Buckle Up: Non-Seat Belt Use and Antisocial Behavior in the United States

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Abstract

Objective—To compare persons who report that they never wear a seat belt while driving or as a passenger to those that do in a nationally representative sample in the United States. Our guiding hypothesis is that failure to wear a seat belt is part of an antisocial behavior spectrum.

Methods—Using public-use data from the 2010 National Survey on Drug Use and Health (NSDUH), this study employed binary logistic regression with adjustments for complex survey sampling to assess relationships between never wearing a seat belt and sociodemographic variables, antisocial behaviors, substance abuse and co-occurring problems, and criminal justice system contact.

Results—Individuals who do not wear seat belts are younger, more likely to be male, less likely to be African-American or Hispanic, have incomes less than $75,000, and be a high school or college graduate. After controlling for the effects of age, gender, race, income, education, and population density, individuals reporting that they never wear a seat belt while driving or as a passenger are more likely to report using alcohol and drugs (adjusted odds ranging from 1.61 to 2.56), committing antisocial behaviors including felony offenses (adjusted odds ranging from 2.13 to 3.57), and possess a dual diagnosis (adjusted odds ranging from 1.62 to 1.73).

Conclusions—Findings indicate that non-seat belt use is convergent with a spectrum of serious antisocial behavior and comorbid psychological distress. Importantly, results suggest that standard seat belt use policies and campaigns may not be effective for non-seat belt using individuals and a targeted approach may be needed.

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Conflict of Interest
No conflicts of interest to report

Keywords

Seat belt use; antisocial behavior; criminal justice; substance abuse

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1. Introduction

Road traffic injuries are one of the leading causes of morbidity and mortality (1-4). Global data reveals that well over one million deaths annually are attributable to traffic accidents, which is comparable to tuberculosis and diabetes (5). A substantial fraction of these motor vehicle accidents are a direct result of reckless driving (6-7). In the U.S., motor vehicle accidents result in economic costs in excess of $60 billion annually (8-9).

It is well established that the use of restraints or seat belts while as a passenger and operator of a motor vehicle reduces the harm caused in accidents (10-11). In any given year, seat belts save thousands of lives (12). Unfortunately, drivers who refrain from using seat belts have been found to be overrepresented in crashes and traffic violations (13). Thus, a better understanding of the determinants of non-seat belt use can inform policy and prevention campaigns aimed at increasing seat belt use and thereby reducing mortality, disability, and total economic burden of motor vehicle accidents.

According to data from the National Highway Traffic Safety Administration (NHTSA), the use of restraints (i.e., seat belts) in the U.S. has increased from 79% in 2003 to 85% in 2010 (14). Previous research on the correlates and factors associated with non-seat belt use have identified a number of sociodemographic variables such as younger age, males, rural areas, rear seating position, African-American ethnicity, and lower incomes (15-16). Although research on persons who never wear seat belts is sparse, extant investigations indicate that such persons are more likely to engage in risky behaviors such as speeding and drinking while driving (17), and are more likely to be impulsive (18). In turn, these behaviors are known to be associated with sensation seeking, a tendency expressed as a desire to seek out novel and new experiences many of which are dangerous situations. In a synthesis of over 40 studies dating back to the 1970s, Jonah (19) found positive correlations of medium strength (r's 0.30-0.40) between sensation seeking and risky driving.

The major limitation of these prior studies on individuals who do not wear seatbelts and risky behaviors is a focused investigation on the antisocial behavior spectrum associated with this group. Borrowing from the criminological and deviance literature that indicates that a small proportion of persons account for substantial share of deviance and crime (20-22), it seems plausible that the small number of non-seat belt users may also exhibit antisocial behavior and as such represent a costly group.

1.1 Study purpose

Despite these studies on seat belt use, there are relatively few empirical investigations of persons who report never wearing a seat belt while riding and driving. This is a concern given the costs and consequences of not wearing a seat belt. Although it is not too difficult to imagine that not wearing a seat belt could be associated with substance use and antisocial and illegal behaviors generally, few studies have extensively documented the specific quantitative nature of these relationships in nationally representative samples. This is important because targeted campaigns and policies aimed at increasing seat belt use are better informed by knowing more about the behavioral characteristics of non-seat belt users derived from large, generalizable samples.

The present study sought to contribute to the literature on the behavioral correlates of non-seat belt use by comparing persons age 18 and above who report that they never wear a seat belt while driving or as a passenger to those that do in a nationally representative sample in the United States. Our guiding hypothesis is that not wearing a seat belt is associated with an antisocial behavior spectrum characterized by a disregard for self and others. Thus, we expect that correlates reflecting violence, illegal behaviors and criminal justice system contact, and co-occurring substance abuse and mental health problems will be associated with increased probability of not wearing a seat belt (24). We estimate the magnitude of these associations in controlled multivariate analyses adjusting for the effects of age, gender, race/ethnicity, income, education, and population density.

2. Methods

This study was based on public-use data from the 2010 National Survey on Drug Use and Health (NSDUH) (25). The NSDUH provided population estimates of substance use and health behaviors in the U.S. general population. It utilized multistage area probability sampling methods to select a representative sample of the U.S. civilian, non-institutionalized population aged 12 years or older for participation in the study. Computer-assisted interviewing (CAI) methodology was used to increase the likelihood of valid respondent reports of health-related behaviors and conditions (25). A more detailed description of the NSDUH sampling and data collection procedures are documented in greater detail elsewhere (25). The current study restricted analyses to individuals 18 years or older (N = 39,259). Questionnaires used for the 2010 NSDUH can be found at http://www.icpsr.umich.edu/icpsrweb/SAMHDA/download.

2.1 Measures

2.11 Seatbelt use—Respondents were queried as to the frequency of use of a seatbelt when riding as a front passenger and while driving. Respondents who reported "never" using a seatbelt while riding as a passenger (N = 1,354; 2.38%) and while driving (N = 1,188; 2.13%) were each coded as 1. These two groups were contrasted with respondents who used seatbelts "seldom", "sometimes", and "always" to form the reference group for study analyses. While significant overlap exists between non-seatbelt use while riding and driving (60%), substantial proportions of the sample reported using a seatbelt in one scenario but not in the other (40%). As such, both outcomes were independently examined.

2.12 Substance misuse—Three items (0 = no, 1 = yes) were used to assess various forms of substance misuse: nicotine dependence, alcohol abuse, and marijuana abuse. Alcohol and marijuana abuse was determined based on the criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), 4th edition (26). Nicotine dependence was determined on the basis of the Nicotine Dependence Syndrome Scale (27) and the Fagerstrom Test of Nicotine Dependence (28).

2.13 Risk behavior—Four self-report items (0 = no, 1 = yes) were used to examine the involvement of respondents in high-risk antisocial behaviors during the previous 12 months: driving under the influence of alcohol, theft, drug selling, and violent attacks with the intention to seriously injure. These risk behaviors are conceptualized as falling within the antisocial behavioral spectrum (21) and, as such, are referred to as antisocial or antisocial risk behaviors throughout the manuscript.

2.14 Criminal justice system involvement—Five self-report items (0 = no, 1 = yes) were examined to assess the criminal justice system involvement of respondents during the previous 12 months. These items include being on parole as well as arrests for larceny,

assault, drug possession or sale, and lethal violence (i.e., murder, homicide, or nonnegligent manslaughter).

2.15 Psychological morbidity—Four items (0 = no, 1 = yes) were used to assess various manifestations of psychological morbidity. Three gradations of psychological distress or illness were examined: mild, moderate, and serious mental illness. These items were determined on the basis of The World Health Organization Disability Assessment Schedule (WHODAS) (29). Additionally, respondents who were found to meet criteria for any degree of mental illness and who met criteria for a substance use disorder were categorized as having a "dual diagnosis".

2.16 Sociodemographic controls—The following demographic variables were used: Age, gender, race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, and other [American Indian or Alaska Native, Asian, other Pacific Islander or Native Hawaiian, and persons reporting more than one race]), total annual family income (less than $20,000, $20,000 to $49,999, $50,000 to $74,999, and $75,000 or more), educational level (less than high school, high school graduate, some college, college graduate) and metropolitan population density (classified as large,   1 million; small, less than 1 million; and nonmetropolitan).

2.2 Statistical Analysis

Logistic regression analyses were conducted that compared non-seatbelt users with seatbelt users in terms of aforementioned sociodemographic, behavioral and mental health outcomes. Adjusted odds ratios (AORs) were considered to be statistically significant if the associated confidence intervals did not cross the 1.0 threshold. For all statistical analyses, weighted prevalence estimates and standard errors were computed using Stata 12.1SE (30). This approach implements a Taylor series linearization to adjust standard errors of estimates for complex survey sampling design effects including clustered data. Listwise deletion was used to address missing data as the percentage of missing values for variables examined in this study was minimal ($< 2.0\%$) and no pattern of association was identified between missing values for the independent variables and variability in the dependent variables.

3. Results

Table 1 presents estimates of the associations between non-seatbelt use as a passenger and key sociodemographic factors. With respect age, non-seatbelt using passengers were significantly less likely to be 50 years or older (AOR = 0.51, 95% CI = 0.38-0.68). In terms of gender, non-seatbelt using passengers were significantly more likely to be male than female (AOR = 1.90, 95% CI = 1.52-2.38). As for race/ethnicity, non-seatbelt using passengers were significantly less likely to be African-American (AOR = 0.54, 95% CI = 0.37-0.78) than to be White. Finally, non-seatbelt using passengers were significantly less likely to earn more than $50,000 per year or to have attended at least some college.

Table 2 examines the associations between non-seatbelt use while driving and sociodemographic factors. Similar to non-seatbelt using passengers, drivers who did not to use seatbelts were less likely to be over the age of 50 (AOR = 0.60, 95% CI = 0.44-0.81) and were more likely to be male (AOR = 1.87, 95% CI = 1.47-2.38). Non-seatbelt using drivers were significantly less likely to be African-American (AOR = 0.53, 95% CI = 0.35-0.80), Hispanic (AOR = 0.48, 95% CI = 0.34-0.66), or other race (AOR = 0.60, 95% CI = 0.36-1.00), compared to Whites. In terms of family income, non-seatbelt using drivers were significantly less likely to reside in households earning more than $75,000 per year (AOR = 0.55, 95% CI = 0.37-0.83). Finally, non-seatbelt using drivers were significantly

less likely to have graduated from high school (AOR = 0.74, 95% CI = 0.55-1.00), attended some college (AOR = 0.51, 95% CI = 0.37-0.71), or to be a college graduate (AOR = 0.17, 95% CI = 0.11-0.27), compared to seat belt using drivers.

Table 3 compares the prevalence of a variety of substance misuse, antisocial behavioral, criminal, and mental health outcomes among non-seatbelt using passengers and seatbelt using passengers. In terms of substance misuse, non-seatbelt using passengers were significantly more likely to meet criteria for nicotine dependence (AOR = 1.61, 95% CI = 1.28-2.04), as well as alcohol (AO R = 1.55, 95% CI = 1.16-2.07) and marijuana abuse (AOR = 2.09, 95% CI = 1.38-3.16). Non-seatbelt using passengers were also significantly more likely to take part in all antisocial risk behaviors examined in the study. With respect to the criminal justice system, non-seatbelt users were significantly more likely to be on parole (AOR = 2.23, 95% CI = 1.10-4.52) and to have been arrested for either larceny (AOR = 2.29, 95% CI = 1.25-4.21), lethal violence (AOR = 2.51, 95% CI = 1.14-5.54), and drug possession or sale (AOR = 1.68, 95% CI = 1.03-2.75). As for psychological morbidity, non-seatbelt using passengers were significantly more likely to meet criteria for mild (AOR = 1.45, 95% CI = 1.04-2.03) or moderate (AOR = 1.48, 95% CI = 1.03-2.14) mental illness and to meet criteria for a dual diagnosis (AOR = 1.73, 95% CI = 1.26-2.39).

Table 4 presents the prevalence of behavioral and mental health outcomes among non-seatbelt using drivers and seatbelt using drivers. Consistent with non-seatbelt using passengers, non-seatbelt using drivers were significantly more likely to be nicotine dependent (AOR = 1.77, 95% CI = 1.38-2.27) and to abuse marijuana (AOR = 2.52, 95% CI = 1.48-4.29). Also in keeping with non-seatbelt using passengers, non-seatbelt using drivers were at increased odds in reporting participating in all antisocial behaviors examined in the study. As for criminal justice system involvement, non-seatbelt using drivers were significantly more likely to have recently been on parole (AOR = 2.13, 95% CI = 1.16-3.90) and to have been arrested for the use of lethal violence (AOR = 3.57, 95% CI = 1.36-9.33). Finally, in terms of psychological morbidity, non-seatbelt using drivers were significantly more likely to meet criteria for a mild mental illness (AOR = 1.47, 95% CI = 1.01-2.13), serious mental illness (AOR = 1.48, 95% CI = 1.07-2.03), or a dual diagnosis (AOR = 1.62, 95% CI = 1.22-2.16).

4. Discussion

Although many advocated for the use of seat belts in motor vehicles during the early years of automobile production, it was not until the 1950s and 1960s that the rise of the installation of seatbelts in cars was common (16). In recent decades it has become widely understood, normative, and lawful to wear a seat belt while driving or riding in a motor vehicle (31). In the present study, our hypotheses were supported showing that individuals who report never wearing seatbelts were at increased odds of reporting antisocial behavior and criminal justice system contact for several offenses. Persons who endorse never wearing a seat belt were also at greater odds for meeting criteria for nicotine dependence and alcohol and marijuana abuse and to possess a dual diagnosis. Demographically, results were consistent with prior research with one exception. Contrary to previous reports that found that African-Americans were more likely to be non-seat belt users, the NSDUH data show that African-Americans were less likely to be in this group.

At least 2 out of every 100 individuals reported never wearing seatbelts while driving and riding in a motor vehicle. This does not include those who reported they seldom or sometimes do. To place the prevalence of never wearing a seat belt in perspective, the rate in the present study is substantially higher than for autism, celiac disease, multiple sclerosis,

rheumatoid arthritis and many other disorders and diseases and yet the study of persons who never use seat belts has received little research attention and funding.

The connection between non seat belt use and antisocial behavior in this study suggests that this behavior overlaps to some extent with antisocial personality characteristics. Antisocial behavior, in turn, is strongly linked to traits such as impulsivity, sensation seeking, and diminished self-control. In other studies examining the relationships between individual difference characteristics, especially low-self-control, Keane et al. (32) observed that lack of seat belt use was related to drinking and driving (especially among females), Junger and Tremblay (33) found that low self-control was significantly associated with accidents, and Piquero et al. (34) found that low self-control was related to binge-drinking and related alcohol problems. In the present study, the fact that passenger and driver findings are virtually identical suggests that associations with antisocial behavior are not seat specific.

Although laws requiring seat belt use are important, additional interventions are likely necessary for non-seat belt users. One possibility is the use of pedal accelerator force. Van Houten, Hilton, Schulman, and Reagan (35) investigated the outcome of a technological device designed to provide up to eighteen pounds of accelerator pedal back force among a small sample of drivers exceeding a specified speed limit without buckling their seat belts. Once drivers buckled up, the force of the device relinquished. Study results showed that the pedal back force device achieved one hundred percent compliance within twenty five seconds. How such a device would be employed remains to be seen but in the future could be a mandatory installation for some drivers.

Despite the strengths of the current investigation such as the data source and national representation of the sample, findings should be interpreted in light of several limitations. First, seat belt use was based on a single self-reported measure. The optimal method for assessing seat belt use is direct observation (36), but this requirement is likely to be unfeasible on a large-scale, national level. Additionally, as noted by anonymous reviewer, the NSDUH did not measure physical features, such as height or girth, which may make the use of seatbelts uncomfortable or unfeasible for particularly individuals. Third, the NSDUH does not provide state-level data that would allow from the examination of the influence of variation in seatbelt laws across U.S. states. Fourth, the study design is cross-sectional and the usual causal conclusions regarding the important relationships identified cannot be determined in light of the lack of temporal ordering of variables. Another limitation is that the NSDUH relies on respondent recall and is therefore subject to under-reporting or over-reporting of behaviors. Response bias such as found in social desirability effects (37) are a threat to the internal validity of these types of studies. Finally, although the NSDUH is of broad scope, it does not include contextual, situational, precipitating, or biological variables, which would provide for a fuller elucidation of the relationships within this study.

In sum, the present study found that non-seat belt use is associated with a variety of antisocial behaviors, criminal justice system contact, and substance abuse. Innovative efforts to increase seat belt use among this group will likely benefit from taking into account these behavioral patterns. Addressing seat belt use will have additional, ancillary benefits in potentially reducing other adverse and costly (mis-)behaviors.

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Table 1

Socio-demographic associations with passenger seatbelt use among respondents ages 18 and older in the United States

Sociodemographic Factors	Ride without seatbelt				Unadjusted		Adjusted	
	No (N = 37,905)		Yes (N = 1,354)					
	Row %	95% CI	Row %	95% CI	OR	(95% CI)	OR	(95% CI)
Age								
18-25 years	96.33	(96.0-96.6)	3.67	(3.3-4.0)	1.00		1.00	
26-49 years	97.45	(97.1-97.7)	2.55	(2.2-2.9)	0.69	(0.58-0.81)	0.86	(0.72-1.01)
50+ years	98.26	(97.7-98.7)	1.74	(1.3-2.3)	0.47	(0.35-0.62)	0.51	(0.38-0.68)
Gender								
Female	98.34	(98.0-98.6)	1.66	(1.4-2.0)	1.00		1.00	
Male	96.85	(96.5-97.2)	3.14	(2.8-3.5)	1.92	(1.53-2.41)	1.90	(1.52-2.38)
Race/Ethnicity								
White	97.58	(97.3-97.8)	2.42	(2.1-2.7)	1.00		1.00	
African-American	98.19	(97.5-98.7)	1.81	(1.3-2.5)	0.74	(0.52-1.05)	0.54	(0.37-0.78)
Hispanic	97.10	(96.3-97.7)	2.90	(2.3-3.7)	1.20	(0.90-1.60)	0.75	(0.54-1.03)
Other	98.18	(97.0-98.9)	1.82	(1.1-3.0)	0.75	(0.44-1.27)	0.84	(0.49-1.43)
Family Income								
< $20,000	96.61	(95.9-97.2)	3.39	(2.8-4.1)	1.00		1.00	
$20,000-$49,000	96.94	(96.4-97.4)	3.06	(2.6-3.6)	0.90	(0.70-1.16)	0.94	(0.71-1.23)
$50,000-74,999	98.13	(97.6-98.5)	1.87	(1.5-2.4)	0.54	(0.39-0.75)	0.63	(0.45-0.89)
> $75,000	98.69	(98.3-99.0)	1.31	(1.0-1.7)	0.38	(0.26-0.54)	0.57	(0.38-0.86)
Education Level								
Less than H.S.	95.78	(94.9-96.5)	4.22	(3.5-5.1)	1.00		1.00	
H.S. Graduate	96.67	(96.1-97.2)	3.32	(2.8-3.9)	0.78	(0.60-1.02)	0.80	(0.61-1.05)
Some College	97.93	(97.4-98.3)	2.07	(1.7-2.5)	0.48	(0.36-0.64)	0.51	(0.36-0.71)
College Graduate	99.32	(99.1-99.5)	0.68	(0.5-0.9)	0.15	(0.11-0.23)	0.19	(0.12-0.30)
County								
Large metro	97.92	(97.6-98.2)	2.08	(1.8-2.4)	1.00		1.00	

	Ride without seatbelt				Unadjusted		Adjusted	
	No (N = 37,905)		Yes (N = 1,354)					
	Row %	95% CI	Row %	95% CI	OR	(95% CI)	OR	(95% CI)
Small metro	97.63	(97.2-98.0)	2.37	(2.0-2.8)	1.15	(0.90-1.46)	0.99	(0.76-1.28)
Non-metro	96.60	(95.9-97.2)	3.40	(2.8-4.1)	**1.66**	**(1.29-2.14)**	1.27	(0.96-1.68)

Note: Adjusted odds ratios adjusted for age, gender, race/ethnicity, income, education, and county population density. Odds ratios and confidence intervals in bold are statistically significant (p < .05)

Table 2

Socio-demographic associations with motorist seatbelt use among respondents ages 18 and older in the United States

Sociodemographic Factors	Drive without seatbelt				Unadjusted		Adjusted	
	No (N = 35,335)		Yes (N = 1,188)		OR	(95% CI)	OR	(95% CI)
	Row %	95% CI	Row %	95% CI				
Age								
18-25 years	97.00	(96.7-97.3)	3.00	(2.7-3.3)	1.00		1.00	
26-49 years	97.78	(97.5-98.1)	2.22	(1.9-2.5)	0.73	(0.62-0.87)	0.92	(0.77-1.10)
50+ years	98.27	(97.8-98.7)	1.73	(1.3-2.2)	0.57	(0.43-0.76)	0.60	(0.44-0.81)
Gender								
Female	98.49	(98.1-98.8)	1.51	(1.2-1.8)	1.00		1.00	
Male	97.22	(96.8-97.5)	2.78	(2.4-3.2)	1.87	(1.46-2.38)	1.87	(1.47-2.38)
Race/Ethnicity								
White	97.65	(97.3-97.9)	2.35	(2.1-2.7)	1.00		1.00	
African-American	98.29	(97.5-98.8)	1.71	(1.1-2.5)	0.72	(0.47-1.10)	0.53	(0.35-0.80)
Hispanic	98.22	(97.7-98.6)	1.78	(1.3-2.3)	0.75	(0.55-1.02)	0.48	(0.34-0.66)
Other	98.74	(97.9-99.2)	1.26	(0.7-2.0)	0.53	(0.32-0.88)	0.60	(0.36-1.00)
Family Income								
< $20,000	96.93	(96.2-97.5)	3.07	(2.5-3.8)	1.00		1.00	
$20,000-$49,000	97.44	(97.0-97.8)	2.56	(2.2-3.0)	0.83	(0.63-1.10)	0.86	(0.64-1.14)
$50,000-74,999	98.04	(97.4-98.5)	1.96	(1.5-2.6)	0.63	(0.44-0.90)	0.72	(0.50-1.03)
> $75,000	98.82	(98.4-99.1)	1.18	(0.9-1.6)	0.38	(0.26-0.55)	0.55	(0.37-0.83)
Education Level								
Less than H.S.	96.28	(95.3-97.0)	3.72	(3.0-4.6)	1.00		1.00	
H.S. Graduate	97.09	(96.5-97.5)	2.91	(2.4-3.4)	0.78	(0.58-1.04)	0.74	(0.55-1.00)
Some College	98.03	(97.6-98.4)	1.97	(1.6-2.4)	0.52	(0.38-0.72)	0.51	(0.37-0.71)
College Graduate	99.41	(99.2-99.6)	0.59	(0.4-0.8)	0.15	(0.10-0.23)	0.17	(0.11-0.27)
County								
Large metro	98.20	(97.8-98.5)	1.80	(1.5-2.1)	1.00		1.00	

	Drive without seatbelt					Unadjusted		Adjusted	
	No (*N* = 35,335)		Yes (*N* = 1,188)						
	Row %	**95% CI**	**Row %**	**95% CI**	**OR**	**(95% CI)**	**OR**	**(95% CI)**
Small metro	97.94	(97.5-98.3)	2.06	(1.7-2.5)	1.15	(0.88-1.49)	0.95	(0.72-1.25)
Non-metro	96.67	(95.9-97.3)	3.33	(2.7-4.1)	**1.88**	**(1.43-2.47)**	1.32	(0.99-1.75)

Note: Adjusted odds ratios adjusted for age, gender, race/ethnicity, income, education level, and county population density. Odds ratios and confidence intervals in bold are statistically significant (p < .05)

Table 3

Behavioral and mental health correlates with passenger seatbelt use among respondents ages 18 and older in the United States

| | Ride without seatbelt | | | | Unadjusted | | Adjusted | |
| | No (N = 37,905) | | Yes (N = 1,354) | | | | | |
	Row %	95% CI	Row %	95% CI	OR	(95% CI)	OR	(95% CI)
Substance Misuse								
Nicotine								
No	97.90	(97.6-98.1)	2.10	(1.9-2.4)	1.00		1.00	
Yes	95.01	(94.0-95.9)	4.99	(4.1-6.0)	2.45	(1.95-3.09)	1.61	(1.28-2.04)
Alcohol								
No	97.71	(97.4-97.9)	2.29	(2.0-2.6)	1.00		1.00	
Yes	95.38	(94.0-96.4)	4.62	(3.5-6.0)	2.07	(1.54-2.78)	1.55	(1.16-2.07)
Marijuana								
No	97.65	(97.4-97.9)	2.35	(2.1-2.6)	1.00		1.00	
Yes	92.63	(89.3-95.0)	7.37	(5.0-10.7)	3.30	(2.17-5.02)	2.09	(1.38-3.16)
Antisocial Risk Behavior								
Driving Under Influence								
No	97.75	(97.5-98.0)	2.25	(2.0-2.5)	1.00		1.00	
Yes	96.70	(96.1-97.2)	3.30	(2.8-3.9)	1.48	(1.20-1.82)	1.46	(1.19-1.79)
Theft (< $50)								
No	97.69	(97.4-97.9)	2.31	(2.1-2.6)	1.00		1.00	
Yes	91.72	(88.5-94.1)	8.28	(5.9-11.5)	3.82	(2.62-5.58)	2.54	(1.71-3.78)
Sold Drugs								
No	97.70	(97.4-97.9)	2.30	(2.1-2.5)	1.00		1.00	
Yes	93.05	(90.6-94.9)	6.95	(5.1-9.4)	3.17	(2.29-4.39)	1.86	(1.30-2.67)
Violent Attack								
No	97.69	(97.4-97.9)	2.31	(2.1-2.6)	1.00		1.00	
Yes	92.14	(89.6-94.1)	7.86	(5.9-10.4)	3.61	(2.62-4.99)	2.16	(1.56-2.98)
Criminal Justice System								

| | Ride without seatbelt | | | | Unadjusted | | Adjusted | |
| | No (N = 37,905) | | Yes (N = 1,354) | | | | | |
	Row %	95% CI	Row %	95% CI	OR	(95% CI)	OR	(95% CI)
Parole								
No	97.66	(97.4-97.9)	2.34	(2.1-2.6)	1.00		1.00	
Yes	91.06	(83.7-95.3)	8.94	(4.7-16.3)	**4.10**	**(2.05-8.19)**	**2.23**	**(1.10-4.52)**
Larceny								
No	97.68	(97.4-97.9)	2.32	(2.1-2.6)	1.00		1.00	
Yes	91.32	(84.9-95.2)	8.68	(4.8-15.1)	**4.00**	**(2.12-7.55)**	**2.29**	**(1.25-4.21)**
Lethal Violence								
No	97.68	(97.4-97.9)	2.32	(2.1-2.6)	1.00		1.00	
Yes	91.16	(82.7-95.7)	8.84	(4.3-17.3)	**4.07**	**(1.88-8.85)**	**2.51**	**(1.14-5.54)**
Assault								
No	97.68	(97.4-97.9)	2.32	(2.1-2.6)	1.00		1.00	
Yes	95.43	(92.7-97.2)	4.57	(2.8-7.3)	**2.01**	**(1.21-3.34)**	1.12	(0.67-1.87)
Drug Possession/Sale								
No	97.7	(97.4-97.9)	2.31	(2.1-2.6)	1.00		1.00	
Yes	92.47	(88.5-95.1)	7.53	(4.9-11.5)	**3.44**	**(2.13-5.56)**	**1.68**	**(1.03-2.75)**
Psychological Morbidity								
Mild								
No	97.76	(97.5-98.0)	2.24	(2.0-2.5)	1.00		1.00	
Yes	96.50	(95.3-97.4)	3.50	(2.6-4.6)	**1.58**	**(1.15-2.17)**	**1.45**	**(1.04-2.03)**
Moderate								
No	97.68	(97.4-97.9)	2.32	(2.1-2.6)	1.00		1.00	
Yes	96.1	(94.6-97.2)	3.88	(2.8-5.4)	**1.70**	**(1.18-2.46)**	**1.48**	**(1.03-2.14)**
Serious								
No	97.71	(97.4-97.9)	2.29	(2.0-2.6)	1.00		1.00	
Yes	96.73	(95.9-97.4)	3.27	(2.6-4.1)	**1.44**	**(1.10-1.89)**	1.26	(0.97-1.65)
Dual Diagnosis								
No	97.74	(97.5-98.0)	2.26	(2.0-2.5)	1.00		1.00	

	Ride without seatbelt				Unadjusted		Adjusted	
	No (N = 37,905)		Yes (N = 1,354)					
	Row %	95% CI	Row %	95% CI	OR	(95% CI)	OR	(95% CI)
Yes	94.84	(93.1-96.2)	5.15	(3.8-6.9)	2.35	(1.69-3.25)	1.73	(1.26-2.39)

Note: Adjusted odds ratios adjusted for age, gender, race/ethnicity, income, education level, and county population density. Odds ratios and confidence intervals in bold are statistically significant (p < .05)

Table 4

Behavioral and mental health correlates with passenger seatbelt use among respondents ages 18 and older in the United States

| | Drive without seatbelt | | | | | Unadjusted | | Adjusted | |
| | No (N = 35,335) | | Yes (N = 1,188) | | | | | | |
	Row %	95% CI	Row %	95% CI	OR	(95% CI)	OR	(95% CI)
Substance Misuse								
Nicotine								
No	98.05	(97.8-98.3)	1.95	(1.7-2.2)	1.00		1.00	
Yes	94.70	(93.6-95.6)	5.30	(4.4-6.4)	2.81	(2.21-3.38)	1.77	(1.38-2.27)
Alcohol								
No	97.78	(97.5-98.0)	2.21	(2.0-2.5)	1.00		1.00	
Yes	96.38	(95.4-96.2)	3.62	(2.8-4.6)	1.66	(1.25-2.19)	1.29	(0.98-1.70)
Marijuana								
No	97.76	(97.5-98.0)	2.24	(2.0-2.5)	1.00		1.00	
Yes	91.95	(87.4-94.9)	8.05	(5.0-12.6)	3.82	(2.29-6.37)	2.52	(1.48-4.29)
Antisocial Risk Behavior								
Driving Under Influence								
No	97.87	(97.6-98.1)	2.13	(1.9-2.4)	1.00		1.00	
Yes	96.81	(96.2-97.3)	3.19	(2.7-3.8)	1.51	(1.22-1.88)	1.54	(1.24-1.92)
Theft (< $50)								
No	97.78	(97.5-98.0)	2.22	(2.0-2.5)	1.00		1.00	
Yes	93.16	(90.2-95.3)	6.84	(4.7-9.8)	3.23	(2.14-4.87)	2.19	(1.43-3.37)
Sold Drugs								
No	97.80	(97.5-98.0)	2.20	(2.0-2.5)	1.00		1.00	
Yes	93.63	(91.1-95.4)	6.37	(4.5-8.8)	3.02	(2.08-4.39)	1.80	(1.21-2.68)
Violent Attack								
No	97.79	(97.5-98.0)	2.21	(2.0-2.5)	1.00		1.00	
Yes	93.21	(90.7-95.1)	6.79	(4.9-9.3)	3.22	(2.24-4.63)	1.95	(1.35-2.83)
Criminal Justice System								

	Drive without seatbelt				Unadjusted		Adjusted	
	No (N = 35,335)		Yes (N = 1,188)					
	Row %	95% CI	Row %	95% CI	OR	(95% CI)	OR	(95% CI)
Parole								
No	97.76	(97.5-98.0)	2.24	(2.0-2.5)	1.00		1.00	
Yes	91.61	(85.7-95.2)	8.39	(4.8-14.2)	4.00	(2.18-7.34)	2.13	(1.16-3.90)
Larceny								
No	97.76	(97.5-98.0)	2.24	(2.0-2.5)	1.00		1.00	
Yes	93.94	(89.3-96.6)	6.06	(3.3-10.7)	2.81	(1.49-5.29)	1.58	(0.83-2.99)
Lethal Violence								
No	97.76	(97.5-98.0)	2.24	(2.0-2.5)	1.00		1.00	
Yes	88.77	(76.7-94.9)	11.23	(5.0-23.3)	5.52	(2.29-13.3)	3.57	(1.36-9.33)
Assault								
No	97.77	(97.5-98.0)	2.23	(2.0-2.5)	1.00		1.00	
Yes	93.47	(88.5-96.4)	6.53	(3.6-11.5)	3.05	(1.63-5.73)	1.73	(0.88-3.39)
Drug Possession/Sale								
No	97.76	(97.5-98.0)	2.24	(2.0-2.5)	1.00		1.00	
Yes	93.94	(90.0-96.4)	6.06	(3.6-10.0)	2.82	(1.61-4.92)	1.36	(0.76-2.44)
Psychological Morbidity								
Mild								
No	97.87	(97.6-98.1)	2.13	(1.9-2.4)	1.00		1.00	
Yes	96.60	(95.3-97.5)	3.40	(2.5-4.7)	1.61	(1.13-2.30)	1.47	(1.01-2.13)
Moderate								
No	97.80	(97.5-98.0)	2.21	(2.0-2.5)	1.00		1.00	
Yes	96.27	(94.4-97.5)	3.73	(2.4-5.6)	1.71	(1.09-2.68)	1.47	0.93-2.30
Serious								
No	97.85	(97.6-98.1)	2.15	(1.9-2.4)	1.00		1.00	
Yes	96.42	(95.3-97.3)	3.58	(2.7-4.7)	1.69	(1.24-2.30)	1.48	(1.07-2.03)
Dual Diagnosis								
No	97.80	(97.6-98.1)	2.18	(1.9-2.4)	1.00		1.00	

	Drive without seatbelt				Unadjusted		Adjusted	
	No (N = 35,335)		Yes (N = 1,188)					
	Row %	95% CI	Row %	95% CI	OR	(95% CI)	OR	(95% CI)
Yes	95.40	(94.1-96.4)	4.60	(3.6-5.9)	2.17	(1.63-2.88)	1.62	(1.22-2.16)

Note: Adjusted odds ratios adjusted for age, gender, race/ethnicity, income, education level, and county population density. Odds ratios and confidence intervals in bold are statistically significant (p < .05)