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16. Abstract
The Psychological Constructs Related to Seat Belt Use (PCRSBU) survey was designed to "go beyond" demographic correlates of seat belt use (e.g., age, income, race) and identify psychological constructs that may help explain additional variance in seat belt use among the general U.S. population. The survey was administered in 2018 to a representative sample of U.S. residents aged 16 years or older who reported driving or riding in a car in the past year. Analyses of survey results demonstrated that people with greater willingness to delay gratification, greater life satisfaction, more aversion to risks, greater perception of risk in various driving situations, greater loneliness, and more resistance to peer influence were more likely to be full-time seat belt users. People with greater impulsivity and inclination to engage in risky behaviors as acts of "social resistance" were less likely to be full-time belt users. Additionally, mediation analyses revealed that the psychological constructs fully explained some of the observed effects of demographic variables (age, sex, and one regional difference) on seat belt use. The results of this study may be useful both for identifying people at higher risk of seat belt non-use and for developing countermeasures targeted at high-risk occupants. The current volume is the second of two volumes describing the survey and the results. The other report is Volume 1: Methodology Report.

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This report is the second of two reports on the Psychological Constructs Related to Seat Belt Use (PCRSBU) survey. The other report is as follows:

Sheveland, A.C., Bleiberg, M. A., Mendelson, J., Luchman, J. N., Eby, D. W., Molnar, L. J., & Walton, B. R. (2020, November). *Psychological constructs related to seat belt use, volume 1: Methodology report* (Report No. DOT HS 813 032). National Highway Traffic Safety Administration.

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Executive Summary

Administered in June 2018, the Psychological Constructs Related to Seat Belt Use (PCRSBU) survey was designed to deepen our understanding of possible psychological mechanisms underlying individuals' seat belt use behaviors. The probability survey was administered using GfK's KnowledgePanel and yielded a total of 6,038 valid cases. The target population was U.S. residents age 16 and older. Detailed information on the study methodology is provided in *Volume 1: Methodology Report* (DOT HS 813 032).

In this report, we present the results of the survey, a discussion of its implications and limitations, and implications for countermeasure development. We sought to address several research questions, including:

1. What is the breakdown of the U.S. population age 16 and older by not-always and always belt users?
2. What reasons for wearing their seat belt are people most likely to endorse?
3. What reasons for seat belt non-use are people most likely to endorse?
4. How does seat belt use differ by demographic and personal history characteristics?
5. Which psychological constructs are predictive of full-time seat belt use?
6. Do any of the psychological or psychosocial variables explain observed demographic or regional differences in seat belt use?
7. Which non-social-situational factors appear to influence seat belt use?

We used three different measures to operationalize full-time belt use, including traditional as well as more comprehensive definitions. This resulted in estimates of always-users that ranged from 52% to 76% of the population. Avoiding injury, seat belt use as a habit, and compliance with the law were the most frequently endorsed reasons for wearing a seat belt. Driving a short distance, forgetting, and seat belt discomfort were the most frequently endorsed reasons for not wearing a seat belt.

Consistent with prior research, seat belt use was correlated with several demographic variables, including age, race/ethnicity, marital status, and geographic region. We also found that several psychological constructs predicted seat belt use. Higher scores on measures of delay of gratification, life satisfaction, risk aversion, risk perception, loneliness, and resistance to peer influence were associated with increased frequency of seat belt use. Higher scores on impulsivity and social resistance orientation were associated with decreased frequency of seat belt use.

We also conducted mediation analyses to determine whether the selected psychological and psychosocial constructs explained—entirely or in part—observed associations between demographic variables and seat belt use. We found that religiosity, risk aversion, risk perception, descriptive norms, social resistance orientation, loneliness, and sensation-seeking significantly mediated the effects of two or more demographic variables significantly associated with seat belt use (i.e., age, gender, marital status, and geographic region). After including psychological constructs as mediators, age, gender, and one of the regional differences no longer significantly predicted seat belt use directly. Together, these findings suggest that differences in psychological and psychosocial constructs partly underlie previously observed effects of demographic variables on seat belt use. However, significant direct effects remained for marital status and two regional comparisons; in other words, the psychological and psychosocial variables did not fully explain

the differences in seat belt use between married and unmarried respondents, or between respondents from these regions.

Finally, we examined whether seat belt use was affected by non-social-situational factors like being in a taxi or rideshare, or being in the back seat. In a model that also included all demographic, psychological, and psychosocial variables, we found that people reported being less likely to wear a seat belt in the back seat, in a taxi or rideshare, or in a work vehicle relative to when driving, with riding in a taxi having the largest impact.

Introduction

As one of the most effective traffic safety interventions, seat belt use can reduce fatality of front-seat passenger car occupants in crashes by 45% and front seat occupants of light trucks, such as pickups and sport utility vehicles, by 60% (Kahane, 2000). In the United States, nearly 15,000 lives were saved, and an additional 2,500 could have been saved, by seat belts in 2017 (National Center for Statistics and Analysis [NCSA], 2019, March). Nearly half of passenger vehicle occupants fatally injured in motor vehicle crashes were not using a seat belt (NCSA, 2019, April). Although the national rate of seat belt use has increased since 2000 and was estimated to be 90.7% in 2019 (NCSA, 2019, December), gains have plateaued in recent years. Traffic safety researchers continue to seek a better understanding of why a non-negligible minority of the U.S. population does not consistently use a seat belt.

Several demographic factors are correlated with seat belt use, including age, race/ethnicity, sex, and urban/rural dwelling status (Beck et al., 2017; Li & Pickrell, 2019). Situational factors, such as time of day, vehicle speed, and length of trip, also predict belt use (Boyle & Lampkin, 2008; Fhanér & Hane, 1973; NCSA, 2019, April). Yet, despite extensive research on how psychological factors predict other health behaviors (e.g., smoking, Coggins et al., 2009; sunscreen use, Craciun et al., 2012; and alcohol-impaired driving, González-Iglesias et al., 2015), the evidence base regarding the influence of such factors on seat belt use is relatively limited. The few existing studies suggest that anger, fatalism, sensation-seeking, and conservatism are negatively related to seat belt use (Daugherty & Brase, 2010; Molnar et al., 2012; Sarma et al., 2013; Shin et al., 1999; Wilson, 1990). Additionally, some studies have examined the effect of delay of gratification on seat belt use, but findings are mixed: Daugherty and Brase (2010) reported a positive association with seat belt use, while Henson et al. (2006) found no relationship.

Given the important role that psychological factors have been shown to play in numerous protective and risky health behaviors, further research into potential psychological mechanisms that underpin seat belt non-use appears warranted. The current study sought to add to the nascent body of literature in this domain by conducting a nationally representative survey to examine associations between self-reported seat belt use and 18 psychological constructs: anger, decision rule, delay of gratification, fatalism, government intervention orientation, hostility, impulsivity, life satisfaction, loneliness, optimism, political orientation, religiosity, resistance to peer influence, risk aversion, risk perception, sensation-seeking, social norms espousal, and social resistance orientation.

This is the second part of a two-volume series. *Volume 1: Methodology Report* (DOT HS XXX XXX) contains the details of the survey methodology, including information about respondents, sampling design, data collection, and weighting. Volume 1 also describes the way in which the survey was developed, including the results of a literature review on seat belt use and range of health behaviors used to identify the 18 psychological constructs included in the survey. Finally, the *Methodology Report* also contains a description of the research questions the survey was intended to address as well as the associated hypotheses. Here, in *Volume 2: Results Report*, we present the results of analyses conducted to answer a subset of these research questions. This subset was selected based on relevance to the overall goal of the research project (i.e., to examine associations between self-reported seat belt use and psychological constructs), as well

as interest to broad audience of those involved in traffic safety. Analyses conducted to answer additional research questions listed in the *Methodology Report* are included in Appendix C (Supplemental Findings). All research questions and hypotheses were assigned a number that we used throughout both reports to facilitate cross-referencing.

Methods

Briefly, the Psychological Constructs Related to Seat Belt Use (PCRSBU) survey was administered in June 2018 to a nationally representative sample of U.S. residents age 16 or older who reported driving or riding in a passenger vehicle in the past year.[1] The survey contained questions about seat belt use in different situations, the selected psychological constructs, and demographic characteristics. Survey participants were recruited through GfK's KnowledgePanel, and the final data set included 5,833 adults (18 years or older) and 205 teens (16–17 years old). Descriptive statistics about respondents' demographic and personal history information can be found in Table A1 in **Appendix A**.

Data Analysis

Appendix A contains detailed information about the way in which individual survey questions were prepared for data analysis. In short, the dependent variable of interest was seat belt use, and we operationalized it in three different ways:

1) *Primary Binary seat-belt-use indicator*. Seat belt user status (always or not always), based on the survey's screener items (Q3, Q4, and Q5).

2) *Adjusted Binary seat-belt-use indicator.* Seat belt user status (always or not always) as determined by the screener-based categorization (1) plus survey questions that assessed the likelihood of seat belt use in various situations (Qs 8, e.g., at night or when others are present in the vehicle). When we considered these additional situations, 1,208 respondents initially classified as "always users" on the Primary Binary seat-belt-use indicator (1) were reclassified as "not-always users."

3) *Semi-Continuous seat-belt-use indicator*. A semi-continuous scale developed using multiple correspondence analysis (MCA) computed from respondents' answers to Q3, Q4, Q5, and Qs 8. This indicator served as a continuous measure of seat belt use compared and was scaled to have a mean of 0 and a standard deviation of 1. Thus, respondents who scored equal to or greater than 1 on this measure reported well-above-average seat belt use, whereas those who scored equal to or less than -1 reported well-below-average seat belt use.

Details on the specific statistical models (e.g., survey logistic regression) used to address each research question are described below; all models were adjusted for the sampling design. However, we note that most analyses were conducted three times—once with each of the three seat-belt-use indicators. A hypothesis for a given variable was considered supported if the corresponding variable had statistically significant and directionally consistent coefficients in at least two of the three models. Some analyses were only conducted on a single seat-belt-use indicator, also described on the following pages.

[1] Office of Management and Budget (OMB) Control Number: 2127-0729.

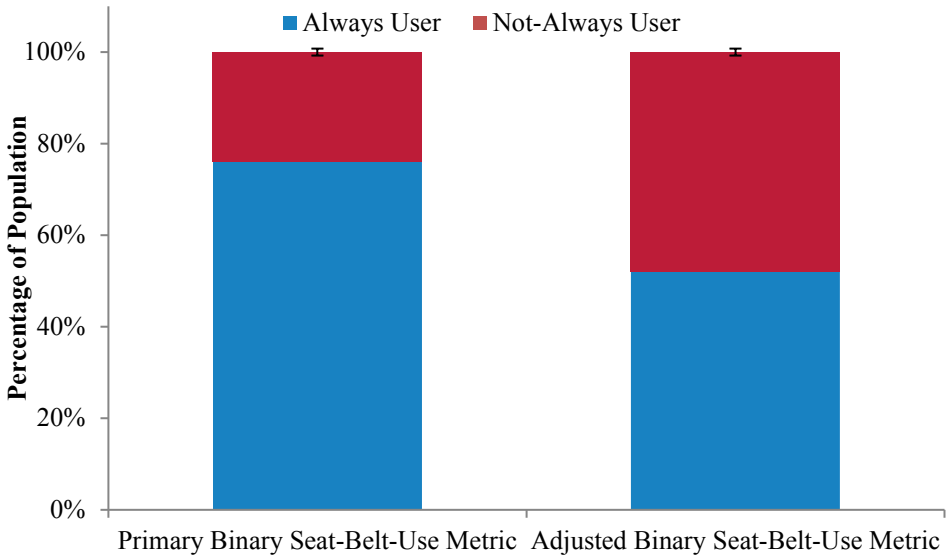
Results

Research Question 1: What Is the Breakdown of the U.S. Population 16 Years and Older by Not-Always and Always Seat Belt Users?

To determine the prevalence of not-always and always seat belt users among the U.S. population 16 years and older, the research team computed survey design-adjusted proportions for each level of the two binary seat belt use indicators. On the primary binary indicator of seat belt use, 75.56% (*SE* = 0.59; 95% CI = 74.38% - 76.69%) of the U.S. population were full-time (i.e., "always") seat belt users. By comparison, the adjusted seat-belt-use indicator suggested that only 52.22% (*SE* = 0.76%; 95% CI = 50.73% - 53.71%) of the U.S. population were always seat belt users.

These two seat-belt-use metrics indicate that over half of Americans report always wearing their seat belts. Where the two metrics diverge is with respect to how consistently seat belts are used across all situations. In typical vehicle situations, such as when driving or riding as a front seat passenger, just over three in four Americans reported always wearing their seat belt. However, when asked about additional situations, such as when riding as a rear seat passenger or in a taxi (see **Appendix A**, Table A3), the proportion of Americans who reported always wearing a seat belt dropped to just over one in two.

Figure 1. Self-Reported Seat Belt Use Among the U.S. Population Age 16+



Note: N = 6,038. The semi-continuous scale is omitted here because its mean does not have a useful interpretation in an absolute sense: the mean of the scale is expected to be near 0, as this is a characteristic of the scale construction method, multiple correspondence analysis (MCA).

Research Question 2: What Reasons for Wearing Their Seat Belt Are People Most Likely to Endorse?

We next examined the reasons people endorsed for using a seat belt by estimating the complex survey design-adjusted proportion of the population who endorsed each reason (Table 1). Except for "other" reasons and the seat belt being automatic—which is heavily dependent on car type and a rare feature of newer cars—all reasons for seat belt use were endorsed by more than 50% of the population. Avoiding injury, seat belt use as a habit, and compliance with the law were the most frequently endorsed reasons for wearing a seat belt.

Table 1. Weighted Reasons for Seat-Belt-Use Endorsement

Reason to Wear a Seat Belt	% Endorsed	*SE*
Want to avoid serious injury or death	95.06%	0.30%
Seat belt use is a habit	92.43%	0.38%
Seat belt use is the law	90.85%	0.44%
Don't want to get a ticket	86.38%	0.53%
Driving/riding on the highway	81.54%	0.59%
Road, traffic, or weather conditions	80.85%	0.61%
Driving/riding for a long distance	77.78%	0.64%
Bell, buzzer, or light that reminds me	76.54%	0.67%
Uncomfortable without seat belt	67.17%	0.72%
Brought up to wear seat belt	66.66%	0.68%
With people wearing seat belts	63.11%	0.74%
Others want me to wear seat belt	60.96%	0.75%
Seat belt is automatic	36.43%	0.74%
Other reason	17.74%	0.86%

Note: N ranges from 6,020 to 5,966. SE = standard error of the mean.

Research Question 3: What Reasons for Seat Belt Non-Use Are People Most Likely to Endorse?

We similarly examined the reasons for seat belt *non-use* by estimating the complex survey design-adjusted proportion of the population who endorsed each reason (Table 2). The results show that endorsement of reasons for seat belt non-use was low overall. Driving a short distance, forgetting, and seat belt discomfort were the most frequently endorsed reasons for not wearing a seat belt.

Table 2. Weighted Reasons for Seat Belt Non-Use Endorsement Rates

Reason to Not Wear a Seat Belt	% Endorsed	*SE*
Driving Short Distance	15.48%	0.52%
Forgot to Use	14.43%	0.51%
Seat Belt is Uncomfortable	11.25%	0.46%
Was in a Rush	8.64%	0.42%
Other Reason	7.86%	0.54%
Injure/Trap Me in Crash	7.53%	0.40%
Unlikely to Get in Crash	6.75%	0.36%
Dislike Being Told What to Do	6.58%	0.36%
Hassle to Use	6.12%	0.34%
Someone Injured by Seat Belt in Crash	5.89%	0.34%
Light Traffic Driving	5.79%	0.33%
Don't Need to Wear Seat Belt	5.44%	0.35%
People I'm with Not Wearing	4.73%	0.31%
Avoid Wrinkling Clothes	4.07%	0.30%

Note: N ranges from 5,993 to 5,980. SE = standard error of the mean.

Research Question 4: How Does Seat Belt Use Differ by Demographic and Personal History Characteristics?

Next, we examined relationships between seat belt use and demographic and personal history characteristics of respondents, like age, gender, race/ethnicity, marital status, socioeconomic status (SES), metropolitan statistical area (MSA) status, parental status, crash history, vehicle year, and geographic region. For each seat-belt-use indicator (primary binary, adjusted binary, and semi-continuous), we estimated sets of model-averaged coefficients using a multimodel inference framework based on information criteria (e.g., Burnham & Anderson, 2004). Multimodel inference is a method in which one or more estimated models' coefficients and standard errors are averaged together, usually weighting the contribution of each individual model based on a fit metric such as the Akaike information criterion. The use of a multimodel inference approach tends to reduce parameter estimate bias by explicitly accommodating model selection uncertainty into the estimate of each parameter and its sampling variance.

Sampling-design-corrected Akaike information criteria (i.e., AICw; Lumley & Scott, 2015) were used, and the analysis was implemented using the MIINC module (Luchman, 2014) in Stata 15.1. We adhered to the most conservative approach in the multimodel inference framework by estimating all possible inclusion and exclusion combinations of the demographic and personal history variables, yielding a total of 2^{10} (1,024) models. A weight was derived for each model based on its sampling-design-corrected Akaike information value (i.e., AIC_w, Lumley & Scott, 2015). These weights were used to average the coefficients and their sampling variances/ standard errors across all models to derive a single set of coefficients.

For both the primary and adjusted binary seat-belt-use indicators, we selected logit models. Additionally, the logit link function obtained the lowest AIC index for both binary indicators. We modeled the semi-continuous scale using a standard linear regression, as it fared well in comparison to alternative, more complex models (e.g., gamma distribution). As noted above, all

models were adjusted for the sample design. We employed several different methods to evaluate the utility of the sampling weights (e.g., see Winship & Radbill, 1994), all of which pointed to the conclusion that the weights were non-negligible.

Results for analyses examining the relationships between demographic and personal history characteristics and seat belt use are reported in Table 3. A hypothesis for a given predictor was considered supported if the predictor was found to be statistically significant in at least two of the three models. Consistent with prior research (e.g., Li & Pickrell, 2018; Vaughn et al., 2012; Wilson, 1990), we found that being younger (*Hypothesis 1, H1*), male (*H2*), and single (*H4*) decreased the likelihood of reporting full-time seat belt use in two models (primary binary and semi-continuous indicators). We also found that being non-Hispanic White (*H3*) increased the likelihood of reporting full-time belt use in two models (adjusted binary and semi-continuous indicators). We did not find support for the hypotheses that having a higher SES (*H5*), being a parent (*H7*), or having a prior crash history (*H8*) increase the likelihood of full-time belt use, or that living in a rural area (*H6*) or driving/riding in an older car on a regular basis (*H9*) decrease the likelihood of full-time belt use. Finally, geographic region[2] was a strong predictor of seat belt use across all three models (for a map of regions and details of regional comparisons, see **Appendix B**, Research Question S1).

[2] Region 1 is composed of the Pacific U.S. Census Division (AK, CA, HI, OR, WA). Region 2 is composed of the Mountain (AZ, CO, ID, MT, NM, NV, UT, WY) and West North Central (IA, KS, MN, MO, ND, NE, SD) U.S. Census Divisions. Region 3 is composed of the West South Central (AR, LA, OK, TX), East South Central (AL, KY, MS, TN), and South Atlantic (DC, DE, FL, GA, MD, NC, SC, VA, WV) U.S. Census Divisions. Region 4 is composed of the East North Central (IL, IN, MI, OH, WI), Middle Atlantic (NJ, NY, PA), and New England (CT, MA, ME, NH, RH, VT) U.S. Census Divisions.

Table 3. Weighted Demographic and Personal History Variable Regression Coefficients for Seat-Belt-Use Outcome Variables

Variable	Hypothesis #, Support	Primary Binary Seat Belt Use			Adjusted Binary Seat Belt Use			Semi-Continuous Scale	
		B	*SE*	*OR*	*B*	*SE*	*OR*	*B*	*SE*
Age	1, Yes	**.0103**	**.0020**	**1.0104**	.0010	.0018	1.0010	**.0040**	**.0008**
Gender: Male (ref) vs. Female	2, Yes	**.1766**	**.0774**	**1.1931**	.0990	.0765	1.1041	**.0850**	**.0279**
Race/ethnicity: Not (ref) vs. Non-Hispanic White	3, Yes	.0252	.0586	1.0255	**.3430**	**.0750**	**1.4092**	**.0832**	**.0345**
Marital status: Not (ref) vs. Married	4, Yes	**.3449**	**.0774**	**1.4119**	.1574	.0838	1.1704	**.0845**	**.0350**
Socioeconomic status: Income	5, No	.0056	.0084	1.0056	-.0013	.0044	0.9987	**.0159**	**.0035**
Lives in MSA	6, No	.2177	.1127	1.2432	-.0210	.0585	0.9792	.0540	.0497
Parental status	7, No	-.0102	.0495	0.9899	.0306	.0672	1.0310	.0125	.0282
Past crashes	8, No	-.0265	.0578	0.9738	.0144	.0435	1.0146	.0433	.0362
Vehicle age	9, No	-.0067	.0071	0.9933	-.0001	.0025	0.9999	-.0034	.0030
Region: Region 1 (ref) vs.									
Region 2	Other, Yes	**-.5064**	**.1324**	**0.6027**	**-.4385**	**.1195**	**0.6450**	**-.2410**	**.0494**
Region 3	Other, Yes	**-.2735**	**.1131**	**0.7607**	**-.4293**	**.0994**	**0.6510**	**-.1668**	**.0368**
Region 4	Other, Yes	**-.6516**	**.1139**	**0.5212**	**-.8679**	**.1020**	**0.4198**	**-.3128**	**.0389**
(Model Intercept)		.4495	.2642	1.5676	.1484	.1912	1.1600	-.3370	.1114

Note: N = 5,644. Statistically significant effects (p < .05) are shown in bold. Statistical significance of model intercept is not noted. B = Unstandardized regression coefficient. SE = Standard error of unstandardized regression coefficient. OR = odds ratio. ref = reference level.

Research Question 5: Which Psychological Constructs Are Predictive of Full-Time Seat Belt Use?

In the previous Research Questions, we examined the prevalence of and reasons for seat belt use/non-use and investigated relationships between demographic variables (e.g., age, sex) and seat belt use. In Research Question 5, we investigated the relationships between seat belt use and the selected psychological constructs, specifically: existence of a seat belt decision rule, anger, delay of gratification, fatalism, government intervention orientation, hostility, impulsivity, life satisfaction, loneliness, optimism, political orientation, religiosity, risk aversion, risk perception, sensation-seeking, social norms espousal, social resistance orientation, and resistance to peer influence. Detailed information about how we selected this set of psychological constructs, including a review of supporting literature and hypotheses for each construct, can be found in *Volume 1: Methodology Report* (DOT HS XXX XXX). We have also noted hypotheses associated with each construct within our discussion of the results.

The analyses conducted for Research Question 5 paralleled our approach for Research Question 4. That is, we estimated three sets of model-averaged coefficients, one for each seat-belt-use indicator. Each coefficient and standard error estimate was model averaged using AIC_w value-based weights, and all models incorporated the complex sampling design. Finally, both the primary and adjusted binary seat-belt-use models were selected to be logit models, and the semi-continuous scale was modeled using a linear regression.

Our results for this set of analyses are reported in Table 4. As before, a hypothesis was considered supported if it was supported by the results of at least two of the three models. Impulsivity (*H16)*, risk aversion (*H22*), risk perception (*H23*), and social resistance orientation (*H26*) were significant predictors of seat belt use in all three models, in the hypothesized directions. People who were higher on impulsivity and social resistance orientation were less likely to use their seat belt than people who scored lower on these dimensions, while people who were more risk averse and perceived not wearing a seat belt as riskier were more likely to use their seat belt.

Delay of gratification (*H12*), life satisfaction (*H17*), risk aversion (*H22*), and risk perception (*H23*) were significantly associated with seat belt use in the hypothesized (positive) directions in two of the three models. Loneliness was positively associated with seat belt use (i.e., people who were higher on loneliness were more likely to wear a seat belt), which was the opposite of what we hypothesized (*H18*). Resistance to peer influence was also positively associated with seat belt use, although we had no a priori hypothesis regarding this relationship. Impulsivity (*H16*) and social resistance orientation (*H26*) were significantly associated with seat belt use in the hypothesized (negative) directions in two of the three models. We did not find evidence that having a seat-belt-use decision rule (*H10*), trait-based anger (*H11*), fatalism (*H13*), government intervention orientation (*H14*), hostility (*H15*), optimism (*H19*), political orientation (*H20*), religiosity (*H21*), sensation-seeking (*H24*), or social norms espousal (*H25*) were related to seat-belt-use.

Table 4. Weighted Averaged Regression Coefficients from Models Using Psychological Constructs to Predict Seat-Belt-Use Indicators

Variable	Hypothesis #, Support	Primary Seat Belt Use			Adjusted Seat Belt Use			Semi-Continuous Scale	
		B	*SE*	*OR*	*B*	*SE*	*OR*	*B*	*SE*
Decision Rule	10, No	.0046	.0372	1.0046	-.0114	.0391	0.9886	.0215	.0273
Anger	11, No	.0733	.0573	1.0760	.0169	.0387	1.0171	.0006	.0048
Delay of Gratification	12, Yes	-.0017	.0384	0.9983	**.1635**	**.0765**	**1.1776**	**.1005**	**.0256**
Fatalism	13, No	-.0578	.0426	0.9438	-.0008	.0134	0.9992	**-.0310**	**.0134**
Government Intervention Orientation	14, No	-.0026	.0227	0.9974	-.0197	.0353	0.9805	.0020	.0086
Hostility	15, No	-.0549	.0634	0.9466	-.0037	.0252	0.9963	-.0002	.0039
Impulsivity	16, Yes	**-.3052**	**.0876**	**0.7370**	**-.2034**	**.0890**	**0.8160**	**-.1211**	**.0329**
Life Satisfaction	17, Yes	**.1272**	**.0580**	**1.1357**	.0129	.0346	1.0130	**.0544**	**.0213**
Loneliness*	18, No	**.1961**	**.0606**	**1.2166**	.0220	.0475	1.0223	**.0379**	**.0186**
Optimism	19, No	.0320	.0712	1.0326	-.0049	.0308	0.9951	-.0076	.0224
Political Orientation: Conservatism	20, No	-.0012	.0143	0.9988	.0109	.0212	1.0109	-.0036	.0080
Religiosity	21, No	-.0509	.0265	0.9504	-.0093	.0174	0.9907	-.0120	.0095
Risk Aversion	22, Yes	**.5092**	**.0749**	**1.6640**	**.5176**	**.0710**	**1.6781**	**.1966**	**.0288**
Risk Perception	23, Yes	**.8426**	**.0549**	**2.3224**	**.6169**	**.0566**	**1.8532**	**.4454**	**.0254**
Sensation-Seeking	24, No	**-.1705**	**.0704**	**0.8432**	-.0247	.0518	0.9756	.0002	.0043
Social Norm Espousal	25, No	-.0372	.0669	0.9635	**-.2308**	**.0712**	**0.7939**	-.0167	.0245
Social Resistance Orientation	26, Yes	**-.2479**	**.0571**	**0.7804**	**-.1528**	**.0558**	**0.8583**	**-.1063**	**.0228**
Resistance to Peer Influence	None	.0493	.0770	1.0506	**.1765**	**.0845**	**1.1930**	**.0681**	**.0319**
(Model Intercept)		-3.9859	.7538	0.0186	-4.6315	.7706	0.0097	-2.9450	.2842

*Note: N = 5,644. Statistically significant effects (p < .05) are shown in bold. Statistical significance of model intercept is not noted. *Significant in two of three models but in the opposite direction predicted. B = Unstandardized regression coefficient. SE = Standard error of unstandardized regression coefficient. OR = odds ratio.*

Research Question 6: Do Any of the Psychological or Psychosocial Variables Measured Explain Observed Demographic or Regional Differences in Seat Belt Use?

In Research Questions 4 and 5, we found that seat belt use was significantly predicted by demographic and personal history characteristics, as well as by several psychological constructs. However, demographic characteristics likely covary with personality traits and other psychological constructs; for example, some studies suggest that younger people are less likely to perceive health-threatening activities as risky compared to older people (e.g., Cohn et al., 1995). Thus, to determine whether the examined psychological constructs explained—entirely or in part—the observed associations between demographic variables and seat belt use, we conducted mediation analyses (Baron & Kenny, 1986). In this study, mediation analyses are intended to determine whether a given demographic variable (e.g., age) affects seat belt use directly, or indirectly via mediating variable like a psychological construct.

For the mediation analyses, we only modeled the primary binary seat-belt-use indicator, as it was the broadest, most general seat-belt-use metric, and modeling more than one seat-belt-use indicator would have yielded an impractically large volume of results. We also focused only on the demographic and personal history characteristics that were significantly associated with the primary binary seat-belt-use indicator in Research Question 4, that is: age, gender, marital status, and geographic region (Geographic Region 1 vs. 2, 3, or 4). Finally, we also included two psychosocial variables in the set of possible mediating variables: the degrees to which respondents endorse descriptive and injunctive norms.

We used a mediated generalized structural equation model to conduct a series of logistic regressions that were adapted for evaluating the effect of different odds ratio effects, as translated across the mediation variables into direct and indirect effect components (e.g., Buis, 2010). As for previous research questions, the models were adjusted for the complex sample design. The mediation analyses were structured so that, in the first stage, each significant demographic variable from Research Question 4 was separately predicted by each psychological construct from Research Question 5. In the second stage, each significant demographic variable separately predicted the primary binary seat-belt-use metric. In addition, in this second stage, each psychological construct also predicted the primary binary seat-belt-use metric. In this framework, the "indirect" effects refer to the product of the paths linking each significant demographic variable to each psychological construct and, subsequently, each psychological construct to seat belt use. "Direct" effects refer to the paths linking each significant demographic variable to seat belt use, independent of the psychological constructs.

Results of the mediation analyses are reported in Table 5. The results indicated that several psychological and psychosocial variables explain, at least in part, the association between the demographic variables and seat belt use. Religiosity, risk aversion, risk perception, and descriptive norms significantly mediated the effects of age, gender, marital status, and two of three regional differences. Social resistance orientation significant mediated the effects of age, marital status, and one of the regional comparisons. Loneliness and sensation-seeking significantly mediated the effects of all three demographic variables but none of the regional differences. Together, these findings suggest that differences in psychological and psychosocial constructs partly underlie observed effects of demographic variables on seat belt use. After including all mediators, the direct effects of age, gender, and one of the regional comparisons on

seat belt use were no longer significant. However, significant direct effects on seat belt use persisted for marital status and two regional comparisons (Geographic Region 2 vs. 1, and 4 vs. 1). That is, the psychological and psychosocial variables did not fully explain the difference in seat belt use between married and unmarried respondents, or between residents of these geographic regions.

Table 5. Weighted Demographic Indirect Effects for Primary Binary Seat Belt Use Outcome Variable

	Age			Gender: Male (ref) vs. Female			Marital Status: Not (ref) vs. Married		
Variable	*B*	*SE*	% of Total	*B*	*SE*	% of Total	*B*	*SE*	% of Total
Decision Rule	< .0001	.0000	-0.02%	.0027	.0033	1.75%	.0010	.0015	0.18%
Anger	-.0006	.0004	-3.68%	-.0027	.0029	-1.76%	-.0070	.0060	-1.29%
Delay of Gratification	< .0001	.0001	0.19%	.0004	.0015	0.26%	.0021	.0104	0.39%
Fatalism	.0002	.0002	1.50%	.0002	.0022	0.14%	.0015	.0025	0.27%
Government Intervention Orientation	.0001	.0001	0.42%	-.0052	.0059	-3.41%	.0074	.0093	1.35%
Hostility	.0008	.0007	4.93%	-.0004	.0017	-0.27%	.0144	.0150	2.64%
Impulsivity	.0005	.0004	3.33%	.0029	.0030	1.90%	.0167	.0131	3.07%
Life Satisfaction	.0007	.0004	4.36%	.0025	.0029	1.63%	.0323	.0257	5.91%
Loneliness	**-.0013**	**.0004**	**-8.35%**	**-.0188**	**.0076**	**-12.20%**	**-.0343**	**.0104**	**-6.29%**
Optimism	< .0001	.0005	0.07%	.0001	.0027	0.04%	.0014	.0111	0.27%
Political Orientation: Conservatism	.0001	.0004	0.43%	-.0004	.0072	-0.26%	.0020	.0142	0.38%
Religiosity	**-.0008**	**.0003**	**-4.90%**	**-.0139**	**.0066**	**-9.03%**	**-.0290**	**.0116**	**-5.31%**
Risk Aversion	**.0025**	**.0005**	**15.73%**	**.0909**	**.0161**	**59.12%**	**.0409**	**.0112**	**7.50%**
Risk Perception	**.0024**	**.0005**	**15.28%**	**.0993**	**.0178**	**64.60%**	**.0799**	**.0182**	**14.63%**
Sensation-seeking	**.0023**	**.0009**	**14.45%**	**.0384**	**.0145**	**24.96%**	**.0371**	**.0157**	**6.79%**
Social Norm Espousal	-.001	.0006	-6.43%	.0002	.0024	0.11%	-.0207	.0112	-3.80%
Social Resistance Orientation	**.0027**	**.0008**	**17.06%**	.0048	.0057	3.11%	**.0709**	**.0218**	**12.98%**
Resistance to Peer Influence	.0004	.0003	2.41%	.0056	.0048	3.67%	.0055	.0049	1.00%
Descriptive Norms	**.0086**	**.0010**	**54.24%**	**.0744**	**.0214**	**48.41%**	**.1784**	**.0263**	**32.68%**
Injunctive Norms	-.0008	.0007	-5.21%	-.0082	.0073	-5.32%	-.0200	.0163	-3.67%
Direct Effect	-.0009	.0023	-5.79%	-.1191	.0781	-77.49%	**.1656**	**.0791**	**30.33%**

Note: N ranges from 5,602 to 6,036. Statistically significant effects (p < .05) are shown in bold. Model intercepts are not reported. B = Unstandardized regression coefficient. SE = Standard error of unstandardized regression coefficient. % of Total = the percentage of the total effect comprising each indirect effect. ref = reference level.

Table 5 (cont.). Weighted Demographic Indirect Effects for Primary Binary Seat Belt Use Outcome Variable

	Geographic Region 1 (ref) vs. 2			Geographic Region 1 (ref) vs. 3			Geographic Region 1 (ref) vs. 4		
Variable	*B*	*SE*	*% of Total*	*B*	*SE*	*% of Total*	*B*	*SE*	*% of Total*
Decision Rule	-.0023	.0032	0.38%	-.0008	.0017	0.25%	.0006	.0017	-0.08%
Anger	-.0001	.0034	0.01%	-.0009	.0029	0.28%	-.0045	.0043	0.56%
Delay of Gratification	.0004	.0016	-0.07%	-.0007	.0023	0.24%	< .0001	.0007	< 0.01%
Fatalism	.0064	.0057	-1.07%	.0037	.0042	-1.20%	-.0015	.0034	0.19%
Government Intervention Orientation	.0121	.0123	-2.02%	.0086	.0089	-2.79%	.0060	.0064	-0.75%
Hostility	-.0030	.0040	0.51%	-.0014	.0028	0.46%	-.0005	.0027	0.07%
Impulsivity	-.0019	.0040	0.32%	-.0036	.0040	1.16%	.0009	.0035	-0.12%
Life Satisfaction	.0041	.0055	-0.69%	.0001	.0039	-0.05%	-.0033	.0044	0.42%
Loneliness	.0009	.0107	-0.16%	.0062	.0089	-2.01%	-.0012	.0087	0.16%
Optimism	-.0002	.0011	0.03%	-.0002	.0010	0.06%	.0008	.0041	-0.10%
Political Orientation: Conservatism	-.0006	.0110	0.10%	-.0006	.0116	0.21%	-.0001	.0014	0.01%
Religiosity	**-.0183**	**.0093**	**3.06%**	**-.0256**	**.0109**	**8.32%**	-.0045	.0053	0.56%
Risk Aversion	-.0027	.0176	0.46%	**.0361**	**.0163**	**-11.77%**	**.0322**	**.0159**	**-4.05%**
Risk Perception	**-.0804**	**.0301**	**13.46%**	-.0162	.0238	5.29%	**-.0804**	**.0252**	**10.11%**
Sensation-Seeking	.0100	.0081	-1.67%	.0158	.0087	-5.13%	.0149	.0086	-1.88%
Social Norm Espousal	.0032	.0046	-0.53%	-.0055	.0046	1.81%	-.0029	.0040	0.37%
Social Resistance Orientation	**.0329**	**.0147**	**-5.51%**	.0227	.0118	-7.40%	.0279	.0126	-3.51%
Resistance to Peer Influence	.0005	.0026	-0.08%	.0012	.0026	-0.40%	-.0017	.0027	0.21%
Descriptive Norms	**-.2916**	**.0452**	**48.84%**	**-.1811**	**.0340**	**58.94%**	**-.2440**	**.0376**	**30.70%**
Injunctive Norms	.0265	.0218	-4.44%	.0150	.0128	-4.89%	.0225	.0186	-2.83%
Direct Effect	**-.2930**	**.1489**	**49.07%**	-.1801	.1320	58.64%	**-.5561**	**.1300**	**69.96%**

Note: N ranges from 5,602 to 6,036. Statistically significant effects (p < .05) are shown in bold. Model intercepts are not reported. B = Unstandardized regression coefficient. SE = Standard error of unstandardized regression coefficient. % of Total = the percentage of the total effect comprising each indirect effect. ref = reference level.

Research Question 7: Which Non-Social Situational Factors Appear to Influence Seat Belt Use?

In addition to psychological and psychosocial predictors of seat belt use, we also examined the effects of non-social situational factors (e.g., seating position, time of day).[3] Similar to earlier analyses**,** we estimated model-averaged coefficients using AIC_w value-based weights and adjusting, based on the complex sample design. However, this research question differed from previous questions in that our analyses of the eight relevant situational variables were structured as a within-person, or panel, analysis. That is, responses to the eight situation questions (i.e., Q8_1 – Q8_8) were considered repeated measures of a single seat-belt-use indicator, with the different situational questions structured as a within-person varying set of predictors. Because of the way the questions were phrased and their similarity in format (i.e., Likert scales), one of the most efficient ways to test for differences across questions was as a within-person analysis. In this way, each person's random effect could adjust responses within a respondent for the tendency to be a seat belt user or not irrespective of the situation and provide a better estimate of each situation's effect on seat belt use as distinguished from any one person's response tendencies.

The model used in this analysis was an ordered logit regression, with fixed, ordered logit equation cut points (i.e., the ordered logit model's multivariate analog to a model intercept) estimated across the entire sample. A between-person random effect was also estimated for each respondent, which permitted a respondent-by-respondent "offset" in terms of their tendency to endorse seat belt use across all eight situations. In addition, all demographic, personal history, psychological, and psychosocial variables were included as predictors of each respondent's random effect/offset value to control for alternative explanations for the non-social situations' effects. Hypotheses were tested through pairwise, design-adjusted, Bonferroni-corrected Wald tests using marginal effects based on the coefficients and standard errors estimated through model averaging.

The results for this analysis are reported in Table 6. In a model that also includes all demographic, personal history, psychological, and psychosocial variables, individuals were less likely to report wearing a seat belt in nearly all examined situations relative to driving. People reported being less likely to wear a seat belt when riding as a back-seat passenger, in a taxi or rideshare, or in a work vehicle, relative to when driving. Pairwise comparisons between situations indicated that individuals were less likely to wear a seat belt when riding in a taxi than in either a ride share or work vehicle (*H27*). Similarly, riding in a ride-share decreased the likelihood of wearing a seat belt relative to riding or driving in a work vehicle (*H28*). However, there was no difference between likelihood of seat belt use when driving or riding as a passenger at night versus during the day (*H29*). Finally, while riding as a front-seat passenger had no effect on seat belt use relative to driving (*H31*), riding as a back-seat passenger decreased the likelihood of seat belt use relative to driving (*H30*).

[3] Non-social situational factors (e.g., seating position, time of day) contrast with social situational factors (not reported here), like the presence of friends, family, spouses, or children in the vehicle.

Table 6. Weighted Non-Social Situational Variable Regression Coefficients for Seat-Belt-Use Outcome Variables

	Within-Person Seat Belt Use		
Variable	*B*	*SE*	*OR*
Non-Social Situation[1]			
Driving (ref) vs.			
Front-Seat Passenger	-0.0823	0.0734	0.9210
Back-Seat Passenger	**-3.3360**	**0.1003**	**0.0356**
Taxi	**-4.1742**	**0.1128**	**0.0154**
Ride Sharing	**-3.2632**	**0.1161**	**0.0383**
Work Vehicle	**-1.3876**	**0.1195**	**0.2497**
Work Vehicle (ref) vs.			
Taxi	**-2.7866**	**0.1269**	**0.0616**
Ride Sharing	**-1.8756**	**0.1225**	**0.1533**
Ride Sharing (ref) vs. Taxi	**-0.9110**	**0.0638**	**0.4021**
Day (ref) vs. Night	-.0219	.0449	0.9783
Geographic Region: Region 1 (ref) vs.			
Region 2	**-0.8562**	**0.2449**	**0.4248**
Region 3	**-1.1296**	**0.2116**	**0.3232**
Region 4	**-1.8690**	**0.2079**	**0.1543**
Vehicle Age	0.0050	0.0113	1.0050
Past Crashes	**-0.3578**	**0.1460**	**0.6992**
Socioeconomic Status: Income	-0.0129	0.0174	0.9872
Lives in Metropolitan Statistical Area	-0.3072	0.2074	0.7355
Age	**-0.0192**	**0.0052**	**0.9809**
Gender: Male (ref) vs. Female	**-0.2872**	**0.1358**	**0.7503**
Race/Ethnicity: Not (ref) vs. Non-Hispanic White	**0.7401**	**0.1567**	**2.0962**
Marital Status: Not (ref) vs. Married	-0.0119	0.1575	0.9882
Parent Status	0.0167	0.1804	1.0168
Decision Rule	0.1356	0.1257	1.1452
Religiosity	-0.0133	0.0416	0.9868
Political Orientation: Conservatism	-0.0195	0.0569	0.9807
Fatalism	-0.0639	0.0654	0.9381
Risk Perception	**1.3022**	**0.0923**	**3.6772**
Anger	0.1017	0.1034	1.1070
Delay of Gratification	**0.5810**	**0.1368**	**1.7878**
Government Intervention Orientation	-0.0734	0.0882	0.9292
Impulsivity	-0.3040	0.1933	0.7379
Life Satisfaction	0.1659	0.0990	1.1805
Loneliness	**0.2849**	**0.0968**	**1.3296**
Optimism	0.0312	0.1336	1.0317
Resistance to Peer Influence	0.2883	0.1498	1.3341
Risk Aversion	**0.8748**	**0.1426**	**2.3983**
Sensation-Seeking	-0.1004	0.1219	0.9045
Social Norm Espousal	**-0.2581**	**0.1309**	**0.7725**
Social Resistance Orientation	-0.0946	0.1142	0.9097
Hostility	-0.1286	0.0983	0.8793
Descriptive Norms	**1.3647**	**0.1717**	**3.9146**

Table 6. Weighted Non-Social Situational Variable Regression Coefficients for Seat-Belt-Use Outcome Variables

	Within-Person Seat Belt Use		
Variable	*B*	*SE*	*OR*
Injunctive Norms	0.0474	0.1399	1.0485
(Model Intercept: *Never* to *Rarely*)	4.7908	1.6700	
(Model Intercept: *Rarely* to *Some of the time*)	6.3269	1.6715	
(Model Intercept: *Some of the time* to *Most of the time*)	7.7112	1.6730	
(Model Intercept: *Most of the time* to *All of the time*)	9.6618	1.6764	
(Variance of between-person offsets)	10.8089	0.5777	

Note: $N_{between}$ = 5,333. N_{within} = 34,802. Statistically significant effects (p < .05) are shown in bold. Statistical significance of model intercepts and between-person variance are not noted. B = Unstandardized regression coefficient. SE = Standard error of unstandardized regression coefficient. OR = odds ratio. [1] Although not all pairwise comparisons between Non-Social Situations are reported, statistical significance of the reported comparisons was Bonferroni-corrected for all possible comparisons between situations (n = 28) ref = reference level.

Discussion

The results of the *PCRSBU* survey confirmed several of the demographic associations with seat belt use observed in prior research (e.g., Vivoda & Eby, 2011), including higher seat belt use among women, non-Hispanic Whites, married individuals, and older age groups. Additionally, several psychological and psychosocial variables were associated with seat belt use in the hypothesized direction, including delay of gratification, impulsivity, life satisfaction, risk aversion, risk perception, social resistance orientation, and resistance to peer influence. Outside of the traffic safety domain, many of these psychological constructs have been linked to risky health behaviors, more generally; this study extends those findings to a novel risky behavior, that of seat belt non-use.

Because psychological and psychosocial factors are likely to covary with demographics, we also conducted a set of mediation analyses to determine whether observed associations between demographic factors and seat belt use could be explained—at least in part—by the mediating influence of psychological factors (e.g., whether differences in seat belt use by age can be explained by psychological and psychosocial differences between younger and older people). The mediation analyses showed that several psychological and psychosocial variables significantly mediated the relationships between demographic factors and seat belt use. In some cases, no direct effect of the demographic factors remained after including the psychological mediators, suggesting that these psychological influences may be useful for explaining observed differences in seat belt use by demographic groups. In other cases, a significant effect between the demographic variable and seat belt use remained, suggesting that additional variables not captured in this study (e.g., State laws, latent cultural variables) influence seat belt use independent of the demographic, psychological, and psychosocial factors measured in this survey.

A limitation of this study was that we operationalized our dependent variable of interest (seat belt use) in three different ways. Although we considered a hypothesis for a given variable supported if it was significant in the predicted direction in two of three models, it is possible that some supported results were, in fact, false positives. In addition, the two-out-of-three threshold was not as conservative an approach to correction for multiple tests of the same hypothesis relative to other approaches, like Bonferroni correction.[4] Yet, while the differences we observed across the three seat belt use indicators suggest that there is value in asking participants about belt use in different ways, additional research is needed to determine the optimal way to measure belt use in a survey—that is, the measure that most accurately reflects actual behavior.

Additionally, all dependent variables reflected drivers' self-reported seat belt use behaviors, and self-report measures are subject to social desirability bias (e.g., van de Mortel, 2008). Although recent studies have found a strong correlation between self-reported and observed seat belt use (Ibrahimova et al., 2011; Shakya et al., 2020), self-reported seat belt use in the current study may be biased if social desirability differentially influences drivers with different demographic, psychological, or psychosocial characteristics, or when drivers are recalling different non-social situations (e.g., taxis, ride-shares, or work vehicles). Despite this limitation in the accuracy of

[4] Note, however, that the Bonferroni test is overly conservative in cases where outcome measurements are not independent (as is the case here) (Bland & Altman, 1995).

self-reported seat belt use, self-report is a useful way to gather information about psychological and psychosocial factors that are difficult to measure directly.

Another limitation of the study was the fact that we only measured individual-level influences on seat belt use like demographic, psychological, and psychosocial factors. However, seat belt use behavior is influenced by higher-level factors, as well, like community, State, and national laws and culture. Indeed, we found that some regional differences in seat belt use were not fully explained by differences on psychological or psychosocial variables. Future research would benefit from a multi-level approach that combines the current study's focus on individual-level influences with information about State- or regional-level influences on seat belt use (e.g., Molnar et al., 2012).

A final limitation of the current study is that the mediation analyses we conducted assumed that psychological/psychosocial mediators *cause* seat belt use. However, there may be variables omitted from the current study that jointly cause a mediator and seat belt use, i.e., confounding variables. In this case, interventions developed to cause changes on a psychological/psychosocial dimension (and, thus, seat belt use) may be ineffective because they do not address the underlying factors.

Even with the limitations, the results of this study (and resulting study dataset) may be useful to those seeking both to identify those at higher risk of seat belt non-use and to develop countermeasures targeted at high-risk occupants. The mediation analyses demonstrated that the effects of psychological/psychosocial influences may underlie apparent differences in seat belt use by different demographic groups. This information can be used by those developing programs aimed at specific, or high-risk, sub-groups. For example, risk perception emerged as a critical mediator of the effect of gender on seat belt use. Thus, education programs or messaging campaigns aimed at males—who typically exhibit lower seat belt use than females—may benefit from incorporating content designed to increase males' perceived risk of belt non-use.

Additionally, endorsement of social norms—the degree to which people believed that their friends, family, and peers wore seat belts—significantly mediated all examined demographic effects (i.e., age, sex, marital status, and regional differences). Social norms campaigns have shown promise in reducing alcohol-impaired driving and speeding (Richard et al., 2018), and the current results suggest that social norms may also have value for altering seat belt use behavior. Further development of messages that use the psychological constructs shown to resonate with the target audience and that stress social norms are likely to help us increase seat belt use in all situations, at all times.

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APPENDIX A: DATA MANAGEMENT

Predictor Variables

Predictor variables were recoded to negate the distinction between the adult and teen sample and to reflect the hypothesis that was to be tested for each.

Demographic and personal history variables

Adult and teen variable merges. The separation between the adult and teen versions of the variables in the data was implemented due to the way in which the respondents were sampled, and separation was not an important distinction for analysis. The teen and adult versions of six variables were combined at this stage. First, the primary seat-belt-use indicator (*DOV_Assign*) was recoded so that there was no adult and teen distinction among its responses (this information was, however, retained through the age variable). The additional recodes concerned gender (*ppgender_Teen* and *PPGENDER* to create *PPGENDER_Final*), race and ethnicity (*ppethm_Teen* and *PPETHM* to create *PPETHM_Final*), age (*dov_teen_age* and *PPAGE* to create *PPAGE_Final*), religiosity (*Q31* and *ppp20072* to create *RELIGIOSITY_Final*), and political orientation (*Q32* and *ppp10012* to create *POLORIENT_Final*). Once combined, some of these variables were transformed further, as discussed below.

Race and ethnicity. The race and ethnicity variable (*PPETHM_Final*) was recoded so that non-Hispanic White was scored as 1 and all other non-missing responses were coded as 0. This recode permitted testing of Hypothesis 3.

Marital status. Marital status (*PPMARIT*) was recoded so that married was scored as 1 and all other non-missing responses were coded as 0. This recode permitted testing of Hypothesis 4.

Socioeconomic status (SES). SES was represented in this analysis by household income (*PPINCIMP*). Although education is commonly combined with income to form an SES composite variable (e.g., Hauser, 1994; Shavers, 2007), the composition of the sample is such that a noteworthy subpopulation (i.e., teens) could not have been able to attain education beyond "some high school." By comparison, household income describes the income of the household of the respondent as a whole, which is more likely better able to describe the SES of teens as well as adults in a single variable.

Crash history. Crash history (Q16) was recoded so that endorsing the question was scored as 1 and all other non-missing responses were coded as 0. This recode resulted in a more interpretable set of results for crash history in the tables and results involving this variable.

Descriptives. Survey weighted descriptive statistics for the above demographic and personal history variables are provided in Table A1.

Table A1. Survey Weighted Descriptive Statistics for Recoded Demographic and Personal History Variables

Variable	Percent
Q15: Vehicle year	
2015 – 2019	31.54%
2014 – 2010	30.09%
2009 – 2005	21.00%
2004 and prior	17.36%
Q16: Crash history	
No	34.79%
Yes	65.21%
XNHTSA: NHTSA-defined geographic region	
Region 1	16.54%
Region 2	13.82%
Region 3	37.42%
Region 4	32.22%
ppage: Age	
Mean (Standard Deviation)	46.65 (17.99)
ppgender: Gender	
Male	48.35%
Female	51.65%
ppmsacat: Metropolitan statistical area (MSA) status	
Non-metro	13.56%
Metro	86.44%
ppethm: Race/ethnicity	
Non-Hispanic White	63.37%
Not Non-Hispanic White	36.63%
ppmarit: Marital status	
Married	56.66%
Not married	43.34%
core_par: Parent/Stepparent/Adoptive parent of Children age 0–17 in Household (Parental status)	
No	78.18%
Yes	21.82%
ppincimp: Household income	
$34,999 or less	22.57%
$74,999 to $35,000	27.15%
$124,999 to $75,000	25.71%
$125,000 and more	24.56%

Note: Ns range from 6,038 to 5,873, depending on variable.

Psychological, psychosocial, and social-situational variables

Recodes. Several psychological and social-situational scale variables were recoded to improve the interpretability of their results. Q6 was recoded so that having a seat-belt-use decision rule was associated with high scores. *RELIGIOSITY_Final* was recoded so that more religious participants had higher scores. Q9's questions were recoded so that higher scores corresponded with being more likely to wear a seat belt in the presence of the specific person and lower scores corresponded to being less likely to wear a seat belt in the presence of the specific person

referenced. A "specific other" composite variable that averaged the responses across all six of Q9's questions was also created, with the contributing variables standardized before calculating the mean.

Scale score generation. All psychological scales with two items or more were aggregated using the mean value across all items comprising each scale. Each scale's internal consistency reliability, as estimated using Cronbach's alpha, was also evaluated to confirm that the scale performed satisfactorily with the present sample.

Descriptives. The descriptive statistics for all psychological and psychosocial scales, as well as the social-situational variables and corresponding "specific other" scale, are provided in Table A2.

Table A2. Weighted Statistics for Psychological and Psychosocial Scales as well as Social-Situational Variables After Recoding

Variable	Mean	*SD*	Coefficient Alpha	Survey Questions
POLORIENT_Final: Political Orientation: Conservatism	4.07	1.54	.	n/a—profile variable
RELIGIOSITY_Final: Religiosity	4.00	1.73	.	n/a—profile variable
Decision Rule	0.53	0.50	.	*Q6*
Fatalism	2.67	1.15	.68	*Q20 Q21*
Risk Perception	4.63	0.75	.74	*Q18 Q19*
Anger	2.25	0.80	.77	*Q23_1* Q23_2–Q23_3 Q24_1 – Q24_2 Q24_3* Q24_4* Q24_5* Q24_6–Q24_8 Q24_9**
Delay of Gratification	3.41	0.55	.79	*Q24_10* Q24_11* Q24_12**
Government Intervention Orientation	3.52	0.92	.84	*Q28_1–Q28_4 Q22_1* Q22_2* Q22_3 Q22_4* Q22_5* Q22_6 Q22_7* Q22_8-*
Impulsivity	2.31	0.54	.86	*Q22_10 Q22_11* Q22_12* Q22_13**
Life Satisfaction	3.32	0.81	.88	*Q27_7–Q27_11 Q27_12* Q27_13* Q27_14 Q27_15**
Loneliness	2.45	0.76	.85	*Q27_16 Q27_1 Q27_2* Q27_3 Q27_4* Q27_5**
Optimism	3.36	0.67	.82	*Q27_6 Q26_1 Q26_2* Q26_3-Q26_5 Q26_6**
Resistance to Peer Influence	2.97	0.49	.78	*Q26_7-Q26_9 Q26_10* Q17_1* Q17_2* Q17_3* Q17_4**
Risk Aversion	4.35	0.59	.72	*Q17_5* Q17_6**
Sensation-Seeking	2.47	0.70	.81	*Q23_7–Q23_14 Q25_1 Q25_2* Q25_3* Q25_4-Q25_7 Q25_8* Q25_9-Q25_11 Q25_12**
Social Norms Espousal	3.12	0.50	.83	*Q25_13**
Social Resistance Orientation	1.91	0.79	.80	*Q29_5–Q29_8*
Hostility	2.51	0.83	.75	*Q23_4–Q23_6*
Descriptive Norms	4.34	0.67	.85	*Q12_1-Q12_3*
Injunctive Norms	4.46	0.72	.90	*Q13_1-Q13_3*
Seat Belt Use — Not Alone	4.70	0.78	.	*Q8_9*
Seat Belt Use — Alone	4.67	0.85	.	*Q8_10*
Seat Belt Use — Friend	2.08	0.33	.	*Q9_1*
Seat Belt Use — Child	2.15	0.38	.	*Q9_2*

Table A2. Weighted Statistics for Psychological and Psychosocial Scales as well as Social-Situational Variables After Recoding

Variable	Mean	*SD*	Coefficient Alpha	Survey Questions
Seat Belt Use — Teen	2.13	0.37	.	*Q9_3*
Seat Belt Use — Parent	2.12	0.36	.	*Q9_4*
Seat Belt Use — Other Family	2.11	0.35	.	*Q9_6*
Significant Other Seat Belt Use	4.71	0.76	.	*Q14*
Special Other Scale	-0.01	0.81	.88	*Q9_1-Q9_4 Q9_6 Q14**

Note: N ranges from 4,804 to 6,036. Starred questions were reverse coded.

Seat Belt Use Indicators

Adjusted binary seat-belt-use-indicator

The primary indicator of seat belt use combined participants' responses regarding wearing one's seat belt (global assessment), the last time not wearing a seat belt when driving, and the last time not wearing a seat belt as a passenger (Q3, Q4, and Q5, respectively).

However, Q3, Q4, and Q5 were not the only questions about seat belt use included in the survey. Questions 8 asked respondents about their seat belt use in 10 different situations, such as while "driving," "in a taxi," or "at night." Responses to these 10 questions were used to adjust the primary seat-belt-use indicator; this adjusted variable served as our secondary seat-belt-use indicator. More specifically, respondents who were classified as *always* seat belt users on the primary seat-belt-use indicator yet who also indicated that they did not *always* wear their seat belt in all 10 situations were reclassified as *not-always* seat belt user on this secondary seat-belt-use indicator. Refused responses as well as *not applicable* responses were not counted toward the *not-always* reclassification. Thus, if a respondent noted *always* to nine of the 10 Q8 questions but refused to answer one, they would not be reclassified as a *not-always* seat belt user, as all of their valid Q8 responses were *always*. Table A3 summarizes these reclassifications. Thus, the first row reports the number of always and not-always respondents in the data. The second row shows the number that were reassigned based on the variable in the first column along with the updated number of respondents in each response category. For example, 62 respondents were reassigned from *always* responses on *DOV Assign* to *not-always*, owing to their responses to *Q8_1*.

Table A3. Seat Belt Use Reassignment Based on Responses to Questions 8

Question	Always Respondents	Number re-assigned to Not Always	Not-Always Respondents
DOV_Assign	3,992	-	2,046
Q8_1: Seat Belt Use – Driving	3,930	62	2,108
Q8_2: Seat Belt Use – Front Seat Passenger	3,898	32	2,140
Q8_3: Seat Belt Use – Back Seat Passenger	3,155	743	2,883
Q8_4: Seat Belt Use – Taxi	2,858	297	3,180
Q8_5: Seat Belt Use – Ride Sharing	2,837	21	3,201
Q8_6: Seat Belt Use – Work Vehicle	2,814	23	3,224
Q8_7: Seat Belt Use – Day	2,806	8	3,232
Q8_8: Seat Belt Use – Night	2,803	3	3,235

Table A3. Seat Belt Use Reassignment Based on Responses to Questions 8

Question	Always Respondents	Number re-assigned to Not Always	Not-Always Respondents
Q8_9: Seat Belt Use – Not Alone	2,791	12	3,247
Q8_10: Seat Belt Use – Alone	2,784	7	3,254

Semi-continuous seat-belt-use indicator

Lastly, we generated a third seat-belt-use indicator—this time, a semi-continuous scale—using a multiple correspondence analysis (MCA). MCA is a categorical data, or cross-tabulation-based, generalization of the more commonly known principal components analysis (PCA). Both MCA and PCA are based on eigenvalue decomposition of question response matrices. PCA is a decomposition based on the Pearson product-moment correlation matrix of the questions in the analysis. MCA differs from the PCA in that it does not require an ordered structure to the question responses on each survey item. As opposed to the Pearson product-moment correlation matrix, MCA uses Burt tables, which are built from question–response option frequencies for each possible cross-tabulation of the input questions and are structured like a covariance matrix. An MCA-based approach is advantageous for the present work, as it can examine variables category by category. As such, it is better able to accommodate the many unordered categorical variables present in the current survey and does not force a rigid linear relationship on each set of responses.

For consistency with *DOV_Assign* and *Seat_Belt_Bin*, each of the questions included in the analysis (i.e., Q3, Q4, Q5, and Q8_1 through Q8_10) were recoded so that the only valid responses were *always* and *not always*. In addition, *refused* and *valid skip* responses were permitted to be entered into the analysis as separate categories in order to ascertain how they corresponded with valid responses. The MCA extracted 10 total dimensions, but the first one explained 72% of the inertia (i.e., the multivariate Chi-square value divided by the sample size; total inertia was .40).

This first dimension reflected a tendency among respondents to endorse *always* (i.e., negative values) versus *not always* (i.e., positive values) categories. *Refused* responses tended to be more similar to *not-always* responders and *not applicable* responses tended to split across *always* and *not-always* responses in terms of similarity on the underlying dimension.

Predicted scores on the dimension were obtained but reverse coded so that higher values corresponded with greater seat belt usage. The predicted scores on this first dimension were used as our third, semi-continuous seat-belt-use indicator.

Descriptives. The descriptive statistics for each seat-belt-use indicator are provided in Table A4.

Table A4. Weighted Descriptive Statistics for Demographic and Personal History Variables After Recoding

Variable	Percentage
DOV_Assign: DOV Assignment Flag for Seat Belt Use	
Not Always	24%
Always	76%
Seat_Belt_Bin: Adjusted Seat Belt Use Assignment Flag	
Not Always	48%
Always	52%
Seat_Belt_Alt: Semi-continuous Seat Belt Use Scale	
Mean (Standard Deviation)	0.11 (0.94)

APPENDIX B: SUPPLEMENTAL FINDINGS

Research Question S1: How Does Seat Belt Use Differ by Geographic Region?

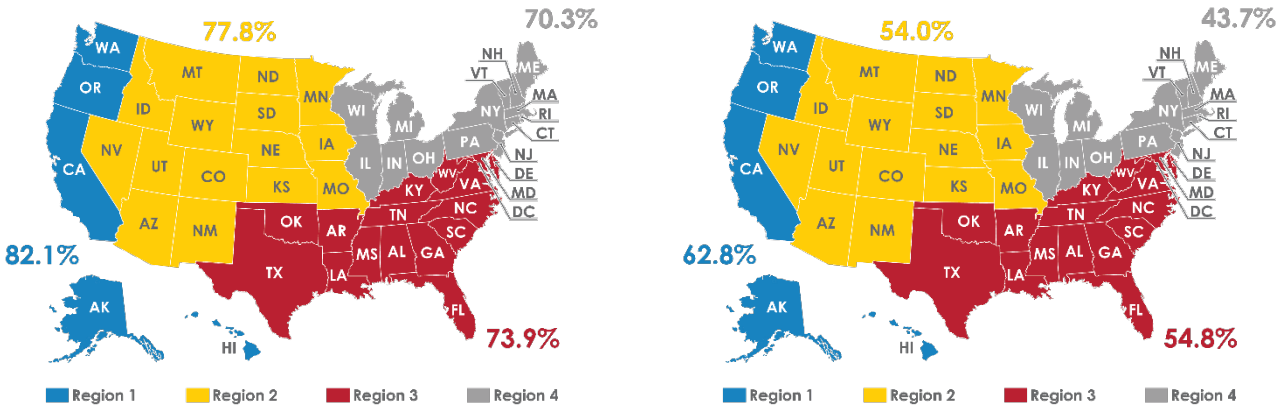
The research team computed survey design-adjusted proportions (primary and adjusted binary seat-belt-use indicators) and means (semi-continuous seat-belt-use indicator) separately for each of four U.S. geographic regions (Table S1).

Table S1. Weighted Descriptive Statistics for Seat-Belt-Use Indicators by Geographic Region

	Seat-Belt-Use Indicator					
	Primary Binary		Adjusted Binary		Semi-Continuous Scale	
Geographic Region	*% Always*	*SE*	*% Always*	*SE*	*Mean*	*SE*
Region 1	82.11	1.34	62.78	1.06	0.31	.03
Region 2	73.91	1.62	54.84	1.98	0.07	.04
Region 3	77.79	.94	53.96	1.27	0.14	.02
Region 4	70.30	1.09	43.66	1.31	< -0.01	.02

Note: N = 6,038. SE = Standard error of the mean.

Figure S1. Map of Primary (Left) and Adjusted (Right) Binary Seat-Belt-Use Indicators by Geographic Region



Across all three seat-belt-use indicators, Geographic Region 1 (the Pacific U.S. Census Division) had the highest percentage of always seat belt users, and Geographic Region 4 (the New England, Mid-Atlantic, and East North Central U.S. Census Divisions) had the lowest. The research team statistically compared seat belt use across geographic regions using weighted linear regression (Bonferroni-corrected for multiple comparisons) (Table S2). Across all three indicators, full-time seat belt use in Geographic Region 1 was almost always significantly higher than that in the other three regions, while full-time belt use in Geographic Region 4 was almost always significantly lower than that in the other three regions. Full-time belt use did not differ between Geographic Regions 2 and 3.

Table S2. Weighted Regional Differences on Seat-Belt-Use Indicators

	Seat-Belt-Use Indicator					
	Primary Binary		Adjusted Binary		Semi-Continuous Scale	
Geographic Region	*Difference (% Always)*	*SE*	*Difference (% Always)*	*SE*	*Difference (Mean)*	*SE*
Region 1						
vs. Region 2	**8.21**	**2.11**	**7.94**	**2.72**	**0.24**	**.05**
vs. Region 3	4.32	1.64	**8.82**	**2.25**	**0.17**	**.04**
vs. Region 4	**11.82**	**1.73**	**19.12**	**2.27**	**0.31**	**.04**
Region 2						
vs. Region 3	-3.89	1.88	0.88	2.35	-0.06	.05
vs. Region 4	3.61	1.96	**11.17**	**2.37**	**0.08**	**.05**
Region 3						
vs. Region 4	**7.49**	**1.44**	**10.29**	**1.82**	**0.14**	**.03**

Note: N = 6,038. Differences estimated based on weighted linear regression. Statistically significant effects (p < .05, Bonferroni-adjusted) are shown in bold. SE = Standard error of the difference.

Research Questions S2 and S3: How Are Reasons for Wearing a Seat Belt Associated with Demographic Factors? How are Reasons for Wearing a Seat Belt Associated with Psychological and Psychosocial Factors?

We investigated patterns of endorsement of different seat-belt-use reasons by demographic variables (Research Question S2) and psychological and psychosocial factors (Research Question S3). To do so, we used survey design-weighted, generalized structural equation models adjusted for complex sampling design. Because the questions involved in this analysis were "mark all that apply" batteries, all potential reasons for wearing a seat belt were modeled simultaneously as a set of correlated, binary logistic regressions. However, although our analysis approach controlled for relationships among endorsed reasons, we only report results for the three most frequently endorsed reasons for seat belt use (i.e., avoid injury, habit, and adhere to the law) here for brevity.

To investigate Research Question S2, the 13 reasons for wearing a seat belt were each regressed onto all outcome variables from Research Question 4 (i.e., demographic, personal history, and regional variables). To investigate Research Question S3, the 13 reasons for wearing a seat belt were each regressed onto all psychological/psychosocial variables examined in Research Question 5. For both Research Questions S2 and S3, each seat-belt-use reason outcome variable was modeled as a logit regression. AIC_w-based model averaging was not applied to these models because of their large size, which would make model estimation impractical.

Research Question S2: How Are Reasons for Wearing a Seat Belt Associated with Demographic Factors?

Results are reported in Table S3. Gender was significantly associated with endorsement of the top three reasons for seat belt use. Consistent with their higher overall seat belt use, women were more likely to endorse these reasons than men. Marital status, income, and some regional differences also emerged as significant predictors of likelihood of endorsing these reasons for seat belt use.

Table S3. Demographic and Personal History Predictors of Most Frequently Endorsed Weighted Reasons for Seat Belt Use

	Avoid Injury			Habit			Adhere to Law		
Variable	*B*	*SE*	*OR*	*B*	*SE*	*OR*	*B*	*SE*	*OR*
Age	-0.0047	0.0040	0.9953	0.0051	0.0036	1.0051	0.0049	0.0035	1.0050
Gender: Male (ref) vs. Female	**0.4327**	**0.1320**	**1.5414**	**0.5039**	**0.1178**	**1.6551**	**0.7178**	**0.1119**	**2.0498**
Race/Ethnicity: Not (ref) vs. Non-Hispanic White	-0.1938	0.1651	0.8238	-0.1197	0.1431	0.8872	-0.2395	0.1407	0.7870
Marital Status: Not (ref) vs. Married	**0.3119**	**0.1597**	**1.3660**	**-0.0582**	**0.1401**	**0.9435**	0.1851	0.1335	1.2033
SES: Income	**0.0427**	**0.0165**	**1.0436**	**0.0614**	**0.0135**	**1.0633**	-0.0060	0.0132	0.9940
Lives in MSA	0.2503	0.1646	1.2845	0.2395	0.1478	1.2707	-0.0639	0.1864	0.9381
Parental Status	-0.1590	0.1840	0.8530	0.3224	0.1682	1.3804	-0.0583	0.1448	0.9433
Past Crashes	0.0762	0.1494	1.0792	-0.0602	0.1284	0.9416	-0.2026	0.1257	0.8166
Vehicle Age	-0.0118	0.0122	0.9883	-0.0134	0.0101	0.9867	0.0012	0.0095	1.0012
Geographic Region: Region 1 (ref) vs.									
Region 2	**-0.6443**	**0.2721**	**0.5250**	-0.3713	0.2291	0.6898	**-0.5934**	**0.2045**	**0.5524**
Region 3	-0.1005	0.2419	0.9044	0.0738	0.2157	1.0765	-0.1768	0.1872	0.8379
Region 4	-0.4110	0.2348	0.6630	**-0.4512**	**0.2098**	**0.6369**	**-0.4987**	**0.1805**	**0.6073**
(Model Intercept)	*2.1793*	*0.5172*	8.8403	1.0465	0.4105	2.8478	1.7308	0.4789	5.6450

Note: N = 5,737. Statistically significant effects (p < .05) are shown in bold. Statistical significance of model intercept is not noted. SES = socioeconomic status. MSA = metropolitan statistical area. ref = reference level.

Research Question S3: How Are Reasons for Wearing a Seat Belt Associated with Psychological and Psychosocial Factors?

Results are reported in Table S4. As with self-reported seat belt use (Research Question 5) itself, delay of gratification, risk aversion, risk perception, and resistance to peer influence were significant predictors of endorsing these three reasons for seat belt use. Additionally, the use of a decision rule, anger, fatalism, government intervention orientation, hostility, religiosity, and social norm espousal were all significant predictors of at least one of the three most frequently endorsed reasons for seat belt use, despite not being significant predictors of seat belt use, overall. Additionally, descriptive norms and injunctive norms emerged as significant predictors of these reasons for seat belt use. Descriptive norms were also a significant mediator of the effects of all demographic variables examined in the mediation analyses (Research Question 6).

Table S4. Psychological/Psychosocial Predictors of Most Frequently Endorsed Weighted Reasons for Seat Belt Use

	Avoid Injury			Habit			Adhere to Law		
Variable	*B*	*SE*	*OR*	*B*	*SE*	*OR*	*B*	*SE*	*OR*
Decision Rule	**0.4317**	**0.1550**	**1.5398**	**0.3996**	**0.1308**	**1.4912**	**0.4553**	**0.1186**	**1.5766**
Anger	**0.2363**	**0.1177**	**1.2666**	-0.0471	0.1041	0.9540	0.0864	0.0993	1.0902
Delay of Gratification	**0.4223**	**0.1678**	**1.5255**	0.2810	0.1488	1.3245	-0.2386	0.1323	0.7877
Fatalism	-0.1091	0.0744	0.8966	0.0205	0.0676	1.0207	**0.1953**	**0.0593**	**1.2157**
Government Intervention Orientation	**0.2418**	**0.0872**	**1.2736**	0.0488	0.0823	1.0500	**0.1612**	**0.0767**	**1.1750**
Hostility	-0.0300	0.1123	0.9704	0.0155	0.0947	1.0156	**0.4010**	**0.0937**	**1.4934**
Impulsivity	-0.2132	0.1713	0.8080	-0.0737	0.1522	0.9290	-0.2001	0.1686	0.8187
Life Satisfaction	0.0399	0.0979	1.0407	0.1068	0.1123	1.1127	-0.0593	0.0948	0.9424
Loneliness	0.0013	0.1222	1.0013	0.0989	0.1141	1.1040	-0.0154	0.0902	0.9847
Optimism	0.0616	0.1520	1.0636	-0.0050	0.1201	0.9950	0.0450	0.1194	1.0460
Political Orientation: Conservatism	-0.0233	0.0572	0.9769	-0.0340	0.0497	0.9666	-0.0084	0.0431	0.9916
Religiosity	-0.0040	0.0457	0.9960	0.0462	0.0381	1.0473	**0.0926**	**0.0371**	**1.0970**
Risk Aversion	0.2507	0.1331	1.2849	**0.2524**	**0.1270**	**1.2872**	**0.4096**	**0.1074**	**1.5061**
Risk Perception	**0.8606**	**0.0701**	**2.3647**	**0.8180**	**0.0621**	**2.2660**	**0.5068**	**0.0621**	**1.6600**
Sensation-Seeking	0.2286	0.1262	1.2569	0.1619	0.1018	1.1757	-0.0294	0.0971	0.9711
Social Norm Espousal	0.1799	0.1647	1.1971	-0.0223	0.1297	0.9780	**0.4271**	**0.1176**	**1.5328**
Social Resistance Orientation	-0.2360	0.1077	0.7898	-0.1531	0.0958	0.8580	-0.1676	0.0979	0.8457
Resistance to Peer Influence	**-0.3855**	**0.1657**	**0.6801**	**-0.3716**	**0.1498**	**0.6896**	-0.0278	0.1222	0.9726
Descriptive Norms	**0.3765**	**0.1480**	**1.4572**	**0.7830**	**0.1301**	**2.1881**	**0.3386**	**0.1113**	**1.4029**
Injunctive Norms	**0.3246**	**0.1452**	**1.3835**	-0.0007	0.1232	0.9993	0.1561	0.0940	1.1689
(Model Intercept)	-6.4457	1.5362	0.0016	-5.9695	1.4642	0.0026	-5.9122	1.1673	0.0027

Note: N = 5,601. Statistically significant effects (p < .05) are shown in bold. Statistical significance of model intercept is not noted.

Research Questions S4 and S5: How Are Reasons for Not Wearing a Seat Belt Associated with Demographic Factors? How Are Reasons for Not Wearing a Seat Belt Associated with Psychological and Psychosocial Factors?

Similar to Research Questions S2 & S3, we sought to determine the demographic, or psychological and psychosocial, predictors of endorsement of reasons for seat belt non-use. To do so, we used survey design-weighted, generalized structural equation models adjusted for complex sampling design. Because the questions involved in this analysis were "mark all that apply" batteries, all potential reasons for wearing a seat belt were modeled simultaneously as a set of correlated, binary logistic regressions. However, although our analysis approach controlled for relationships among endorsed reasons, we only report results for the three most frequently endorsed reasons for seat belt non-use (i.e., driving a short distance, forgot to use, and seat belt is uncomfortable) here for brevity.

Research Question S4: How Are Reasons for Not Wearing a Seat Belt Associated with Demographic Factors?

The results for Research Question S4 are reported in Table S5. As with Research Question S2, gender and regional differences emerged as significant predictors of reasons for seat belt non-use; additionally, age, race/ethnicity, income, lives in MSA, parental status, and past crashes significantly predicted endorsement of at least one of the three most frequently endorsed reasons for seat belt non-use.

Table S5. Demographic and Personal History Predictors of Most Frequently Endorsed Weighted Reasons for Seat Belt Non-Use

	Short Distance			Forgot			Uncomfortable to Wear		
Variable	*B*	*SE*	*OR*	*B*	*SE*	*OR*	*B*	*SE*	*OR*
Age	**-0.0142**	**0.0027**	**0.9859**	**-0.0132**	**0.0028**	**0.9869**	**-0.0127**	**0.0029**	**0.9874**
Gender: Male (ref) vs. Female	**-0.1959**	**0.0832**	**0.8221**	**-0.61458**	**0.0876**	**0.8643**	-0.1243	0.0986	0.1324
Race/Ethnicity: Not (ref) vs. Non-Hispanic White	-0.0134	0.0973	0.9866	-0.1305	0.0991	1.8776	**-0.0701**	**0.1123**	**0.0726**
Marital Status: Not (ref) vs. Married	-0.0999	0.0998	0.9049	-0.0690	0.1026	0.9333	-0.0838	0.1117	0.9196
SES: Income	-0.0082	0.0106	0.9918	**-0.0343**	**0.0104**	**0.9663**	**-0.0478**	**0.0116**	**0.9534**
Lives in MSA	**-0.2402**	**0.1091**	**0.7864**	-0.2617	0.1155	0.7697	**-0.1922**	**0.1237**	**0.8252**
Parental Status	0.0429	0.1076	1.0439	**-0.1117**	**0.1170**	**0.8943**	-0.1616	0.1321	0.8508
Past Crashes	-0.0084	0.0920	0.0084	**-0.0401**	**0.0950**	**0.0409**	-0.0464	0.1055	0.0475
Vehicle Age	-0.0017	0.0076	0.9983	0.0228	0.0081	1.0231	0.0092	0.0089	1.0093
Geographic Region: Region 1 (ref) vs.									
Region 2	**0.5446**	**0.1609**	**1.7240**	**0.1438**	**0.1627**	**1.1546**	0.3973	0.1830	1.4878
Region 3	**0.3124**	**0.1407**	**1.3667**	0.0766	0.1412	1.0796	0.2049	0.1665	1.2275
Region 4	**0.3469**	**0.1415**	**1.4146**	0.2577	0.1412	1.2940	**0.3283**	**0.1677**	**1.3886**
(Model Intercept)	-0.7291	0.3434	0.54824	-0.6125	0.93427	0.5420	-1.3406	0.3907	0.2617

Note: N = 5,715. Statistically significant effects (p < .05) are shown in bold. Statistical significance of model intercept is not noted. SES = socioeconomic status. MSA = metropolitan statistical area. ref = reference level.

Research Question S5: How Are Reasons for Seat Belt Non-Use Associated with Psychological and Psychosocial Factors?

Results are reported in Table S6. The psychological/psychosocial factors that emerged as significant predictors of endorsement of reasons for seat belt non-use largely overlapped with significant predictors of seat belt use (Research Question S3); unlike reasons for use, anger and resistance to peer influence were not significant predictors. Additionally, impulsivity, life satisfaction, and loneliness significantly predicted endorsement of at least one of the three most frequently endorsed reasons for seat belt non-use.

Table S6. Psychological/Psychosocial Predictors of Most Frequently Endorsed Weighted Reasons for Seat Belt Non-Use

	Short Distance			Forgot			Uncomfortable to Wear		
Variable	*B*	*SE*	*OR*	*B*	*SE*	*OR*	*B*	*SE*	*OR*
Decision Rule	-0.0271	0.0899	0.9733	**-0.1933**	**0.0958**	**0.8242**	-0.0020	0.1057	0.9980
Anger	-0.1217	0.0676	0.8854	0.0711	0.0741	1.0737	-0.0901	0.0774	0.9138
Delay of Gratification	-0.0843	0.0984	0.9192	-0.0785	0.1065	0.9245	**-0.2791**	**0.1145**	**0.7565**
Fatalism	**0.1137**	**0.0398**	**1.1205**	**0.1488**	**0.0425**	**1.1604**	**0.1852**	**0.0488**	**1.2034**
Government Intervention Orientation	0.0903	0.0582	1.0945	**0.1687**	**0.0637**	**1.1837**	-0.0093	0.0718	0.9908
Hostility	0.0944	0.0676	1.0990	0.1051	0.0720	1.1108	**0.2209**	**0.0818**	**1.2472**
Impulsivity	0.1924	0.1133	1.2122	**0.2616**	**0.1068**	**1.2990**	0.1783	0.1256	1.1952
Life Satisfaction	-0.0796	0.0697	0.9235	-0.1016	0.0781	0.9034	**-0.2269**	**0.0807**	**0.7970**
Loneliness	-0.1314	0.0726	0.8768	**-0.1499**	**0.0712**	**0.8608**	**-0.2476**	**0.0850**	**0.7807**
Optimism	0.0878	0.0900	1.0918	-0.1461	0.0900	0.8640	0.0030	0.0998	1.0030
Political Orientation: Conservatism	0.0417	0.0379	1.0426	0.0332	0.0395	1.0338	-0.0050	0.0424	0.9950
Religiosity	**0.0950**	**0.0279**	**1.0996**	**0.1087**	**0.0285**	**1.1149**	**0.0772**	**0.0322**	**1.0803**
Risk Aversion	**-0.6181**	**0.0814**	**0.5389**	**-0.4613**	**0.0838**	**0.6305**	**-0.4390**	**0.0946**	**0.6447**
Risk Perception	**-0.6030**	**0.0548**	**0.5471**	**-0.5020**	**0.0550**	**0.6053**	**-0.6803**	**0.0566**	**0.5065**
Sensation-Seeking	**0.2070**	**0.0776**	**1.2300**	**0.2015**	**0.0783**	**1.2232**	0.1590	0.0891	1.1723
Social Norm Espousal	**0.1985**	**0.0982**	**1.2196**	-0.0053	0.1027	0.9947	0.0855	0.1142	1.0893
Social Resistance Orientation	0.0643	0.0712	1.0664	0.0190	0.0718	1.0192	0.0524	0.0782	1.0538
Resistance to Peer Influence	-0.1068	0.1029	0.8987	-0.0179	0.1057	0.9823	-0.0154	0.1187	0.9848
Descriptive Norms	**-0.7514**	**0.0978**	**0.4717**	**-0.8125**	**0.1089**	**0.4438**	**-0.6415**	**0.1127**	**0.5265**
Injunctive Norms	0.0824	0.0896	1.0859	**0.2634**	**0.1013**	**1.3014**	0.0530	0.1085	1.0544
(Model Intercept)	4.5562	1.0708	95.2171	3.2100	1.0766	24.7780	5.2574	1.2169	191.9724

Note: N = 5,580. Statistically significant effects (p < .05) are shown in bold. Statistical significance of model intercept is not noted.

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