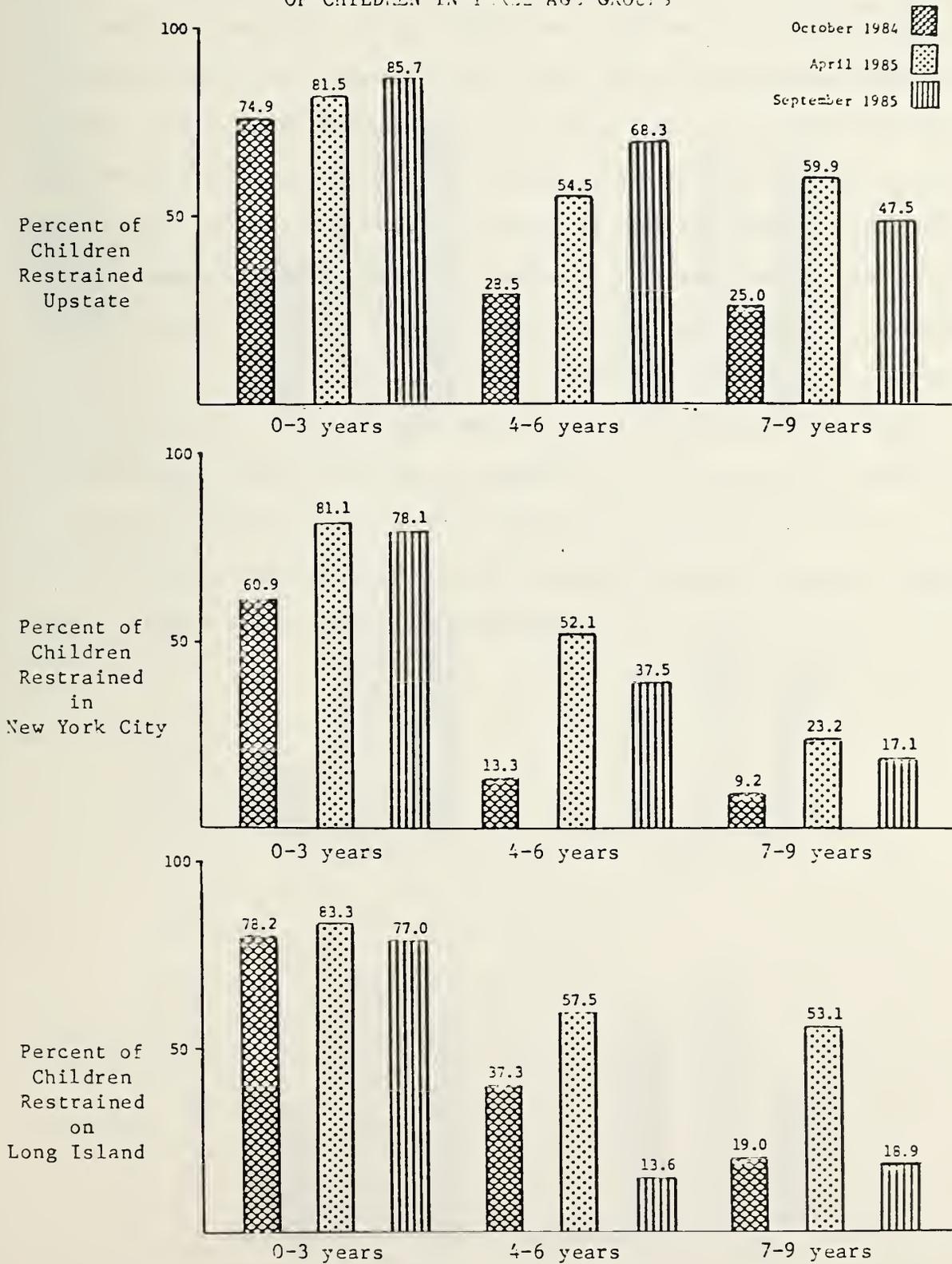
Usage among children in the two older age groups varied more by region. Although restraint use was required for all children under seven years of age in October 1984, usage among children four to six years of age ranged from a high of only 37 percent on Long Island to 13 percent in New York City. After implementation of the Mandatory Occupant Restraint Law, restraint use in this age group was higher in all three regions. In April 1985, similar usage rates were measured in each region (55% in the Upstate region, 52% in New York City, and 58% on Long Island). However, in September 1985 there were large differences in the regional usage rates for

children four to six years of age. In the Upstate region, usage increased further (68%), while usage dropped in the two downstate regions (to 38% in New York City and to 14% on Long Island). In fact, in the Long Island region the September 1985 usage rate (14%) was lower than the October 1984 baseline rate (37%).

The lowest baseline usage rate for children seven to nine years of age was measured in New York City (9% compared to 19% on Long Island and 25% Upstate). In all three regions there were increases in usage for this age group after implementation of the Mandatory Occupant Restraint Law. However, in April 1985, only 23 percent of the oldest children observed in New York City were using restraints compared to 53 percent on Long Island and 60 percent in the Upstate region. In all three regions, the usage rates for these children declined over time. In September 1985, the Upstate region maintained the highest usage rate (48%), while restraint use in New York City continued to be the lowest (17%). As was the case with children four to six years of age, the greatest change in usage among the oldest children was noted on Long Island where usage dropped from 53 percent to the baseline rate of 19 percent.

Figure 3.7

REGIONAL DIFFERENCES IN RESTRAINT USE
OF CHILDREN IN THREE AGE GROUPS

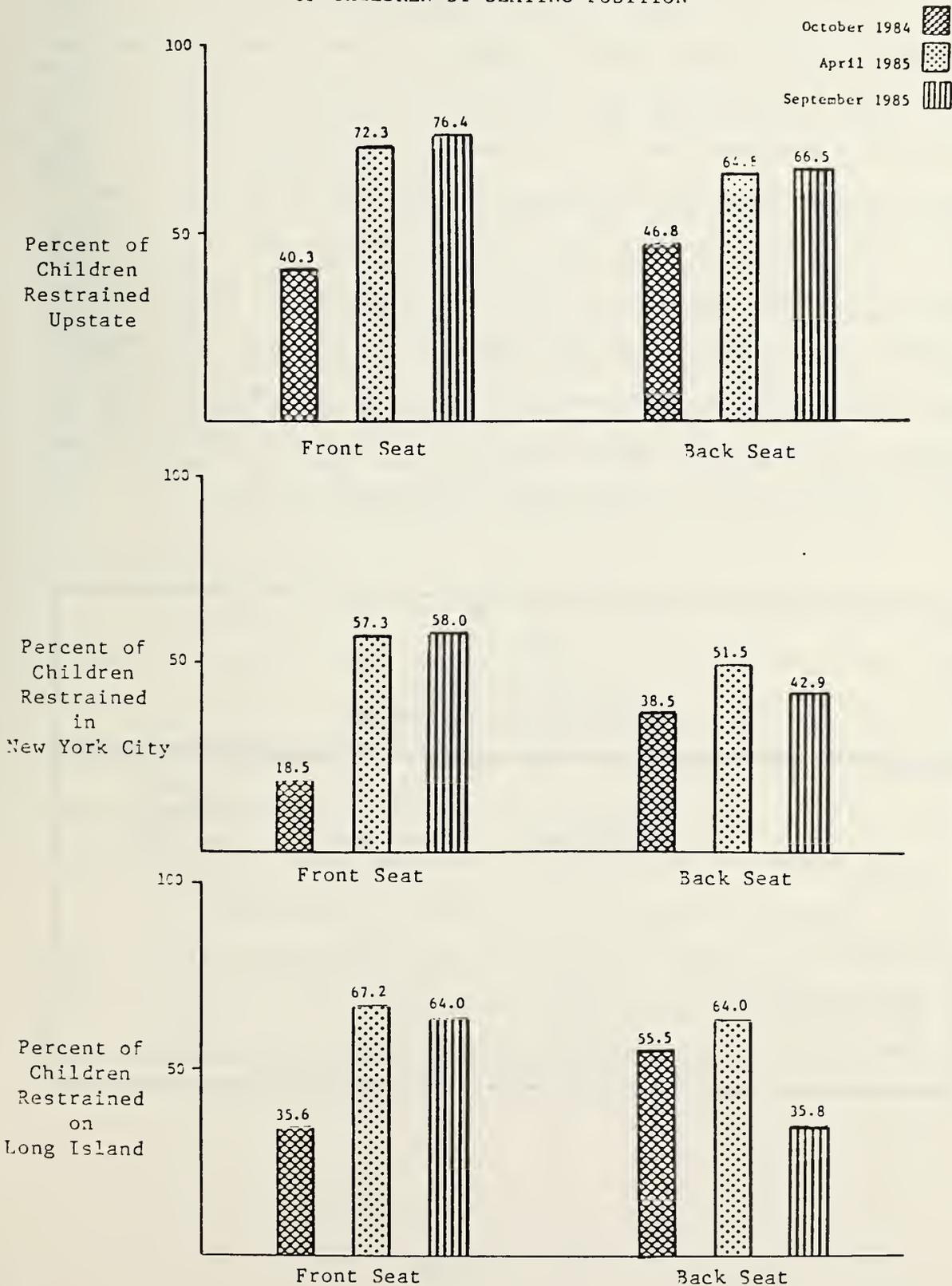


Further analysis of restraint use by seating position provided additional information about children's use of restraints in the three regions. In October 1984, restraint use in all three regions was higher in the back seat than in the front seat (Figure 3.8). Although restraint use increased in both seating positions after implementation of the Mandatory Occupant Restraint Law, the larger increases occurred among children riding in the front seat. As a result, in both post-law surveys restraint use was higher in the front seat than in the back in all three regions. These high front seat usage rates were sustained over time and in September 1985, restraint use in the front seat ranged from 76 percent in the Upstate region to 58 percent in New York City.

The changes in restraint use in the back seat were less consistent over time. After the initial increases in April 1985, back seat restraint use in both the New York City and Long Island regions declined while a slight increase in usage was measured in the Upstate region. In September 1985, back seat restraint use ranged from 67 percent in the Upstate region to 36 percent on Long Island.

Figure 3.8

REGIONAL DIFFERENCES IN RESTRAINT USE
OF CHILDREN BY SEATING POSITION



The usage rates of the drivers observed in each survey are presented by region in Table 3.3. In each region, there was a large initial increase in drivers' restraint use between the baseline survey and the first post-law survey, followed by a decline in usage over time. Upstate drivers had the highest baseline usage rate (27%) and restraint use increased to 72 percent after implementation of the Mandatory Occupant Restraint Law. The lowest baseline rate (12%) was measured for New York City drivers, but in April 1985 their usage increased to the same level as that of the Long Island drivers (60%). In September 1985, the usage rate for Upstate drivers decreased to 63 percent and the usage rate for New York City drivers dropped to 42 percent. The lowest post-law usage rate for drivers was observed at Long Island shopping centers where usage in September 1985 was nearly half that measured in April 1985 (32% compared to 60%).

TABLE 3.3
REGIONAL DIFFERENCES
IN RESTRAINT USE OF DRIVERS

<u>REGION</u>	<u>Baseline Oct.1984 %</u>	<u>First Post-Law Apr.1985 %</u>	<u>Second Post-Law Sept.1985 %</u>
Upstate	27.2	72.2	62.8
New York City	11.6	60.2	42.3
Long Island	16.8	60.0	31.8

SUMMARY

After implementation of the Mandatory Occupant Restraint Law, the use of safety restraints increased among children under ten, including those age groups covered by earlier legislation. In all three surveys, restraint use was highest for children three years of age and under and lowest for children seven to nine years of age.

Before the Mandatory Occupant Restraint Law took effect, the children observed used restraints more often in the back seat (46%) than in the front seat (36%). In the first post-law survey, restraint use was higher in both seating positions. A larger increase was measured in the front seat (68% compared to 61% in the back seat). In September 1985, front seat usage remained the same, while restraint use in the back seat declined (53%). In both post-law surveys, restraint use among the two older age groups was much lower in the back seat than in the front seat.

The implementation of the Mandatory Occupant Restraint Law also affected the restraint use of the drivers in these surveys who were transporting children under age ten. After a large initial increase (from 21% to 68%), usage decreased somewhat over time (51%). Baseline rates of 21 percent were measured for both male and female drivers. However, in the two post-law surveys women were more likely to buckle up than men.

In all three surveys, restraint use was higher for children riding with drivers who were buckled up than for children riding with drivers who were not buckled up. The children least likely to buckle up were those in the two older age groups riding with unrestrained drivers.

Children's restraint use also differed by region. The highest baseline rate (50%) was measured on Long Island, followed by the Upstate region (44%) and New York City (34%). Usage rates increased in all three regions after implementation of the Mandatory Occupant Restraint Law. The September 1985 usage rates in the Upstate and New York City regions differed only three to four percentage points from those measured in April 1985, while usage on Long Island dropped nearly 20 percentage points. This large drop in usage on Long Island occurred primarily among the two older age groups and among children riding in the back seat.

Finally, after implementation of the Mandatory Occupant Restraint Law, there were also large increases in usage among the drivers observed in each region. These high levels of usage, however, declined over time. The largest decrease in restraint use was measured on Long Island where the usage rate in September 1985 dropped to half the level measured in April 1985 (from 60% to 32%).

4. DISCUSSION

This report presents the results of a series of observational surveys of restraint use by children under ten years of age and their drivers. These surveys were conducted to determine whether the implementation of New York State's Mandatory Occupant Restraint Law in January 1985 affected the level of restraint use for children under ten, and to identify factors which may influence restraint usage among children.

A baseline survey was conducted in October 1984. At that time New York State law already required restraint use for all children under seven years of age, regardless of seating position. The 1985 Mandatory Occupant Restraint Law extended mandatory restraint use to drivers and all front seat passengers and to children seven, eight and nine years of age, regardless of seating position. Post-law surveys were conducted in April 1985 and September 1985. This chapter summarizes several important findings that emerged from a detailed analysis of the results of the three surveys.

The first finding concerns changes in the level of restraint use among children under ten. After implementation of the Mandatory Occupant Restraint Law, there were higher levels of restraint use among all children under ten, including those covered by earlier legislation. The level of usage rose from 42 percent in October 1984 to 61 percent in April 1985. This large increase was followed by a small decrease in usage (to 57%) in September 1985.

The other major findings involve a number of variables which were associated with the level of usage among children in all three surveys. These variables are age, seating position, restraint use of the driver, and region.

A clear and consistent inverse relationship between the age of the child and restraint use was identified. In each survey, the usage rates for children three years of age and under were substantially higher than the usage rates for the older age groups (4-6 years, 7-9 years). This pattern was evident even in the baseline survey, when children four to six years of age, as well as those in the youngest age group, were covered by restraint use legislation. These apparent differences in restraint use among the age groups may be due to a lack of awareness that mandatory use had been extended to children up to seven years of age earlier in 1984, and to children up to ten years of age under the new law. Another explanation, however, is that even with mandatory use legislation, age is an important factor in restraint use. In fact, in both post-law surveys, when legislation covered all children under ten, restraint use continued to decline with age.

Children's restraint use also differed by seating position. Before the Mandatory Occupant Restraint Law, restraint use was slightly higher in the back seat than in the front seat. However, after implementation of the Mandatory Occupant Restraint Law, usage was higher in the front seat. Although the restraint use of children in both seating positions was higher in the April 1985 survey, the difference between front and back seat usage was a result of the large increases that occurred among children in the two older age groups riding in the front seat. Since comparable increases in restraint use did not occur among older children riding in the back seat, it is likely that front seat use was higher because the Mandatory Occupant Restraint Law requires restraint use for all front seat occupants, regardless of age.

A third important factor in the restraint use of the children in all three surveys was the restraint use of the drivers. The children riding with drivers who were buckled up were much more likely to be restrained than the children riding with drivers who were not buckled up. This strong, positive relationship between the restraint use of drivers and children did not change when there was a large increase in use among drivers after implementation of the Mandatory Occupant Restraint Law. The presence of an unrestrained driver also exaggerated the age differences in restraint use identified earlier. For those children riding with unrestrained drivers, restraint use was high for the youngest age group, but then dropped to very low levels for the two older groups.

A final variable related to restraint use was region of the State. Within all three regions there were also large increases in usage among the children and their drivers after implementation of the Mandatory Occupant Restraint Law. The changes in restraint use among children in the second post-law survey, however, were not consistent across the regions. Usage by children at Long Island shopping centers dropped to below the baseline level for that region, while usage in the other two regions changed only slightly. As a result, the September 1985 usage rate on Long Island (which had the highest baseline rate) was similar to that measured in New York City and nearly 25 percentage points lower than the usage rate in the Upstate region.

It also appears that changes in the restraint use of drivers may have contributed to the overall regional differences in children's restraint use. After large initial increases in April 1985, restraint use among drivers in all three regions declined in the September 1985 survey. However, the September drop in usage on Long Island was over three times

the size of the decline in the Upstate region. Given the strong relationship between driver usage and usage by children, this drop in driver usage may partially explain the decrease in usage among children.

The results of these surveys indicate that the impact of the Mandatory Occupant Restraint Law on the restraint use of children and their drivers was similar to the effects found in statewide surveys of restraint use by drivers and front seat passengers conducted during the same three time periods.¹ In both series of surveys there were large increases in usage in April 1985 for those occupants observed. These high post-law usage rates generally were not sustained over time. The decrease in usage among the children observed, however, was not as large as that measured in the survey of front seat occupants. In addition, the usage rates of drivers transporting young children were higher in all three surveys than front seat occupants in general.

In summary, the October 1984 survey of children shows that the implementation of earlier child restraint legislation was not sufficient to ensure that children would be protected, especially children four to six years of age. The results of the April 1985 and September 1985 surveys indicate that the extension of mandatory restraint use to the general population had a positive effect on the restraint use of children covered by earlier legislation, as well as those newly covered. However, it also appears that these positive effects were not sustained over time and were influenced by other variables.

1

Debra H. Rood, Patricia P. Kraichy and Jean Carubia, Evaluation of New York State's Mandatory Occupant Restraint Law: Observational Surveys of Safety Restraint Use in New York State. Final Report (Institute for Traffic Safety Management and Research, December 1985).

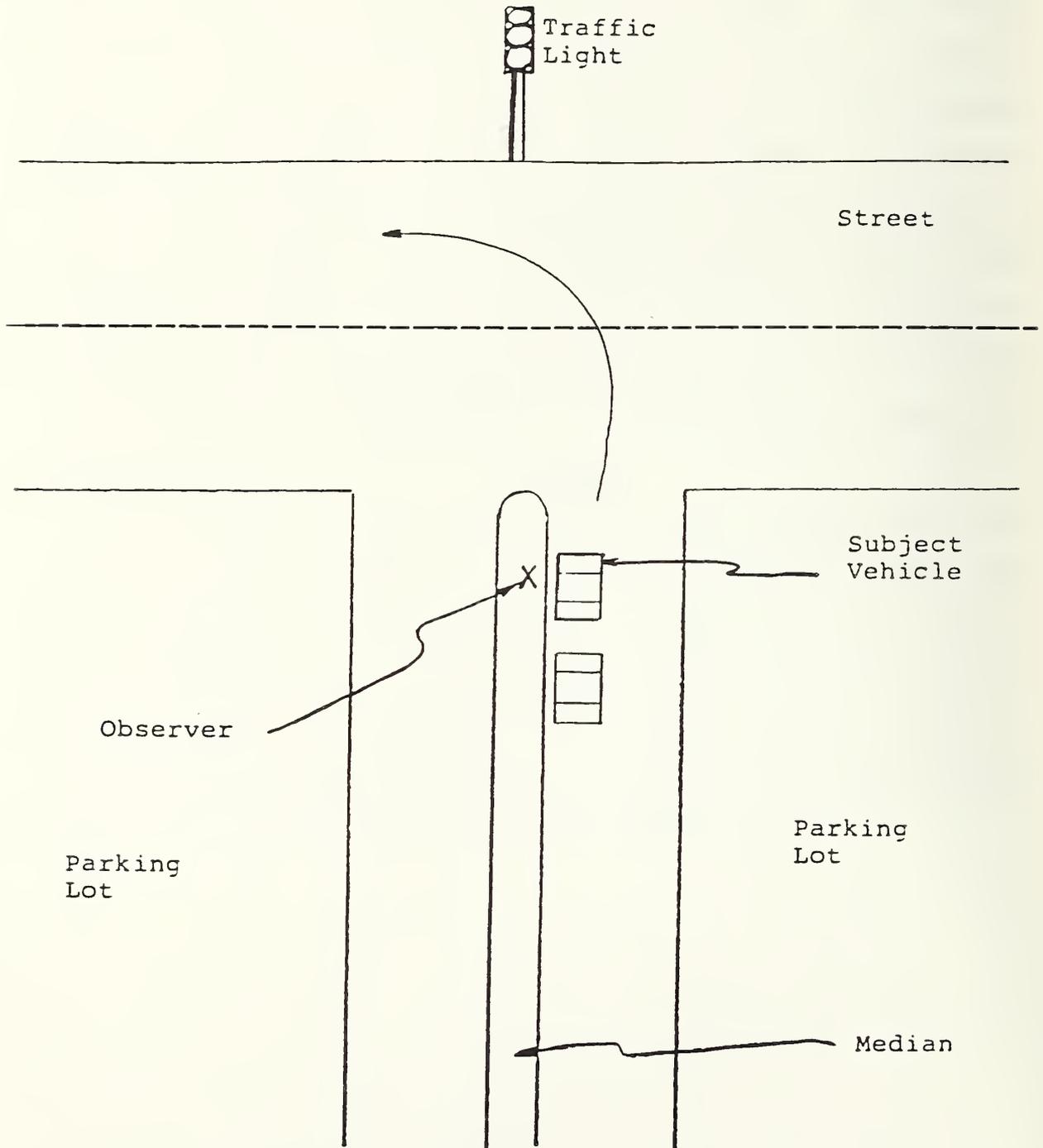
The surveys of children provided data that help identify the characteristics of the children most at risk from a decline in usage rates. Based on the September 1985 survey results and the changes that occurred between April 1985 and September 1985, children in the two older age groups riding in the back seat were much less likely to be protected than younger children, or children of any age sitting in the front seat. In all three surveys, children riding with unrestrained drivers were much less likely to be protected. Finally, a regional analysis showed that the children most at risk were those in the two older age groups in the two downstate regions. In fact, the September 1985 usage rates for these children were lower than those of the drivers in the Long Island and New York City regions.

These findings indicate there may be a lack of awareness that the Mandatory Occupant Restraint Law requires restraint use in the back seat for all children up to ten years of age. It is also clear that a decline in the restraint use of drivers adversely affects the usage rate of children, especially those over three years of age. Increased awareness of the back seat provisions of the law and increased compliance among drivers should result in higher usage rates among children as well.

APPENDIX A

FIGURE A.1

Generic Diagram of Shopping Mall Survey Sites



APPENDIX B

TABLE B.1

SHOPPING CENTERS USED IN
CHILD RESTRAINT OBSERVATION

<u>SHOPPING CENTER</u>	<u>REGION</u>
Appletree Mall Buffalo, NY	Upstate
Caldor Plaza Poughkeepsie, NY	Upstate
Colonie Center Albany, NY	Upstate
Crossgates Mall Albany, NY	Upstate
Dutchess Mall Fishkill, NY	Upstate
Eastchester Mall Scarsdale, NY	New York City
Jefferson Valley Mall Yorktown, NY	New York City
Kings Plaza Brooklyn, NY	New York City
Long Ridge Mall Rochester, NY	Upstate
Oakdale Mall Johnson City, NY	Upstate
Queens Center Queens, NY	New York City
Roosevelt Field Mall Garden City, NY	Long Island
Shoppingtown Dewitt, NY	Upstate
Staten Island Mall Staten Island, NY	New York City
Sunrise Mall Massapequa, NY	Long Island
Thruway Mall Cheektowaga, NY	Upstate

APPENDIX C

APPENDIX C

INSTITUTE FOR TRAFFIC SAFETY
MANAGEMENT AND RESEARCH
CHILD RESTRAINT RECORDING SHEET

Observer: _____ Start time: _____ AM
(1-2) _____ PM

Date: _____ End time: _____ AM
(3-6) _____ PM

County: _____
(7-8) _____

Shopping Center: _____
(9-10) _____

Exit to: _____
(street name) _____

Hello. I'm conducting a traffic safety survey. How old are the children in your vehicle?

Child No.	Driver*		Child		
	Sex: 1 Male 2 Female	Restraint Use: 0 None 1 Lap only 2 Shoulder	Age: (enter age in years, under 1 yr. enter 00)	Seat: 1 Front 2 Back 3 Rear	Restraint Use: 0 None 1 Lap only 2 Shoulder 3 Child Restraint
1					
2					
3					
4					
5					
6					
7					
8					

(11) (12) (13-14) (15) (16)
 (17-18) (19) (20)
 (21-22) (23) (24)
 (25-26) (27) (28)
 (29-30) (31) (32)
 (33-34) (35) (36)

* If more than one child is in car, only enter driver information once.

APPENDIX D

TABLE D.1

AGE DISTRIBUTION OF THE SAMPLES OF CHILDREN OBSERVED

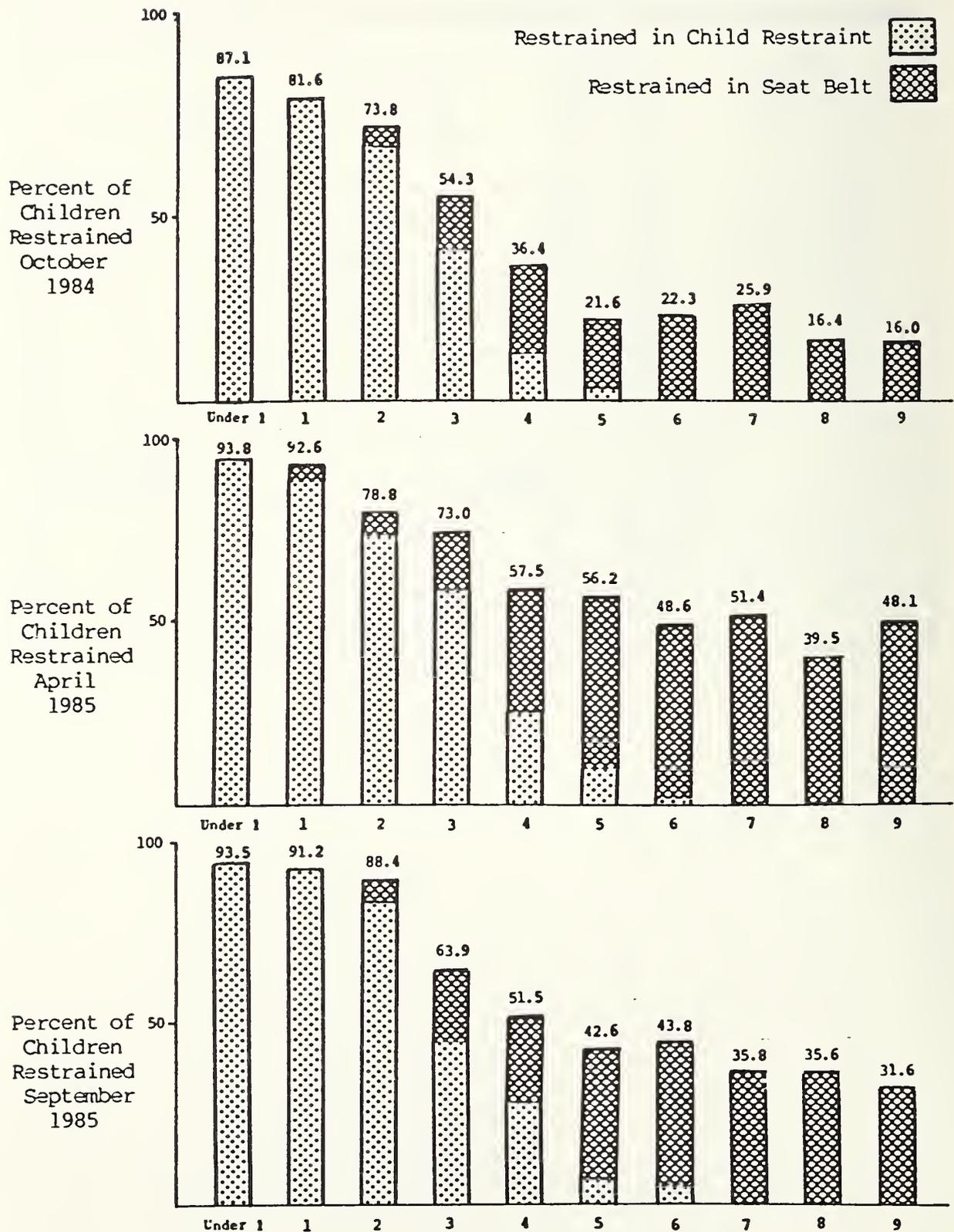
<u>AGE IN YEARS</u>	Baseline		First		Second	
	Oct.1984		Post-Law		Post-Law	
	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>
Under 1	6.1	62	7.2	112	8.1	153
1	8.6	87	4.4	68	6.0	114
2	10.6	107	9.9	151	11.4	216
3	12.8	129	12.5	193	12.8	244
4	14.2	143	13.0	202	14.1	268
5	13.4	134	13.4	208	13.1	249
6	11.1	112	11.4	177	9.4	178
7	8.0	81	9.3	144	9.3	176
8	7.2	73	10.1	157	7.8	149
9	8.0	81	8.8	136	8.0	152

<u>AGE GROUPS IN YEARS</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>
	0-3	38.1	385	33.9	524	38.3
4-6	38.6	389	37.9	587	36.6	695
7-9	23.3	235	28.2	437	25.1	477

APPENDIX E

FIGURE E.1

RESTRAINT USE OF CHILDREN BY AGE



APPENDIX F

TABLE F.1

SEATING POSITION OF CHILDREN IN VEHICLE

	Baseline Oct. 1984		First Post-Law Apr. 1985		Second Post-Law Sept. 1985	
	%	N	%	N	%	N
<u>Total Sample</u>						
Front Seat	30.3	305	29.5	456	31.2	593
Back Seat	67.9	684	67.3	1041	66.1	1254
Cargo Area	1.8	18	3.2	50	2.7	52
<hr/>						
<u>0-3 Years</u>						
Front Seat	28.7	110	24.6	129	32.6	237
Back Seat	70.2	269	73.9	387	66.3	482
Cargo Area	1.1	4	1.5	8	1.1	8
<u>4-6 Years</u>						
Front Seat	31.4	122	30.0	176	28.2	196
Back Seat	66.1	257	66.4	389	68.3	475
Cargo Area	2.5	10	3.6	21	3.5	24
<u>7-9 Years</u>						
Front Seat	31.1	73	34.6	151	33.5	160
Back Seat	67.2	158	60.6	265	62.3	297
Cargo Area	1.7	4	4.8	21	4.2	20

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