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16. Abstract

This study combined direct observation of seat belt use with interview methods to identify factors related to seat belt use in a state with a mandatory seat belt use law. Trained observers recorded restraint use for a probability sample of motorists traveling on roads throughout the State of Michigan. Roadside interviews of 1,864 drivers measured sociodemographic, situational, attitudinal, normative, and behavioral characteristics related to seat belt use.

Selected sociodemographic characteristics which are not susceptible to change, as well as crash experience and safety attitudes that are difficult to modify, were related to belt use. Few factors examined had an effect comparable to the known effects of compulsory belt use. Specifically, we examined actual belt use across a variety of social situations, and only found small differences. Results also indicated that seat belt use was lower than average among: (1) males, (2) individuals with lower socioeconomic status, (3) those of minority ethnic backgrounds, (4) those below age 30, (5) alcoholic beverage drinkers who drink to intoxication or while driving, (6) drivers in urban environments, and (7) married individuals below age 25. Our findings suggest several potentially effective seat belt use programs which focus on creating a stronger norm for belt use. These programs include use of prompts in locations characterized by low belt use, efforts to increase knowledge of crash involvement and seat belt efficacy, and programs to establish normative pressure to use belts. Finally, results indicate that the effectiveness of compulsory belt use will likely be increased by stricter enforcement efforts that are well publicized.

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Introduction

Motor vehicle crashes are the leading cause of death among persons age 1 to 36 in the U.S. and are a major health risk to individuals of any age. In 1985, motor vehicle crashes were responsible for 43,795 deaths and an estimated 1.7 million injuries. Estimates of the societal costs of motor vehicle crashes range from $48.6 billion to $69.5 billion annually. The efficacy of seat belts in preventing a substantial proportion of crash fatalities and injuries is well documented and 28 states have now enacted legislation requiring use of seat belts. Although Michigan implemented such a law in July 1985, observation surveys throughout the state revealed that as recently as July 1987, over 55% of motorists were still traveling unrestrained. The goal of this study was to gain a better understanding of the characteristics which distinguish motorists who comply with mandatory belt laws from those who do not. Of particular interest in this study are potential effects on belt use of the immediate social context or situation of motorists, such as who they are traveling with and where they are going on that particular trip. To answer such questions, we combined direct observation of belt use with roadside personal interviews of motorists at a probability sample of intersections throughout the State of Michigan.

Objectives

1. Conduct analyses of an existing database of motorists observed using or not using seat belts to identify situations in which use rates vary from average;

2. Directly observe actual seat belt use and measure via roadside interviews demographic, situational, and behavioral factors potentially related to compliance with a mandatory belt use law;

3. Identify and measure relationships between respondent and situational characteristics and observed seat belt use; and

4. Describe motorists likely to be nonusers of seat belts despite a compulsory use law, and identify target groups and situations that might be the focus of programs designed to increase belt use.

Methods

To provide adequate coverage of the entire state, 240 intersections were selected as sites for observation, using a multi-stage stratified probability sampling procedure. Observation sites were generally limited to intersections with three-color cycling traffic signals since flashing red lights and stop signs do not usually require stop times long enough for accurate observation of restraint use for all occupants. Observations were well distributed across the hours of adequate daylight and days of the week.

Motorists observed at the 240 sites were asked to participate in a brief interview in exchange for a $5.00 payment. Interviews were conducted near the intersection where motorists were first observed. Drivers who acknowledged the observer at the observation location (i.e., rolled down their car window), but refused to be interviewed at that time were given a card asking them to call collect at a later time to complete a telephone interview for the $5.00 payment.

The following items were observed prior to the interview: vehicle size, restraint use, and estimated age and sex of occupants of the six primary seating positions. The interview measured sociodemographic, attitudinal, and other factors related to respondents' seat belt use. Multiple interview forms were used for different respondents depending on their observed and self-reported belt use.

Results

A total of 16,300 Michigan drivers were observed at 240 intersections throughout the state. Of these 16,300 drivers, 4,487 were candidates for roadside interviews. A total of 1,869 of these candidates agreed to be interviewed at the site; 1,801 of these interviews were complete and valid. An additional 832 drivers refused to be interviewed at the site but accepted a card asking them to call in for a telephone interview. Of these 832 drivers accepting the call-back card, 72 called in for the telephone interview; 63 of the subsequent telephone interviews were complete and valid. The remaining 1,786 candidates refused both the roadside interview and the call-back card. The final sample consisted of 1,864 cases (1,801 roadside and 63 telephone interviews).

Interview respondents ranged in age from 16-87 years with a mean of 37 years. Sixty-two percent of respondents were male and 37.7% were female. In terms of socioeconomic status, 61.5% reported a family income of at least $25,000 and 85.9% reported having attained at least a high school education. Finally, 82.2% of respondents identified themselves as white, 14.0% Black, 1.5% Hispanic, 1.3% Native American, and 1.1% other.

Among interview respondents, 42.5% reported they "always" use belts; 24.4% reported belt use "most of the time"; and 10.8% reported they "never" use belts. Of respondents who reported always using belts, 94.0% were observed using belts at the time of the interview, but only 23.3% of respondents who reported using belts most of the time were actually observed buckled. A companion study involving observation of belt use among a much larger sample of 16,225 drivers at the same times and intersections found 46.8% using seat belts.

Almost all interviewees (94.6%) reported living in Michigan in July 1985 when the mandatory seat belt law took effect. Of these, 53.8% reported their belt use increased when the law took effect and 45.5% reported their belt use stayed the same. Over a third (38.4%) of respondents who do not consistently use belts reported that a fine at its current $25 level would induce them to use their belts on every trip. Seventeen percent reported the fine would need to be $50, 15.4% reported the fine would need to be $100, and 9.4% reported the fine would need to be $200 or more to get them to use belts on every trip.

Drivers in suburban areas had the highest belt use rates (51.1%), followed by drivers in rural areas (46.9%), with drivers in urban areas having the lowest rate of belt use (41.9%). When urban and suburban sites were combined, belt use in urban/suburban areas was identical to rural areas. Socioeconomic status was positively related to belt use. Consistent with other studies conducted where mandatory use laws are in effect, we found that age was significantly related to observed belt use. When belt use is mandated by law, belt use is highest among older drivers. Marital status was significantly related to driver belt use. However, effects of marriage on belt use diverged depending on driver age. Among drivers under age 25, seat belt use was greater for those who were never married and the reverse relationship was found for drivers over age 25.

A major objective of this study was improved understanding of the effects of social-situational characteristics on use of seat belts. Because we observed respondents in traffic at the time of the interviews, we had both an accurate measure of belt use and knowledge of any passengers present with the driver. Results revealed that effects of specific social situations on belt use were small.

Relationships between belt use, trip purpose, and trip length were examined using logistic regression, to determine whether belt use varied depending on the nature of the trip. The overall model was statistically significant. However, when relationships were examined individually, most of the effect was due to a significant association between trip length and belt use, not an association between trip purpose and belt use.

Based on logit analyses, no statistically significant associations were found between belt use and weekday versus weekend and daytime versus evening driving. A significant relationship was detected between vehicle make and belt use and this relationship remained significant when socioeconomic status and driver age were controlled.

Respondents self-reported more frequent belt use when on a date or when riding as a passenger, and less frequent belt use when traveling at night or after consuming alcohol than was reported for the overall measure of belt use. Finally, reported frequency of intoxication was found to be negatively related to observed belt use.

Observed belt use was significantly related to the percent of friends reported to use belts. Drivers' perceptions of the chance of being in a crash were not significantly related to seat belt use; the lack of a significant relationship might be due to the restricted range of responses on the crash probability item (the distribution of this item was skewed toward low chance of crash involvement).

We asked belt users what influenced them to begin using belts. A third of the sample reported that the compulsory use law was the primary factor influencing them to begin using belts. Another third reported that crash experience of their own, friends or others, or concern for safety was the primary factor that influenced them to begin using belts.

Multivariate logistic regression procedures found that a combination of several variables, including socioeconomic status, proportion of friends who use belts, ethnic background, sex, frequency driver requests belt use of passengers, and number of occasions drivers reported drinking to intoxication, increased the ability to predict seat belt users 14.8% over a prediction based solely on the prevalence rate of seat belt use in the population.

Conclusion

Results identified several groups of drivers who are less likely to use belts despite a compulsory use law and who might be targets for program efforts: (1) males, (2) individuals with lower socioeconomic status measured by education and income, (3) those of minority ethnic backgrounds, (4) those below age 30, (5) alcoholic beverage drinkers who drink to intoxication or while driving, (6) drivers in urban environments (especially city streets), and (7) married individuals below age 25. We did not find substantial effects of specific social situations on belt use. Most motorists do not selectively use belts in certain social situations and not in other social situations. Since belt use was not substantially affected by the specific social situations examined here, programs should focus on increasing belt use among target groups of likely nonusers, rather than focus on target social situations.

1 Introduction and Review of Literature

Motor vehicle crashes are the leading cause of death among persons 1 one to 36 in the U.S. and are a major health risk to individuals of any age. In 1985, motor vehicle crashes were responsible for 43,795 deaths (National Highway Traffic Safety Administration, 1987) and an estimated 1.7 million injuries (National Safety Council, 1986). Estimates of the societal costs of motor vehicle crashes range from $48.6 billion to $69.5 billion annually, including medical expenses, insurance costs, and loss of wages (National Highway Traffic Safety Administration, 1983; National Safety Council, 1986). The efficacy of seat belts in preventing a substantial portion of crash fatalities and injuries is well documented (Rutherford and others, 1985; Baranick and others, 1986; Evans, 1986). Twenty-eight states have now enacted legislation requiring use of seat belts (Highway and Vehicle Safety Report, 1987). Although Michigan implemented such a law in July 1985, observation surveys at a probability sample of 240 intersections throughout the state revealed that as recently as July 1987, over 55% of motorists were still traveling unrestrained (Wagenaar and others, 1987b). The goal of this study is to gain a better understanding of the factors or characteristics which distinguish motorists who comply with mandatory seat belt laws from those who do not. Of particular interest in this study are potential effects on belt use of the immediate social context or situation of motorists, such as who they are traveling with and where they are going on that particular trip. To answer such questions, we combined direct observation of belt use with roadside personal interviews of a probability sample of motorists throughout the State of Michigan.

1.1 Sociodemographic Characteristics

The most frequently examined correlates of seat belt use have been sociodemographic factors. Jonah and Lawson (1986) conducted an extensive review of the literature to identify sociodemographic and other characteristics of seat belt users. They found the relationship between sex and seat belt use to be the most consistent finding in the literature and concluded that females were generally more likely to use restraints than males, but differences were not normally very large. Several recent studies of observed and self-reported seat belt use not reviewed by Jonah and Lawson support their conclusions (Ashton and others, 1983; Rood and Kraichy, 1985; Bunch and others, 1986; Wagenaar and Wiviott, 1986). Findings from other studies of both observed and self-reported belt use, however, indicate no difference in belt use among males and females (Beitel and others, 1974; O'Day and Filkins, 1983; Wasielewski, 1984; Goldbaum and others, 1986) or in one case, higher use among males than females (Helsing and Comstock, 1977).

The relationship between seat belt use and age appears to be complex. Jonah and Lawson (1986) concluded from a review of the literature that seat belt use generally increased with age in jurisdictions with compulsory belt use. This effect was not found in jurisdictions with voluntary use. Specifically, some studies of voluntary seat belt use found belt use to be either inversely related to age or characterized by a curvilinear relationship, while other studies found no relationship between belt use and age. Jonah and Lawson noted that one study of compulsory use found belt use and age to be unrelated. While findings from several other studies support the pattern noted by Jonah and Lawson, a result common to the majority of these studies is that the lowest rates of belt use (under both compulsory and voluntary conditions) tend to be among younger drivers (Goldbaum and others, 1986; Lund, 1986; McCarthy, 1986).

Examining the relationship between marital status and seat belt use, Jonah and Lawson (1986) concluded that married people were more likely to report using seat belts than single people. They argued, however, that the association between marital status and seat belt use may actually reflect an underlying age difference given that single people are more likely to be younger. Helsing and Comstock (1977) examined the interaction between sex and marital status and found that among those age 18-24 years, married females were less likely to report belt use than women who had never married; for males, the reverse was true (this interaction was not found among other age groups). Overall, they found that while self-reported belt use was lower among those who were separated or divorced than those who were married, the differences were not significant.

Education, one measure of socioeconomic status, has consistently been found to be related to seat belt use. Results from a number of studies indicate that people with less education have lower rates of seat belt use (Helsing and Comstock, 1977; Goldbaum and others, 1986; McCarthy, 1986). Jonah and Lawson (1986) reviewed several additional studies which indicate a positive relationship between education and seat belt use. They pointed out, however, that the causal structure of the relationship is unclear. They suggested the association "may mean that the level of knowledge regarding the effectiveness of safety belt use for reducing casualties increases with education, . . . [or] it may reflect differences in attitudes regarding belt use or in values concerning risk-taking in general" (page 60). Family income, another measure of socioeconomic status, has also been found to be positively related to seat belt use (Jonah and Lawson, 1986; Lund, 1986; and McCarthy, 1986).

Few studies have examined the relationship between race or ethnicity and seat belt use, and findings to date have been mixed. For example, Beitel and others (1974) found no significant differences in observed nighttime belt use across racial groups. However, Lund (1986) found observed belt use to be lower among drivers from Black or Hispanic neighborhoods. Goldbaum and others (1986) found self-reported seat belt use to be lowest among Blacks and highest among Hispanics. Finally, Klein and Thayer (1979) reported that while Blacks and Whites were equally likely to report never using belts, Blacks were slightly more likely than Whites to report always using belts.

With regard to the effect of population density on seat belt use, studies have generally found use to be higher in urban than rural areas (Minnesota Occupant Restraint Program and Minnesota Department of Public Health, 1985; McCarthy, 1986; Morgan and Wilson, 1986). Higher rates of belt use in urban areas may be due to the nature of urban versus rural roadways. However, several studies have shown that belt use is generally higher among highway drivers (and those exiting from highways) than drivers at intersections in local traffic (Jonah and Dawson, 1982a; Lund, 1986; Wagenaar and Wiviott, 1986).

1.2 Situational Factors

Studies focusing on situational factors as correlates of seat belt use are less numerous than those focusing on sociodemographic factors. Nevertheless, a number of both physical- and social-situational factors have been identified in the literature as potentially affecting belt use. One such factor is vehicle size. The relationship between vehicle size and seat belt use is not straightforward. Two studies, which collected data on vehicle size but not vehicle make, found that belt use was higher among occupants of small cars than large cars (Minnesota Occupant Restraint Program and Minnesota Department of Public Safety, 1985; Wagenaar and Wiviott, 1986). O'Neill and others (1983), however, in reanalyzing survey data collected by the National Highway Traffic Safety Administration, found that most of the differences in belt use by car size were due to higher belt use in imported versus domestic cars and by geographic differences in belt use in domestic cars. Lund (1986) found belt use in large domestic cars to be substantially lower than belt use in both smaller imported and smaller domestic cars. He concluded, however, that the source of this difference was probably not larger car size, given the finding of a nonlinear relationship between car size and belt use in two of the geographic regions examined in the study.

With regard to the effect of weather conditions on seat belt use, it appears from most observational studies (e.g., Boughton and others, 1981; Wagenaar and others, 1987b) that there is not a strong relationship between weather conditions and use. Mayas and others (1983), however, found that people who reported "sometimes" using their belts reported increasing their belt use under poor driving conditions.

Findings regarding the effect of time of day on seat belt use are limited since most observational studies are conducted during daylight hours only. Wagenaar and others (1987b) found no consistent pattern of seat belt use across time of day for observations made during daytime hours (i.e., between 7:00 a.m. and 8:00 p.m.). Beitel and others (1974) observed only nighttime belt use (7:00 p.m. to 3:00 a.m.) and found that belt use did not change significantly during the course of the night. Boughton and others (1981) reviewed findings of observational studies conducted during both daytime and evening hours (6:00 a.m. to 12:00 p.m.) and found use rates to be significantly lower in the evening (after 7:00 p.m.) than during the day. Rood and others (1985) also found observed daytime seat belt use to be generally higher than evening use (7:00 p.m. to 9:30 p.m.). However, the differences, although statistically significant, were small.

Results regarding the relationship between day of week and seat belt use are also inconclusive. Some studies have found no consistent relationship between day of week and use (e.g., Rood and others, 1985; Wagenaar and others, 1987b), while others have found use to be higher on weekends (e.g., Beitel and others, 1974) or conversely, higher on weekdays (e.g., Boughton and others, 1981).

Several potential correlates of seat belt use relate to social situations rather than physical environments. These correlates include certain characteristics of the vehicle trip as well as the presence of passengers in the vehicle and characteristics of these passengers. There is a paucity of research examining these situational factors. Three studies (Boughton and others, 1981; Mackay and others, 1982; Ashton and others, 1983) found observed seat belt use to be higher among drivers with front-seat passengers present than drivers alone. Furthermore, findings indicate that when a front-seat passenger is present, driver and passenger belt use are positively related. Mackay and others (1982) found that sex of the passenger, regardless of belt use, had no significant effect on the driver's use. Ashton and others (1983) found male drivers with unrestrained front-seat passengers to have the lowest driver belt use rates, while female drivers with restrained passengers had the highest belt use rates.

1.3 Norms and Attitudes

Jonah and Lawson (1986) suggested that the association between driver and passenger belt use may result from belted occupants facilitating belt use by other occupants either directly (by requesting others to put on belts) or indirectly (by serving as models). Findings from a number of studies support this argument. Mayas and others (1983) found that self-reported "infrequent" users were least likely to ask others to buckle up. Furthermore, when asked, most people (94%) reported complying with the request. Similarly, in a telephone survey analyzed by O'Day and Filkins (1983), approximately 90% of respondents reported that they would be likely or very likely to buckle up if asked by the driver. Finally, findings from two studies indicate that normative pressure from friends and family motivates some people to use seat belts. In the first study, Jonah and Dawson (1982b) measured normative or social pressure by asking respondents to indicate the extent of their agreement with the statement "My family and friends believe that I should always wear a seat belt when I am driving." In a stepwise regression analysis, social pressure and perceived belt use of others[1] were among four factors which significantly predicted self-reported seat belt use. The contribution of the normative factors in predicting belt use, however, was not as great as that of the other two factors, favorability toward seat belt legislation and attitude toward belt use.

Jonah (1984) also examined the role of normative pressure from friends and family in influencing belt use. He measured normative pressure by asking respondents to indicate the extent of their agreement with two statements: "My family/friends believe that I should wear a seat belt when I am in a car" (normative belief) and "I usually go along with the wishes of my family/friends" (motivation to comply). Responses were then combined to produce the normative pressure variable. Regression analyses performed separately for respondents from jurisdictions with and without compulsory belt use indicated that for both groups, major predictors of self-reported past and intended belt use (in order of their contribution) were attitudes toward seat belt use, normative pressure, and favorability toward seat belt legislation.

Numerous studies have examined the reasons people use or do not use seat belts. In telephone surveys conducted after compulsory belt use took effect in New York, the reason most frequently cited by respondents for beginning to use belts on a regular basis was implementation of the law (Rood and Kraichy, 1985). The major reason given by respondents for never using belts was that belts were too confining and uncomfortable. Major reasons given by respondents for using belts only some of the time were first, forgetting or never formed the habit, and second, inconvenience of buckling up on short trips. Absence of a seat belt habit has been identified as a primary reason for nonuse of belts in other studies (e.g., Knapper and others, 1976; Jonah and Dawson, 1982a). However, explaining nonuse of belts on the basis of failure to (habitually) use belts seems tautological and of little help in understanding why some motorists develop the seat belt habit and others do not.

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1. Jonah and Dawson (1982b) measured perceived use by asking respondents to estimate the percent of drivers in their community who used belts.

1.4 Mandatory Use Laws

Since passage and implementation of compulsory belt use laws in a number of foreign countries and states within the U.S., many studies have examined the association between beliefs about enforcement of these laws and seat belt use. Findings from these studies are mixed. In a study by Jonah and Dawson (1982b), the perceived chances of being ticketed for not using a belt were unrelated to self-reported belt use. Bergan and others (1979) found no relationship between past receipt of a ticket for violation of the seat belt law and observed seat belt use. Jonah and Grant (1985), however, found that Selective Traffic Enforcement Programs (consisting of enforcement, publicity concerning the enforcement, and public education) were effective in increasing observed seat belt use in jurisdictions with compulsory use, and suggested that such programs influence driver behavior by increasing the subjective as well as objective probability of receiving a citation. Rood and Kraichy (1985) concluded that declining belt use rates in New York over time were related to a decrease in publicity and a perception of low risk of enforcement, rather than a decrease in support for the law. Williams and others (1986) reported that seat belt use increased substantially in Elmira, New York following a law enforcement and publicity campaign, while declining in a comparison city during the same period. Finally, in a study by Mortimer (1986), the majority of respondents indicated they would increase their belt use if enforcement was increased.

1.5 Behavior Modification Efforts

A number of studies have found employer-based and community-wide promotional programs to be an effective means of increasing seat belt use. For example, Geller (1986) reviewed 28 employer-based programs to promote seat belt use, representing three types of incentive strategies (direct and immediate rewards, direct and delayed rewards, and indirect and delayed rewards) and an awareness and commitment strategy involving no rewards. He found all programs substantially increased belt use among targeted employees in the short-term. Although belt use declined after the removal of the incentives, long-term (i.e., one year later) belt use remained above baseline levels. Horne and Terry (1983) examined an employee incentive program utilizing prizes after group belt use reached a predetermined level. The five-and-a-half month program increased belt use from 36% before to 70% after. Hunter and others (1984) evaluated the effectiveness of a community-wide program utilizing incentives ranging in value from three to five dollars and monthly lottery drawings. Findings indicate that belt use increased significantly during the incentive phase and remained high six months later. In short, incentive-based seat belt promotion programs are effective in increasing belt use, but their impact diminishes once the incentives are removed.

1.6 Behavioral Factors

Associations between seat belt use and other driving- and health-related behaviors have been examined extensively. Jonah and Lawson (1986) reviewed several studies which suggest that alcohol-impaired drivers (blood alcohol concentration over 80 mg/dl) are less likely to use seat belts than other drivers, not because they forget to buckle up when impaired, but because failure to use belts and alcohol-impaired driving are both aspects of risk-taking or risk-tolerant behavior. Numerous studies also suggest that lack of seat belt use is associated with risk-taking behaviors. For example, Evans and Wasielewski (1983) found close following in freeway traffic to be associated with lack of belt use. Ashton and others (1983) found that unbelted drivers accepted shorter gaps in turning across approaching traffic than belted drivers. Findings from Goldbaum and others (1986) indicate that people who perform other risky behaviors (e.g., smoking, binge drinking, chronic drinking, and alcohol-impaired driving) are less likely to use seat belts. Finally, Mayas and others (1983) found that people reporting "frequent" and "sometimes" belt use were more likely to report taking precautions regarding their personal health than "infrequent" users. One risk-taking behavior which has not been consistently found to be associated with belt use is increased vehicle speed (Jonah and Lawson, 1986). However, Streff and Geller (in press) found in an experimental study that when nonusers complied with a request from research staff to buckle up, they increased their driving speed more than drivers who did not switch from driving unbuckled to driving buckled.

1.7 Summary

Studies suggest that seat belt use is lower among young drivers, males, those who are not married, and those with lower levels of education and income. Drivers traveling alone are less likely to use belts than drivers with passengers present. Further, when passengers are present, belt use of drivers and passengers is strongly associated. Finally, literature suggests that failure to use seat belts is part of a risk-taking or risk-tolerance pattern as evidenced by the association between nonuse of seat belts and other risky behaviors.

Building on the extant literature, this study had four major objectives.

1. Conduct analyses of an existing database of motorists observed using or not using seat belts to identify situations in which use rates vary from average;

2. Directly observe actual seat belt use and measure via roadside personal interviews demographic, situational, and behavioral factors potentially related to compliance with a mandatory belt use law;

3. Identify and measure relationships between subject and situational characteristics and observed belt use;

4. Describe motorists likely to be nonusers of seat belts despite a compulsory use law, and identify target groups and situations that might be the focus of programs designed to increase belt use.

2 Data Collection Methods

This study combined direct observation of seat belt use with on-site, roadside interview methods. Data for this study were collected simultaneously with data for a direct-observation seat belt survey of Michigan motorists (funded separately). The direct observation survey was part of a series of surveys conducted at four-month intervals by the University of Michigan Transportation Research Institute (UMTRI) evaluating the effects of Michigan's mandatory seat belt law. Methods used to obtain **observation** data in the present study were virtually identical to those used in all of the direct observation surveys, including use of the same observation sites used in previous survey waves (Wagenaar and Wiviott, 1985, 1986). Methods specifically used to obtain **interview** data were developed under the current grant.

2.1 Sample Design

2.1.1 Selection of Observation Sites

The major goal of the sample design was selection of observation sites that would accurately represent all motorists traveling on Michigan roads. Design of the best sample involved minimizing the total survey error, including sampling error and measurement error, while providing sites where observations could be made efficiently and economically. To observe all modes of restraint use of **all** occupants of passenger cars and light trucks (not just shoulder belt use among drivers and right-front passengers), vehicles had to be stopped for at least several seconds. Therefore, observation sites were generally limited to intersections with three-color cycling traffic signals. Flashing red lights and stop signs do not usually require stop times long enough for accurate observation of restraint use for all occupants. Alternatives such as stopping motorists traveling on randomly selected road segments (presumably with police assistance), or observing motorists at nonroadway locations (e.g., parking lots) were either too cumbersome and expensive or insufficiently representative of the traveling population. Another advantage of using signalized intersections was that they provide enough traffic to efficiently observe motorists without long wait periods between vehicles.

To provide adequate coverage of the entire state, 240 intersections were selected, using a multi-stage stratified probability sampling procedure. The first step in selecting intersections was identification of all counties in Michigan with at least three signalized intersections. Calls to road commissions and sheriff's departments in all rural counties revealed 20 counties (out of a total of 83 Michigan counties) that did not meet this minimum criterion. These counties were grouped with those of adjacent counties to form 63 counties and county groups.

The 63 jurisdictions were then divided into seven regions: upper peninsula, and northern, western, central, south central, eastern, and southeastern lower peninsula. The upper peninsula and northern lower peninsula regions were overrepresented in the sample in relation to their populations in order to provide sufficient cases for analysis by region. Even though the upper peninsula contains 3.5% and the northern lower peninsula contains 5.4% of the state's population, each region was allocated 20 sites (8.3% of the total 240 sites).[2] Similarly, the densely populated southeastern region of the state was underrepresented. Although containing 57.8% of the state's population, the southeastern region was allocated 50% of all sites (120 of 240).

The remaining four regions were each allocated 20 sites in the sample. Percent of the state's population in each region is: 8.2% in western, 8.5% in central, 8.4% in south central, and 8.2% in eastern. Because the northern regions were overrepresented and the southeastern region was underrepresented in the sample, weighting was required to provide accurate estimates for the entire population of the state. All results presented in this report are based on data weighted according to the sampling fraction used in each region.

The 63 counties and county-groups in the seven regions were candidate primary sampling units (PSUs). Five PSU selections were made in each region except the southeastern region, where 30 PSU selections were made. Four observation sites were chosen for each of the 60 PSUs, for a total of 240 sites in the sample. PSUs were selected with probability proportional to size; that is, candidate counties (or county-groups) with the largest population had the highest probability of inclusion in the sample. The total population of a region was divided by five (except the southeastern, where 30 was the divisor), producing a quotient used as a systematic sampling fraction. Five PSU selections were made systematically, using a random start from the ordered cumulative population distribution for each region (except the southeastern, where 30 PSUs were selected). In some cases additional PSU selections were in the same county as the first PSU selection because of the large population in the county.[3] Thus, a total of 60 PSU selections were made, resulting in 32 counties and county-groups being included in the sample.

For the 32 counties and county-groups, a complete list of signalized intersections was constructed, using information provided by the Michigan Department of Transportation, county

2. All population figures are based on the 1980 census.

3. The following counties were selected more than once, with the number of selections shown in parentheses: Berrien (2), Genesee (3), Ingham (2), Kalamazoo (2), Kent (3), Macomb (3), Marquette (2), Oakland (6), Saginaw (2), and Wayne (13).

road commissions, and city transportation departments.[4] Because seven large counties had so many signalized intersections, they were divided into subareas consisting of individual cities, groups of cities, and the remaining nonincorporated area of the county. One subarea was selected for each PSU-selection allocated to that county, using the same probability-proportionate-to-size procedure used for selection of counties within regions. From these seven large counties, 19 subcounty areas were selected into the sample. Therefore, the final sample included 44 areas: three consisting of two counties each, 22 consisting of a single county, and 19 consisting of subcounty districts.

The final step in the sample design was the selection of intersections for observation within each of the 44 sampling areas. Four intersections were randomly selected for each PSU selection allocated to that area. Because an estimated 23% of all traffic in Michigan occurs on freeways (Federal Highway Administration, 1983), one freeway exit and three nonfreeway intersections were selected for each PSU allocated to a community. Separate lists of freeway exit and regular signalized intersections were used to systematically select (with random start) the intersections required. In the City of Detroit, 21 small areas of the city were first randomly selected from a grid map. Lists of all intersections within the selected areas were then constructed, and specific intersections were selected systematically (with random start). In each sampling area, two alternative sites were also systematically selected for each chosen intersection where possible. The final sample used in the current survey included seven of these alternate sites, used to replace sites at which construction was occurring or at which an insufficient number of observations could be made due to the absence of traffic.

In some areas in the sample, no signalized freeway intersections existed. For Berrien County (excluding Niles), Berrien County-City of Niles, and Van Buren County stop-sign freeway exits onto roads with fairly heavy traffic flow were used instead. For five other areas in the sample (Barry, Lenawee, Monroe, Montcalm, and Saginaw) freeway exits were selected in adjacent counties. For nine areas no nearby signalized freeway exits existed, so they were replaced with additional regular intersections. The final sample of 240 sites included 190 regular intersections and 50 freeway exits. Freeway exits therefore constituted 20.8% of the sites, representing the estimated 23% of all vehicle miles traveled on freeways in Michigan.

After the sample of 240 sites was selected, further sampling considerations determined the schedule for observing a particular site. The goal was to represent motor vehicle occupants at all times on Michigan roads. Observations were limited to daylight hours for accurate

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4. The state inventory of Electrical Traffic Control Devices was supplemented by lists and maps from local traffic authorities to form complete lists of signalized intersections in each sampling area.

Table 2.1: Descriptive Statistics for the 240 Observation Sites

Day of Week		Start Time		Site Choice		Weather		Observer	
Monday	14.2%	7-9 AM	8.7%	Primary	97.1%	Sunny	69.6%	(A)	14.6%
Tuesday	13.8%	9-11 AM	13.3%	Alternate	2.9%	Cloudy	27.5%	(B)	10.0%
Wednesday	14.6%	11-1 PM	18.4%			Rain	2.9%	(C)	11.3%
Thursday	15.8%	1-3 PM	17.1%					(D)	15.0%
Friday	15.8%	3-5 PM	17.5%					(E)	5.8%
Saturday	13.3%	5-7 PM	15.0%					(F)	11.7%
Sunday	12.5%	7-9 PM	10.0%					(G)	10.4%
								(H)	10.0%
								(I)	11.3%
TOTALS	100%		100%		100%		100%		100%

observation of restraint use. Observations were well distributed across the hours of adequate daylight and days of the week (Table 2.1). Within each sampling area, the first site observed for each day and city was selected randomly, with the order of observing the rest of the sites for that day and city determined by proximity. Random selection of the first site for each day was designed to avoid any possible bias due to certain kinds of sites being consistently observed at a particular time of day.

2.1.2 Selection of Interview Locations

Motorists observed at the 240 sites were asked to participate in a brief follow-up interview. Interviews were conducted near the intersection where corresponding observations occurred. The particular interview location for each intersection site was selected based on a number of criteria. First, each location needed to be as closely adjacent to its corresponding observation location as possible. Second, the location could not compromise the safety of the interviewer or respondent. Finally, the interview location was selected to avoid impeding normal traffic flow. If a location immediately adjacent to the observation location was not available, a nearby location such as a gasoline station, restaurant parking lot, or shopping center was used and respondents were directed by the observer to that location. However, the actual location of the interview was almost always within 75 yards of the intersection where belt use was observed.

2.2 Data Collection

2.2.1 Design of Data Collection Forms

Five data collection forms were used: (1) vehicle observation form, (2) site form, (3) daily travel record, (4) interview instrument, and (5) site log (see Appendix A for a copy of each form). In addition, an expense and time log was used by each field staff person to record hours worked and expenses incurred in the field. One vehicle observation form was used for each vehicle observed. Recorded information included: vehicle size, restraint use, estimated age, and sex of occupants of the six primary seating positions. Incorrect use of seat belts was also recorded. Examples of incorrect use included positioning the shoulder harness under the outboard arm, behind the back, or over the inside shoulder and restraining two occupants with one seat belt. The category of incorrect use did not include occupants (typically in the 4-15 age group) who were too short to use a shoulder belt in the correct position across the chest. Often such occupants placed the belt behind the back. These occupants were coded as correctly belted. All occupants observed to be incorrectly restrained were still coded as "belted" and therefore appear in tables and figures in this report as restrained. However, incorrect use of seat belts was recorded to assess the extent of incorrect use and to permit further analyses of occupants who use seat belts incorrectly. A comment section on the vehicle observation form was used to record information on other passengers present in the vehicle (including children in laps), and any other unusual characteristics of the vehicle or its occupants. Three vehicle forms were printed on a single 8-1/2 by 14 inch sheet in an effort to reduce the amount of page turning needed during an observation period. Each of the primary seating positions was listed left to right across the form: driver, front-center, front-right, rear-left, rear-center, and rear-right. Under each seating position the items to be recorded were listed: restraint use, sex, and approximate age. Boxes were placed at the left of each item to be marked with a horizontal line. The vehicle size and type item was located at the bottom of the form. To the right of vehicle size and type was a vehicle identification code and a section for comments. Information regarding a driver's refusal or agreement to be interviewed was recorded on the form as well as a respondent number so that observation and interview forms could be matched. The form was precoded for accurate keypunching by including code values to the left of each category and column numbers at the bottom of each item. The layout of the vehicle form was designed to be clear to both the observer recording data in the field and to keypunchers and others reviewing data forms after the field work was completed.

Vehicle observation forms were assembled into packets. A single packet was used to record data at a single site. Each packet was attached to a site form which described the location where the observations occurred. The site form provided information such as site number, street names, site type (intersection or freeway exit), site choice (primary or alternate site), date, time of day, day of week, weather, and a comments section. As with the vehicle observation form, the site forms were precoded for keypunching purposes.

The third form, daily travel record, was used by field staff to record their actual data collection schedule. One travel record was used for each day and included the date, starting location, starting time, each destination visited, and the departure and arrival time for each destination. This allowed determination of the exact hours worked by field staff as well as the amount of travel time needed to go from site to site.

The fourth form, the interview instrument, was used to measure sociodemographic, attitudinal, and other factors related to respondents' seat belt use. Multiple interview forms were developed for different respondents depending on their observed and self-reported seat belt use. The use of multiple forms was intended to minimize skip patterns within each interview form and to minimize the complexity of the interview form for ease of use in the field. Form A was used if a respondent reported "always" using a belt and was observed to be using a belt. Form B was used if a respondent reported "always" using a belt but was observed to be unbelted or if a respondent reported "most times", "sometimes", or "seldom" using a belt, regardless of observed use. Form C was used if a respondent reported never using a seat belt. Development of the interview instrument was guided by several criteria. First, we included variables which could not be measured through observation. Second, we focused on items which would enable identification of patterns of seat belt use and nonuse, particularly across specific social situations in which belt use might vary. Third, the interview length was limited to 5 to 10 minutes. Finally, the items had to be easily understood by a wide range of respondents. The interview instrument underwent numerous revisions as a result of project staff review and several iterations of pretesting in the field. Some early items were eliminated as a result of this process. For example, the open-ended item "What would it take to get you to use your seat belt on every trip?" was dropped from the interview because of respondents' inability to give meaningful and timely responses during pretesting.

The fifth form used during data collection was the site log. Its purpose was to identify the number of completed interviews and refusals at each site.

2.2.2 Pretesting of Data Collection Field Process

Initial pretesting of the field data collection process took place between October 15, 1986 and November 21, 1986 at a number of freeway exits and intersections in seven communities in southeastern Michigan. Communities of varying size, population density, and socioeconomic status were selected to ensure that the pretest population was representative of the larger population from which the actual study sample was drawn. The purpose of pretesting was to assess the format and content of the interview instrument, to estimate the number of interview refusals, to determine how best to integrate observation and interview processes, to determine the most effective type of subject payment, and to identify other potential problems and issues that could arise during actual data collection.[5] As a result of pretesting, the interview form underwent extensive revision to shorten the length and improve subjects' understanding of the items. From February 16, 1987 to April 7, 1987, several additional iterations of pretesting and revision were conducted.

One major problem identified during pretesting was a high interview refusal rate, particularly in central-city areas. With a higher than desired refusal rate, and limited time available for field interviews (because the interviews were conducted in conjunction with a separately funded observation survey), we were concerned that we might not have enough cases for multivariate analyses. Therefore, several field procedures were refined to minimize these potential problems. First, three-person data collection teams comprised of one observer and two interviewers were used so that two interviews could be conducted simultaneously, thereby increasing the number of interviews completed in the available time at each site. The use of three-person teams also addressed the need for added security that existed at many of the sites, particularly in central-city areas. Second, to ensure the appearance of professionalism and authority, all team members wore uniform dark-blue jackets with an official University of Michigan seal clearly visible on the sleeve, orange reflective safety vests, and an official University photograph identification card in plain view of the driver. Third, a $5.00 cash payment was used as a subject incentive. A cash dispersement was considered to be a more effective incentive than merchandise or restaurant gift certificates. In order to minimize safety risks during actual data collection, field staff were given travelers checks which they cashed at the beginning of each day to avoid carrying large sums of money. During the second phase of pretesting, the size of the cash dispersement was briefly tested ($5.00 vs. $10.00). Surprisingly, we found that the $5.00 incentive produced a lower refusal rate than the $10.00 incentive. Many of the respondents who refused the $10.00 incentive stated that there must be a catch to the offer; it seemed too good to be true.

The final step taken to reduce the interview refusal rate was to provide subjects an opportunity to complete a telephone interview at a later time. Subjects who had refused to be interviewed despite the $5.00 incentive were given a card stating that they could call UMTRI

5. With the exception of the site log, the seat belt observation data collection forms had been used in previous survey waves in an identical or similar form and needed no revision.

collect during selected hours, be interviewed over the telephone, and receive a $5.00 payment through the mail. Each card had a respondent number so that telephone interviews could be matched with their respective observation data. Each card also had a code indicating seat belt use so that interviewers could select the appropriate interview form.[6] Telephone interview instruments were identical to those used in the field. The identity of respondents was not recorded with other data but was used only to mail the subject payment.

2.2.3 Field Personnel Hiring and Training

Nine field staff were used for the study, divided into three teams of three members each. The three team leaders had experience on previous traffic-safety field surveys. Each team included one observer and two interviewers at any given time, although functions rotated among team members for maximum efficiency and productivity.[7]

All field staff participated in eight days of intensive training. The history of the project, sample design, data collection procedures, and study goals and objectives were reviewed. Previous studies of restraint use conducted by UMTRI were summarized. Each field staff person was provided with a written training manual; after each field staff person read the manual, all topics were discussed by the field supervisor and other senior project staff (see Appendix B). The manual included a brief summary of the project, general information on each site assigned, time schedules, and procedures for recording data. All field personnel were given detailed time schedules which listed the site number, street names, and the specific time during which observation was to take place at each location. Sample data collection forms were distributed and the coding of each category of each variable was discussed.

After the data collection procedures were discussed, additional time was spent reviewing the coding of the core restraint use item on the vehicle observation form. Various types and models of child restraint devices were introduced and sample seats for each major category of child restraint device (infant, toddler, booster) were available for examination. Proper and improper use of each type of seat was discussed. Since it was difficult to observe whether a child restraint device (CRD) was properly installed in the vehicle in the brief observation time available, misuse was determined by how the child was positioned in the seat rather than how the seat was secured to the vehicle (unless obviously secured improperly, for

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6. For example, if a respondent stated that they always wore their seat belt but the code on the card indicated they were unbelted at the time of the observation, Form B rather than Form A was used by the interviewer.

7. After a couple hours of interviewing, the interviewer's voice would tire. The interviewer would then reverse roles with the observer for a period of time.

example, an infant seat facing forward). Results are best considered an estimate of "obviously incorrect" use only.

During training, field personnel spent two days at pre-selected sites, including regular signalized intersections and a freeway exit ramp, practicing observation techniques and field procedures. Although all field personnel monitored the same site, data were recorded individually. After each site the team met with the field supervisor to discuss each person's observations and to determine any difficulties in coding categories of such items as restraint use, age, vehicle size, and sex.

After practice at several sites, followed by debriefing sessions, field personnel worked in teams of two, observing the same vehicles, but completing their own sets of data forms. The field supervisor compared the two sets of data forms. Any discrepancies were noted and discussed with the two observers. Further combinations of practice site observations with immediate review significantly improved inter-observer reliability.

Observers worked in teams with rotating members so that each observer was paired with every other observer. Practice observations continued at a variety of sites until inter-observer differences in coding were minimal. The additional practice sites were selected to represent the range of situations the observers would encounter in the field (e.g., rush hour versus nonrush hour, sites with a significant number of children versus sites with few children).

After attaining proficiency in observation techniques, field staff spent four days practicing interview techniques. During the first day they interviewed other project staff posing as study subjects in the UMTRI parking lot. During the subsequent three days they were taken to preselected intersections where they interviewed actual motorists. Debriefing sessions were held after each practice session and all recorded data were reviewed by the field supervisor.

Field staff were given maps for all counties in which they had assigned sites; all necessary supplies were distributed. They were cautioned about the importance of conducting the observations and interviews carefully, and of observing the **exact** site assigned at the **exact** time scheduled. They were told the field supervisor would make unannounced visits to the specific sites assigned.

2.2.4 Field Personnel Supervision and Monitoring

Each field staff person was spot checked at least twice a week during the four-week data collection period by the field supervisor. Field personnel also telephoned the office at least twice a week to report their progress and discuss any difficulties they may have encountered. The calls and spot checks in the field kept field personnel in close contact with supervisors. Field personnel were given both office and home phone numbers of supervisors and were told to call whenever a question or problem arose.

As data recording sheets were turned in by field personnel, they were reviewed immediately by the field supervisor and recoded when necessary (for example, coding vehicle size when observers had recorded make and model but indicated that they were unsure of vehicle size code). During this review process, data on occupants not in the six primary seating positions (e.g., passengers riding on other passengers' laps, in cargo areas, or in third or fourth seats) and incorrect belt use were coded from the comments section of the form onto separate coding sheets.

2.2.5 Field Procedures

Data collection began April 20 and was completed May 15, 1987. Three teams, each comprised of an observer and two interviewers, collected data simultaneously at different sites. Immediately upon reaching an observation site, each team assessed the area to identify the optimal interview location. If a location immediately adjacent to the observation site was not available, a nearby location such as a restaurant parking lot or gasoline station was chosen. A letter from the Michigan State Police, Office of Highway Safety Planning was presented to the manager of the location explaining the study and requesting permission to conduct interviews on the property. Each team was also provided with letters for police personnel explaining their presence in the area. Copies of both letters are provided in Appendix C.

Once an interview location was selected, an observer began making observations at the intersection and soliciting drivers to participate in the interview process. Observers limited the number of vehicles recorded during any given signal cycle to three.[8] If a driver agreed to complete the interview he or she was given a card with a respondent number and a code indicating seat belt use, and directed to one of the interviewers. The interviewer took the card from the driver, recorded the respondent number on the interview form, and proceeded with the interview. The code indicating seat belt use was used to select the appropriate interview form. Upon completing the interview the driver was given a $5.00 cash payment.

Drivers who acknowledged the observer at the observation location (i.e., rolled down their car window), but refused to be interviewed were given a card asking them to call UMTRI collect at a later time to complete a telephone interview for a $5.00 payment. A respondent

8. This procedure was adopted during our July 1985 seat belt survey. After the mandatory use law took effect, occupants in long traffic queues buckled up after noticing the observer examine vehicles ahead of them in the queue. Recording data on only the first three vehicles prevented inclusion of these occupants in the survey.

number was written on each card so that interview and observation data could be matched at a later time. Observed seat belt use was also coded on each card so that the appropriate interview form could be used for the telephone interview. Respondents who called more than one week after the field observation was made were not interviewed due to potential difficulties in recalling events on the observation day. These respondents were thanked and mailed the $5.00 subject payment. A few calls were received from vehicle occupants other than the driver. These callers were asked to have the driver call back for the interview.

2.3 Data Processing

All data collection forms were carefully reviewed by a data editor. Comparisons were made between corresponding observation and interview forms to ensure consistency. All responses to open-ended items and text responses coded under "other" were manually recoded into numeric categories and added to the data file. The coding process included several iterations and involved independent coding by multiple project staff to ensure consistent categorization. For example, recoding of the interview item "What influenced you to start using seat belts?" involved manually reviewing each interview form, listing all unique open-ended responses, deriving from them a set of exhaustive response categories, and recoding each response to conform with the newly derived categorization.

All data collection forms were keypunched and verified to ensure data accuracy. All raw data files were carefully examined for errors by checking for invalid codes or inconsistent codes across related items. A small number of errors were found and corrected after consulting the original data collection forms.

Site-level and vehicle-level data files were merged so that all site-level information was attached to the records for all vehicles observed that particular site. The vehicle-level data file was then used to construct an occupant file which had one case for each occupant observed. As a result, all site- and vehicle-level items were attached to each occupant record. All occupants observed outside the six primary seating positions were added to the occupant file, providing a single comprehensive data file on all occupants observed. While the focus of the study was on characteristics of drivers, the occupant file was created to permit analyses of social situations within vehicles.

The OSIRIS IV (The University of Michigan, 1982) and SAS version 5.15 (SAS Institute, 1985) systems of data analysis software were used for data file management and analyses, because of their extensive data transformation and documentation capabilities, and capability for differential weighting of sample observations. First, observations and interviews were weighted by region of the state to take into account the overrepresentation of the northern rural regions and underrepresentation of the urban southeastern region of the state in the sample design. Second, since the mean number of interviews at each site was 7.77, observation and interview data from sites where fewer interviews were completed were weighted up to 7.77. Similarly, observation and interview data from sites where more interviews were completed were weighted down. The sampling strategy along with weighted analyses provide the most accurate estimates for the state as a whole.

3 Analyses Of Previous Direct Observation Surveys

To identify specific social situations for which seat belt use varied, we analyzed data from a series of previous statewide observation surveys of motorists throughout Michigan. For example, the presence of one or more passengers in the vehicle might affect restraint use and that effect might vary across driver and passenger age and sex groups. Findings from these analyses were useful in two ways. First, they helped to identify groups with lower than average restraint use who might be targeted for efforts to increase seat belt use. Second, and more importantly, the findings informed development of the interview instrument and informed analyses of the interview survey.

3.1 Methods

The University of Michigan Transportation Research Institute has been conducting periodic observation surveys of seat belt use of a probability sample of Michigan motorists for the past several years: Two survey waves (December 1984 and April 1985) were conducted prior to implementation of Michigan's mandatory seat belt law and provide a baseline against which effects of the law were assessed. Data from four waves conducted after implementation of the compulsory belt use law in July 1985 were reanalyzed in this study (July and December 1985, April and July 1986).[9] Each of the surveys measured restraint use and a number of potential correlates, including age, sex, seating position, time of day, day of week, type of roadway, weather conditions, vehicle type and size, and region of the state. Since the focus of the current study is on factors associated with the nonuse of seat belts under compulsory use laws, the two pre-law waves were excluded from these analyses. In each survey wave approximately 18,000 motorists were observed by trained field staff at a probability sample of 240 sites throughout the state. Methods used in each of the observation survey waves were essentially the same as those used to observe motorists who were interviewed in the current study.

Data files prepared for previous analyses contained a separate record for each motor vehicle occupant. To analyze specific social situations within a vehicle, a new vehicle-level file was constructed, with records including information on all occupants in a vehicle. The new vehicle-level file contained information on the age, sex, and belt use of the driver as well as the

9. This series of direct-observation surveys is continuing at approximately four-month intervals.

age, sex, and belt use for each passenger position in the vehicle (front-right, front-center, rear-right, rear-center, rear-left, cargo area, extra seats, and passengers standing or held in another's lap) for all vehicles surveyed in July 1985, December 1985, April 1986, and July 1986. A total of 48,790 vehicles were in the file. Of those vehicles, 64% contained a driver only. An additional 26% contained a driver and one passenger. The remaining 10% contained a driver and two or more passengers.

A series of multi-way cross-classification tables were constructed to examine driver restraint use by various driver and passenger characteristics. All analyses were weighted to take into account the differential selection probabilities in the sample design. Specifically, driver restraint use rates were calculated by driver age and sex and passenger age and sex. In all tables, records were filtered to include only vehicles with one passenger in the vehicle in either the front-right, front-center, rear-right, rear-center, or rear-left seat positions. Because only 10% of the 48,790 vehicles observed contained two or more passengers, the numbers of cases within each age by sex cell were too small for useful analyses of drivers with multiple passengers. Passengers standing, held in laps, and seated in cargo areas or extra seats were also excluded because they comprised a very small number of cases. An additional set of analyses were conducted of selected subgroups of drivers who were hypothesized to have substantially lower or higher than average use rates (e.g., young drivers traveling with their parents, young males traveling with other young males).

Restraint use rates were compared across selected driver groups, using conventional tests of significance for differences between proportions. The direct observation sample, however, was based on a multi-stage cluster sampling design. Our previous analyses of the design effect for overall restraint use estimates from this sample indicate sampling errors approximately three times larger than those for a simple random sample of the same size (Wagenaar and Wiviott, 1986). Estimating a specific sampling design effect for every cross-classification cell examined was not deemed worth the massive effort required. Given the exploratory nature of these analyses, use of highly stringent sampling error estimates derived from the multi-stage sampling design could hide potentially interesting but weak relationships between variables of interest. Finally, because our observation surveys are continuing at periodic intervals, relationships identified in the analyses of the first four post-law waves can be replicated after additional waves of data are collected.

3.2 Results

Among drivers traveling alone, belt use increased with age, and female drivers were observed using belts more than male drivers (Table 3.1).[10] In addition, if a passenger was

Table 3.1: **Seat Belt Use by Age and Sex: Driver Traveling Alone**

	N	Percent Belted
Female	12,161	57.6 ± 0.9
Male	19,753	45.0 ± 0.7
16-29 Yrs.	9,995	46.9 ± 1.0
30-59 Yrs.	18,499	50.2 ± 0.7
60+ Yrs.	3,405	55.8 ± 1.7

Table 3.2: **Driver Seat Belt Use by Passenger Sex and Seat Belt Use**

	Driver			
	Male N	Percent Belted	Female N	Percent Belted
Passenger				
All Male	2,679	35.9 ± 1.9	1,582	56.8 ± 2.5
Male Belted	884	84.8 ± 2.4	854	88.0 ± 2.2
Male Not Belted	1,795	11.8 ± 1.5	728	20.1 ± 3.0
All Female	5,244	53.5 ± 1.4	2,766	56.7 ± 1.9
Female Belted	2,840	86.8 ± 1.3	1,512	87.2 ± 1.9
Female Not Belted	2,404	14.2 ± 1.4	1,254	20.0 ± 2.3

present with the driver of a vehicle, it was usually the case that both occupants were observed with similar belt use (or nonuse). Belt use for drivers traveling with a passenger who was belted was significantly higher than for drivers of the same age and sex category traveling alone. Drivers traveling with a passenger who was not belted had significantly lower belt use than drivers of the same age and sex categories traveling alone. Tables 3.2 and 3.3 present proportions of drivers observed using seat belts for various sex and age combinations of drivers and passengers.

There are a number of mechanisms through which driver and passenger seat belt use could be related. It is possible that the driver is dominant (i.e., is the leader in the car for that trip) and any positive relationship between driver and passenger belt use is the result of the passenger behaving like the driver. It may also be possible that the "driver as leader" relationship is moderated by social circumstances unrelated to the driving task or trip at hand. Passenger seat belt use could affect the seat belt use of the driver in situations where the

10. Total N=48,790; 95% confidence limits are based on simple random sample estimates.

Table 3.3: Driver Seat Belt Use by Passenger Age and Seat Belt Use

	Driver					
	16-29 Years Old		30-59 Years Old		60+ Years Old	
	N	Percent	N	Percent	N	Percent
Passenger						
Infant	263	60.9 ± 6.0	161	59.5 ± 7.8		
Infant Belted	220	69.6 ± 6.2	137	67.6 ± 8.0		
Infant Not Belted	43	16.9 ± 11.4	24	13.9 ± 14.1		
4-15 Yrs	370	55.9 ± 5.2	1,155	56.4 ± 3.0	37	50.2 ± 16.4
4-15 Yrs Belted	231	83.2 ± 4.9	695	85.5 ± 2.7	16	97.4 ± 8.0
4-15 Yrs Not Belted	139	10.6 ± 5.2	460	12.4 ± 3.1	21	15.3 ± 15.7
16-29 Yrs	2,617	37.0 ± 1.9	853	48.1 ± 3.4	45	54.4 ± 14.9
16-29 Yrs Belted	848	89.8 ± 2.1	377	87.6 ± 3.4	23	79.5 ± 16.8
16-29 Yrs Not Belted	1,769	11.6 ± 1.5	476	16.9 ± 3.4	22	27.8 ± 19.1
30-59 Yrs	399	53.9 ± 5.0	4,077	50.0 ± 1.6	162	60.0 ± 7.7
30-59 Yrs Belted	193	85.3 ± 5.1	1,959	88.0 ± 1.5	93	85.0 ± 7.4
30-59 Yrs Not Belted	206	24.3 ± 6.0	2,118	15.0 ± 1.6	69	26.5 ± 10.6
60+ Yrs	84	58.2 ± 10.8	362	59.9 ± 5.2	1,694	64.5 ± 2.3
60+ Yrs Belted	38	86.8 ± 11.0	196	87.4 ± 4.7	1,075	89.7 ± 1.9
60+ Yrs Not Belted	45	34.1 ± 14.0	166	27.6 ± 6.9	619	20.7 ± 3.3

passenger is perceived as being dominant in the situation. An example of such a possible situation is a son driving with a parent as passenger. Although he is the driver, the son will likely perceive his parent to be dominant in the situation, and will subsequently behave in a manner he feels his parent will approve. If the parent uses a seat belt, the son may be more likely to.

Another possible influence on seat belt use in a social situation is social posturing. Social posturing occurs when an individual behaves in such a way as to project a desirable image. For example, a young man traveling with some of his young male friends may not use his seat belt to look "macho" or show toughness in front of his friends. In the case of a family traveling together, one may expect social modeling to be one cause for the observed safety belt use. Parents may use a seat belt when in the car with their children to provide a good example even though they do not consistently use seat belts when traveling alone. The dominance, social posturing, and modeling theories were examined using the data collected during July and December 1985 and April and July 1986.

To test the theory that a driver's belt use may be affected by the presence and belt use of a dominant passenger, the belt use of drivers age 16-29 traveling with a passenger age 30-59 was compared to the belt use of drivers age 16-29 traveling with a passenger also age 16-29. The theory would predict belt use of drivers age 16-29 to be higher when a dominant individual is riding in the vehicle (a passenger age 30-59) than when a nondominant individual is riding as a passenger, particularly when the dominant passenger is using the seat belt.

The dominance effect was found only when both buckled and unbuckled passengers were included in the analyses ($Z=6.5$; $p<.05$). This is probably due in part to a ceiling effect. Driver belt use (age 16-29) traveling with other 16-29 year-old unbuckled passengers was 89.8% while belt use of this age group was 85.3% when a 30-59 year-old buckled passenger was present.

The social posturing or "macho" effect theory predicts that driver belt use will be lower when male drivers are traveling with male passengers than with female passengers. This effect was tested in three ways. First, belt use among male drivers traveling with female passengers was compared with that of male drivers traveling with male passengers. Second, belt use of male drivers age 16-29 traveling with female passengers of the same age was compared with belt use of male drivers traveling with a male companion of same age; and third, belt use of male drivers age 30-59 traveling with female passengers of the same age was compared with belt use of male drivers age 30-59 when traveling with male passenger of the same age.

The social posturing theory was supported in all three of the analyses. Males traveling with male passengers had significantly lower belt use than males traveling with female passengers (35.9% vs. 53.5%; $Z=14.67$; $p<.05$). Males age 16-29 traveling with males of the same age had significantly lower belt use than males age 16-29 traveling with a female passenger age 16-29 (25.7% versus 40.8%; $Z=6.9$; $p<.05$). Finally, males age 30-59 traveling with males of the same age had significantly lower belt use than males age 30-59 traveling with females age 30-59 (35.9% versus 53.1%; $Z=8.6$; $p<.05$)

The modeling theory predicts that the belt use of adults traveling with children will be higher than same age adults traveling together. This hypothesis was tested by comparing belt use of drivers age 30-59 when traveling with passengers age 4-15 with that of drivers age 30-59 traveling with passengers age 30-59. Drivers age 30-59 traveling with passengers age 4-15 were found to have significantly higher belt use than drivers age 30-59 traveling with same age passengers (56.4% versus 50.0%; $Z=3.8$; $p<.05$). Although support was found for each of these theories, clearly other factors not measured by these direct observation surveys also influence seat belt use.

4 Results

Before the core data analyses were performed, we examined rates of refusal to participate in the study and rates of missing data for specific items within the interview. The objective was to ensure that subjects who refused to participate were not substantially different from those who accepted participation, or if they were different, to be able to take such differences into account in subsequent analyses. After reviewing analyses of refusals in Section 4.1 and missing data rates in Section 4.2, univariate distributions for all major study variables are presented in Section 4.3. The next three sections describe bivariate relationships between observed seat belt use and sociodemographic (Section 4.4), situational (Section 4.5), and normative and attitudinal (Section 4.6) determinants of belt use. Section 4.7 examines self-reported effects of the mandatory use law. Finally, results of multivariate analyses predicting observed belt use on the basis of both sociodemographic characteristics and potentially modifiable perceptions, attitudes, and norms are presented.

4.1 Refusal Rate Analyses

A total of 16,300 Michigan drivers were observed at 240 intersections throughout the state. Of these 16,300 drivers, 4,487 were candidates (i.e., were approached) for roadside interviews. A total of 1,869 of these candidates agreed to be interviewed at the site; 1,801 of these interviews were valid.[11] An additional 832 drivers refused to be interviewed at the site but accepted a card asking them to call in for a telephone interview. Of these drivers accepting the call-back card, 72 called in for the telephone interview; 63 of the subsequent telephone interviews were valid.[12] The remaining 1,786 candidates refused both the roadside interview and the call-back card. The final interview sample consisted of 1,864 cases (1,801 roadside interviews and 63 telephone interviews). Figure 4.1 illustrates response patterns at each stage.

Because only 42% of all candidates selected into the sample completed interviews, we were concerned that there may be systematic differences between subjects who participated in the interview and those who did not. Using the observation data available on all candidates, we

11. A total of 68 interviews were invalid. The incorrect interview form was used in 38 cases. In 23 cases vehicle occupant characteristics identified on the interview instrument did not match those on the observation form. In five cases the corresponding observation form was missing. In one case the driver had completed an earlier interview. In the final case the interview was terminated because the respondent could not speak English.

12. Nine telephone interviews were invalid. In four cases the corresponding observation form was missing. In three cases the incorrect interview form was used. In one case the occupant characteristics identified on the interview instrument did not match those on the observation form. In the final case the person interviewed was not the driver of the vehicle.

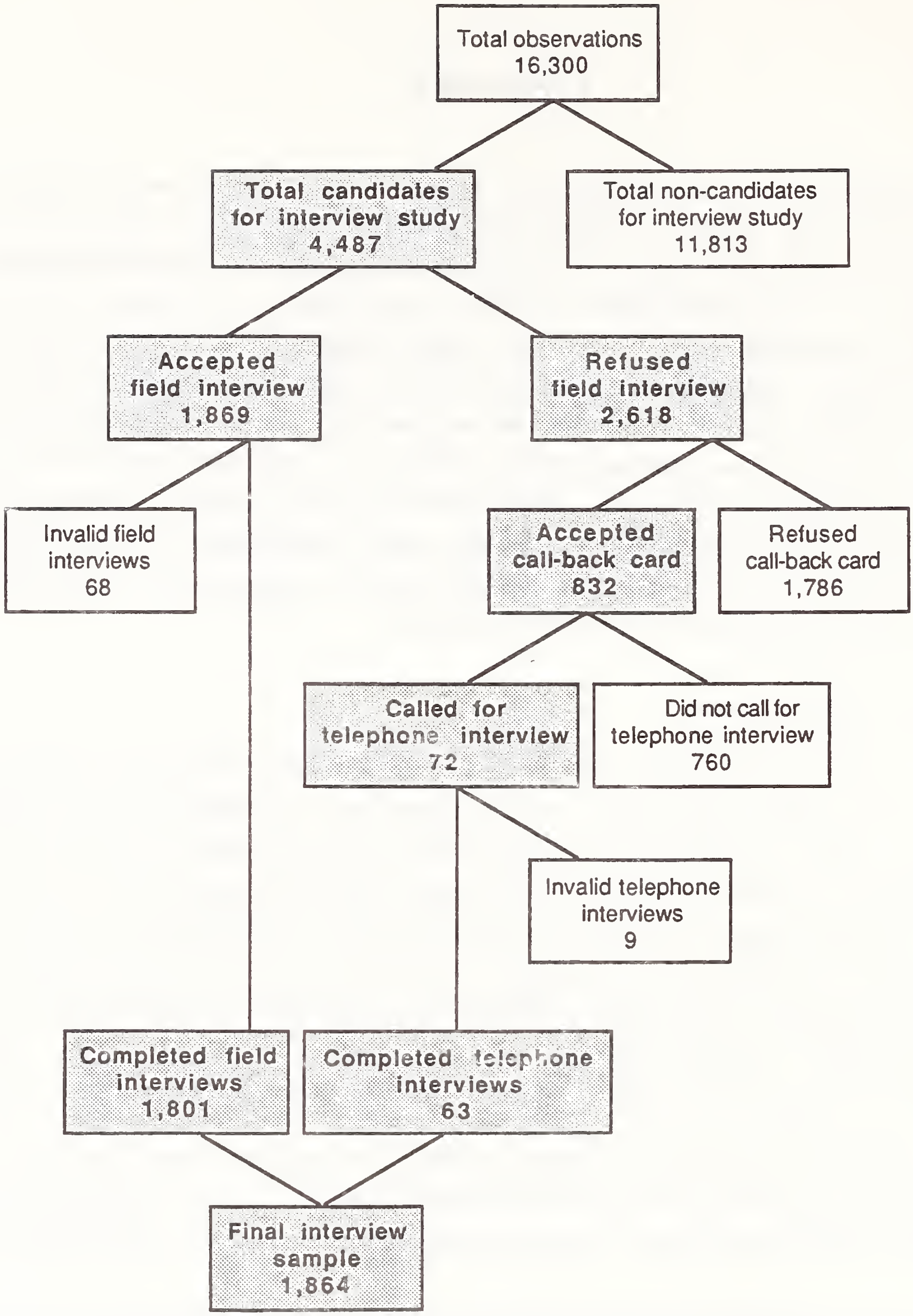

Figure 4.1: Response Rates at Each Stage of the Study

compared participants and nonparticipants to measure potential biases introduced by differential refusal rates. Specifically, we compared five groups defined on the basis of their level of participation in the study:

1. Drivers who completed the roadside interview;

2. Drivers who refused the roadside interview, accepted the call-back card, and completed the telephone interview;

3. Drivers who refused the roadside interview, accepted the call-back card, and did not call in for the telephone interview;

4. Drivers who refused both the roadside interview and the call-back card; and

5. Observed drivers at the same intersections who were not candidates for the interview study.

The last group was examined to ensure that implementation of procedures to select interview candidates did not introduce biases due to differences between the candidates selected for interviews and the rest of the population of motorists at a site. Available observation data permitted comparisons of observed seat belt use, sex, estimated age, and vehicle size across the five study participation groups.

Overall, few differences were seen among the five groups. Observed seat belt use ranged from 42.8% to 47.1% across the groups with the exception of drivers who completed telephone interviews, whose belt use was 55.6% (Table 4.1). However, there were only 63 cases in the telephone interview group. Nevertheless, one might expect those who take the initiative to call a research institute for an interview to be different from those who do not. These results have clear implications for the design of surveys in which both observed and self-reported information is required. Requesting telephone call-backs (and perhaps also mail-back questionnaires) to obtain self-reported information appears to produce a less representative sample than requesting a brief immediate interview at the observation site.

The proportion of females within each group ranged from 37.6% among drivers who completed roadside interviews to 47.6% among drivers who completed telephone interviews (38.7% of the total pool of observed drivers were female; Table 4.1). Again, while it appears that females were slightly overrepresented in the group of drivers who completed telephone interviews, there were only 30 females interviewed via telephone.

Table 4.1: Observed Driver Characteristics By Level of Participation in the Study

Observed Driver Characteristics	Level of Participation: Interviewed at Roadside	Accepted Call-back Card, Telephone Interview Completed	Accepted Call-back Card, No Telephone Interview	Refused Call-back Card	Non-candidates	Total Drivers
Seat Belt Use						
% Belted	45.5	55.6	45.4	42.8	47.1	46.4
Sex						
% Male	62.4	52.4	54.6	59.6	61.8	61.3
% Female	37.6	47.6	45.4	40.4	38.2	38.7
Estimated Age						
% 16-29	41.7	22.2	33.2	33.0	33.1	34.0
% 30-59	49.9	69.8	58.4	53.5	56.1	55.3
% 60+	8.4	7.9	8.4	13.5	10.8	10.7
Vehicle Type						
% Small Car	33.1	33.3	29.2	30.5	29.7	30.2
% Midsize Car	27.0	31.7	27.0	26.5	28.5	28.1
% Large Car	20.5	17.5	24.3	23.3	23.2	23.0
% Pickup	10.8	11.1	11.3	10.8	10.6	10.7
% Van	5.3	3.2	5.0	6.2	5.2	5.3
% Other	3.3	3.2	3.2	2.7	2.8	2.8
Region						
Western U.P.	4.7	9.5	7.0	0.6	5.1	4.7
Eastern U.P.	3.2	1.6	3.4	0.6	3.4	3.1
Northwest	5.1	7.9	5.5	1.6	4.7	4.4
Northeast	3.8	1.6	2.1	1.9	3.4	3.2
West Central	12.3	7.9	5.5	10.0	11.7	11.3
East Central	12.5	14.3	6.1	15.2	11.2	11.6
Southwest	11.7	12.7	8.6	6.5	10.8	10.3
Southeast	9.7	4.8	4.1	11.9	10.3	10.1
Metro Detroit	37.0	39.7	57.8	51.8	39.4	41.4
Total N	1,801	63	760	1,786	11,813	16,223

With regard to estimated driver age, drivers age 16-29 were slightly overrepresented in the group who completed roadside interviews (Table 4.1). Forty-two percent of drivers who completed roadside interviews were age 16-29. By comparison, the proportion of drivers age 16-29 in each of the other groups was approximately 33%. Drivers age 30-59 were slightly underrepresented among interviewees, although differences were not large (49.9% among interviewees versus 55.3% among all drivers observed).

Finally, there were only marginal differences between groups in terms of size of vehicle (Table 4.1). For example, the proportion of small car drivers in the group who completed roadside interviews was similar to that of all other groups of drivers analyzed; the difference between the lowest and highest proportion of small cars was less than four percentage points.

Differences in these driver characteristics between participation groups were also examined by region of the state to ensure that there were not major biases in selected regions.[13]

13. A map showing regions of the state is in Appendix D.

However, results of region-specific analyses were consistent with those from the overall analyses (Table 4.2). Taking into account the small number of cases in several cells, there appear to be few major biases introduced because of a higher than desired rate of refusal. As a result of these analyses, we were more confident that the refusal rate did not introduce substantial biases, and that the interview sample fairly represents motorists throughout the State of Michigan.

4.2 Missing Data Rates

All variables in the study had less than five cases of missing data with the exception of the item measuring employer belt use requirements (5 cases missing) and respondent race or ethnic background (9 cases missing; see Appendix E for missing data frequencies and percentages for all variables). It should be noted that in addition to the missing data category, several variables have skip and/or not applicable categories. The data in these categories are not missing data. They constitute legitimate response categories when particular items on the interview instrument were not appropriate for the respondent. For example, respondents who reported that they were not employed were not asked if their employers required seat belt use for workers who drove on the job.

Table 4.2: Observed Driver Characteristics By Level of Participation Stratified By Region

	Level of Participation					
Observed Driver Characteristics	**Interviewed at Roadside**	**Accepted Call-back Card Telephone Interview Completed**	**Accepted Call-back Card No Telephone Interview**	**Refused Call-back Card**	**Non-candidates**	**Total Drivers**
Seat Belt Use						
Western U.P.						
% Belted	57.6	50.0	47.2	27.3	45.4	46.7
(Total N)	(85)	(6)	(53)	(11)	(603)	(758)
Eastern U.P.						
% Belted	27.6	0.0	34.6	27.3	39.3	37.4
(Total N)	(58)	(1)	(26)	(11)	(399)	(495)
Northwest						
% Belted	49.5	40.0	50.0	25.0	49.8	48.8
(Total N)	(91)	(5)	(42)	(28)	(554)	(720)
Northeast						
% Belted	58.8	100.0	31.3	50.0	48.2	49.2
(Total N)	(68)	(1)	(16)	(34)	(407)	(526)
West Central						
% Belted	40.5	40.0	38.1	42.1	48.2	46.4
(Total N)	(222)	(5)	(42)	(178)	(1,379)	(1,826)
East Central						
% Belted	47.6	66.7	60.9	36.9	45.7	45.1
(Total N)	(225)	(9)	(46)	(271)	(1,328)	(1,879)
Southwest						
%Belted	48.3	50.0	52.3	48.3	48.7	48.8
(Total N)	(211)	(8)	(65)	(116)	(1,279)	(1,679)
Southeast						
% Belted	55.2	100.0	80.6	50.0	48.6	50.2
(Total N)	(174)	(3)	(31)	(212)	(1,211)	(1,631)
Metro Detroit						
% Belted	41.2	56.0	41.5	42.9	46.8	45.4
(Total N)	(667)	(25)	(439)	(925)	(4,653)	(6,709)

Level of Participation

Observed Driver Characteristics	Interviewed at Roadside	Accepted Call-back Card Telephone Interview Completed	Accepted Call-back Card No Telephone Interview	Refused Call-back Card	Non-candidates	Total Drivers
Sex						
Western U.P.						
% Male	54.1	33.3	43.4	54.5	57.0	55.5
% Female	45.9	66.7	56.6	45.5	43.0	44.5
(Total N)	(85)	(6)	(53)	(11)	(603)	(758)
Eastern U.P.						
% Male	67.2	100.0	57.7	63.6	61.7	62.2
% Female	32.8	0.0	42.3	36.4	38.3	37.8
(Total N)	(58)	(1)	(26)	(11)	(399)	(495)
Northwest						
% Male	62.6	40.0	57.1	67.9	65.4	64.5
% Female	37.4	60.0	42.9	32.1	34.6	35.5
(Total N)	(91)	(5)	(42)	(28)	(554)	(720)
Northeast						
% Male	57.4	100.0	75.0	76.5	65.3	65.3
% Female	42.6	0.0	25.0	23.5	34.7	34.7
(Total N)	(68)	(1)	(16)	(34)	(407)	(526)
West Central						
% Male	59.0	20.0	54.8	53.4	60.8	59.6
% Female	41.0	80.0	45.2	46.6	39.2	40.4
(Total N)	(222)	(5)	(42)	(178)	(1,379)	(1,826)
East Central						
% Male	62.2	77.8	45.7	59.4	59.6	59.6
% Female	37.8	22.2	54.3	40.6	40.4	40.4
(Total N)	(225)	(9)	(46)	(271)	(1,328)	(1,879)
Southwest						
% Male	61.1	50.0	55.4	56.0	61.2	60.5
% Female	38.9	50.0	44.6	44.0	38.8	39.5
(Total N)	(211)	(8)	(65)	(116)	(1,279)	(1,679)
Southeast						
% Male	56.9	0.0	45.2	60.4	60.7	59.9
% Female	43.1	100.0	54.8	39.6	39.3	40.1
(Total N)	(174)	(3)	(31)	(212)	(1,211)	(1,631)
Metro Detroit						
% Male	66.4	60.0	56.3	60.3	63.1	62.6
% Female	33.6	40.0	43.7	39.7	36.9	37.4
(Total N)	(667)	(25)	(439)	(925)	(4,653)	(6,709)
Estimated Age						
Western U.P.						
% 16-29	40.0	50.0	39.6	27.3	31.3	33.0
% 30-59	51.8	33.3	52.8	72.7	56.4	55.7
% 60+	8.2	16.7	7.5	0.0	12.1	11.2
(Total N)	(85)	(6)	(53)	(11)	(603)	(758)
Eastern U.P.						
% 16-29	46.6	0.0	19.2	45.5	35.6	36.2
% 30-59	48.3	100.0	69.2	27.3	50.9	51.1
% 60+	5.2	0.0	11.5	27.3	13.3	12.5
(Total N)	(58)	(1)	(26)	(11)	(399)	(495)
Northwest						
% 16-29	44.0	20.0	33.3	46.4	28.3	31.3
% 30-59	46.2	40.0	57.1	42.9	58.3	56.0
% 60+	9.9	40.0	9.5	10.7	13.2	12.6
(Total N)	(91)	(5)	(42)	(28)	(554)	(720)
Northeast						
% 16-29	30.9	0.0	12.5	23.5	24.4	24.8
% 30-59	48.5	0.0	68.8	52.9	56.4	55.4
% 60+	20.6	100.0	18.8	23.5	19.2	19.8
(Total N)	(68)	(1)	(16)	(34)	(407)	(526)
West Central						
% 16-29	45.0	0.0	40.5	38.2	33.8	35.7
% 30-59	46.4	100.0	54.8	50.6	54.0	52.9
% 60+	8.6	0.0	4.8	11.2	12.2	11.5
(Total N)	(222)	(5)	(42)	(178)	(1,379)	(1,826)

Observed Driver Characteristics	Interviewed at Roadside	Accepted Call-back Card Telephone Interview Completed	Accepted Call-back Card No Telephone Interview	Refused Call-back Card	Non-candidates	Total Drivers
		Level of Participation				
Estimated Age, cont.						
East Central						
% 16-29	34.7	33.3	41.3	35.4	35.1	35.3
% 30-59	53.8	66.7	45.7	50.9	55.5	54.4
% 60+	11.6	0.0	13.0	13.7	9.4	10.3
(Total N)	(225)	(9)	(46)	(271)	(1,328)	(1,879)
Southwest						
% 16-29	45.2	12.5	29.2	32.8	34.4	35.0
% 30-59	49.8	87.5	60.0	54.3	54.9	54.6
% 60+	8.1	0.0	10.8	12.9	10.7	10.5
(Total N)	(211)	(8)	(65)	(116)	(1,279)	(1,679)
Southeast						
% 16-29	39.1	0.0	54.8	34.9	36.8	37.1
% 30-59	54.6	100.0	41.9	53.3	53.8	53.7
% 60+	6.3	0.0	3.2	11.8	9.3	9.2
(Total N)	(174)	(3)	(31)	(212)	(1,211)	(1,631)
Metro Detroit						
% 16-29	44.1	24.0	31.4	30.8	32.2	33.1
% 30-59	49.0	72.0	60.8	55.1	57.9	56.9
% 60+	6.9	4.0	7.7	14.1	9.9	10.0
(Total N)	(667)	(25)	(439)	(925)	(4,653)	(6,709)
Vehicle Type						
Western U.P.						
% Small Car	42.4	16.7	30.2	18.2	24.0	26.4
% Midsize Car	20.0	50.0	30.2	18.2	25.4	25.2
% Large Car	12.9	0.0	7.5	18.2	24.4	21.6
% Pickup	15.3	33.3	22.6	18.2	18.1	18.2
% Van	3.5	0.0	3.8	0.0	3.5	3.4
% Other	5.9	0.0	5.7	27.3	4.6	5.1
(Total N)	(85)	(6)	(53)	(11)	(603)	(758)
Eastern U.P.						
% Small Car	20.7	0.0	26.9	9.1	25.1	24.2
% Midsize Car	31.0	100.0	23.1	27.3	26.3	26.9
% Large Car	19.0	0.0	19.2	36.4	26.1	25.1
% Pickup	19.0	0.0	23.1	27.3	16.5	17.4
% Van	5.2	0.0	3.8	0.0	3.0	3.2
% Other	5.2	0.0	3.8	0.0	3.0	3.2
(Total N)	(58)	(1)	(26)	(11)	(399)	(495)
Northwest						
% Small Car	37.4	80.0	28.6	35.7	28.1	29.9
% Midsize Car	23.1	20.0	26.2	17.9	21.7	22.0
% Large Car	14.3	0.0	14.3	21.4	24.6	22.4
% Pickup	12.1	0.0	23.8	21.4	14.9	15.2
% Van	5.5	0.0	2.4	3.6	6.0	5.6
% Other	7.7	0.0	4.8	0.0	4.7	4.9
(Total N)	(91)	(5)	(42)	(28)	(554)	(720)
Northeast						
% Small Car	29.4	0.0	6.3	26.5	20.4	21.5
% Midsize Car	32.4	0.0	31.3	29.4	28.6	29.1
% Large Car	25.0	100.0	18.8	8.8	20.2	20.2
% Pickup	10.3	0.0	25.0	20.6	20.4	19.2
% Van	1.5	0.0	12.5	11.8	4.7	5.0
% Other	1.5	0.0	6.3	2.9	5.7	5.0
(Total N)	(68)	(1)	(16)	(34)	(407)	(526)
West Central						
% Small Car	36.9	40.0	28.6	36.5	33.3	34.0
% Midsize Car	28.8	0.0	31.0	19.7	28.6	27.7
% Large Car	17.6	20.0	14.3	19.1	22.4	21.3
% Pickup	9.0	40.0	16.7	15.7	9.9	10.6
% Van	3.6	0.0	2.4	6.2	3.3	3.6
% Other	4.1	0.0	7.1	2.8	2.4	2.7
(Total N)	(222)	(5)	(42)	(178)	(1,379)	(1,826)
East Central						
% Small Car	28.4	22.2	26.1	26.2	24.6	25.3
% Midsize Car	31.1	55.6	37.0	29.9	31.5	31.5
% Large Car	20.4	11.1	17.4	23.6	23.2	22.7
% Pickup	12.4	0.0	15.2	10.7	11.9	11.8
% Van	6.2	11.1	2.2	6.6	5.0	5.3
% Other	1.3	0.0	2.2	3.0	3.8	3.4
(Total N)	(225)	(9)	(46)	(271)	(1,328)	(1,879)

Observed Driver Characteristics	Interviewed at Roadside	Accepted Call-back Card Telephone Interview Completed	Accepted Call-back Card No Telephone Interview	Refused Call-back Card	Non-candidates	Total Drivers
	Level of Participation					
Vehicle Type, cont.						
Southwest						
% Small Car	27.5	25.0	21.5	27.6	29.1	28.4
% Midsize Car	21.8	37.5	15.4	22.4	25.1	24.2
% Large Car	22.7	12.5	35.4	27.6	23.5	24.1
% Pickup	16.1	12.5	16.9	14.7	14.1	14.5
% Van	5.7	0.0	6.2	5.2	5.2	5.2
% Other	6.2	12.5	4.6	2.6	3.1	3.5
(Total N)	(211)	(8)	(65)	(116)	(1,279)	(1,679)
Southeast						
% Small Car	33.9	33.3	38.7	34.0	34.5	34.5
% Midsize Car	28.7	33.3	32.3	26.9	28.3	28.3
% Large Car	17.8	33.3	12.9	20.3	18.0	18.2
% Pickup	10.9	0.0	3.2	11.3	10.5	10.5
% Van	5.2	0.0	9.7	5.7	6.3	6.1
% Other	3.4	0.0	3.2	1.9	2.4	2.5
(Total N)	(174)	(3)	(31)	(212)	(1,211)	(1,631)
Metro Detroit						
% Small Car	34.6	36.0	31.0	30.6	31.2	31.4
% Midsize Car	26.7	24.0	26.7	27.6	30.1	29.2
% Large Car	23.1	24.0	28.7	24.6	24.4	24.6
% Pickup	7.8	8.0	6.4	8.3	6.6	7.0
% Van	6.0	4.0	5.2	6.3	5.9	5.9
% Other	1.8	4.0	2.1	2.6	1.8	1.9
(Total N)	(667)	(25)	(439)	(925)	(4,653)	(6,709)

4.3 Univariate Distributions

4.3.1 Sociodemographic Characteristics

The proportion of respondents in various age, sex, income, and education categories were similar to statewide census distributions (U.S. Bureau of the Census, 1986). Interview respondents ranged in age from 16 to 87 years with a mean of 37 years. Sixty-two percent of respondents were male and 37.7% were female (Figure 4.2).[14] Fifty-one percent of respondents identified themselves as married, 32.0% as never married, and 16.9% as separated, divorced, or widowed. In terms of socioeconomic status, 61.5% of respondents reported a family income of at least $25,000 and 85.9% reported having attained at least a high school education. Finally, 82.2% of respondents identified themselves as white, 14.0% Black, 1.5% Hispanic, 1.3% Native American, and 1.1% other.

4.3.2 Driver Seat Belt Use

Self-reported seat belt use often overestimates actual use (e.g., Waller and Berry, 1969; Stulginskas and others, 1985). We compared three measures of seat belt use in the current study:

14. All frequencies and percentages presented here are weighted. Unweighted frequencies and percentages for all variables are shown in Appendix E.

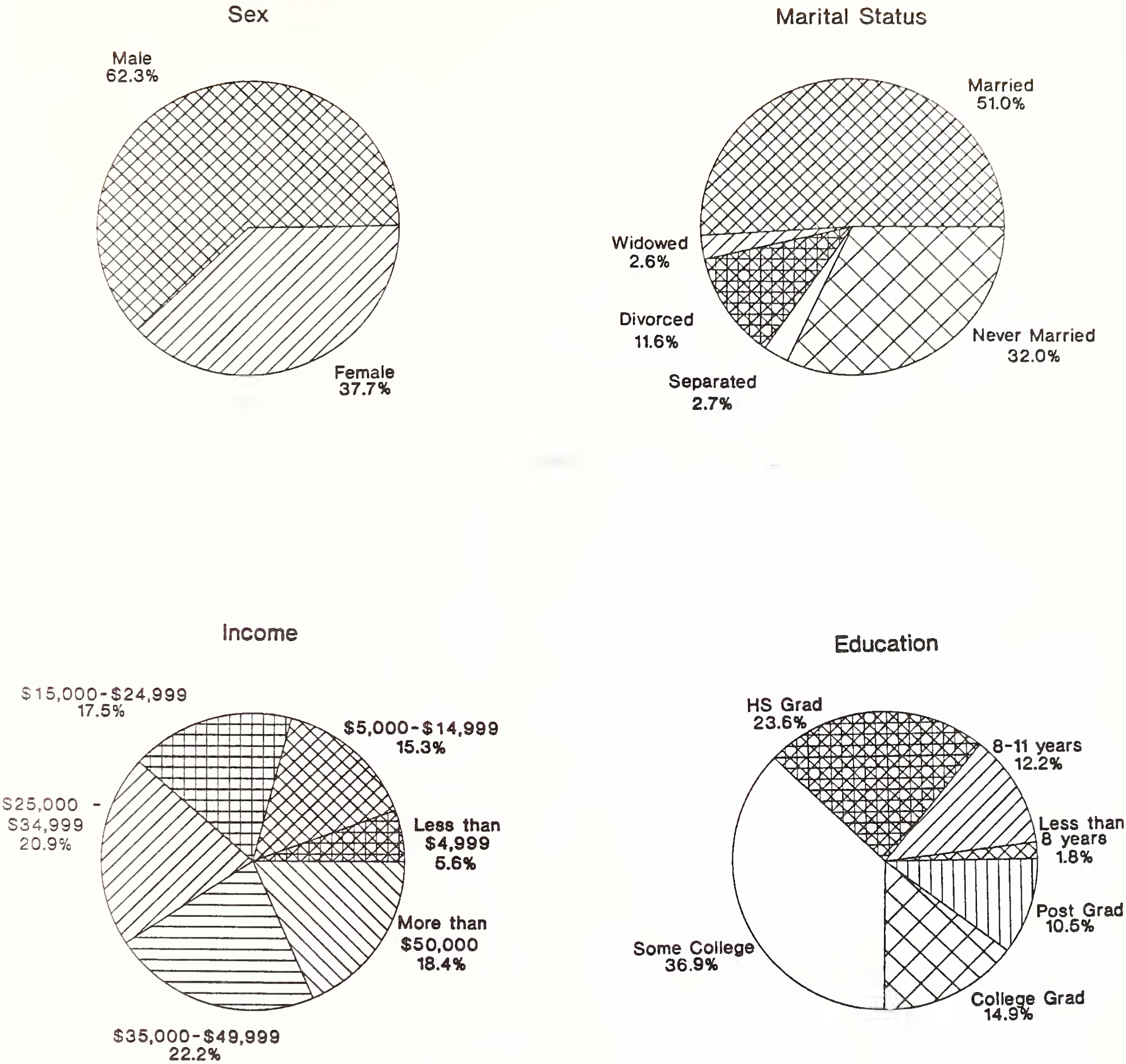

Figure 4.2: Sociodemographic Characteristics of Interview Sample

Race

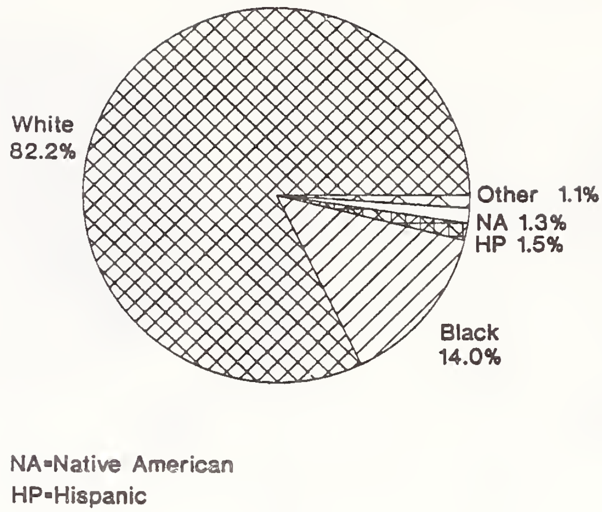

Figure 4.2: Sociodemographic Characteristics of Interview Sample, Continued

observed use, self-reported frequency of use ("always," "most of the time," "sometimes," "seldom," and "never"), and the reported number of times belts were used in the last ten trips. As expected, observed belt use was positively correlated with self-reported frequency of use ($r=.71$; $p<.001$).[15] Over two-thirds (66.9%) of the sample reported using belts always or most of the time. Specifically, 42.5% of respondents stated they used belts always, and 24.4% reported belt use most of the time; 10.8% reported they never used belts (Figure 4.3). Of respondents who reported always using belts, 94.0% were observed using belts at the time of the interview, but only 23.3% of respondents who reported using belts most of the time were actually observed buckled. None of the respondents who reported never using belts were observed buckled.

Observed belt use and the number of times belts were used in the last ten trips was also positively correlated ($r=.28$; $p<.001$), although the magnitude of the correlation was smaller than that between observed belt use and the always-never scale. Of respondents who reported using belts ten times out of the last ten trips, only 32.8% were observed buckled. Furthermore, only 28.2% of those reporting belt use nine out of ten times were buckled, and only 13.1% of those reporting belt use eight of ten times were observed buckled. Self-report belt use measures clearly overestimate belt use. However, it is worth noting that any use of self-reports to estimate

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15. Since observed belt use is dichotomous, point-biserial correlations were used.

belt use should only consider those who say they are "always" users. The 42.5% who report always using belts is close to the 46.8% estimate use based on direct observation of 16,225 drivers observed at the same intersections during the same time the interviews were conducted (Wagenaar, Molnar, and Businski, 1987a).

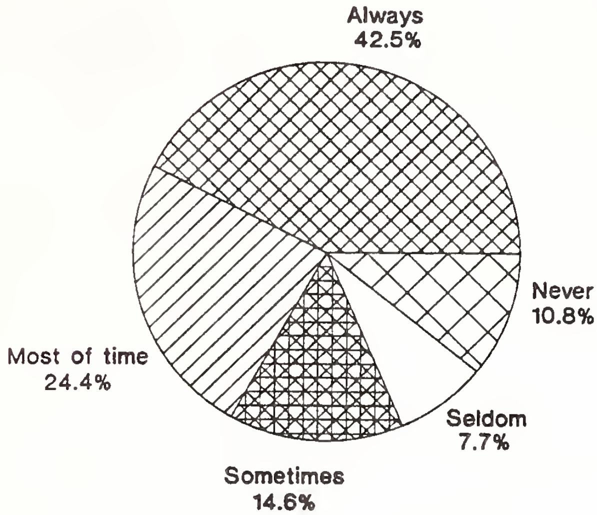
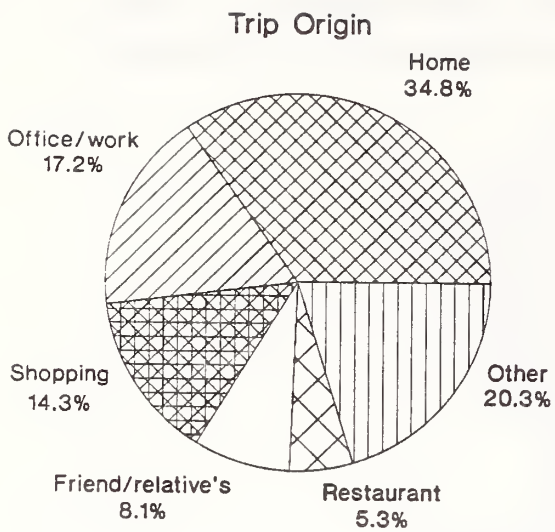
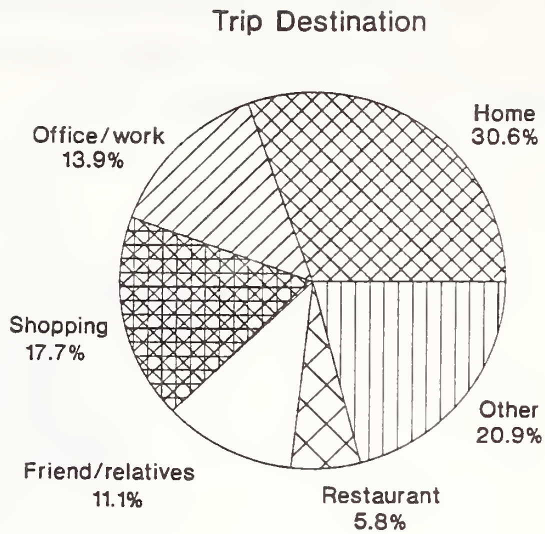


Figure 4.3: Self-reported Seat Belt Use

4.3.3 Situational Factors

Several interview items measured characteristics of the trip at the time of the interview. We defined trip as the travel segment originating where the driver last got in and started the car prior to being interviewed and ending where the driver was next going to stop. The trip origin most frequently reported by drivers was home, followed by office or work, shopping center or store, and friend or relative's home (Figure 4.4). These same categories were also most frequently reported as trip destinations but in a different order (home, shopping center or store, office or work, and friend or relative's home). Most respondents reported the purpose of the trip to be either work-related, shopping, or social. Finally, reported trip length ranged from less than one mile to 750 miles with a mean of 15.7 miles and a median of 6 miles.





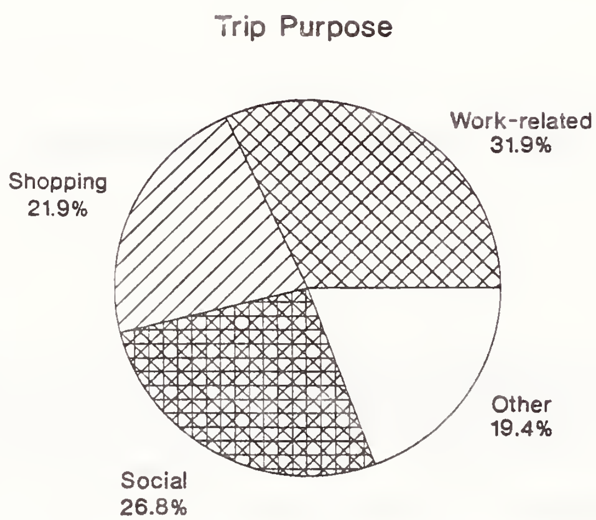


Figure 4.4: Origin, Destination, and Purpose of Trip at Time of Interview

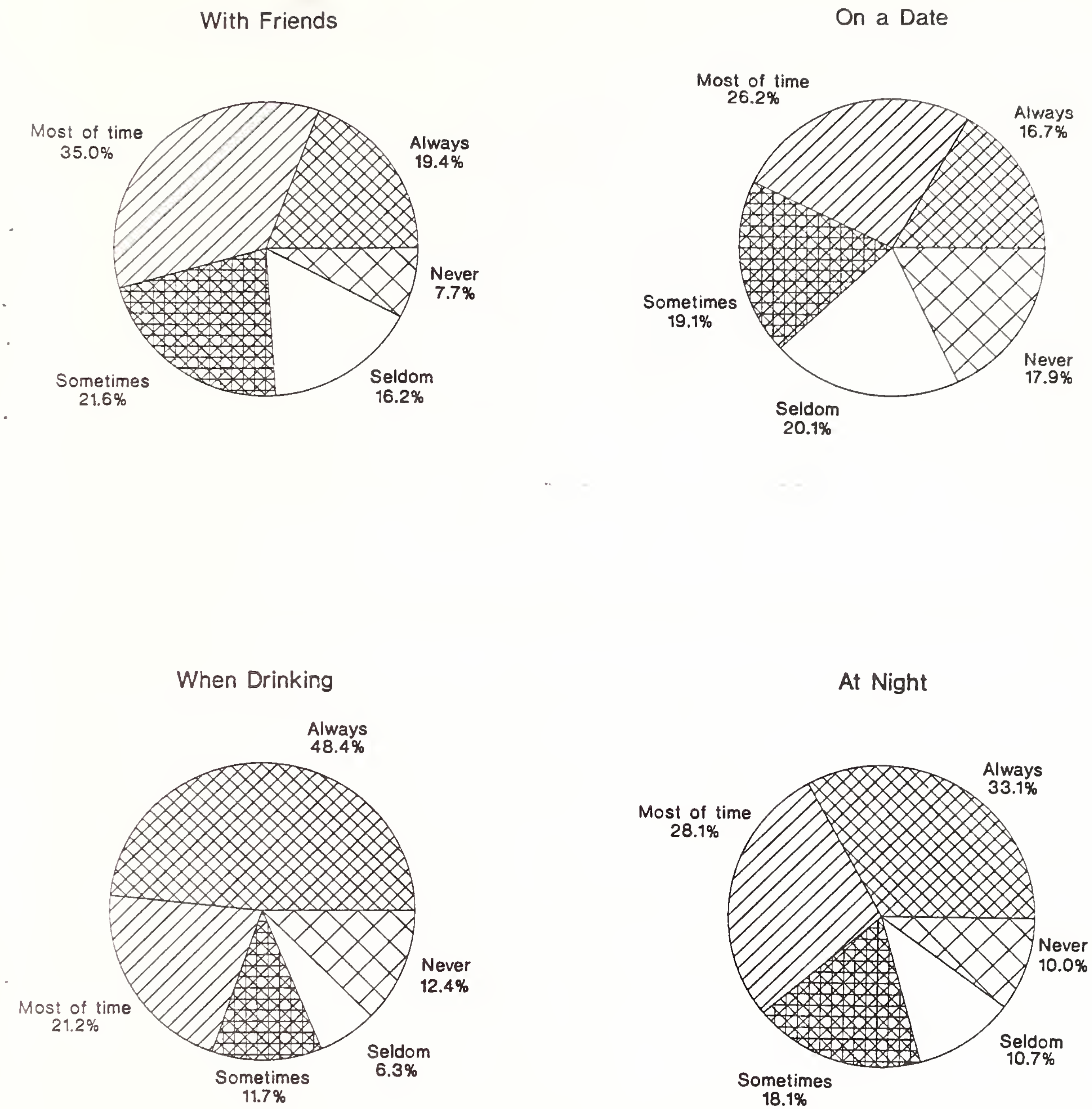


Figure 4.5: Self-reported Seat Belt Use in Specific Social Situations

When Riding as a Passenger

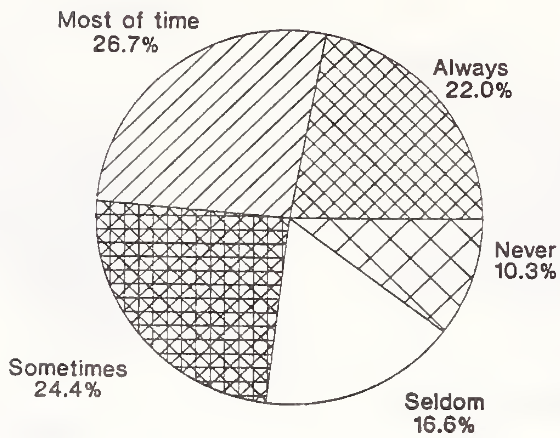
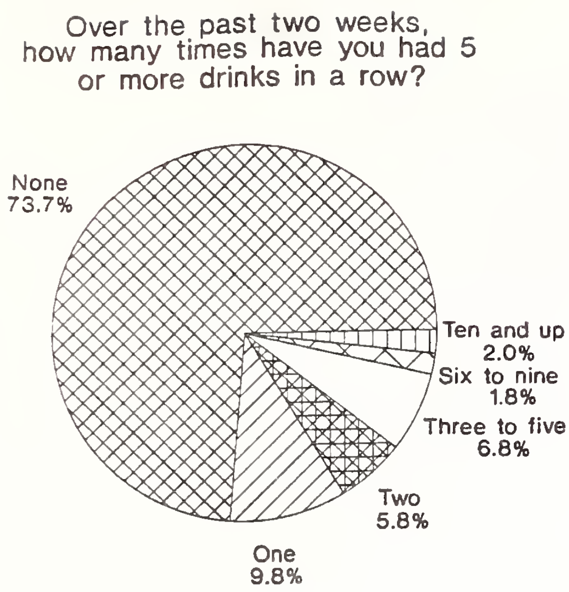


Figure 4.5: Self-reported Seat Belt Use in Specific Social Situations, Continued

Study subjects were asked to report belt use in several specific situations, including when with friends, when on a date, when drinking (alcohol), at night, and when riding as a passenger in someone else's car (Figure 4.5). Respondents who reported they never used belts and those who reported they always used belts **and** were observed using belts at the time of the interview were not asked to respond to the situation-specific belt-use items. Interestingly, although most "always" belt users and all "never" users were excluded from the situation-specific items, responses were still distributed across all response categories. For example, when asked about belt use when drinking, 48.4% of respondents reported they always used belts and 12.4% reported they never used belts. These response patterns again indicate the apparent unreliability of self-reported belt use information.

In addition to the situation-specific item regarding belt use when drinking, two other variables measured alcohol consumption (Figure 4.6). First, respondents were asked how many times they drank five or more alcoholic drinks in a row over the past two weeks. Although nearly three-quarters reported having five or more alcoholic drinks in a row at no time during the past two weeks, just over 10% reported such drinking behavior three or more times. Second, interviewers unobtrusively recorded obvious evidence of alcohol or other drug use by drivers interviewed. In 1.6% of the cases, interviewers noticed use of alcohol or drugs.



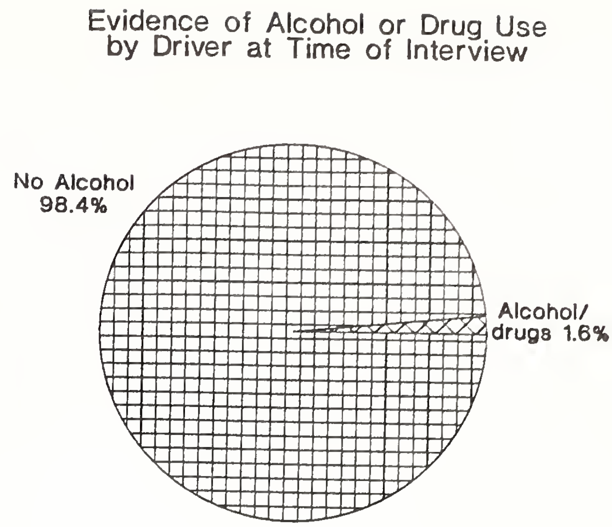


Figure 4.6: **Alcohol and Drug Consumption: Frequency of Intoxication and Use at Time of Interview**

4.3.4 Norms and Attitudes

The majority of respondents reported that over half of their friends used seat belts. Specifically, 28.6% reported that half to three quarters of their friends used belts and 28.7% reported that more than three quarters of their friends used belts. In comparison, 22.8% of respondents reported that less than a quarter of their friends used belts (Figure 4.7). When respondents were questioned about whether they had been asked to use belts by another person in the last month, most respondents indicated they had not (66.3%; Figure 4.8). However, of those respondents who had been asked to use belts, the majority reported they complied with the request (78.7% stated they "always" put the belt on and 7.6% stated they put the belt on "most of the time" after being asked). Respondents were also asked how many times they requested unbuckled passengers to buckle up out of the last ten trips they drove with unbuckled passengers. Forty-four percent reported they did not ask unbuckled passengers to buckle up on any of the last ten trips and 18.2% reported they asked on only one to three of the last ten trips. Twenty-three percent reported that they requested unbuckled passengers to use belts on all ten trips. Again, reported compliance with the request to buckle up was high. Of respondents making such a request, 67.7% reported that passengers "always" buckled up and 20.2% reported that passengers buckled up "most of the time".

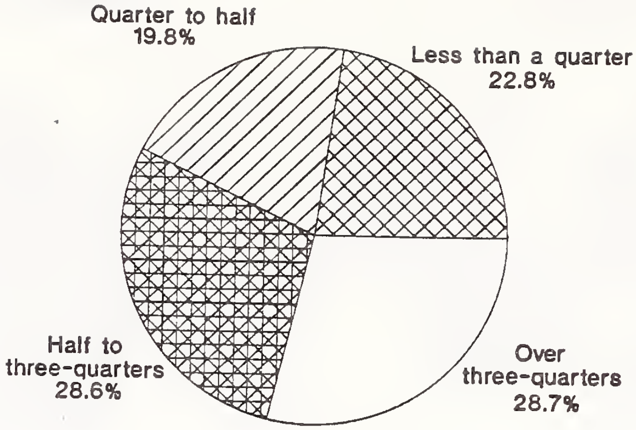


Figure 4.7: **What proportion of your friends use seat belts?**

When asked how long they had been using seat belts, most respondents reported that they began using belts within the past five years (Figure 4.9); 32.6% volunteered that they had been using belts only since the mandatory seat belt law took effect. Consistent with the latter finding, the mandatory belt law was the reason most frequently given by respondents for beginning to use belts (32.6%).[16] Other frequently cited reasons were related to crash-involvement and safety (17.8% and 16.2%, respectively; Figure 4.10).[17]

Finally, respondents perceived their chances of being in a crash over the next year to be relatively low. On a scale from one to ten, with one being certainly won't and ten being certainly will be in a crash, 59.5% of respondents rated their chances three or less (Figure 4.11).

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16. Included in the mandatory belt law category were fear of or receipt of a ticket or fine for failure to comply with the law.

17. Crash-related reasons included personal crash experience (5.0%), crash experience of friends or relatives (5.5%), observation of a crash or contact with injured crash victim (3.3%), and unspecified crash experience (4.0%).

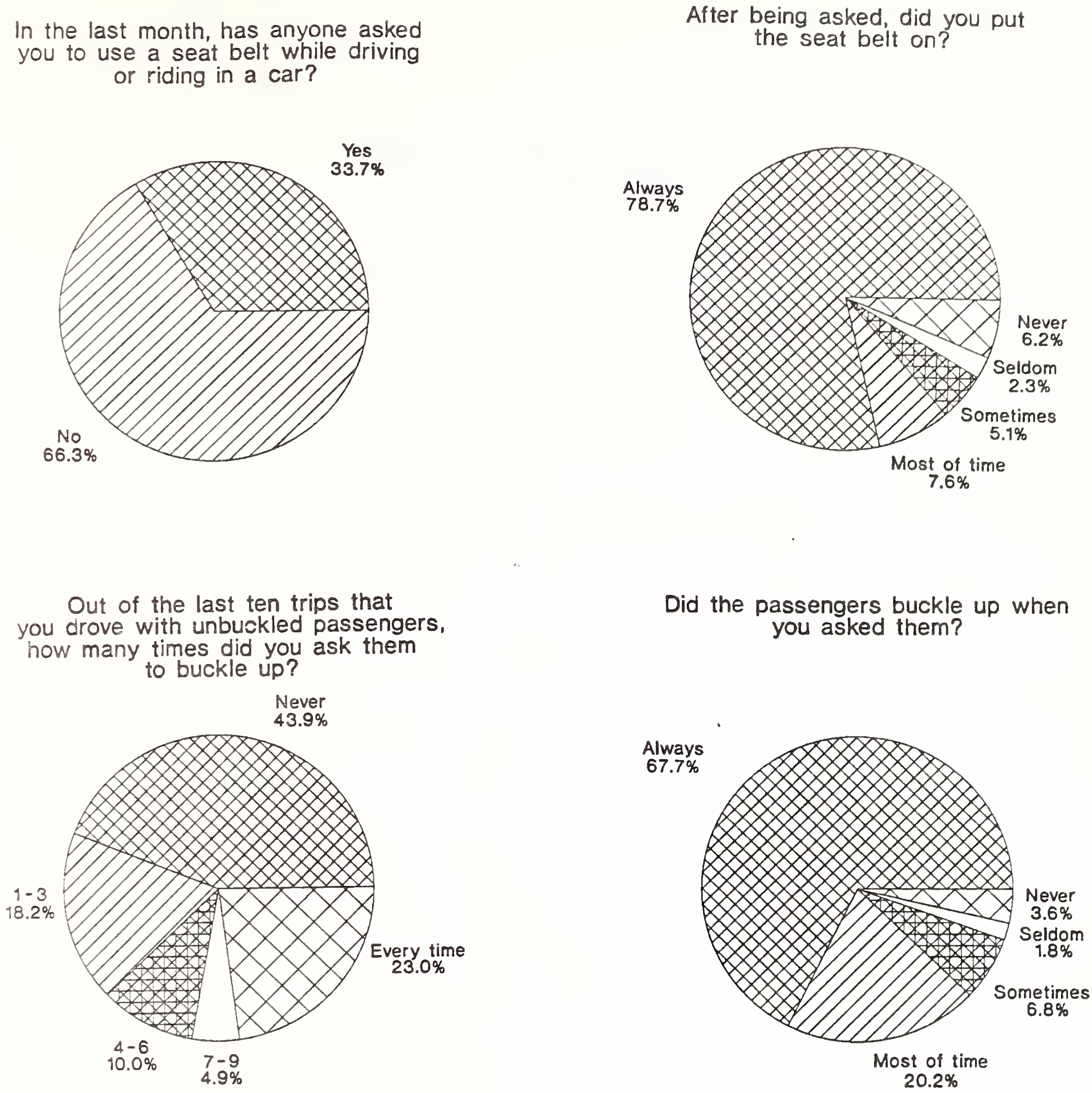


Figure 4.8: Requests to Buckle Up: Frequency of Making Request, Frequency of Receiving Request, and Self-Reported Compliance with Requests.

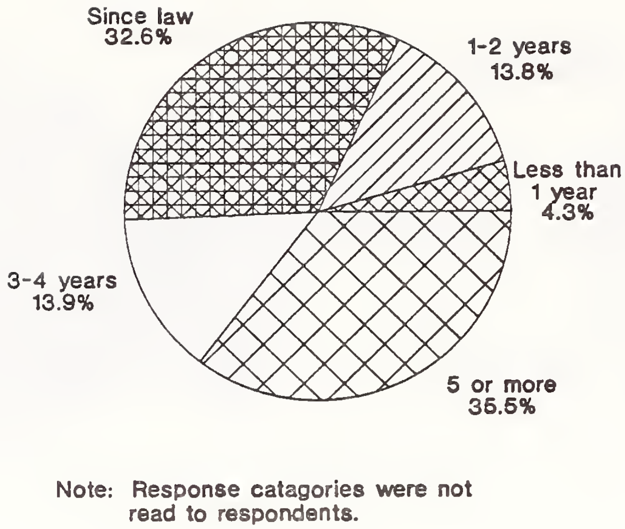


Figure 4.9: How long have you been using seat belts?

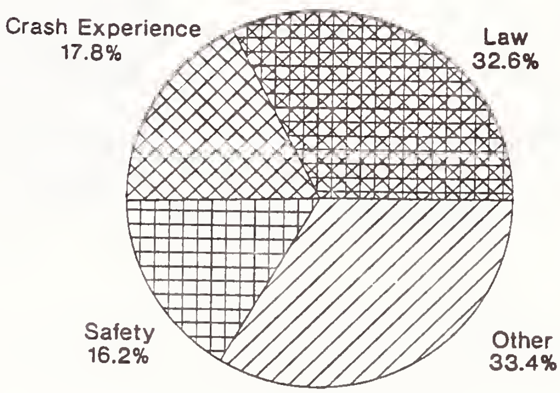


Figure 4.10: What influenced you to start using seat belts?

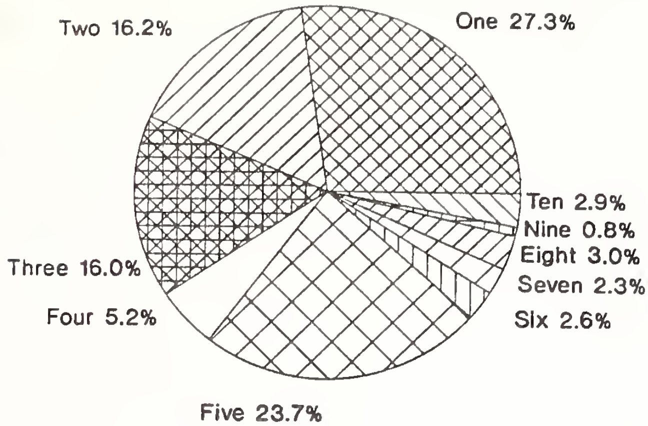
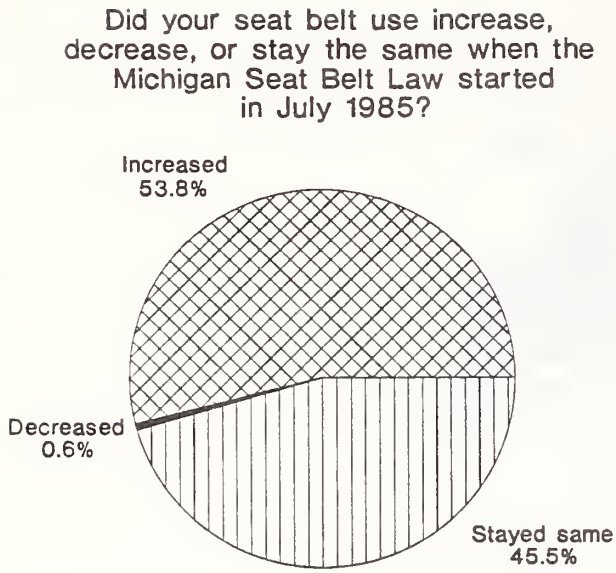
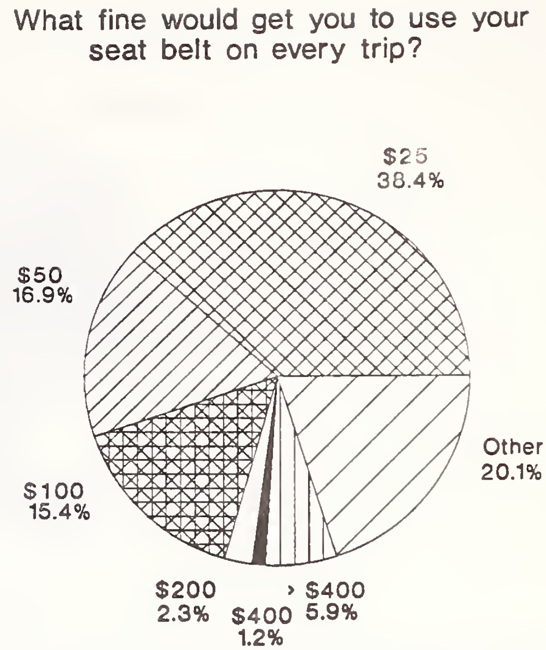


Figure 4.11: On a scale from 1 to 10 please estimate the chance that you will be involved in a car crash over the next year, with 1 being that you certainly won't, and 10 being that you certainly will.

4.3.5 Effects of Mandatory Use Laws

Almost all interviewees (94.6%) reported living in Michigan in July 1985 when the mandatory seat belt law took effect. Of those, 53.8% said their belt use increased when the law took effect and 45.5% said it stayed the same (Figure 4.12). Less than one percent stated their belt use decreased. All respondents except those who reported they always used belts and were observed using belts were asked what fine would get them to use seat belts on every trip (respondents were first told that the current fine is $25). A total of 38.4% of these respondents indicated that a $25 fine would get them to use belts on every trip. That is, over a third of the respondents who do not consistently use belts report that a fine at its current level of $25 would induce them to use their belts consistently. Seventeen percent reported the fine would need to be $50 and 15.4% reported the fine would need to be $100 to get them to use belts on every trip. Interestingly, about nine percent volunteered that no amount of fine would get them to use belts on every trip. Finally, these same respondents were asked how their belt use would change if the law permitted primary rather than secondary enforcement. Specifically, respondents were asked how their belt use would change if police could pull them over just for not using belts the same way they can for speeding. Again, respondents who reported they always used belts and were observed using belts were excluded. The majority of respondents reported their belt use would increase with primary enforcement.





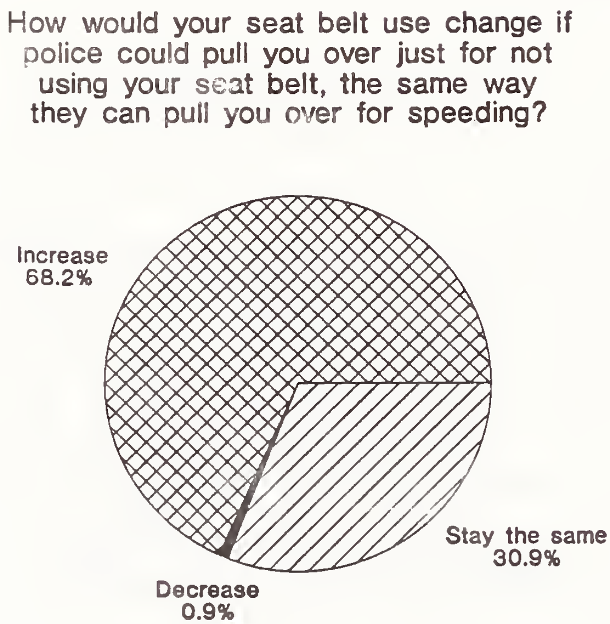


Figure 4.12: Self-reported Effects of the Seat Belt Law, Fines, and Primary Versus Secondary Enforcement.

4.4 Sociodemographic Characteristics and Seat Belt Use

Seat belt use has frequently been found to be higher in urban than rural areas. However, the definition of urbanism differs between studies. The Minnesota (1985) study compared belt use rates for observation sites in the Metropolitan Minneapolis/St. Paul area with sites from other locations in the state. McCarthy (1986) defined urbanism based on population density figures, although the source and meaning of these density figures were not fully explained. Morgan and Wilson (1986) dichotomized urbanism using characterizations provided by the U.S. Census Bureau (i.e., rural areas have a population less than 2,500 persons). We trichotomized urbanism by classifying each observation site in our sample as urban, suburban, or rural. Urban sites are within the legal boundaries of an incorporated city that is the core of a metropolitan area. Metropolitan areas include other contiguous areas that are also incorporated cities. Incorporated areas surrounding core cities were categorized as suburban. Areas outside of incorporated cities were considered rural. In addition, several sites in small incorporated cities not part of a metropolitan area were also categorized as rural. Such cities are in the northern and western regions of Michigan.[18]

We found that drivers in suburban areas had the highest belt use rates, followed by drivers in rural areas and finally, drivers in urban areas (Figure 4.13). When urban and suburban sites were combined, belt use in urban/suburban areas was identical to use in rural areas (Table 4.3). One possible explanation for differences in belt use by urbanism is that driving habits in these areas reflect differences in freeway versus nonfreeway driving. For example, because belt use is higher on limited access expressways, higher belt use rates in suburban than urban areas may reflect a higher proportion of highway travel in suburban areas. Therefore, we examined the relationship between urbanism and belt use controlling for the location of the intersection (freeway exit versus local intersection), using the Cochran-Mantel-Haenzel general association statistic, which tests for association between categorical variables after adjusting for effects of other variables (Cochran, 1954; Landis, Heyman, and Roch, 1978). Results confirmed the bivariate pattern, with belt use lowest in urban areas and highest in suburban areas (Figure 4.14).

Another potential explanation for differences in belt use by urbanism is socioeconomic status. If those living in core city urban areas tend to have lower SES, and if belt use is positively related to SES, the urbanism-belt use relationship may be explained by SES differentials.

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18. See Appendix F for a list of sites and the urbanism category assigned.

Table 4.3: Driver Belt Use By Urbanism

	Number Not Using Belts	Number Using Belts	Percent Using Belts
Urban/Suburban	671	592	46.9
Rural	319	281	46.9

χ^2=0.00; p>.05

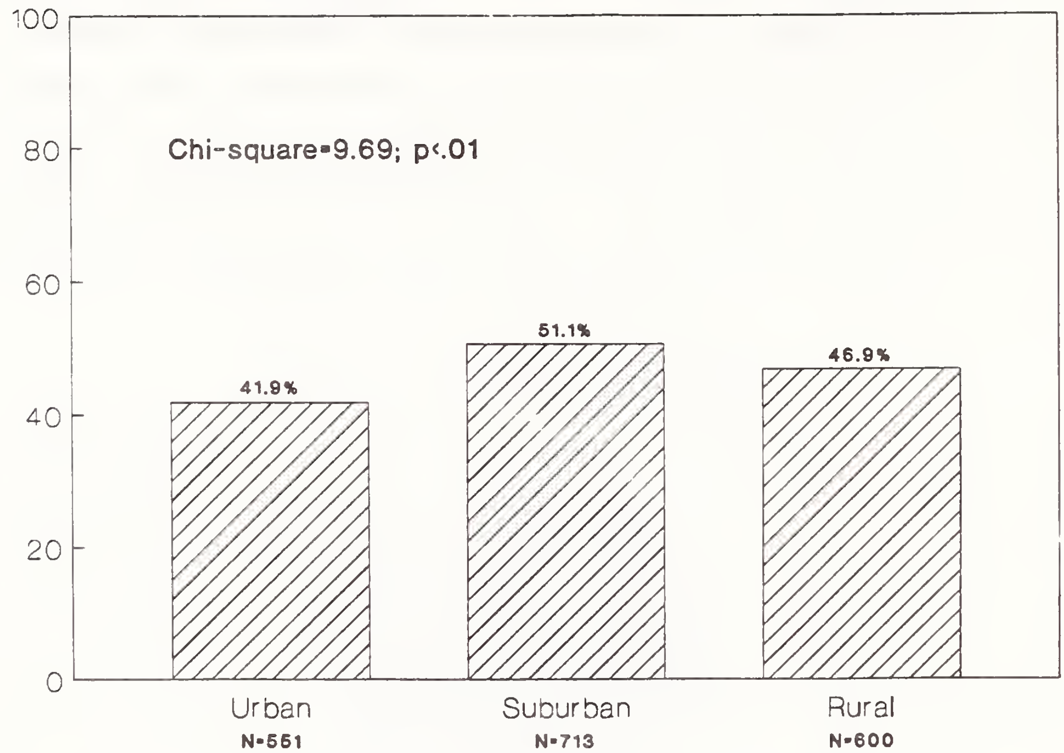

Figure 4.13: Percent Drivers Using Belts by Urbanism Category

We measured the relationship between socioeconomic status and seat belt use using educational achievement alone, income alone, and a combination of education and income. Previous studies (e.g., Jonah and Lawson, 1986) found that education was positively related to seat belt use. Our data again confirm this relationship (r=.17; p<.001). Results were similar for income (r=.16; p<.001). An index of socioeconomic status (SES) was formed by summing the levels of the income and education variables such that an individual with a high income and low education would be roughly equivalent to an individual with a high education and low income.

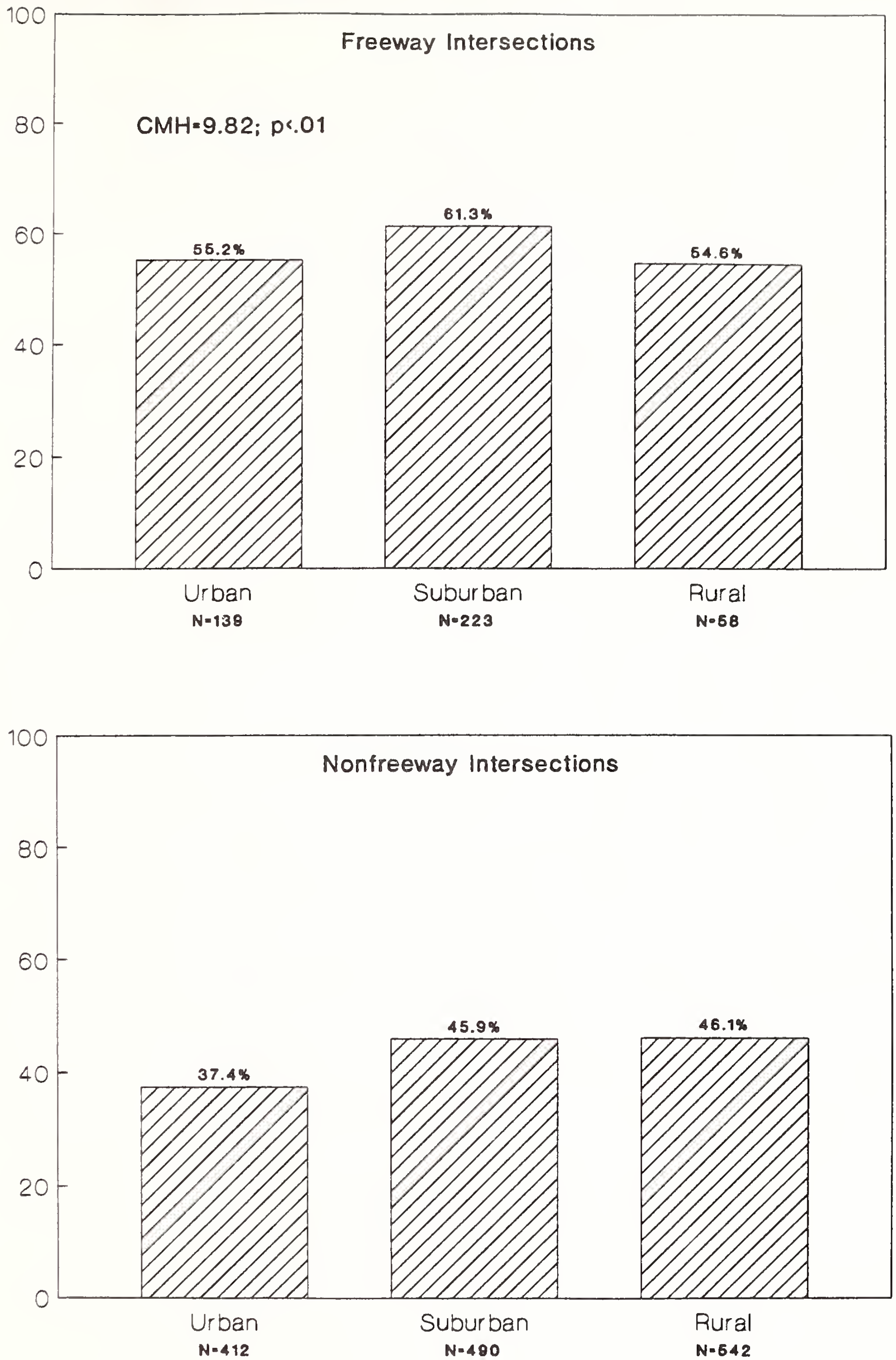

Figure 4.14: Percent Drivers Using Belts by Urbanism Category and Type of Intersection

Results for the SES index revealed a stronger relationship with seat belt use ($r=.213$; $p<.001$) than results for education and income examined separately.

To identify whether SES is the underlying explanation for the urbanism effect, we examined the relationship between belt use and urbanism controlling for SES using Cochran-Mantel-Haenzel statistics (Table 4.4). The relationship between belt use and urbanism remained significant after controlling for SES, indicating that there must be an explanation for the urbanism-belt use relationship other than the SES of drivers in those areas.

Table 4.4: Driver Seat Belt Use by Urbanism and SES

SES	Number Not Using Belts	Number Using Belts	Percent Using Belts
2			
Rural	0	1	100
Suburan	2	0	0
Urban	4	0	0
3			
Rural	6	3	32.3
Suburan	6	6	52.2
Urban	13	7	35.0
4			
Rural	24	15	39.7
Suburan	14	5	24.7
Urban	22	6	20.4
5			
Rural	40	20	32.8
Suburan	31	25	44.8
Urban	32	12	26.4
6			
Rural	38	33	46.6
Suburan	46	25	35.2
Urban	44	27	37.8
7			
Rural	70	43	38.0
Suburan	50	37	42.5
Urban	60	30	33.6
8			
Rural	50	53	51.4
Suburan	87	57	39.3
Urban	40	34	46.0

Table 4.4: **Driver Seat Belt Use by Urbanism and SES, Continued**

9			
Rural	28	40	58.7
Suburan	45	69	60.5
Urban	46	33	41.9
10			
Rural	24	37	60.3
Suburan	37	60	62.2
Urban	52	28	46.9
11			
Rural	16	17	51.1
Suburan	19	31	61.8
Urban	16	21	56.4
12			
Rural	7	11	60.5
Suburan	7	31	80.6
Urban	2	24	90.8
CMH=7.82; p<.05			

Results from studies of the relationship between race or ethnic background and seat belt use have been mixed, but have generally shown nonwhites to have lower belt use than whites. While recognizing the problems of combining numerous different ethnic backgrounds, we collapsed our data into a white versus nonwhite dichotomy due to the small number of cases in each of the nonwhite subcategories. Race was significantly related to seat belt use, with whites observed buckled more often than nonwhites (Figure 4.15). When the relationship between race and belt use was examined controlling for SES, race was still found to be significantly related to belt use (CMH=38.05; d.f.=1; p<.001). Whites were observed using their seat belts more often than nonwhites in each of the SES subgroups (Figure 4.16). However, the effect of SES (measured by the SES index) was stronger than that of race (SES χ^2=91.79; d.f.=10; p<.001 vs. Race χ^2=49.0; d.f.=1; p<.001).

Finally, consistent with other studies conducted where a mandatory use law was in effect, we found that age was significantly related to observed seat belt use (r=.13; p<.001). Figure 4.17 shows the percent seat belt use of drivers of various age groups. When belt use is mandated by law, belt use is highest among older drivers. Older drivers may be more responsive to the legal mandate then middle-age and young drivers.

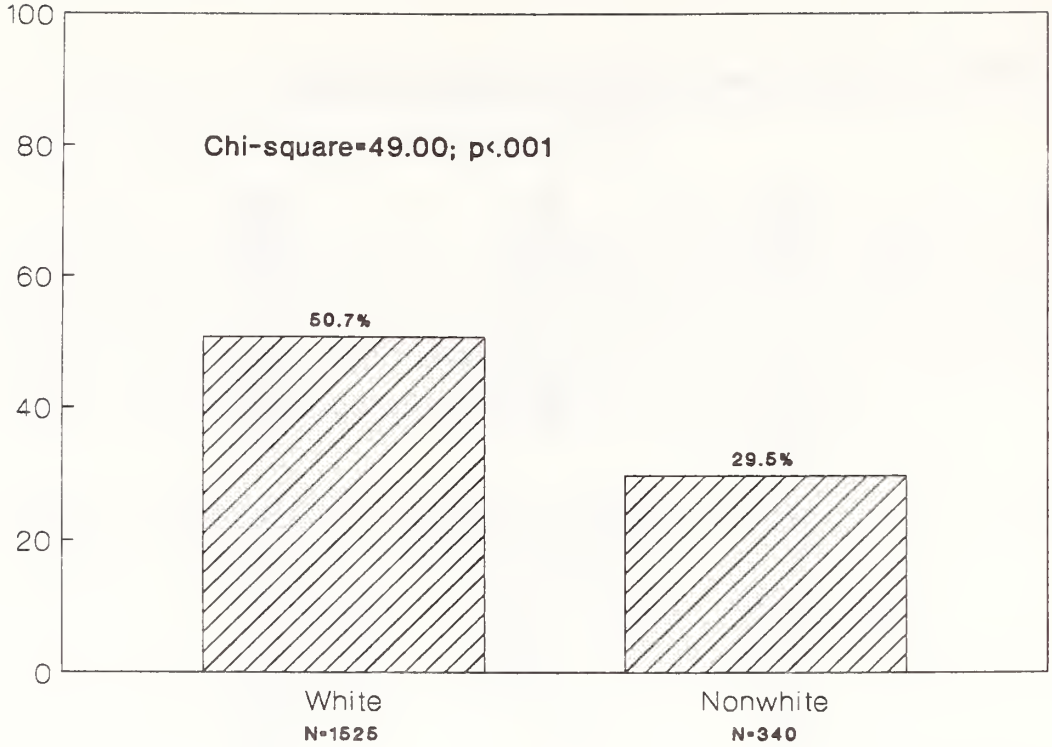

Figure 4.15: Percent Drivers Using Belts by Race

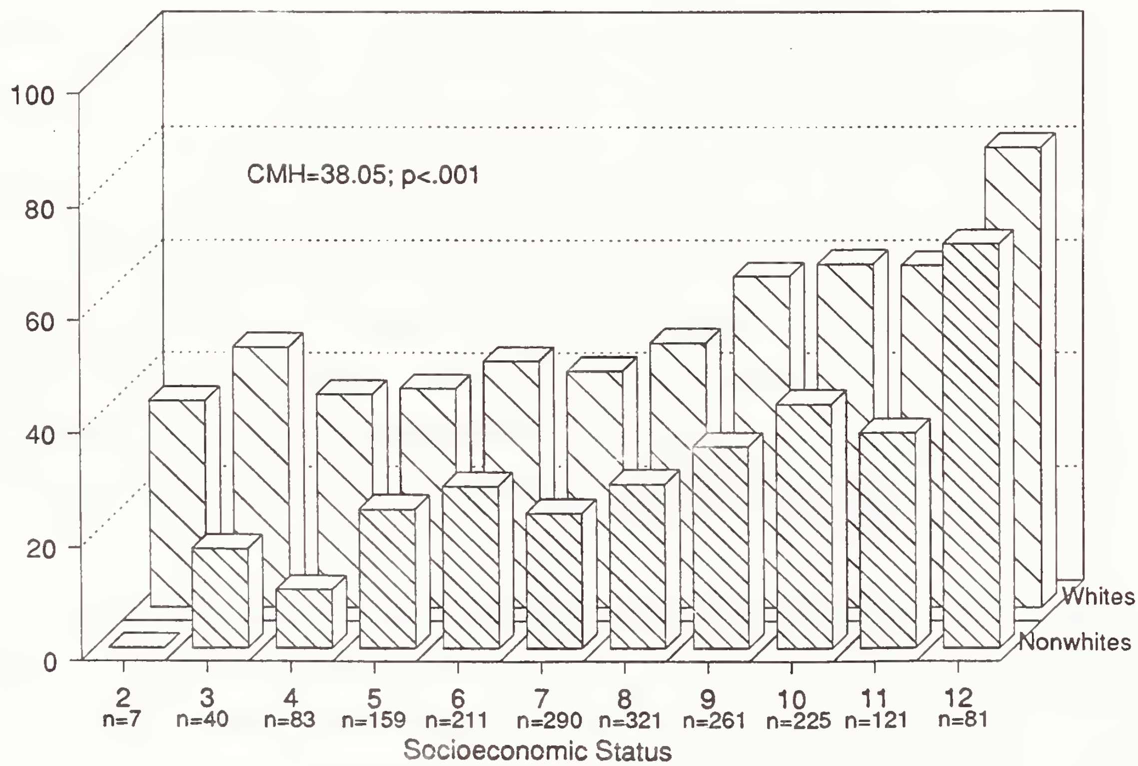

Figure 4.16: Driver Belt Use by Race and Socioeconomic Status Index Value

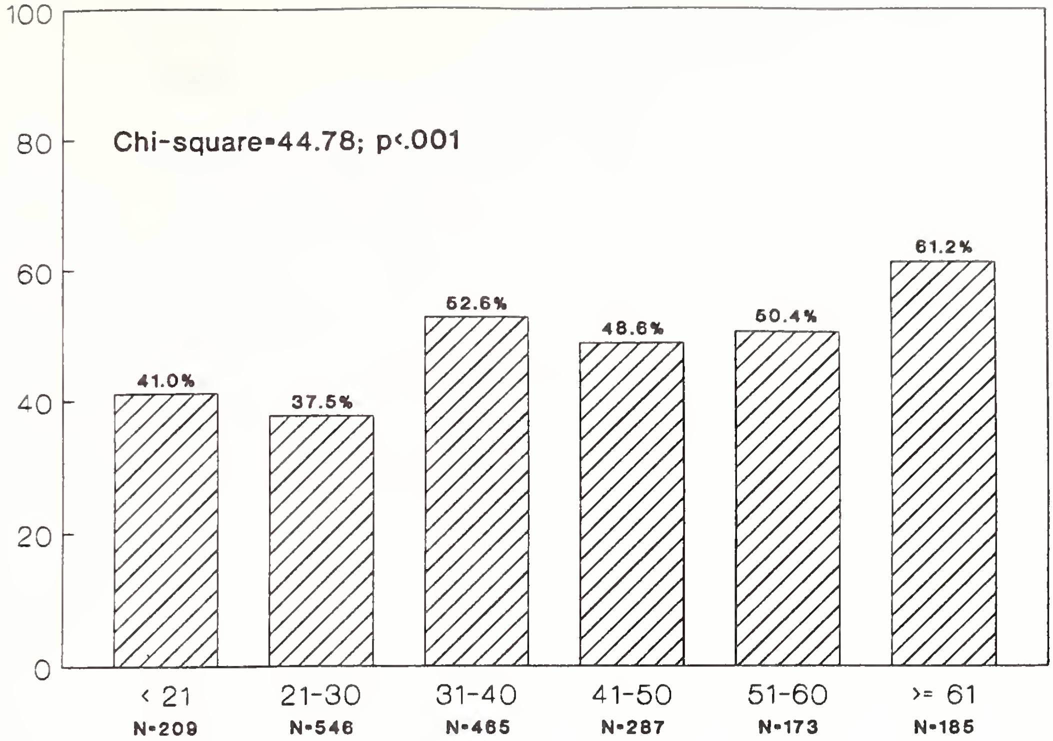

Figure 4.17: Percent Drivers Using Belts by Age

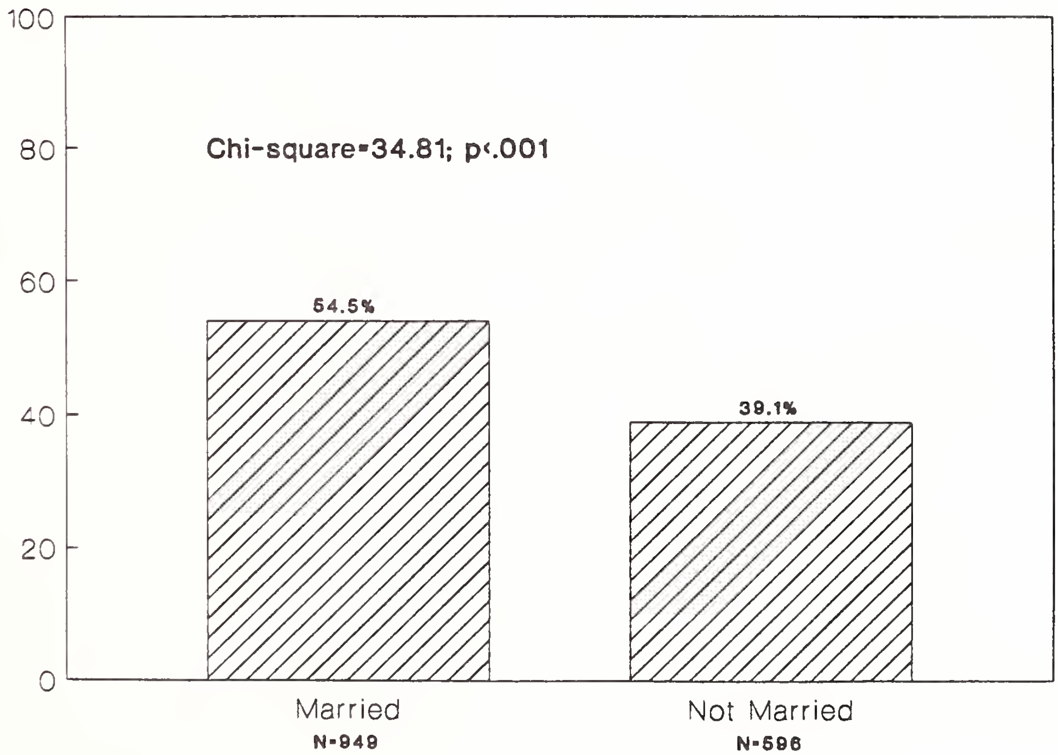

Figure 4.18: Percent Drivers Using Belts by Marital Status

Marital status was significantly related to driver belt use (Figure 4.18). However, effects of marriage on belt use diverged depending on driver age. Among drivers under age 25, seat belt use was greater for those who were never married and the reverse relationship was found for drivers over age 25. The relationship between marital status and seat belt use controlling for age was significant using the Cochran-Mantel-Haenszel general association statistic (Figure 4.19). This relationship may not be as unusual as it may first appear. Unmarried individuals under age 25 and married individuals under age 25 are both following traditional normative age patterns for marriage, while married individuals under age 25 and unmarried individuals over age 25 are following less traditional patterns. These relationships to social convention may also be manifesting themselves in seat belt use (i.e., conventional individuals have higher seat belt use than less conventional).

4.5 Situational Factors and Seat Belt Use

A major objective of this study was improved understanding of the effects of social-situational characteristics on use of seat belts. As noted in Section 1, few studies have examined situational influences on belt use. Because we observed respondents in traffic at the time of the interviews, we have both an accurate measure of belt use and knowledge of any passengers present with the driver. Analyses of the potential effects of situational factors on belt use combined observation measures with interview information on the relationship between the driver and each passenger present, trip origin and destination, and trip purpose. Four sets of analyses of situational characteristics were conducted. First, effects on belt use of presence of passengers, characteristics of passengers, and relationship of passengers to drivers were examined. Second, differences in belt use according to purpose of the trip were examined. Third, effects on belt use of other situational or environmental characteristics such as time of day, day of week, and vehicle make and ownership were examined. Finally, differences in self-reported seat belt use across various social situations were analyzed.

Perhaps the most important dimension of the social situation affecting seat belt use is whether other people are present in the vehicle, and the relationship of those passengers to the driver. In Section 3, we proposed three theories to explain the expected influence of passengers on drivers' belt use: the dominance, social posturing, and modeling theories. As noted in Section 3, each of these theories was initially tested with analyses of our existing database of observed motor vehicle occupants. Although a strength of these analyses was the large number of cases in the total sample (N=48,790), we had to infer the exact nature of the social relationship between passengers and drivers based on age and sex, because we only observed and did not interview subjects in those surveys. The three theories, therefore, were tested with specific data

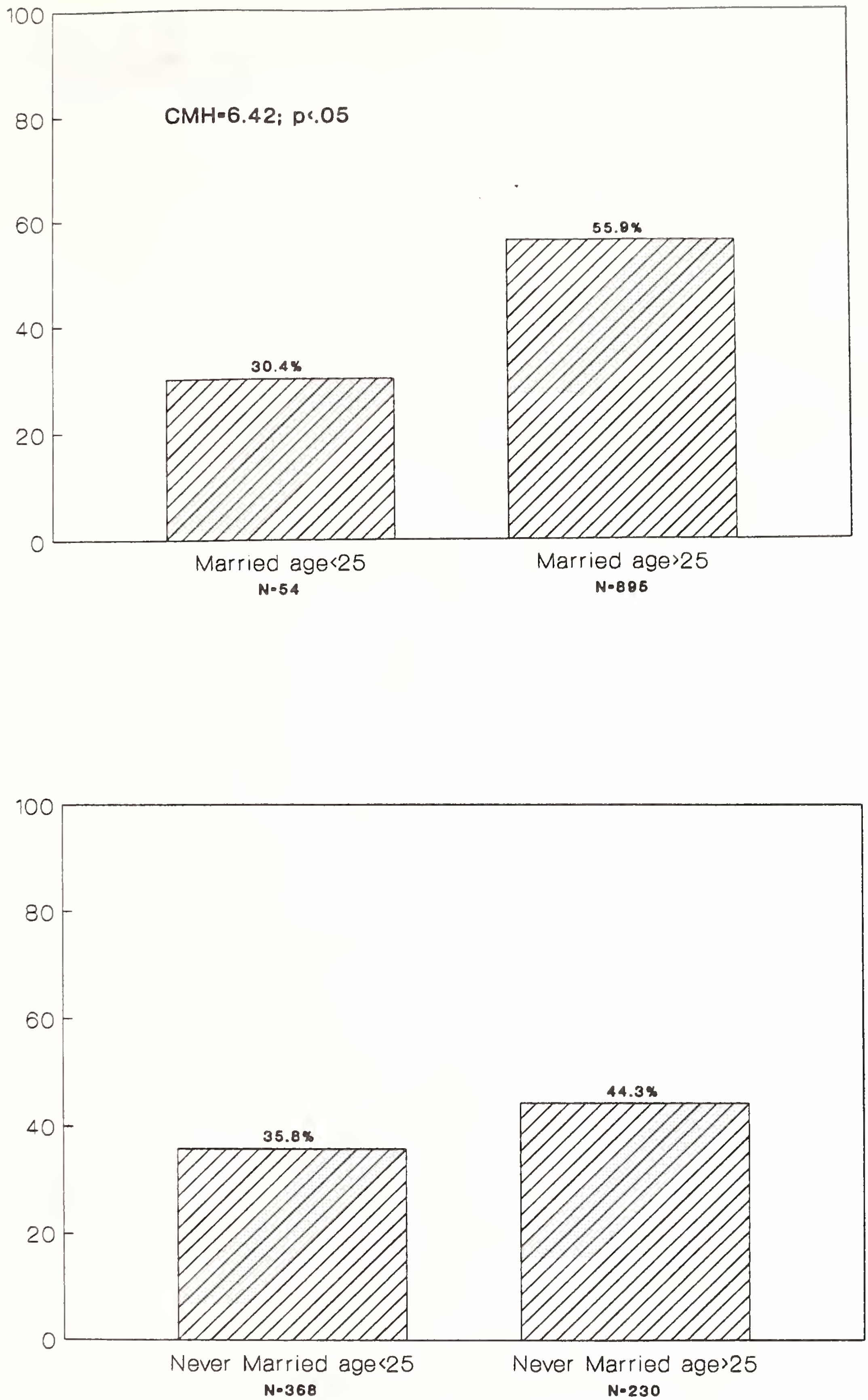

Figure 4.19: Percent Drivers Using Belts by Marital Status and Age

Table 4.5: Tests of the Dominant-passenger Theory: Driver Belt Use by Relationship of Passenger to Driver

Passenger	Number Not Using Belts	Number Using Belts	Percent Using Belts
Parent	7	6	47.9
Peer*	119	74	38.2
χ^2=0.49; $p>.05$			
Parent	7	6	47.9
None	596	551	48.1
χ^2=0.00; $p>.05$			
Buckled Parent	1	2	78.6
Buckled Peer	12	55	81.6
χ^2=0.02; $p>.05$			
Buckled Parent	1	2	78.6
None	596	551	48.1
χ^2=1.14; $p>.05$			

*Peer is defined as a passenger of the same sex and age group.

on the relationship of passengers to drivers collected in the roadside interviews of the current study.

The dominance theory predicts that driver seat belt use will be higher when a parent is present in the vehicle, particularly if that parent is using a seat belt, than when traveling with peers or alone. This hypothesis was not supported by these analyses (Table 4.5). However the parent versus peer, and buckled versus no passenger findings were in the predicted direction. Limited sample sizes for many of the cells made meaningful comparisons difficult.

The social posturing or "macho" theory predicts that belt use of young male drivers traveling with young male passengers will be lower than belt use of young male drivers traveling with young female passengers or traveling alone. Although this theory was supported in the

Table 4.6: Tests of Social-posturing Theory: Male Driver Age 16-29 Belt Use by Relationship of Passenger to Driver

Passenger	Number Not Using Belts	Number Using Belts	Percent Using Belts
Friend	58	26	30.8
None	192	101	34.5
χ^2=0.41; p>.05			
Male Friend	37	17	31.5
None	192	101	34.5
χ^2=0.18; p>.05			
Male Friend	37	17	31.5
Female Friend	11	7	37.2
χ^2=0.20; p>.05			

analyses discussed in Section 3, analyses with the roadside interview data revealed no significant relationships, perhaps a result of limited sample sizes. Each of the three comparisons are in the predicted direction (Table 4.6).

The modeling theory predicts that driver belt use will be higher when the driver is traveling with children than when traveling with peers or alone since the driver would be modeling proper belt use for the children. These hypotheses were not supported (Table 4.7). In fact, several of the relationships were in the opposite direction. One reason for the differences between the results discussed in Section 3 and those reported in this section is the disparity in sample sizes. Section 3 results were based on observation surveys with a total of 48,790 cases. In contrast, we interviewed only 1,864 cases, and this number was greatly reduced by analyzing specific driver and passenger combinations. In other words, the magnitude of the effects of social situation on driver seat belt use appears small, and may be detected only by statistically powerful tests with large sample sizes. With the apparently small effect of specific social situations on belt use, situation-specific programs designed to increase belt use are expected to be of limited utility, unless any effects of the program on belt use generalizes to other situations.

Table 4.7: Tests of Modeling Theory: Driver Belt Use by Relationship of Passenger to Driver

Passenger	Number Not Using Belts	Number Using Belts	Percent Using Belts
Child <16 yrs. old	117	95	44.8
None	596	551	48.1
$\chi^2=0.75$; $p>.05$			
Child <16 yrs. old	117	95	44.8
Peer	113	71	38.5
$\chi^2=1.60$; $p>.05$			
Driver's Child Age <16 yrs. old	10	2	16.4
Not Driver's Child <16 yrs. old	33	20	38.4
$\chi^2=2.71$; $p>.05$			
Driver's Child Age <16 yrs. old	10	2	16.4
None	596	551	48.1
$\chi^2=4.96$; $p>.05$			
Driver's Child Age <16 yrs. Old	10*	2	16.4
Peer	119	76	39.0
$\chi^2=1.33$; $p>.20$			

* Note that the sample size of seemingly identical groups differ due to the omission of cases which include additional passengers that could affect the driver-passenger relationship examined.)

In addition to the immediate social situation, the relationships between belt use, trip purpose and trip length were examined to explore the possibility that belt use might vary depending on the nature of the trip. Using logistic regression, trip purpose (work, errand, recreation), and trip length (in miles) were regressed on belt use. The overall model was found to be statistically significant (χ^2=265.63; d.f.=161; p<.001). However, when the effects were examined individually, most of the effect was due to a significant association between trip length and belt use (χ^2=7.77; d.f.=1; p<.01), rather than trip purpose (χ^2=1.49; d.f.=2; p>.05). Several explanations can be proposed to explain the relationship between trip length and seat belt use. Longer trips may be indicative of highway driving. In fact, observed belt use was found to be significantly associated with the type of observation site (freeway exit versus local intersection; Figure 4.20). In addition, trip length was correlated with observation site such that as trip miles increased, observation was more likely to be from a freeway exit observation site (r=.16; p<.001). The differences observed in belt use at freeway exits and at local intersections may be caused by greater perceived risks on freeways (e.g., higher speed), as well as a greater perceived crash risk produced by longer trips.

Although trip purpose was not significantly related to seat belt use, the trip purpose-belt use relationship might have been masked by a third variable. A likely candidate is whether the vehicle passengers were family members or not, because relationship of passengers to driver is related to trip purpose. If trip purpose and passengers being family members had different effects on belt use, their combined effect could be revealed as no effect if they were not examined independently. A logit analysis was performed between trip purpose (errand, recreation, work), passenger relationships (family versus nonfamily) and belt use. No significant relationships were detected between belt use and trip purpose, passenger relationship, or their 2-way interaction (Table 4.8).

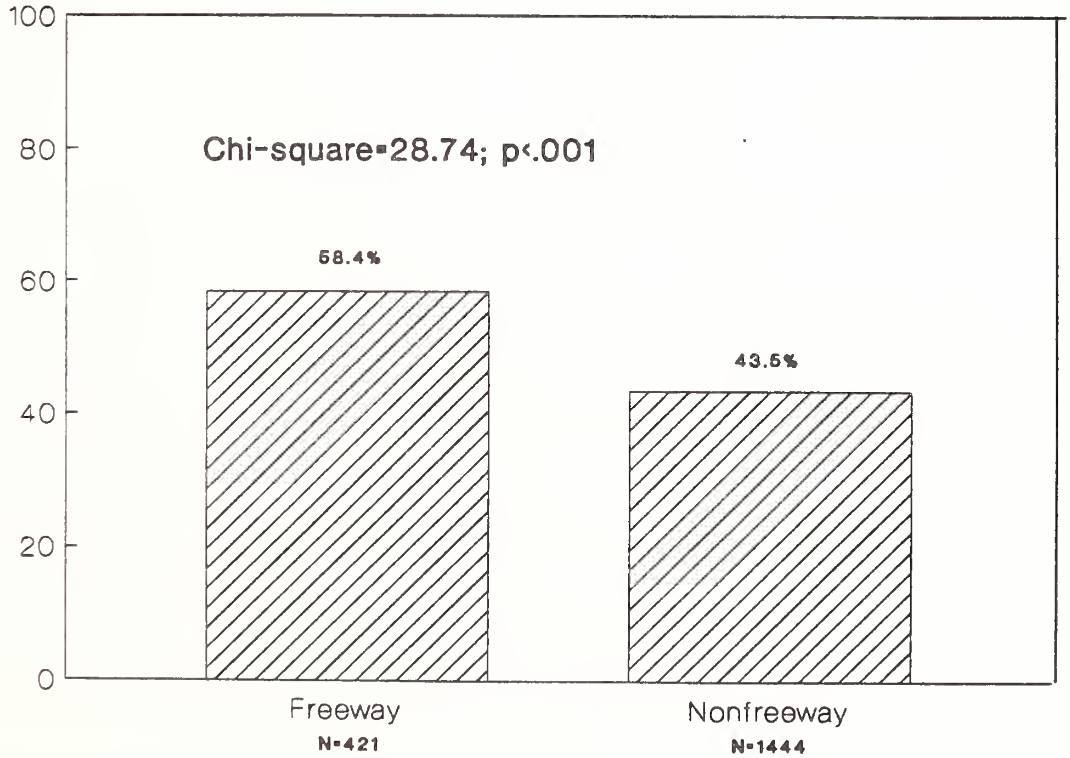

Figure 4.20: Percent Drivers Using Belts by Observation Intersection Type

Table 4.8: Driver Belt Use by Passenger Characteristics and Trip Purpose

	Number Not Using Belts	Number Using Belts	Percent Using Belts
Trip Purpose			
All			
Family	218	223	50.6
Not Family	763	633	45.4
χ^2=3.76; p=.05			
Errands			
Family	127	118	48.4
Not Family	283	233	45.2
Recreation			
Family	77	94	54.8
Not Family	185	133	41.7
Work			
Family	14	11	44.7
Not Family	295	267	47.6

Source	χ^2	d.f.	p
Trip Purpose	0.50	2	.78
Passenger	1.24	1	.27
Purpose X Passenger	4.01	2	.13
Intercept	1.89	1	.17

Other factors related to the trip may also impact belt use. These factors include day of week and time of day the trip occurs, make of vehicle driven, and ownership of the vehicle. Based on logit analyses, no statistically significant associations were found between belt use and weekday versus weekend and daytime versus evening (Table 4.9). A significant relationship was detected between vehicle make and belt use and this relationship remained significant when SES of the driver was controlled (CMH=26.83; d.f.=14; p<.05). The vehicle make/belt use relationship remained significant controlling for age as well (CMH=40.53; d.f.=14; p<.001). Figure 4.21 shows the percent of drivers observed using seat belts for each of the vehicle makes observed. Whether or not the driver owned the vehicle they were driving was not significantly related to seat belt use (Figure 4.22).

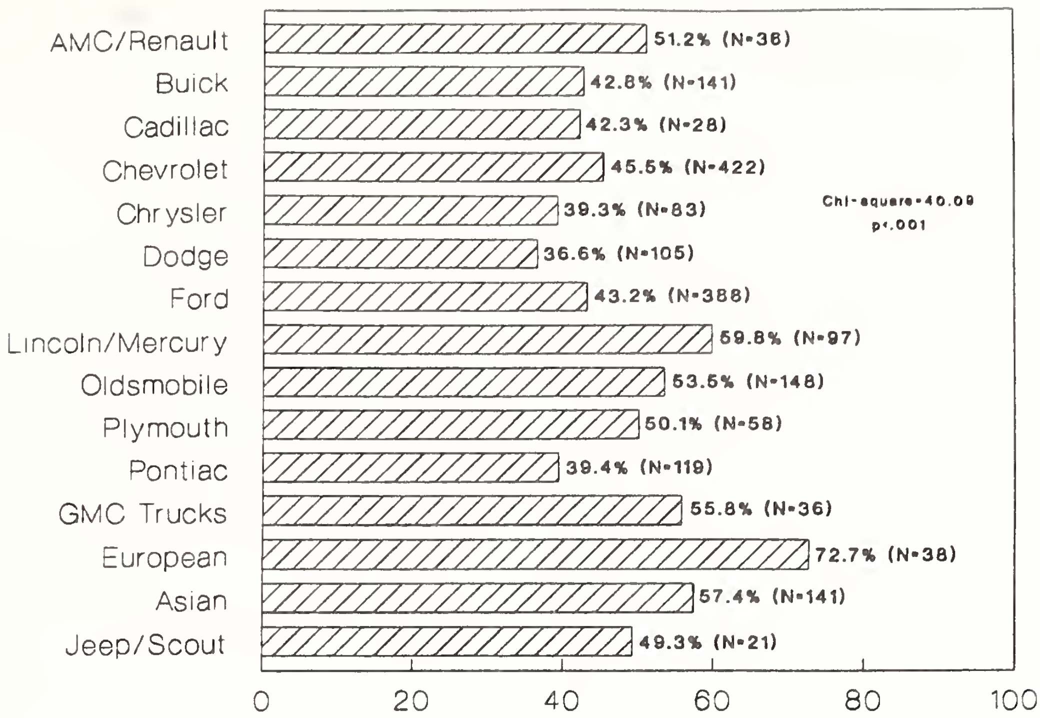

Figure 4.21: Percent Drivers Using Belts by Vehicle Make

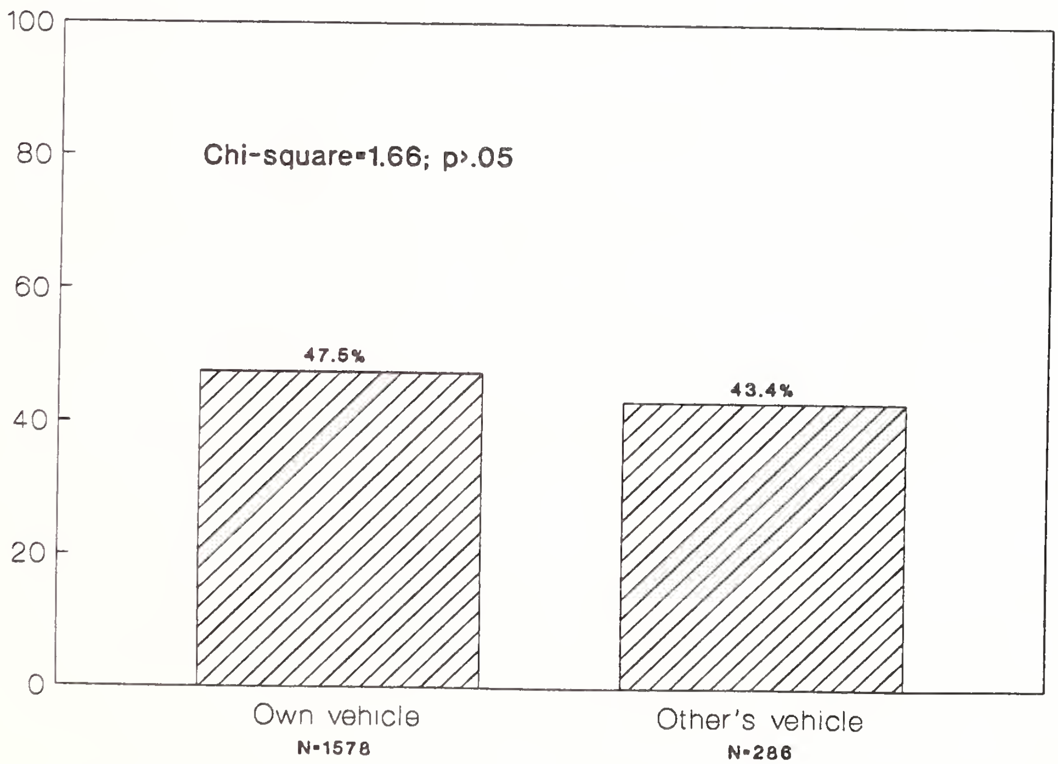

Figure 4.22: Percent Drivers Using Belts by Vehicle Ownership

Table 4.9: Driver Belt Use by Day of Week and Time of Day

	Number Not Using Belts	Number Using Belts	Percent Using Belts
Weekdays			
Before 6 PM	659	590	47.2
After 6 PM	86	63	42.3
Weekends			
Before 6 PM	215	185	46.3
After 6 PM	30	35	54.0

Source	χ^2	d.f.	p
Day of Week	1.82	1	.18
Time of Day	0.12	1	.72
Day of Week X Time of Day	2.56	1	.11
Intercept	1.62	1	.20

To provide another way to determine whether belt use varies across situations, we asked drivers about their belt use in different situations, such as when traveling with friends, on a date, as a passenger, at night, and after drinking. Respondents who reported "always" using belts and who were observed to be belted, and those who reported "never" using belts were not asked to respond to the situation-specific items. Because these multiple self-reports of belt use were very similar, we treated comparisons across items as nonindependent. Difference scores were calculated by subtracting reported use for a given situation from overall reported use. T-ratios on the difference scores were used to determine if they differed significantly from zero.

Reported belt use with friends was not different from the general measure of belt use (t=0.49). If social norms were an important factor in determining belt use, belt use should be similar between friends who presumably share many of the same norms. The stronger the norm for belt use or nonuse, the more likely belt use in all situations would reflect that norm.

Reported belt use when on a date was significantly higher than the general measure of belt use (t=4.75; p<.001). One explanation for this finding would be that drivers are trying to make a positive impression in dating situations. Given that belt use is mandated by law, drivers on dates may buckle up more often to appear lawful.

Reported belt use when riding as a passenger in someone else's car was also significantly higher than the general measure of belt use (t=2.62; p<.01). This may be due to the common feeling of apprehension many people feel when they are not in control of a situation. As passengers, the only control people have over their personal safety is the use or nonuse of seat belts.

Reported belt use at night was significantly lower than the general measure of belt use (t=5.89; p<.001). If belt use is seen as an individual risk-reduction strategy, and with nighttime driving more risky than daytime driving, this finding is counterintuitive. As the risk of crash increases, belt use should increase as drivers act to protect themselves. However, if belt use among those respondents who do drive at night is motivated primarily by the belt use law or social norms, one would expect belt use to decrease at night when it is more difficult to observe belt use.

Drivers who had been drinking immediately before the interview were significantly less likely to be observed belted than drivers with no evidence of drinking (Figure 4.23). There are two possible reasons for this pattern: (1) individuals in a drinking situation are less likely to use seat belts than when they are in a nondrinking situation; or (2) people who tend to consume alcohol frequently are also less likely to be seat belt users. The first explanation received support from analyses of the relationship of drinking prior to the interview and belt use, controlling for drinking pattern as measured by the frequency of intoxication in the prior two weeks. Drinking in the situation continued to significantly predict (low) belt use even when frequency of intoxication was controlled (Table 4.10). Support for the second explanation was provided by the finding that frequency of intoxication was negatively related to belt use (r=-.16; p<.001). Finally, further support for the first explanation came from analyses of self-reported belt use across situations. Drivers were asked how often they use belts in various situations, with one of the situations being after drinking. Respondents reported significantly less frequent belt use after drinking than they reported using belts without mention of any specific situation (t=8.82; p<.001).

Table 4.10: Driver Belt Use by Presence of Alcohol and Drinking to Intoxication in Prior Two Weeks

Drinking to Intoxication	Number Not Using Belts	Number Using Belts	Percent Using Belts
Yes			
Presence of Alcohol	9	0	0
Not Present	663	698	51.3
No			
Presence of Alcohol	12	3	19.7
Not Present	305	173	36.2

CMH=9.09; p<.01

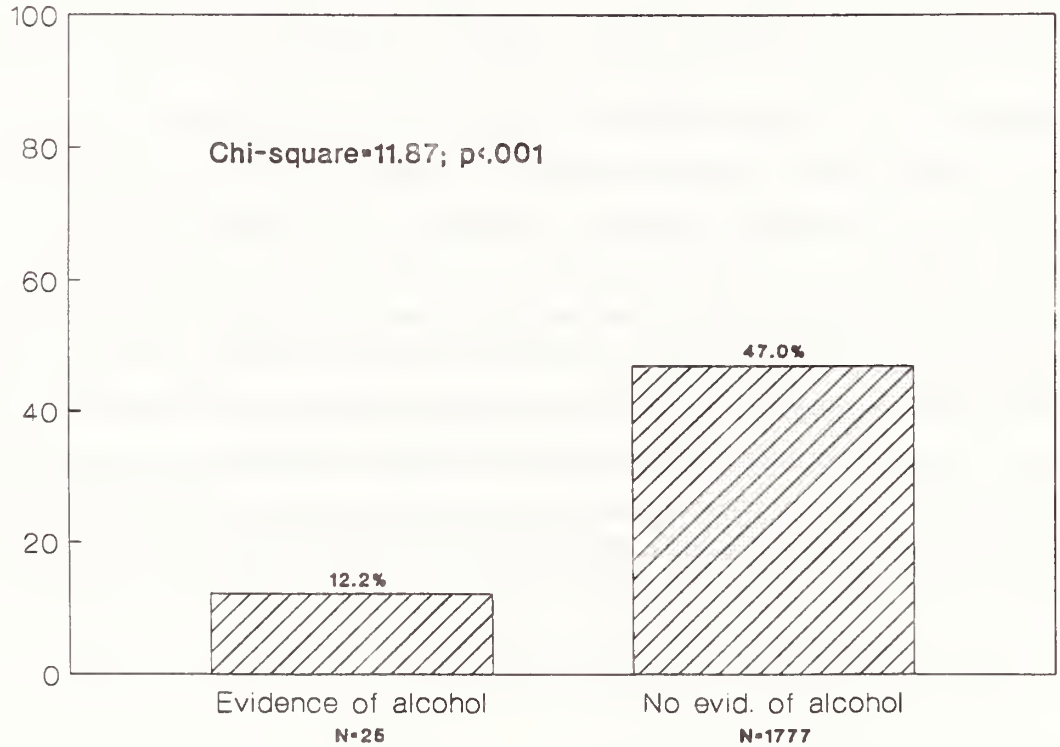

Figure 4.23: Percent Driver Belt Use by Driver Drinking

4.6 Norms and Attitudes Concerning Seat Belts

In addition to situational characteristics, norms and attitudes may also have a significant role in affecting seat belt use. Social norms act to define standards of behavior, with individuals generally behaving in a manner consistent with established norms. Items examined to determine the influence of norms on seat belt use were percent of friends reported to use belts, and frequency with which drivers reported buckling up in response to a request to do so. Attitudes also can shape behavior. Attitudes can either be measured directly by asking subjects or by inferring attitudes from behavior. Attitudes about the likelihood of being in a crash were measured directly by asking subjects to estimate crash likelihood. Attitudes toward belt use were inferred from how often respondents reported requesting others to buckle up and how long drivers reported using belts. Respondents who were more likely to ask others to buckle up and respondents who reported having used belts for a long period of time were expected to have more positive attitudes toward belt use.

We found that observed driver belt use was significantly related to the percent of friends reported to use belts ($r=.38$; $p<.001$). This result indicates that when a norm exists for belt use among a group of friends, belt use is higher than when this norm does not exist. The frequency with which drivers reported buckling up in response to a request to do so was positively related to observed seat belt use ($r=.21$; $p<.001$). This finding suggests that effects of normative pressure to use seat belts strongest for persons who already use seat belts at least part of the time.

Attitude toward belt use, as measured by the number of times drivers asked unbuckled passengers to buckle up, was stronger for drivers observed actually using their belts. A two by two (belt use yes/no versus male or female) analysis of variance found significant main effects for belt use and sex as well as a significant interaction (Table 4.11). Males asked passengers to buckle less often than females, and belt users asked passengers to buckle more often than nonusers. The interaction was primarily due to male-nonusers who requested belt use of passengers less often than could be explained by the additive effects of sex and belt use. Education was positively related to the likelihood of requesting passengers to buckle up ($r=.13$; $p<.001$). Age was significantly related to the number of times drivers reported asking passengers to buckle up ($r=.06$; $p<.05$; Figure 4.24), with drivers in older age groups more likely to request belt use in general, although the specific relationships are complex. Although these analyses do not permit strict causal statements to be made, it is probable that greater seat belt use increases the likelihood of requesting belt use of passengers rather than the converse (requesting

Table 4.11: Analysis of Variance Results for Driver Age and Observed Belt Use on Number of Times Repondents Ask Unbuckled Passengers to Use Seat Belts

Source	d.f.	SS	F	p
Age	1	33.51	219.67	0.0001
Observed Driver Belt Use	1	489.16	15.05	0.0001
Age X Belt Use	1	12.79	5.74	0.02
Error		1,730	3,852.27	

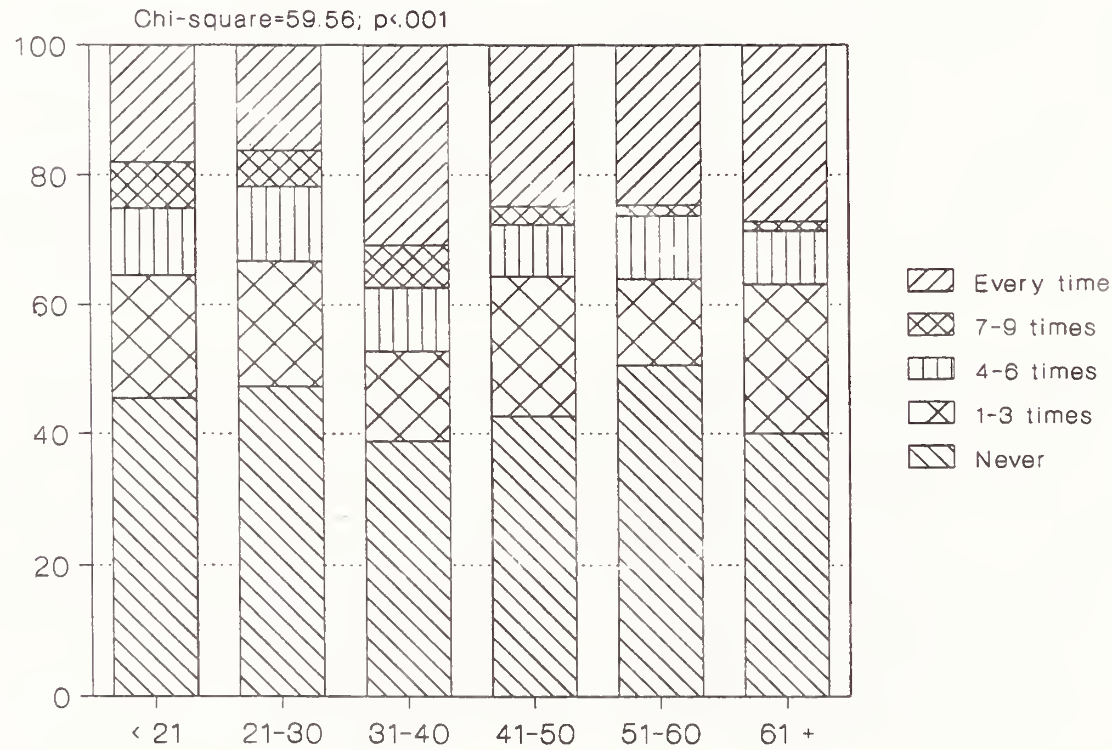

Figure 4.24: Percent Distributions for Frequency of Asking Unbuckled Passengers to Buckle, by Age

passengers to buckle increasing belt use). However, cognitive consistency theories (Festinger, 1957) suggest that if drivers who do not normally use seat belts could be induced to ask their passengers to do so, without feeling pressured into asking, their use would likely increase. As a practical matter, success at getting nonusers to request passengers to use belts is extremely unlikely.

Another measure of attitude toward belt use was length of time a driver has been using seat belts. Respondents who reported using their belts for longer periods of time were presumed to have more positive attitudes toward belt use. Age was controlled in the analyses since one factor contributing to the length of time seat belts had been used could be the amount of time respondents were able to use belts. A one-way analysis of covariance controlling for age found the length of time drivers had been using belts was significantly higher for those subjects observed using belts than those not using belts ($F_{11,642}=17.87$; $p<.001$).

We predicted drivers' perceptions of the chance of being in a crash would be related to seat belt use such that those individuals who feel they are most likely to be involved in a crash would be most likely to use seat belts. This hypothesis was not supported ($r=.003$). The low correlation between these items might be due to the restricted range of responses on the crash probability item (the distribution of this item was skewed toward low chance of involvement).

Similarly, we predicted that total estimated miles driven per year would be positively related to observed driver belt use because of the increased exposure to risk of crash as the number of miles driven increases. This hypothesis was also not supported ($r=.004$). The low correlation between annual travel miles and belt use indicates that one's accumulated driving experience over an entire year may not predict a specific behavior on any single trip.

4.7 Effects of Mandatory Use Laws on Seat Belt Use

Despite the fact that Michigan's mandatory seat belt use law has been in effect since July 1985 (secondary enforcement, $25 fine), 53.1% of the drivers interviewed were observed not using their seat belts. Drivers were asked, "What fine would get you to use your seat belt on every trip?" Responses from this question were inversely related to observed seat belt use; that is, as the amount of fine required to get 100% belt use increased, the rate of observed belt use decreased ($r=-.06$; $p<.05$). This result suggests that large fines may be required to get committed nonusers to begin to use their belts.

Subjects were also asked an open-ended question concerning what they believed influenced them to start using belts. These influences were separated into four categories: (1)

the belt use law; (2) crash experience; (3) concern for safety; and (4) a residual category including the media, "common sense" and other reasons with low numbers of respondents. As shown in Figure 4.25, observed seat belt use was significantly related to reported influence to begin belt use, controlling for whether respondents began belt use before or after the implementation of Michigan's mandatory use law. However, when examined individually, belt use was highly related to the influence to begin belt use among respondents who reported belt use for 3 or more years (χ^2=37.73; p<.001). However, the influence on belt use relationship was not significant among respondents who reported they have been using belts only since the law went into effect (p>.05). This nonsignificant relationship between observed belt use and self-reported influences on belt use suggests that the law had an effect comparable to other major factors reported to influence belt use (such as crash experience or safety concerns).

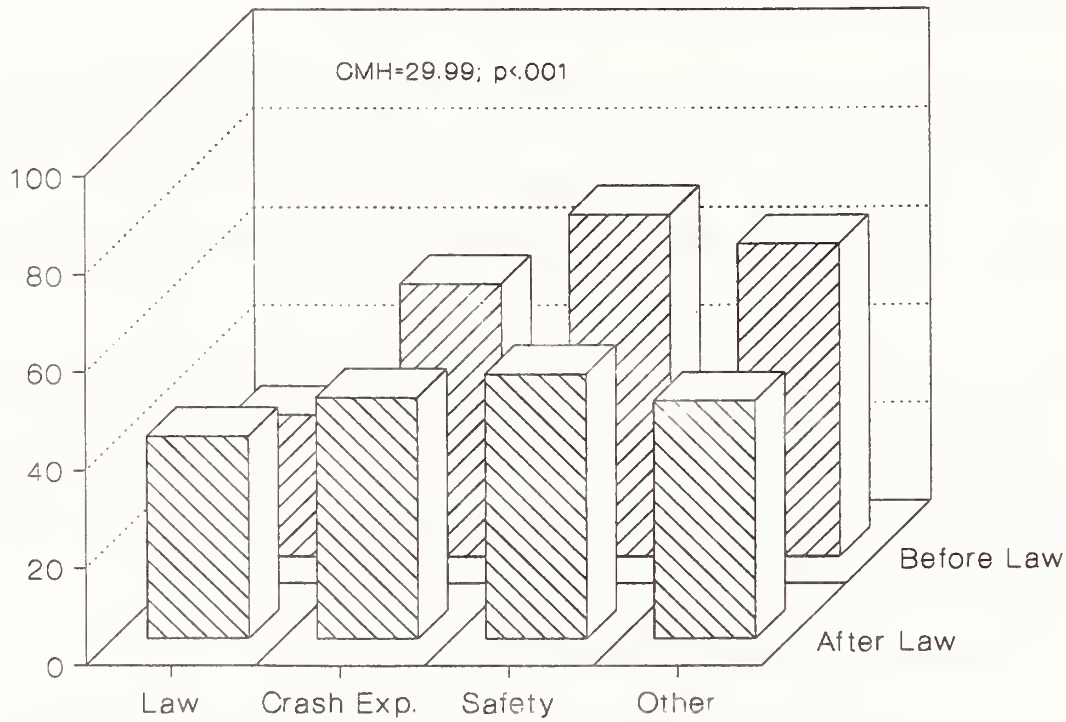

Figure 4.25: Percent Drivers Using Belts by Influence to Start Using Belts

Some inconsistencies in response to items concerning belt use influence and years of belt use were evident. Of five-hundred and thirty-seven respondents who reported that mandates influenced them to start using belts, 65 said they had been using belts for three or more years, a time period prior to the implementation of Michigan's belt use law. It is likely that some subjects misinterpreted these items, and may have in fact responded to the inferred questions, "What got you to begin using your seat belt **regularly**?" and "When did you begin using your seat belt **regularly**?" On the other hand, only 12% (i.e., 65/537) of the sample appeared to have misreported what influenced them to start using belts, indicating the results reported above remain of interest.

If the positive effects of employer belt use programs generalize to nonemployment settings, it is expected that respondents who have employer mandates will be observed using belts more often than those not having employer mandates. This hypothesis was not supported (χ^2=0.99; d.f.=1; p>.05). This finding may be due to respondents behaving differently under different contingencies (i.e., reward for belt use or punishment for nonuse at work versus no such contingencies for belt use when not at work).

In order to determine whether individuals who increased their belt use because of the mandatory use law differed from other categories of belt users, respondents were divided into four mutually exclusive groups: (1) respondents who reported their belt use increased due to the law, reported that the law, fear, or actual receipt of a ticket for seat belt nonuse influenced them to start using belts, began using belts **after** the implementation of the Michigan mandatory use law, and also were observed to be belted; (2) respondents who reported always using their seat belt **and** were observed to be belted; (3) occasional belt users (respondents who reported they use belts "most of the time", "sometimes", or "seldom"; and (4) respondents who reported they never use seat belts.

Respondents whose belt use increased due to the law were more similar to always or occasional belt users than respondents who reported they never use belts. Always belt users and respondents who reported increased belt use because of the law were observed at freeway sites more often than occasional or never users (Figure 4.26), and were more likely to be white (Figure 4.27).

There was a significant relationship found between belt use category (as defined above) and age (Figure 4.28). It appears that respondents whose belt use increased due to the law and always users had greater proportions of drivers age 51 and above than occasional or never users, and smaller proportions of drivers age 30 and younger.

A significant relationship was found between belt use category and sex (Figure 4.29). There appears to be a larger proportion of females in the group of respondents whose belt use increased due to the law than in the other three groups. As belt use declines, the proportion of females in the group declines.

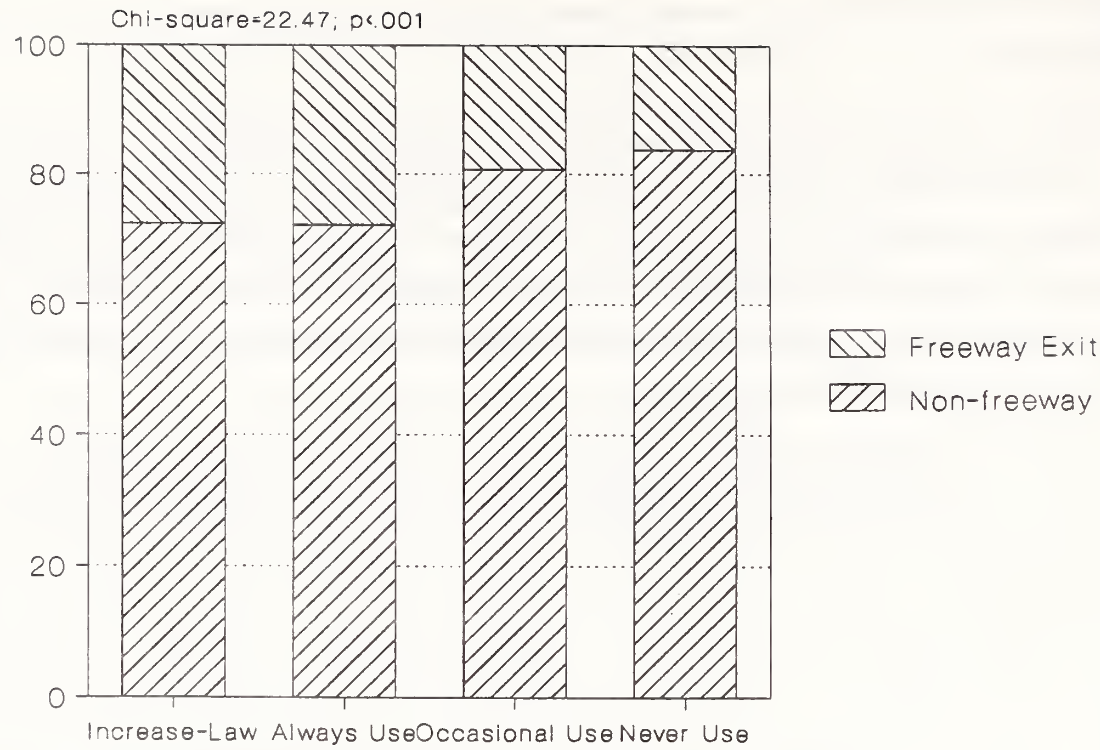

Figure 4.26: Belt Use Category by Type of Intersection

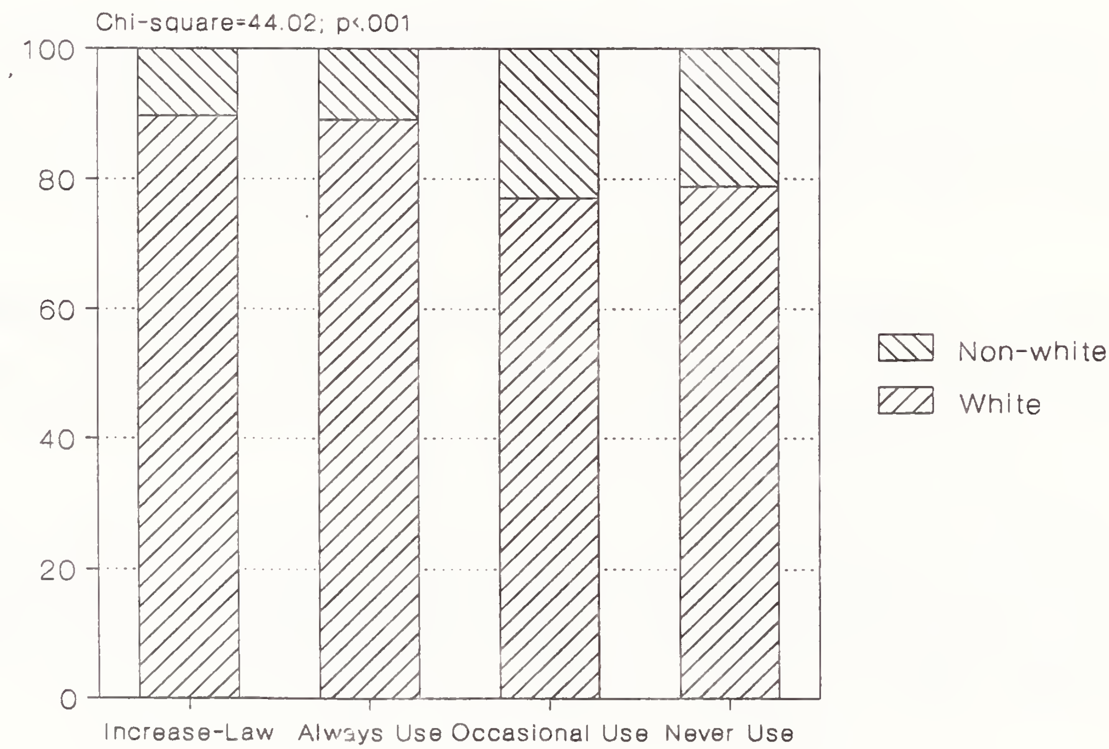

Figure 4.27: Belt Use Category by Race

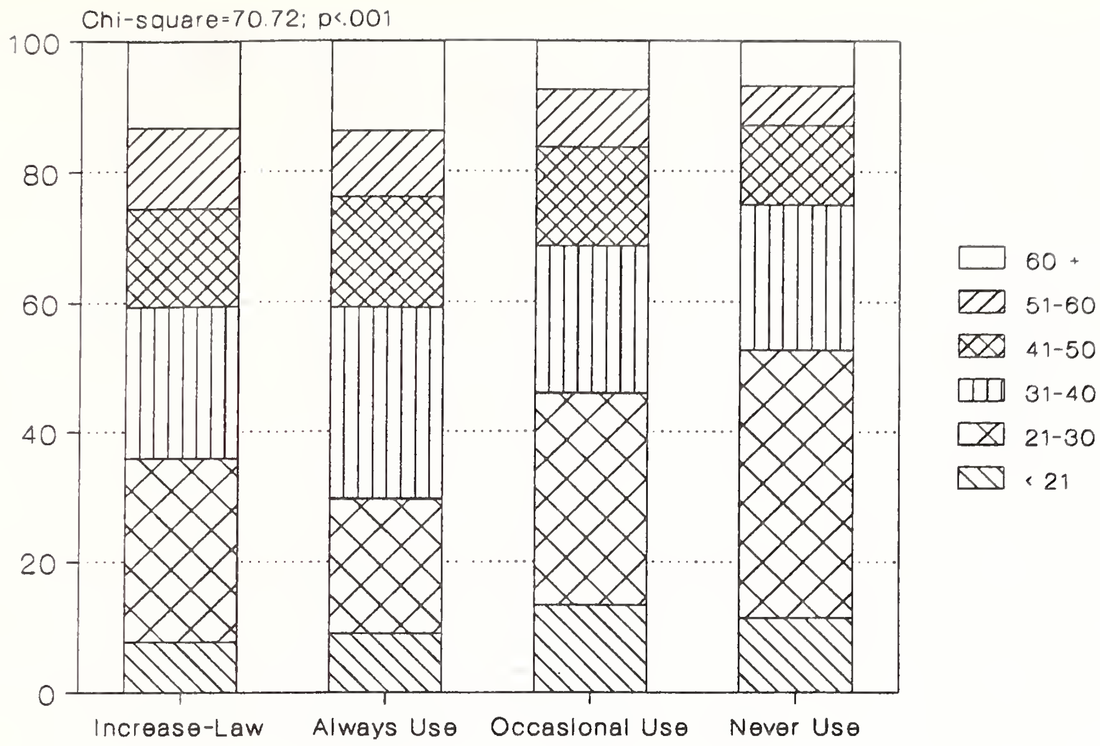

Figure 4.28: Belt Use Category by Age

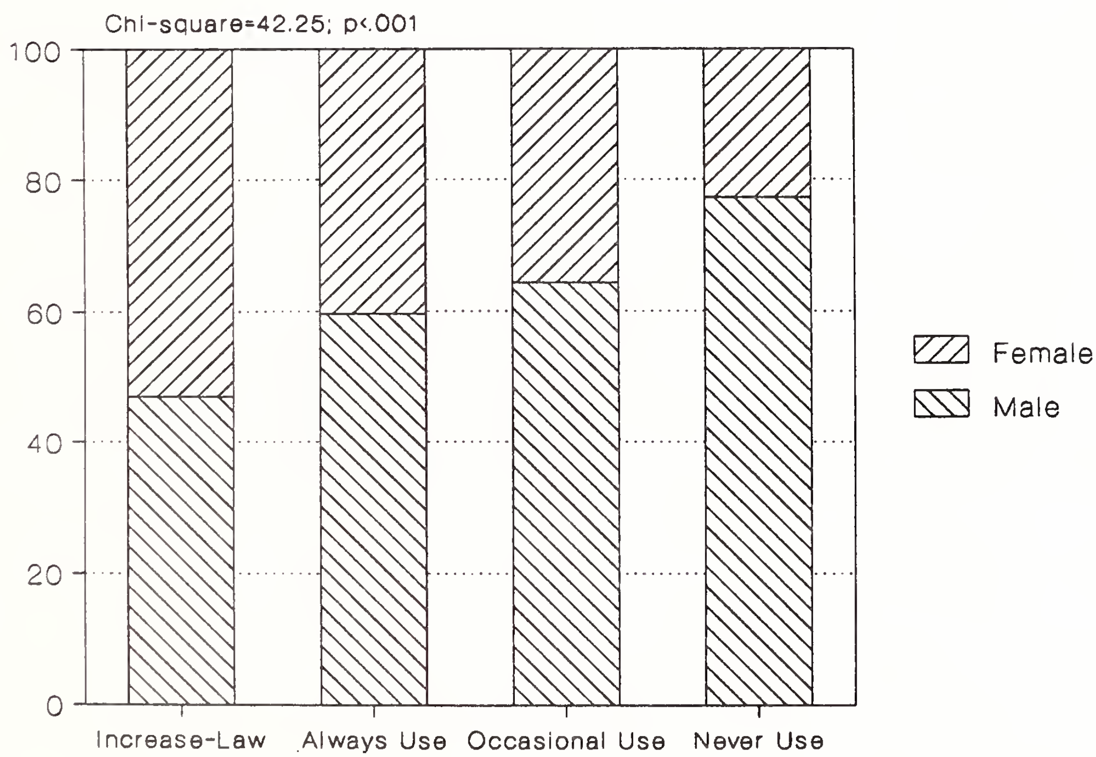

Figure 4.29: Belt Use Category by Sex

Table 4.12: Percent of Respondents in Belt Use Category by SES

SES	2	3	4	5	6	7	8	9	10	11	12
Increase-Law	0.0	2.1	6.1	9.0	13.1	15.4	21.4	17.3	9.8	3.4	2.3
Always Use	0.2	1.8	2.3	5.8	8.5	13.2	15.2	16.8	16.3	10.5	9.4
Occasional Use	0.6	2.5	5.7	9.9	13.2	16.5	19.8	13.2	10.1	5.5	2.8
Never Use	0.6	2.6	6.2	13.3	13.9	24.0	14.1	11.0	9.7	4.0	0.6

The socioeconomic status index was found to be significantly related to belt use category (Table 4.12). However, the nature of the relationship is not clear. Always users appear to have a larger proportion of high SES respondents and a lower proportion of low SES respondent than the other three groups. Respondents whose belt use increased due to the law do not appear to have a different SES pattern than occasional or never users.

Although a significant relationship was detected between belt use category and annual miles traveled, the nature of the relationship is not clear (Figure 4.30). Respondents whose belt use increased due to the law appear to have a greater proportion of drivers who travel between 5,000 and 20,000 miles annually and fewer drivers who travel 40,000 or more miles annually than the other groups. This finding would suggest that drivers who travel a moderate amount over the course of the year were more influenced by the seat belt law.

A significant relationship was found between belt use category and frequency of drivers requesting unbuckled passengers to buckle up (Figure 4.31). A higher proportion of always belt users and those whose belt use increased due to the law consistently asked their passengers to buckle up than occasional and never belt users. Proportions of the other three groups did not seem to differ. Furthermore, respondents who reported they never use belts reported they never request belt use of their passengers over 80% of the time.

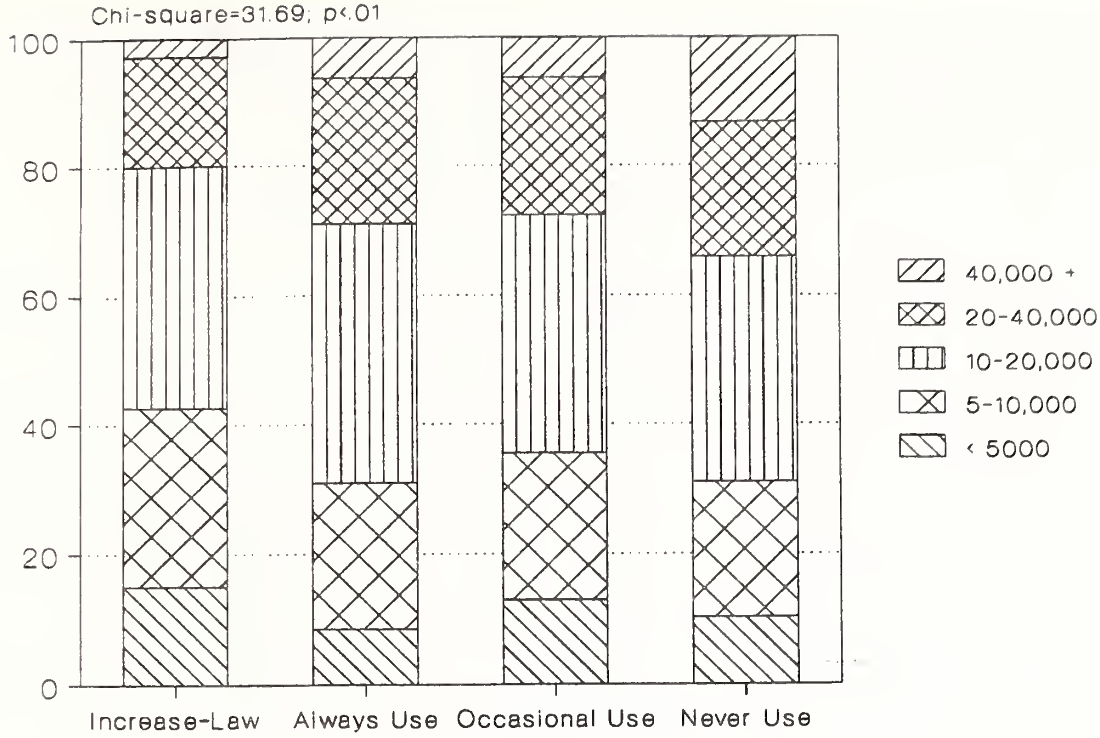

Figure 4.30: Belt Use Category by Annual Miles Traveled

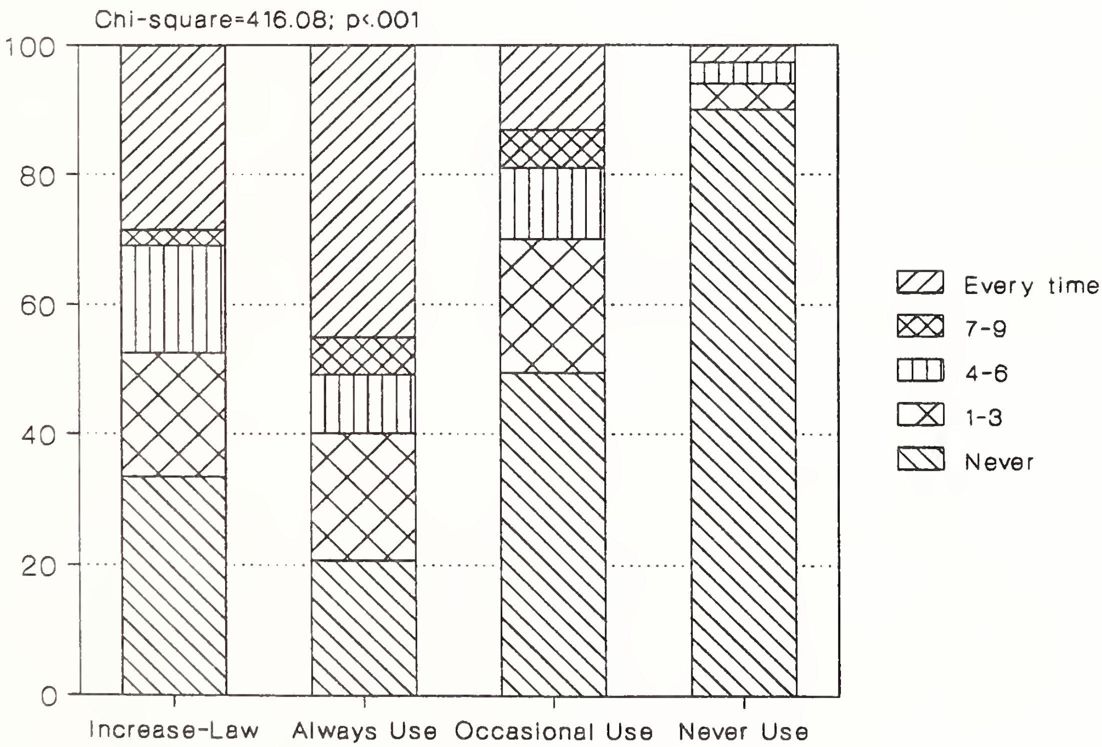

Figure 4.31: Belt Use Category by Frequency of Asking Unbuckled Passengers to Buckle Up

When the proportion of friends who use belts was examined by belt use category, a significant relationship was found (Figure 4.32). The proportion of friends who use belts was quite similar for respondents whose belt use increased due to the law and always users. The reported proportion of friends who use belts declined as the driver belt use rate declined.

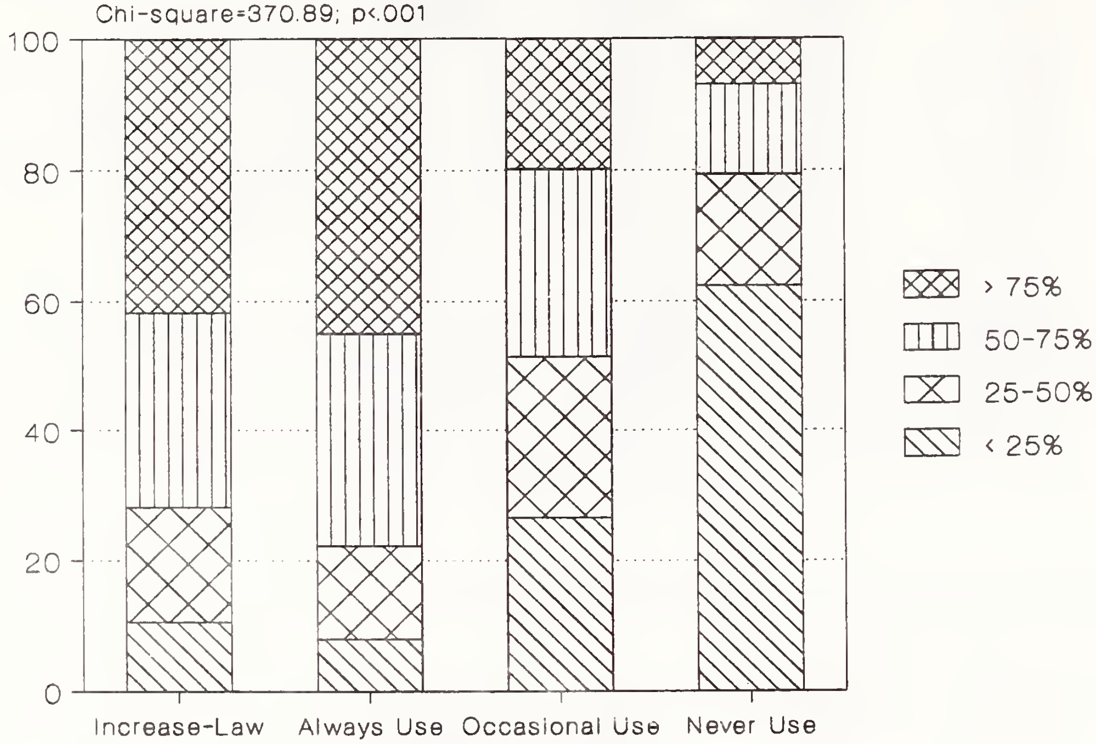

Figure 4.32: Belt Use Category by Proportion of Friends Who Use Belts

Results of analyses using these belt use categories are quite similar to results of analyses of observed belt use, and help indicate which groups were most and least affected by the belt use law. This information can be used to suggest groups to be targeted for increased attention to increase the success of belt laws.

4.8 Multivariate Analyses of Seat Belt Use

Stepwise logistic regression models were examined for three sets of variables: (1) variables describing sociodemographic characteristics of the sample, (2) variables which could be modified by policies or programs, and (3) a combination of sociodemographic and modifiable variables. Variables included were selected by inspecting bivariate analytic results and specifying a priori expectations of each variable's ability to contribute significantly to explained variance. Since we had no clearly specified theory concerning interaction effects, we did not include interaction terms in the models. Using BMDP LPR stepwise logistic regression (Dixon and others, 1983), predictor (independent) variables were selected for inclusion in the logistic regression model using a forward stepwise procedure based on the maximum likelihood ratio. Using this procedure, variables not contributing significantly to the model's goodness-of-fit were excluded.

A number of sociodemographic characteristics were candidate variables, including: socioeconomic status, urbanism, time of day and day of week the observation was made, weather conditions, sex, vehicle make, trip purpose, trip length, employment status, proportion of friends who use belts (measured in quartiles), race (dichotomized white/nonwhite), age, and marital status. The final model included socioeconomic status, proportion of friends who use belts, race, and sex. This model reduced the total predictive error of seat belt nonuse by 9.9%. That is, this model increased the ability to predict seat belt nonusers 9.9% over a prediction based solely on the prevalence rate of belt use in the population.

Several potentially modifiable variables were candidate variables, including: estimated crash probability, vehicle make, vehicle ownership, whether belts are required on the job, frequency driver requests unbuckled passengers to buckle up, and number of occasions driver reported drinking to intoxication. The final model included only frequency driver requests unbuckled passengers to buckle up and number of occasions driver reported drinking to intoxication in the two weeks prior to the interview. This model reduced total predictive error by 5.9%. That is, this model increased the ability to predict seat belt nonusers 5.9% over a prediction based solely on the prevalence rate of belt use in the population.

All of the sociodemographic and potentially modifiable variables were included in an overall model. The combined model reduced total predictive error by 14.8%. Notice that this predictive ability is slightly less than the sum of the sociodemographic and modifiable variable analyses (15.8%) indicating that there is a small amount of shared variance between the two groups of variables.

Although each of the reductions in predictive error are statistically significant ($p<.05$), we need to examine the practical significance of the findings. Sociodemographic variables accounted for a 9.9% reduction in predictive error. If these variables alone are used to target policies and programs to increase seat belt use, a substantial proportion of the nonusers in the state will not be targeted and many seat belt users will unintentionally be targeted for special efforts. Nevertheless, using this information will improve identifying the seat belt nonuser target group above what could be expected from implementing and marketing policies and programs to the entire population.

Modifiable variables accounted for a 5.9% reduction in predictive error. Although this figure may seem small, increasing the likelihood that drivers will request belt use of their passengers seems to be a reasonable program goal (e.g., Friends don't let friends ride unbuckled). However, it may be easier to convert a nonuser to a user than to persuade a nonuser to request passengers to use belts. The implications of results involving data on drivers who reported drinking to intoxication are less straightforward and discussed in greater detail in Section 5.

5 Discussion

The major objective of this study was to identify and measure relationships between driver and situational characteristics and observed seat belt use. Numerous statistically significant relationships were found. For example, significant differences in seat belt use across specific social situations were found, particularly when using our large database on observed motorists in Michigan. However, the size of those differences were modest, indicating that situational factors are not the predominant cause of belt use behavior. The size of observed relationships seem particularly small when compared to the effects of Michigan's mandatory use law, which more than doubled restraint use despite low-intensity secondary enforcement. Other than selected sociodemographic characteristics which are not susceptable to change, none of the factors examined here has an effect comparable to the effect of compulsory belt use. Nevertheless, there are a number of practical implications of our results, presented in three sections. First, groups with low belt use rates are identified. These groups are proposed as special target groups on which to concentrate efforts for program or policy interventions. Second, suggestions are made regarding potential programs that could be implemented to increase belt use based on the findings of this study. Finally, suggestions are made regarding modifications to existing belt use policies as well as suggestions for possible new policies designed to increase restraint use.

5.1 Target Groups

Program resources can be conserved if groups with especially low seat belt use can be identified and targeted rather than establishing program and policy interventions for an entire population. Our analyses identified several groups of people which are less likely to use belts: (1) males, (2) individuals with lower socioeconomic status determined by income and education (belt use was linearly related to SES), (3) those of minority ethnic backgrounds, (4) those below age 30, (5) alcoholic beverage drinkers who drink to intoxication or while driving, (6) drivers in urban environments (especially on city streets), (7) married individuals below age 25, and (8) people with reference groups who are largely seat belt nonusers (i.e., those whose friends do not usually use seat belts). These target groups should be considered when designing or modifying policies or programs designed to increase seat belt use.

5.2 Program Development

Our findings suggest several belt use program components that might be effective in increasing belt use. The majority of these components are educational and focus on attempting to create a stronger norm for belt use. First, several sites appear to be prime candidates for prompting belt use. These sites include locations where low rates of belt use have been identified (i.e., bars, city driving) as well as sites where individuals are known to be driving (e.g., fast-food and bank drive-thru windows, highway on-ramps). To maximize the effectiveness of prompts they should appeal to the audience they are most likely to be encountered by, and should be as specific as possible. In Michigan, specific prompts are already present at state borders and on-ramps from highway rest areas. Similar prompts could be placed at major entrance points to cities to remind drivers to buckle up for city driving. These signs could be placed next to signs identifying city names and placed next to population figures. Although prompts alone are not expected to have a dramatic effect on belt use, the proper use of prompts can be an inexpensive and effective means to increase belt use.

In addition to prompting belt use at particular sites, belt use prompts should be targeted to specific social situations in which belt use is low. For example, we found that drivers reported using their belts less often at night and after drinking than in general. Efforts to educate drivers about the risks of nighttime driving and benefits of belt use might facilitate belt use at night. Prompts might be placed in establishments selling or serving alcohol to remind people to buckle up after drinking and to discourage drinking and driving.

Given our findings that observed belt use was highest among individuals who began using belts because of some experience with crashes (either their own or someone else's) or out of concern for safety, efforts to increase knowledge about crash involvement and the efficacy of belts for reducing injury might prove fruitful. Although research has indicated that most people are aware that belts reduce injury rates, making this point salient to nonusers immediately prior to their trip through special educational displays may motivate them to buckle up. However, overly graphic "shock" techniques should be avoided. Such efforts often backfire because people have difficulty imagining themselves in such extreme situations. One strategy that could prove effective is reporting crash involvement information in mass media news sources (newspaper, television, radio). These reports should include the number of crashes in the local area, along with injury reports and belt use information when available. This information would provide the public with an accurate picture of the likelihood of crash involvement as well as benefits of seat belt use.

One program that may have special promise, based on the findings of our study, is promoting drivers to request belt use by passengers in their vehicle. This would help to further establish normative pressure to use belts. In addition, our study shows that people generally buckle up when asked and that people who request belt use of their passengers generally use belts more than those who do not request belt use. Although our findings are probably due to individuals who use belts requesting passenger belt use more than nonusers, cognitive consistency theories suggest that driver belt use should increase when drivers request belt use of their passengers to reduce the conflict between their personal behavior (seat belt nonuse) and their verbal behavior (requesting belt use of passengers). This program could be accomplished through conventional mass media education and prompting, or through a system of reinforcements or punishments. An example of a reinforcer for requesting passenger belt use is the establishment of a special express traffic lane for vehicles with two or more buckled passengers to travel in, much the same as have been implemented for car pools. A possible punishment for not requesting passenger belt use could be holding the driver liable for the nonuse of passengers traveling in the vehicle; that is, ticketing the driver for the nonuse of passengers traveling in the vehicle.

Our data show a clear relationship between drinking to intoxication and belt use (as respondents reported drinking to intoxication more often, belt use declined). It is doubtful that decreasing the number of times an individual drinks to intoxication will result in greater seat belt use unless this behavior change is assimilated into a new attitude on risk taking, that is, the person becomes more risk adverse and subsequently begins to use seat belts. This conclusion is consistent with the notion that individuals who take risks in one aspect of their life will take risks in other aspects as well. One way to market seat belt use to increase its acceptability and increase normative pressure to use belts is to link belt use with other positive health or safety behaviors such as increased exercise, eating low-fat, low-salt, high fiber foods, decreased alcohol consumption, and smoking cessation. Seat belt use should be marketed as one part of a "total health program." In this way, the norm for belt use gets support from other emerging health and safety norms. Unfortunately, developing new norms is not simple to accomplish, and measures other than education and promotion need to be implemented to support development of new norms. Policies at the state or national level can contribute to belt use directly by stimulating the development of positive belt use norms.

5.3 Policy Recommendations

This study and others have demonstrated that seat belt use mandates are effective in getting some seat belt nonusers to begin using belts. Further, the use of mandates offers a mechanism for increasing seat belt use that appear more feasible and cost effective than many alternatives. For example, our data indicate that individuals who began using belts because of crash experience or out of concern for safety were more likely to be observed using belts than individuals who stated they began using belts because of legal mandates, employer mandates, or insurance incentives. Obviously, it is neither feasible nor desirable to promote crashes as a means of increasing use (although as mentioned earlier, efforts to increase public knowledge about crashes are desirable). There are a number of policy components which could be implemented to increase the effectiveness of existing compulsory belt use policies. Currently Michigan's mandatory use law permits secondary enforcement only, that is, only drivers who have been pulled over for some reason other than seat belt nonuse can be cited for not using a seat belt. Changing the law to include a primary enforcement provision would increase the deterrent effect of the law and increase belt use. In our survey, 41.3% of the sample reported their belt use would increase if the law was changed from secondary to primary enforcement. Regardless of secondary or primary enforcement, stricter enforcement (issuing more tickets to offenders) would increase the deterrent effect and increase belt use, particularly if the increased enforcement efforts were well publicized before and during the campaign.

Our results also suggest that an increased fine for nonuse may have a positive influence on belt use. The data showed that higher fines would be required to get people who had the lowest belt use rates to buckle up on every trip. However this effect would probably be mediated by drivers' perceptions of how likely it is that they will be pulled over and ticketed. Thus, higher fines are likely to have a positive effect on belt use rates if the perceived probability of citation is high.

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Appendix A

Data Collection Forms[1]

1. Forms are reduced from 8 1/2 by 14 inch pages actually used in the field.

DUP COLS. 1-4

Vehicle Form

DRIVER	FRONT CENTER	FRONT RIGHT	REAR LEFT	REAR CENTER	REAR RIGHT
1[ ]No rstrt 2[ ]Belted	1[ ]No rstrt 2[ ]Belted 3[ ]CRD OK 4[ ]CRD Wrng	1[ ]No rstrt 2[ ]Belted 3[ ]CRD OK 4[ ]CRD Wrng	1[ ]No rstrt 2[ ]Belted 3[ ]CRD OK 4[ ]CRD Wrng	1[ ]No rstrt 2[ ]Belted 3[ ]CRD OK 4[ ]CRD Wrng	1[ ]No rstrt 2[ ]Belted 3[ ]CRD OK 4[ ]CRD Wrng
5	6	7	8	9	10
1[ ] Male 2[ ] Female	1[ ] Male 2[ ] Female	1[ ] Male 2[ ] Female	1[ ] Male 2[ ] Female	1[ ] Male 2[ ] Female	1[ ] Male 2[ ] Female
11	12	13	14	15	16
1[ ] 0-3 2[ ] 4-15 3[ ] 16-29 4[ ] 30-59 5[ ] 60+	1[ ] 0-3 2[ ] 4-15 3[ ] 16-29 4[ ] 30-59 5[ ] 60+	1[ ] 0-3 2[ ] 4-15 3[ ] 16-29 4[ ] 30-59 5[ ] 60+	1[ ] 0-3 2[ ] 4-15 3[ ] 16-29 4[ ] 30-59 5[ ] 60+	1[ ] 0-3 2[ ] 4-15 3[ ] 16-29 4[ ] 30-59 5[ ] 60+	1[ ] 0-3 2[ ] 4-15 3[ ] 16-29 4[ ] 30-59 5[ ] 60+
17	18	19	20	21	22

VEHICLE SIZE/TYPE

1[ ] Small car
2[ ] Medium car
3[ ] Large car
4[ ] Pickup
5[ ] Van
6[ ] Other________

23

ID # ___ ___ (24 25)

COMMENTS: Any young children in lap, on floor, standing, extra occupants?

1[ ] Interviewed
2[ ] Refused(card given)
3[ ] Refused(no card given)

26

Record make & model of car

Respondent #:___ ___ (27 28)

Interviewed-V27=0
Refused card-V27=2
Refused no card-leave blank

DUP COLS. 1-4

DRIVER	FRONT CENTER	FRONT RIGHT	REAR LEFT	REAR CENTER	REAR RIGHT
1[ ]No rstrt 2[ ]Belted	1[ ]No rstrt 2[ ]Belted 3[ ]CRD OK 4[ ]CRD Wrng	1[ ]No rstrt 2[ ]Belted 3[ ]CRD OK 4[ ]CRD Wrng	1[ ]No rstrt 2[ ]Belted 3[ ]CRD OK 4[ ]CRD Wrng	1[ ]No rstrt 2[ ]Belted 3[ ]CRD OK 4[ ]CRD Wrng	1[ ]No rstrt 2[ ]Belted 3[ ]CRD OK 4[ ]CRD Wrng
5	6	7	8	9	10
1[ ] Male 2[ ] Female	1[ ] Male 2[ ] Female	1[ ] Male 2[ ] Female	1[ ] Male 2[ ] Female	1[ ] Male 2[ ] Female	1[ ] Male 2[ ] Female
11	12	13	14	15	16
1[ ] 0-3 2[ ] 4-15 3[ ] 16-29 4[ ] 30-59 5[ ] 60+	1[ ] 0-3 2[ ] 4-15 3[ ] 16-29 4[ ] 30-59 5[ ] 60+	1[ ] 0-3 2[ ] 4-15 3[ ] 16-29 4[ ] 30-59 5[ ] 60+	1[ ] 0-3 2[ ] 4-15 3[ ] 16-29 4[ ] 30-59 5[ ] 60+	1[ ] 0-3 2[ ] 4-15 3[ ] 16-29 4[ ] 30-59 5[ ] 60+	1[ ] 0-3 2[ ] 4-15 3[ ] 16-29 4[ ] 30-59 5[ ] 60+
17	18	19	20	21	22

VEHICLE SIZE/TYPE

1[ ] Small car
2[ ] Medium car
3[ ] Large car
4[ ] Pickup
5[ ] Van
6[ ] Other________

23

ID # ___ ___ (24 25)

COMMENTS: Any young children in lap, on floor, standing, extra occupants?

1[ ] Interviewed
2[ ] Refused(card given)
3[ ] Refused(no card given)

26

Record make & model of car

Respondent #:___ ___ (27 28)

Interviewed-V27=0
Refused card-V27=2
Refused no card-leave blank

INTERVIEW FORM

SITE: __ __ __ (1 2 3)   RESPONDENT: __ __ (4 5)   TIME OF INTERVIEW: __ __ : __ __ (6 7 8 9)

1. Vehicle make? *[ASK IF UNKNOWN]*

[ ] AMC	[ ] Mercury	[ ] BMW	[ ] Mercedes	[ ] Toyota
[ ] Buick	[ ] Merkur	[ ] Fiat	[ ] MG	[ ] Triumph
[ ] Cadillac	[ ] Oldsmobile	[ ] Nissan	[ ] Mitsubisi	[ ] Volvo
[ ] Checker	[ ] Plymouth	[ ] Honda	[ ] Opel	[ ] VW
[ ] Chevrolet	[ ] Pontiac	[ ] Hyundai	[ ] Peugeot	[ ] Yugo
[ ] Chrysler	[ ] GMC	[ ] Isuzu	[ ] Porsche	[ ] Other
[ ] Dodge	[ ] Acura	[ ] Jaguar	[ ] Renault	____________
[ ] Ford	[ ] Alfa-Romeo	[ ] Lancia	[ ] Saab	
[ ] Lincoln	[ ] Audi	[ ] Mazda	[ ] Subaru	

__ __
10-11

The first couple of questions are about your car. When I use the word CAR throughout this survey I include pickup trucks, vans and utility vehicles.

2. What type of seat belt system does this car have? *(DRIVER ONLY)*
[READ RESPONSES IF UNKNOWN]

0[ ] none
1[ ] lap only
2[ ] lap/shoulder separate
3[ ] 3 point
4[ ] automatic
6[ ] DK
12

3. Whose car is this? *[READ RESPONSES]*

0[ ] your own car
1[ ] your own family car
2[ ] company car
3[ ] lease or rental car
4[ ] friends car
5[ ] other(who________________________________)
7[ ] refused
13

READ IF THERE ARE PASSENGERS IN THE VEHICLE:
The next few questions are about the passengers riding with you today.

What is the relationship to you of the other passengers with you today?
[DO NOT READ RESPONSES]

4. FRONT CENTER	5. FRONT RIGHT
01[ ] husband/wife	01[ ] husband/wife
02[ ] boy/girl friend	02[ ] boy/girl friend
03[ ] daughter/son	03[ ] daughter/son
04[ ] parent	04[ ] parent
05[ ] someone else's child	05[ ] someone else's child
06[ ] friend	06[ ] friend
07[ ] business associate	07[ ] business associate
08[ ] other____________	08[ ] other____________
77[ ] refused	77[ ] refused
99[ ] N/A no other occ	99[ ] N/A no other occ
14-15	16-17

6. REAR LEFT

01[ ] husband/wife
02[ ] boy/girlfriend
03[ ] daughter/son
04[ ] parent
05[ ] someone else's child
06[ ] friend
07[ ] business assoc.
08[ ] other________
77[ ] refused
99[ ] N/A no other oc
18-19

7. REAR CENTER

01[ ] husband/wife
02[ ] boy/girlfriend
03[ ] daughter/son
04[ ] parent
05[ ] someone else's child
06[ ] friend
07[ ] business assoc.
08[ ] other________
77[ ] refused
99[ ] N/A no other oc
20-21

8. REAR RIGHT

01[ ] husband/wife
02[ ] boy/girl friend
03[ ] daughter/son
04[ ] parent
05[ ] someone else's child
06[ ] friend
07[ ] business assoc.
08[ ] other________
77[ ] refused
99[ ] N/A no other oc
22-23

RECORD RELATIONSHIP AND SEATING POSITION FOR ALL OTHER OCCUPANTS

READ:
The next few questions in this survey are about where you are driving today and how far you are going.

9. **Where was it that you last got in and started your car? Was it your home, work, or somewhere else?** *[IF SOMEWHERE ELSE, PROMPT: Where]*
[DO NOT READ RESPONSES]

01[ ] home
02[ ] office/work
03[ ] service or sales call/delivery
04[ ] daycare/babysitter
05[ ] school/church
06[ ] child's school/activities
07[ ] doctor/dentist
08[ ] motel
09[ ] friend or relatives home
10[ ] restaurant
11[ ] bar/night club
12[ ] shopping center/other store
13[ ] other:________________________
66[ ] DK
77[ ] Refused
24-25

10. **Where are you next going to stop? Is it your home, work, or somewhere else?**
[IF SOMEWHERE ELSE, PROMPT: Where]
[DO NOT READ RESPONSES]

01[ ] home
02[ ] office/work
03[ ] service or sales call/delivery
04[ ] daycare/babysitter
05[ ] school/church
06[ ] child's school/activities
07[ ] doctor/dentist
08[ ] motel
09[ ] friend or relatives home
10[ ] restaurant
11[ ] bar/night club
12[ ] shopping center/other store
13[ ] other:________________________
66[ ] DK
77[ ] Refused
26-27

11. **What is the purpose of this trip right now? Is it:** *[READ RESPONSES]*

01[ ] work related(including driving to/from work)
02[ ] shopping
03[ ] social/recreational
04[ ] other:(specify____________________________________)
66[ ] DK
77[ ] Refused
28-29

12. **Approximately how many miles is this trip from (ORIGIN) to (DESTINATION)?________**
[PROMPT: Just guess about how many miles it is.]

30 31 32 33

13. **Could you tell me how many total miles do you drive per year?**
Would you say its: *[READ RESPONSES]*

1[ ] less than 5,000 miles
2[ ] 5-10,000 miles
3[ ] 10-20,000 miles
4[ ] 20-40,000 miles
5[ ] 40,000 or more
6[ ] DK
7[ ] Refused
34

NOTE: Don't Know and Refused response categories are never read

READ:
The next few questions are about seat belt use.

14. **Could you tell me how often you use your seat belt?** *[READ RESPONSES]*

1[ ] Always———*If observer card states not belted go to green Form B. If observer card states belted go to blue Form A*
2[ ] Most of the time—*GO TO GREEN FORM B*
3[ ] Sometimes———*GO TO GREEN FORM B*
4[ ] Seldom————*GO TO GREEN FORM B*
5[ ] Never————*GO TO YELLOW FORM C*
6[ ] DK—————*GO TO GREEN FORM B*
7[ ] Refused————*GO TO GREEN FORM B*
35

CARD A

ALWAYS

MOST TIMES

SOMETIMES

SELDOM

NEVER

CARD B

A - less than 8th grade

B - between 8th grade and 11th grade

C - high school graduate

D - some college or vocational/technical school

E - college graduate

F - post graduate education

CARD C

A - less than $4,999 a year

B - between $5,000 and 14,999 a year

C - between $15,000 and $24,999 a year

D - between $25,000 and $34,999 a year

E - between $35,000 and $49,999 a year

F - over $50,000 a year

FORM A
TO BE USED WHEN QUESTION 14 IS ALWAYS

1
36

SITE:___ ___ ___ RESPONDENT:___ ___

15. **How long have you been using seat belts?** *[DO NOT READ RESPONSES]*
1[ ] Less than a year
2[ ] One to two years
3[ ] Since the law went into effect
4[ ] Three to four years
5[ ] five years or more
6[ ] DK
7[ ] Refused
8[ ] Skip
37

16. **What influenced you to start using seatbelts?** *[RECORD RESPONSES]*

____

____

____

___ ___ ___ ___ ___ ___
38 39 40 41 42 43

17. **Out of your last ten trips in a car, how many times did you use a seat belt when one was available?** *[DO NOT READ RESPONSES]*
00[ ] 0 01[ ] 1 02[ ] 2 03[ ] 3 04[ ] 4 05[ ] 5 06[ ] 6
07[ ] 7 08[ ] 8 09[ ] 9 10[ ] 10 66[ ] DK 77[ ] Refused
44-45

skip cols. 46-50

23. **What portion of your friends use seat belts? Would you say it's:** *[READ RESPONSES]*
1[ ] **less than a quarter**
2[ ] **a quarter to half**
3[ ] **half to three quarters**
4[ ] **more than three quarters**
6[ ] DK
7[ ] Refused
51

24. **Are you currently:** *[READ RESPONSES]*
01[ ] **Employed full time**
02[ ] **Employed part time**
03[ ] **Unemployed**
04[ ] **Homemaker, not employed outside the home**
05[ ] **Retired, and not employed**
06[ ] **Student, and not employed**
07[ ] **Other:(specify______________________)**
77[ ] Refused
52-53

25. **Do you know whether or not your employer requires seat belt use for workers who drive on the job?** *[READ RESPONSES]*
1[ ] **Yes, you know they DO require use**
2[ ] **Yes, you know they DO NOT require use**
3[ ] **You don't know whether or not they require belt use**
4[ ] **You are self employed**
7[ ] **Refused**
8[ ] **Skip**
54

26. In the last month, has anyone asked you to use a seat belt while driving or riding in a car? *[DO NOT READ RESPONSES]*

1[ ] yes
2[ ] no
6[ ] DK
7[ ] Refused
55

27. How is that person related to you? Is he or she your: *[READ RESPONSES]*

NOTE: RECORD PERSON'S RELATIONSHIP TO DRIVER; IF MULTIPLE RESPONSES RECORD UNDER "OTHER"

01[ ] husband/wife
02[ ] boy/girl friend
03[ ] daughter/son
04[ ] parent
05[ ] someone else's child
06[ ] friend
07[ ] business associate
08[ ] other ____________
77[ ] refused
88[ ] skip
56 57

28. After being asked, did you put the seat belt on? *[READ RESPONSES]*

1[ ] Always
2[ ] Most of the time
3[ ] Sometimes
4[ ] Seldom
5[ ] Never
6[ ] DK
7[ ] Refused
8[ ] Skip
58

29. Out of the last ten trips that you drove with unbuckled passengers, how many times did you ask them to buckle up? *[DO NOT READ RESPONSES]*

0[ ] never
1[ ] 1-3 times
2[ ] 4-6 times
3[ ] 7-9 times
4[ ] every time
6[ ] DK
7[ ] Refused
9[ ] N/A-never drive with unbuckled pass
59

30. Did the passengers buckle up when you asked them? *[READ RESPONSES]*

1[ ] Always
2[ ] Most of the time
3[ ] Sometimes
4[ ] Seldom
5[ ] Never
6[ ] DK
7[ ] Refused
8[ ] Skip
60

skip cols. 61-63

33. Were you living in Michigan in July 1985 when the Seat Belt Law went into effect? *[DO NOT READ RESPONSES]*

1[ ] yes
2[ ] no
7[ ] Refused
64

34. Did your seat belt use increase, decrease or stay the same when you first found out about the law? *[DO NOT READ RESPONSES]*

1[ ] Increased
2[ ] Decreased
3[ ] No change
4[ ] Not aware of the law
6[ ] DK
7[ ] Refused
8[ ] Skip
65

35. Did your seat belt use increase, decrease or stay the same when the Michigan Seat Belt law started in July, 1985? *[DO NOT READ RESPONSES]*

1[ ] Increased use following law
2[ ] Decreased use following law
3[ ] No change following the law
6[ ] DK
7[ ] Refused
8[ ] Skip
66

36. On a scale from 1 to 10, please estimate the chance that you will be involved in a car crash over the next year: With 1 being that you certainly won't and 10 being that you certainly will. *[DO NOT READ RESPONSES]*

01[ ] 1	05[ ] 5	09[ ] 9
02[ ] 2	06[ ] 6	10[ ] 10
03[ ] 3	07[ ] 7	77[ ] Refused
04[ ] 4	08[ ] 8	67-68

37. Thinking back over the past two weeks, how many times have you had 5 or more alcoholic drinks in a row? (a drink is a 12 oz. can of beer, a 4 oz. glass of wine or 1.5 oz. shot of liquor or mixed drink) *[DO NOT READ RESPONSES]*

0[ ] none
1[ ] once
2[ ] twice
3[ ] three to five times
4[ ] six to nine times
5[ ] ten or more times
6[ ] DK
7[ ] Refused
69

READ: The next few questions are just for background information.

38. In what Month and Year were you born? *[DO NOT READ RESPONSES]*

01[ ] Jan	05[ ] May	09[ ] Sept
02[ ] Feb	06[ ] June	10[ ] Oct
03[ ] March	07[ ] July	11[ ] Nov
04[ ] April	08[ ] August	12[ ] Dec
70-71		77[ ] Refused

__ __ 19__ __ CODE 77-Refused
72 73

39. Are you currently: *[READ RESPONSES]*

1[ ] Married
2[ ] Widowed
3[ ] Divorced
4[ ] Separated
5[ ] Never married
7[ ] Refused
.74

40. *[SHOW CARD B]* **Look at this card and please give me the letter that indicates the highest level of education you have completed.**

01[ ] A	05[ ] E
02[ ] B	06[ ] F
03[ ] C	66[ ] DK
04[ ] D	77[ ] Refused

75-76

41. *[SHOW CARD C]* **Look at this card and please give me the letter that indicates your yearly family income, before taxes.**

01[ ] A	05[ ] E
02[ ] B	06[ ] F
03[ ] C	66[ ] DK
04[ ] D	77[ ] Refused

77-78

42. **What is your race or ethnic background? Is it:** *[READ RESPONSES]*

1[ ] White
2[ ] Black
3[ ] Hispanic
4[ ] Native American
5[ ] Other: Please specify____________________
6[ ] DK
7[ ] Refused
79

READ: **Thank you very much for your time and effort in helping us with our survey today. Here is the $5.00 and have a good day.**

END TIME OF INTERVIEW:__ __:__ __
80 81 82 83

INTERVIEWER	EAP	INTERVIEW TYPE
1[ ] Kathy	1[ ] yes (describe)	1[ ] Field
2[ ] Tom	2[ ] no	2[ ] Phone
3[ ] Bob	85	86
4[ ] Danny T.		
5[ ] Anthony		
6[ ] Dan C.		
7[ ] Colm		
8[ ] John		
9[ ] Montgomery		
84		

Write any other comments:

FORM B
USE WHEN QUESTION 14 RESPONSE IS MOST OF THE TIME, SOMETIMES, SELDOM, DON'T KNOW AND REFUSED

2
36 SITE #:___ ___ ___ RESPONDENT #:___ ___

15. **How long have you been using seat belts?** *[DO NOT READ RESPONSES]*
1[ ] Less than a year
2[ ] One to two years
3[ ] Since the law went into effect
4[ ] Three to four years
5[ ] five years or more
6[ ] DK
7[ ] Refused
8[ ] Skip
37

16. **What influenced you to start using seatbelts?** *[RECORD RESPONSES]*

____

____

____

___ ___ ___ ___ ___ ___
38 39 40 41 42 43

17. **Out of your last ten trips in a car, how many times did you use a seat belt when one was available?** *[DO NOT READ RESPONSES]*
00[ ] 0 01[ ] 1 02[ ] 2 03[ ] 3 04[ ] 4 05[ ] 5 06[ ] 6
07[ ] 7 08[ ] 8 09[ ] 9 10[ ] 10 66[ ] DK 77[ ] Refused
44-45

READ:
Think back over the past month. When driving, how often did you use your seat belt under the following circumstances? *[SHOW CARD A]*

18. **When you were with friends**
1[ ] Always
2[ ] Most times
3[ ] Sometimes
4[ ] Seldom
5[ ] Never
6[ ] DK
7[ ] Refused
9[ ] N/A no friends
46

19. **When you were on a date**
1[ ] Always
2[ ] Most times
3[ ] Sometimes
4[ ] Seldom
5[ ] Never
6[ ] DK
7[ ] Refused
9[ ] N/A married or don't date
47

20. **When you had been drinking**
1[ ] Always
2[ ] Most times
3[ ] Sometimes
4[ ] Seldom
5[ ] Never
6[ ] DK
7[ ] Refused
9[ ] N/A don't drink & drive
48

21. **At night between 9:00 and 5:00 in the morning**
1[ ] Always
2[ ] Most times
3[ ] Sometimes
4[ ] Seldom
5[ ] Never
6[ ] DK
7[ ] Refused
9[ ] N/A
49

22. **And now, when you were riding as a passenger in someone else's car how often did you use your seat belt?**
1[ ] Always
2[ ] Most times
3[ ] Sometimes
4[ ] Seldom
5[ ] Never
6[ ] DK
7[ ] Refused
9[ ] N/A
50

23. What portion of your friends use seat belts? Would you say it's: *[READ RESPONSES]*

1[ ] less than a quarter
2[ ] a quarter to half
3[ ] half to three quarters
4[ ] more than three quarters
6[ ] DK
7[ ] Refused
51

24. Are you currently: *[READ RESPONSES]*

01[ ] Employed full time
02[ ] Employed part time
03[ ] Unemployed
04[ ] Homemaker, not employed outside the home
05[ ] Retired, and not employed
06[ ] Student, and not employed
07[ ] Other:(specify________________________________)
77[ ] Refused
52-53

25. Do you know whether or not your employer requires seat belt use for workers who drive on the job? *[READ RESPONSES]*

1[ ] Yes, you know they <u>DO</u> require use
2[ ] Yes, you know they <u>DO</u> <u>NOT</u> require use
3[ ] You don't know whether or not they require belt use
4[ ] You are self employed
7[ ] Refused
8[ ] Skip
54

26. In the last month, has anyone asked you to use a seat belt while driving or riding in a car? *[DO NOT READ RESPONSES]*

1[ ] yes
2[ ] no
6[ ] DK
7[ ] Refused
55

27. How is that person related to you? Is he or she your: *[READ RESPONSES]*

NOTE: RECORD PERSON'S RELATIONSHIP TO DRIVER; IF MULTIPLE RESPONSES RECORD UNDER "OTHER"

01[ ] husband/wife
02[ ] boy/girl friend
03[ ] daughter/son
04[ ] parent
05[ ] someone else's child
06[ ] friend
07[ ] business associate
08[ ] other______________
77[ ] refused
88[ ] skip
56 57

28. After being asked, did you put the seat belt on? *[READ RESPONSES]*

1[ ] Always
2[ ] Most of the time
3[ ] Sometimes
4[ ] Seldom
5[ ] Never
6[ ] DK
7[ ] Refused
8[ ] Skip
58

29. **Out of the last ten trips that you drove with unbuckled passengers, how many times did you ask them to buckle up?** *[DO NOT READ RESPONSES]*

0[ ] never
1[ ] 1-3 times
2[ ] 4-6 times
3[ ] 7-9 times
4[ ] every time
6[ ] DK
7[ ] Refused
9[ ] N/A-never drive with unbuckled pass
59

30. **Did the passengers buckle up when you asked them?** *[READ RESPONSES]*

1[ ] Always
2[ ] Most of the time
3[ ] Sometimes
4[ ] Seldom
5[ ] Never
6[ ] DK
7[ ] Refused
8[ ] Skip
60

31. **Right now the fine for not using a seat belt is $25.00. What fine would get you to use your seat belt on <u>every</u> trip. Would it be a:** *[READ RESPONSES]*

01[ ] $25.00 fine
02[ ] $50.00 fine
03[ ] $100.00 fine
04[ ] $200.00 fine
05[ ] $400.00 fine
06[ ] more than $400.00 fine
07[ ] Other:(what)________________________________
66[ ] DK
77[ ] Refused
61-62

32. **Right now you cannot be pulled over <u>just</u> for not using your seat belt. How would your seat belt use change if police <u>could</u> pull you over just for not using your seat belt the same way they can pull you over for speeding. Would your seat belt use:** *[READ RESPONSES]*

1[ ] increase
2[ ] decrease
3[ ] stay the same
6[ ] DK
7[ ] Refused
63

33. **Were you living in Michigan in July 1985 when the Seat Belt Law went into effect?** *[DO NOT READ RESPONSES]*

1[ ] yes
2[ ] no
7[ ] Refused
64

34. **Did your seat belt use increase, decrease or stay the same when you first found out about the law?** *[DO NOT READ RESPONSES]*

1[ ] Increased
2[ ] Decreased
3[ ] No change
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35. **Did your seat belt use increase, decrease or stay the same when the Michigan Seat Belt law started in July, 1985?** *[DO NOT READ RESPONSES]*

1[ ] Increased use following law
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36. On a scale from 1 to 10, please estimate the chance that you will be involved in a car crash over the next year: With 1 being that you certainly won't and 10 being that you certainly will. *[DO NOT READ RESPONSES]*

01[ ] 1	05[ ] 5	09[ ] 9
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37. Thinking back over the past two weeks, how many times have you had 5 or more alcoholic drinks in a row? (a drink is a 12 oz. can of beer, a 4 oz. glass of wine or 1.5 oz. shot of liquor or mixed drink) *[DO NOT READ RESPONSES]*

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72 73

39. Are you currently: *[READ RESPONSES]*

1[ ] Married
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40. *[SHOW CARD B]* Look at this card and please give me the letter that indicates the highest level of education you have completed.

01[ ] A	05[ ] E
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75-76	

41. *[SHOW CARD C]* Look at this card and please give me the letter that indicates your yearly family income, before taxes.

01[ ] A	05[ ] E
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42. **What is your race or ethnic background? Is it:** *[READ RESPONSES]*

1[ ] **White**
2[ ] **Black**
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5[ ] Anthony		
6[ ] Dan C.		
7[ ] Colm		
8[ ] John		
9[ ] Montgomery		
84		

Write any other comments:

FORM C

TO BE USED WHEN RESPONSE TO QUESTION 14 NEVER

3
36

SITE #:__ __ __ RESPONDENT #:__ __

skip cols. 37-50

23. What portion of your friends use seat belts? Would you say it's: *[READ RESPONSES]*
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__ __ 19__ __ CODE 77-Refused
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02[ ] B	06[ ] F
03[ ] C	66[ ] DK
04[ ] D	77[ ] Refused
75-76	

41. *[SHOW CARD C]* Look at this card and please give me the letter that indicates your yearly family income, before taxes.

01[ ] A	05[ ] E
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4[ ] Native American
5[ ] Other: Please specify______________________
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READ: Thank you very much for your time and effort in helping us with our survey today. Here is the $5.00 and have a good day.

END TIME OF INTERVIEW:___ ___:___ ___
80 81 82 83

INTERVIEWER
1[ ] Kathy
2[ ] Tom
3[ ] Bob
4[ ] Danny T.
5[ ] Anthony
6[ ] Dan C.
7[ ] Colm
8[ ] John
9[ ] Montgomery
84

EAP
1[ ] yes (describe)
2[ ] no
85

INTERVIEW TYPE
1[ ] Field
2[ ] Phone
86

Write any other comments: