TECHNICAL REPORT STANDARD PAGE

1. Title and Subtitle
Highway Safety Culture Assessment through Louisiana's Regions

2. Author(s)
Helmut Schneider, Scott Smith, David Whitchurch

3. Performing Organization Name and Address
Center for Analytics & Research in Transportation Safety
Louisiana State University
Baton Rouge, LA 70803

4. Sponsoring Agency Name and Address
Louisiana Department of Transportation and Development
P.O. Box 94245
Baton Rouge, LA 70804-9245

5. Report No.
FHWA/LA.23/686

6. Report Date
November 2023

7. Performing Organization Code
LTRC Project Number: 21-1SA
SIO Number: DOTLT1000388

8. Type of Report and Period Covered
Final Report
5/2021-7/2023

9. No. of Pages
163

10. Supplementary Notes
Conducted in Cooperation with the U.S. Department of Transportation, Federal Highway Administration

11. Distribution Statement
Unrestricted. This document is available through the National Technical Information Service, Springfield, VA 21161.

12. Key Words
Traffic safety culture; alcohol-involved driving; impaired driving; distracted driving; seatbelt use; risky driving behavior; driver risk behavior; highway safety culture; traffic cultural models; driver values; driver attitudes

13. Abstract
Human behavior and errors in human judgment account for a large proportion of roadway crashes in the United States. Most priorities in Louisiana's Strategic Highway Safety Plan involve human behavior. A comprehensive understanding of highway safety culture throughout Louisiana's regions will enhance the state's public outreach and education efforts to reduce the number of fatalities and serious injuries on all public roads. Although efforts have been made to assess overall traffic safety culture at the national level, research at the state level for Louisiana has been limited and typically involves a single emphasis area such as alcohol-involved driving. This project expanded upon this research by assessing behavioral factors related to highway safety across multiple emphasis areas including impaired driving, distracted driving, speeding, and seatbelt use. This project consisted of a comprehensive literature review, collection and analysis of secondary data sources, design and execution of a survey, and a feasibility study to assess the use of cameras to collect data at road observation sites. The literature review followed a question-and-answer approach to gain understanding of

risky driving behaviors for each emphasis area and identify behavioral models which can be used for assessing cultural propensity to engage in risky driving behaviors. Secondary data identification, collection, and analysis included the identification of multiple data from national and state-level data sources. Descriptive analytics were used to assess current risky driving behaviors, and a metadata analysis was conducted to map survey items to relevant behavioral factors. Results of the metadata analysis showed that survey items related to multiple behavioral models are not evenly distributed across emphasis areas, and survey results for many of these items are only available at the national level. Other efforts with considerable support included increased access to free, safe rides and to treatment for alcoholism and alcohol abuse. Survey design and data collection were based on insights gained from the literature review and analysis of secondary data sources. The research team used advanced statistical modeling methods in survey analysis to test portions of a unified model proposed by Ward et. al. [1]. Significant linkages between geography, social environment, values, and driver risk behavior were identified which can be used to improve the targeting of specific safety messaging as well as driver education efforts. A feasibility study assesses the use of automated camera equipment and sensors and identifies eight sites which can be used in the future to gather naturalistic data related to distracted driving, seatbelt use, and speeding.

Project Review Committee

Each research project will have an advisory committee appointed by the LTRC Director. The Project Review Committee is responsible for assisting the LTRC Administrator or Manager in the development of acceptable research problem statements, requests for proposals, review of research proposals, oversight of approved research projects, and implementation of findings.

LTRC appreciates the dedication of the following Project Review Committee Members in guiding this research study to fruition.

LTRC Administrator/Manager

Elisabeta Mitran, Ph.D.
Safety Research Manager

Members

Autumn Goodfellow-Thompson, DOTD
Ron Whittaker, DOTD
Dortha Cummins, Louisiana Highway Safety Commission
Jessica Bedwell, Louisiana Highway Safety Commission
Betsey Tramonte, FHWA
J. Lyons Hale, III, Louisiana State Police – Troop B

Directorate Implementation Sponsor

Christopher P. Knotts, P.E.
DOTD Chief Engineer

Highway Safety Culture Assessment through Louisiana's Regions

By
Helmut Schneider, Ph.D.
T. Scott Smith, Ph.D.
David E. Whitchurch

Center for Analytics & Research in Transportation Safety
Louisiana State University
Baton Rouge, LA 70803

LTRC Project No. 21-1SA
SIO No. DOTLT1000388

conducted for
Louisiana Department of Transportation and Development
Louisiana Transportation Research Center

November 2023

Acknowledgments

Although not listed to maintain confidentiality, individuals who participated in surveys are thanked for their contributions.

The work efforts of Claire Balutansky and William Storment, graduate students at Louisiana State University, were critical to the successful completion of this project.

The contributions of Kayne Bourque, MS, assistant to Dr. T. Scott Smith, were beneficial to completion of the statistical analyses and other sections of the report.

Implementation Statement

Researchers conducted this study to not only better understand the relationship between culture, values, and driver behaviors, but also develop a structural equation model (SEM) or pathway model to describe and understand these relationships. The project developed a SEM that enables researchers, policy makers, legislators, and others to apprehend the inter-relationship between values (a culturally based factor) and driver behaviors, specifically impaired driving, distracted driving, and seatbelt use. In addition, the research provided statistical evidence that while high-risk driving behaviors do not statistically vary between Strategic Highway Safety Plan (SHSP) Coalition districts, multiple culturally based variables do vary, which may serve as fodder to direct implementation of public outreach. Regarding values, the data suggests that high-risk driving behaviors are significantly associated with an individual's values, specifically benevolence, universalism, and interdependence. Results also demonstrate that the importance of these values differ by social environmental measures, and furthermore, data shows that environmental measures differ significantly within regions of Louisiana. Lastly, researchers offered recommendations to utilize these relationships with driver risk behavior. Recommendations include developing a value-based targeting strategy for educational outreach or recognizing that driver behaviors are independent factors that are often directed by values. If the recommendations are to be implemented, driver education programs and educational outreach efforts can be developed that also take these relationships into account to minimize high-risk driver behaviors.

Table of Contents

List of Tables

List of Figures

Introduction

Very bluntly, culture matters, particularly related to daily, human behaviors. Culture signifies a feature of individuals that affects multiple components of daily life, such as rearing children [2], acceptance of risk [3], and health outcomes [4]. Correspondingly, driving represents an essential feature of who we are as individuals [5]. As an example, a car's design reflects on one's personality [6]; one may simply compare the persona of someone driving a new Chevrolet Corvette versus an older Toyota Corolla. As one's choice of vehicle is reflective of one's personality and self-regard, one's driving behaviors are also reflective of their identity [7];[8]. The task of driving is very individualistic, as some individuals are slow and careful, while others drive fast and risky. Although simple behaviors have been shown to reduce both risk of driver injuries and fatalities, such as use of seatbelts and child restraint seats, willingness to complete these behaviors has been related to race, sex, and political affiliation [9]; [10].

The implication and consequence of cars, trucks, driving, and culture is substantial, and correspondingly a puzzling occurrence, particularly in terms of public concern and awareness. Although total Louisiana fatalities from a recent hurricane, namely Hurricane Ida, numbered less than 50, these deaths are often highlighted across local, regional, and national newsclips. In contrast, 834 deaths were attributed to Louisiana drivers in 2021.

As driver and passenger deaths represent a significant public health concern, discussion about the cause, reason, or justification for the crashes represents a difficult dialog. While several crashes are the result of strictly environmental conditions (i.e., weather, asphalt decay, traffic conditions, improperly working lights), a disproportionately large number of crashes are the result of driver error, stemming from distraction, following too close, improper lane changes, speeding, drinking while driving, or other behaviors. It is proposed that the difficult discourse stems from an essential feature of who we are as individuals—our culture. Readily available and recently published studies highlight the interplay between culture, individual difference, and driving behaviors. As an example, males tend to drive faster and riskier than female drivers [11], and rural drivers tend to use seatbelts less consistently than their urban counterparts [12].

Again, is culture important? What is culture? Can driving behaviors directed by cultural differences change? Will educational outreach focused on changing driver behaviors by individual differences be effective? Who is involved in directing cultural change (i.e., friends, neighbors, school, churches, colleges, and regional or state efforts)? Can models be developed to not only understand driver behaviors by cultural frameworks, but also later direct educational

outreach, or allocations of educational funding to improve driver safety? The primary premise of the present project assumes that culture is important towards the understanding of driver behaviors. Moreover, through an understanding of the interplay between culture and driver behaviors, driver safety may be enhanced. The present project represents a continuation of efforts to understand these dynamics.

Within the last year, Texas A & M University and the Texas Transportation Institute (TTI) completed an LTRC-funded study examining cultural aspects of drinking and driving (LTRC Project No. 18-2SA). Like the referenced TTI study, LSU CARTS concurrently obtained funding via the present project to further examine the impact of culture on driving behavior. Importantly, the present project offers several new initiatives and enhancements from the previous TTI project, including the following:

a. The present project expands consideration of the impact of culture on driving behavior beyond strictly drinking and driving. While this single topic remains vital towards reduction of crashes and fatalities, consideration of other risky driving behaviors is also warranted (i.e., bicycles, pedestrians, speeding, and distracted driving).
b. The previous TTI project identified secondary sources, and it additionally compared socioeconomic and demographic factors to traffic safety measures, such as crashes and fatalities. While correlational analyses were completed, a specific model was not developed. Within the present project, it is a goal that a specific model will be developed to incorporate multiple levels of cultural identification (i.e., individual, family, church, local community, racial identification, alongside others) in an analysis of cultural factors affecting driving behaviors.
c. The present project seeks to emphasize cultural differences across regions, namely New Orleans, Baton Rouge, Houma, Lafayette, Lake Charles, Alexandria, Shreveport, and Monroe. Admittedly, Louisiana is remarkably diverse. A Vietnamese shrimper in Chalmette, St. Bernard Parish is culturally very different from a Caucasian logger in Jonesboro, Jackson Parish. As such, differences across regions will be examined.
d. Driver-based behaviors were assessed and measured beyond strict observation of socioeconomic and demographic variables. Design, completion, and analysis of a statewide survey based on development of a cultural model is a value-added approach which was used to evaluate risky driver behaviors of impairment and distraction, and the risk-mitigating behavior of driver seatbelt

use. In addition, the research team assessed the feasibility and potential effectiveness of using roadside cameras and sensors to collect observational data which helps measure these behaviors, in addition to speeding.

The purpose of this research is to assist the Louisiana Department of Transportation and Development, Louisiana Strategic Highway Safety Program (SHSP) team, highway safety stakeholders, and law enforcement agencies to achieve a thorough understanding of the cultural influences that contribute to risky driving behaviors. The findings of this study will assist DOTD officials, stakeholders, and others in targeting individual, systematic, and system-wide cultural factors and high-risk geographical regions to reduce traffic crashes and fatalities.

Literature Review

A thorough preliminary review of current literature about the intertwining topics of culture and driving performance was completed to establish reference points in key areas of highway safety including distracted driving, occupant protection, driver impairment, older drivers, younger drivers, and vulnerable highway users. These reference points helped guide the review of primary literature for this project as described below.

Admittedly, thousands of articles have been written about the interplay between human behavior and driving performance, and, similarly, past research has been summarized many times. Instead of simply replicating past efforts, this literature review focused on traffic cultural models and beliefs. The research team examined the following subjects:

- Cultural Belief Strategies
    - — Value Based Cultural Belief Strategies
    - — Normative Based Strategies
    - — Control Belief Based Strategies
- Measuring Behavioral Changes in Traffic Research
- Delineating and Measuring Intention in Traffic Research
- Defining Willingness and Applications toward Driving Research
- Defining Behavioral Beliefs and Implications in Driving Performance
- Applying the Concept of Prototype Image and Implications in Driving Performance
- Impact of Perceived Norms on Driving Behavior
- Impact of Control Beliefs on Driving Behavior and Performance
- Individual Values and Driving Performance
- Personality, Acceptance of Risk, and Driving Performance

Three behavioral models and a heavily cited human development theory provide a convenient framework for discussion for the topics listed below:

- Theory of Reasoned Action (TRA) [13]
- Theory of Planned Behavior (TPB) [14]
- Prototype Willingness Model (PWM) [15]
- Ecological Systems Theory (EST) [16]

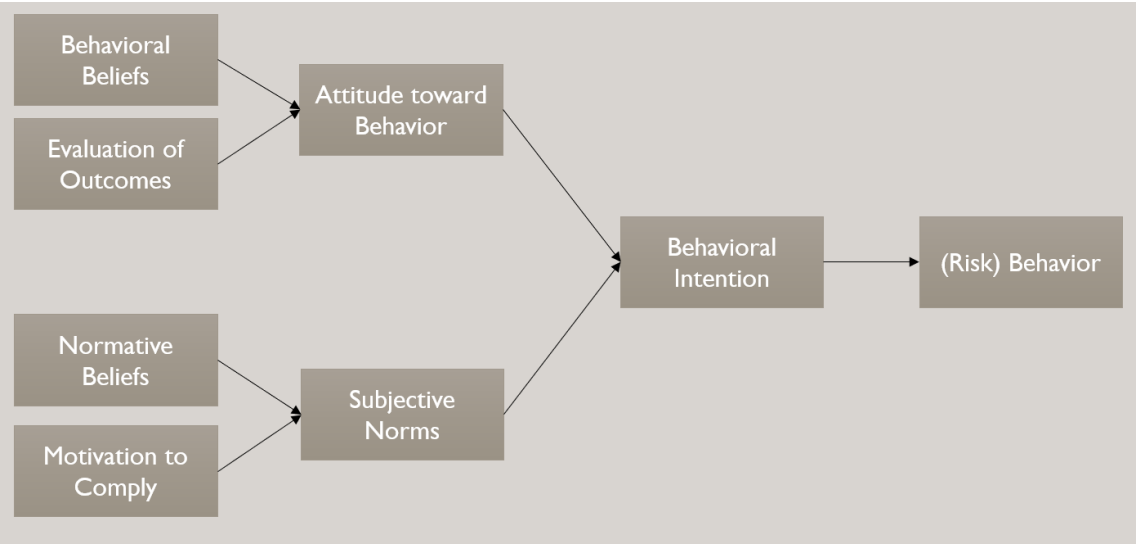
In other research, these models and theory have been integrated into two additional models that extend the theories for research and practitioners.

Behavioral Models and Applications in Highway Safety

Theory of Reasoned Action

The theory of reasoned action (See Figure 1.) was proposed by Fishbein and Ajzen to help explain relationships between attitudes and normative drivers of behavior [13]. When applied to highway safety research, TRA can provide a deeper understanding of the reasoning behind driver behaviors. The factors of this model (See Table 43 in Appendix D) are relevant to normative based strategies, delineating and measuring intention, defining behavioral beliefs, and acceptance of risk. TRA has been used to investigate areas of highway safety research such as prevention of impaired driving and predicting drivers' intention to violate traffic laws.

Figure 1. Theory of Reasoned Action Diagram



Gastil [17] explored how identifying informal social influences using TRA may contribute to structuring anti-DWI public information campaigns. Yagil [18] aimed to predict a driver's intention to commit traffic violations. They found that anxiety and aggression are related to this occurrence. Espada et al. [19] tested a prediction model that aimed to predict alcohol-impaired driving among teenagers via the TRA. They found alcohol use was the most common form of impaired driving and confirmed the hypothesis that gender differences also play a role in these

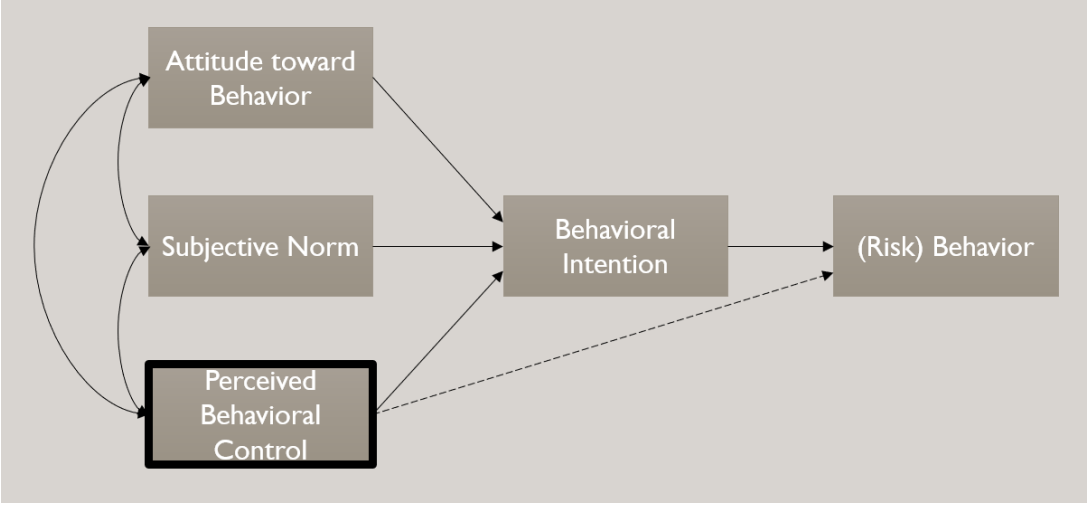
risky behaviors. Furthermore, Åberg et al. [20] studied the relationship between observed vehicle speed and the driver's perceived speed of others driving around them using questionnaires influenced by the TRA. Their model concluded that over 50% of the participated drivers admittedly drove over the speed limit and underestimated the speed of other vehicles.

Although the TRA was heavily cited after its initial burst of popularity, multiple articles have addressed the limitations associated with the utilization of this model. For example, Kippax [21] claimed that TRA fails to properly address behavior change, while Sheppard et al. [22] performed a meta-analysis to determine the efficacy of the models proposed by Fishbein and Ajzen [13]. While the models can accurately predict some human behaviors, Sheppard et al. [22] concluded that over 50% of articles examined in this meta-analysis were using the models for unintended areas of research. To the authors' surprise, however, the models performed extremely well in predicting goals and activities. This study highlights the specific shortcomings of each model.

Theory of Planned Behavior

In the Theory of Planned Behavior (TPB), Ajzen [23] extended TRA by adding the concept of perceived behavioral control and its relationships to attitudes and normative behaviors (See Figure 2 and Table 44 in Appendix D). The factors of TPB are relevant to normative based strategies, control belief strategies, delineating and measuring intention, defining behavioral beliefs, the impact of control beliefs on behavior, and acceptance of risk.

Figure 2. Theory of Planned Behavior Diagram



TPB provides a means to measure driver perception of control in highway safety by assessing a driver's self-reported ability to drive safely in various situations, such as rating the ability to safely operate a vehicle immediately after drinking two beers.

Researchers have used TPB extensively in highway safety research. Drivers' intentions to commit the specific violations of speeding, driving while alcohol-impaired, tailgating, and unsafe passing maneuvers were studied by Parker et al. [24]. In that study, the presence of perceived behavioral control was associated with significant increments in the amount of explained variance in intentions. TPB was used as a frame of reference by Warner and Aberg to study drivers' decision to speed [25]. However, in that study, perceived behavioral control did not directly contribute to drivers' logged speeding. The authors indicated that this may have occurred due to experienced drivers considering actual control and using that as an additional frame of reference in monitoring target speed during everyday driving.

Although the TPB successfully extends the theory of reasoned action, it is not without its own limitations. Sniehotta performed an experimental test on TPB in which the results supported TPB's assumption on the formation of behavioral intention, but behavior change was only associated with control beliefs, unless mediated by post-intervention cognitions [26]. Sussman and Gifford explored the causal relationships proposed by TPB and proposed the inclusion of reverse-causal relationships between behavioral intention and its three base components [27]. De Groot and Steg suggested that integration environmental concerns tied to self, community/society, and biosphere within TPB can provide insight to policymakers [28].

Prototype Willingness Model

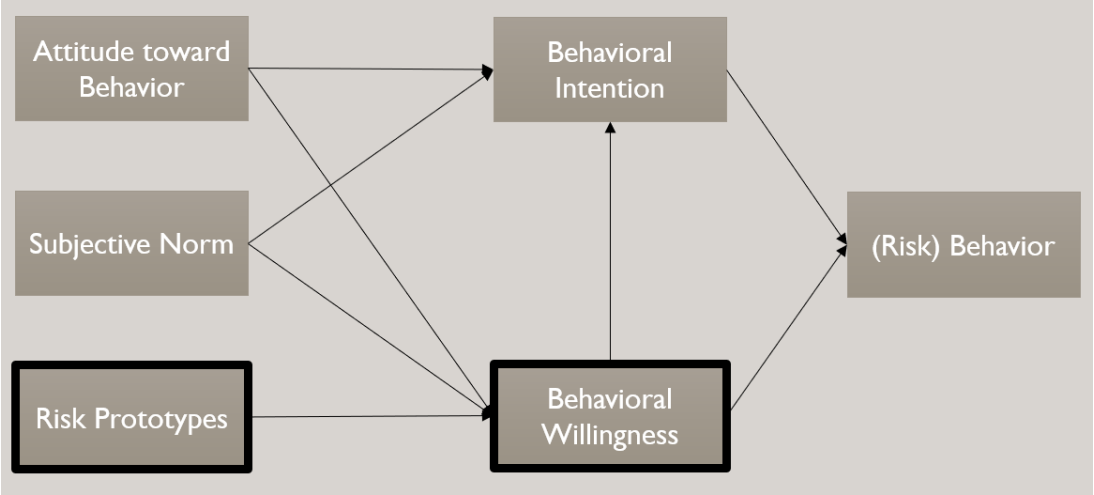
The prototype willingness model includes a dual-process approach to modeling risk behavior with the following types of decision making:

- *Analytical decision making*, an analytical process that involves the same behavioral factors as TRA, and
- Decision making using a *"Social reaction path,"* which is image-based and involves processing that is informed by self-discovery or learning [29].

It includes two additional behavioral factors (See Figure 3 and Table 45 in Appendix D): *risk prototypes,* which are representations of persons who engage in risk behaviors (e.g., drivers who typically speed), and *behavioral willingness* — an acceptance of engaging in risky behavior [29]. The factors of this model are relevant to delineating and measuring intention, defining willingness, defining behavioral beliefs, applying the concept of prototype images, and

acceptance of risk. A significant amount of recent highway safety research uses this model. Some of this research is wide in scope and explores how driver prototypes and behavioral willingness are correlated to a variety of risky driving behaviors [30], while other projects are more narrowly focused on 1–2 specific behaviors such as speeding and texting [31].

Figure 3. Prototype Willingness Model Diagram



Elliot et al. [32] utilized the model to assess drivers' speeding behaviors. This study analyzed questionnaires from 198 participants, concluding that the PWM accounts for 89% of the variance in drivers' behaviors, heavily exceeding the amount of variance accounted for by the Theory of Planned Behavior. Additionally, Scott-Parker et al. [33] utilized the Social Learning Theory (SLT), with augmentations from the PWM. They argued that the PWM can predict young driver speeding, suggesting that young drivers should be discouraged from creating unsafe attitudes towards speeding.

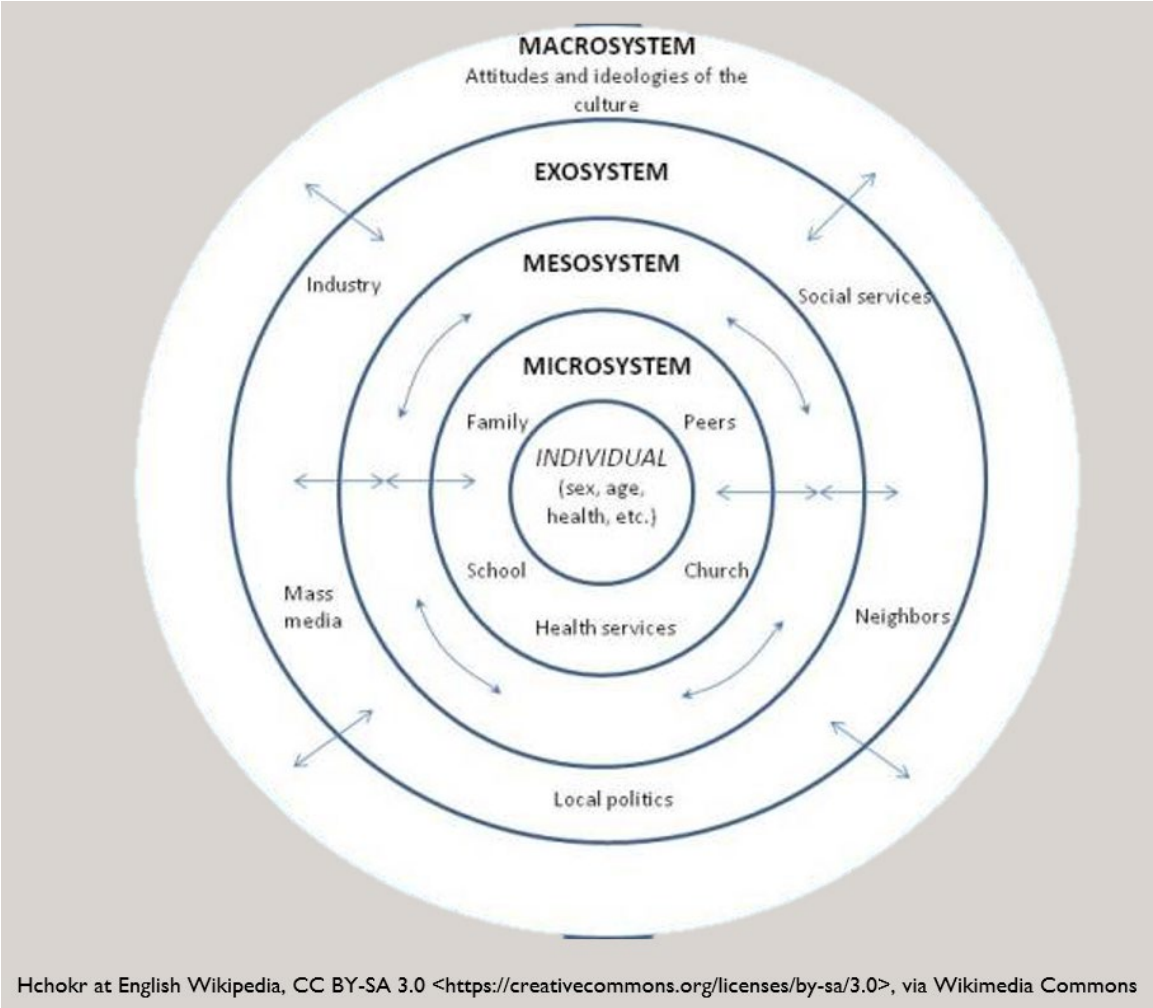
PWM and TPB have many similarities. Demir et al. [34] utilized Structural Equation Modeling (SEM) to compare these two models, reaffirming that PWM has more ability to explain variance in behavior than TPB. The authors claimed that the most significant determinants of traffic violations include protype perceptions, willingness, and perceived behavioral control.

Although PWM tends to explain a large percentage of variance among behaviors being tested, Todd et al. [35] proposed relationships are likely to vary depending on the behavior in question and recommended that PWM can be used generally to predict behaviors for "at-risk populations."

Ecological Systems Theory

Ecological Systems Theory (EST) provides a framework in which individuals' relationships within communities and wider society can be examined [16]. Figure 4 displays the five environmental systems in the framework. The environmental systems defined by EST provide a framework in which factors related to individual values can be explored. Recent highway safety research involving EST includes a meta-analysis of other research from 2009–2018 [36] and more specific topics, such as an analysis of contextual factors which may have influence on the safety of truck drivers [37]. Cassarino and Murphy [36] used EST as a lens to examine other research about young driver risk taking behavior. Their study takes an overhead look into the various aspects of life that affect the way adolescents drive. Incomplete mental development and external influence of others were determined to be the greatest predictors of risky driving behavior among adolescents.

Figure 4. Ecological Systems Theory Diagram

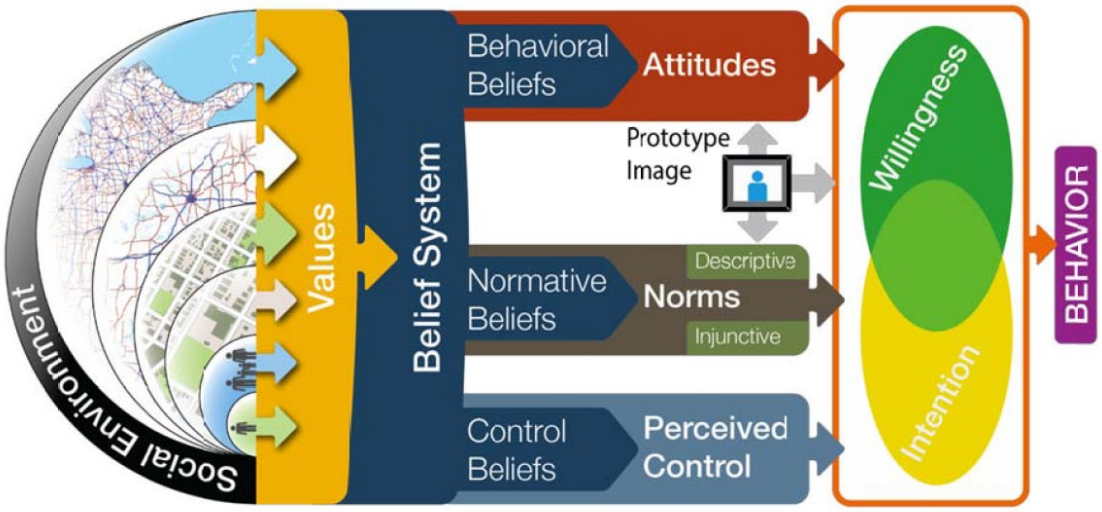


Although successful at explaining the varying social settings, Hughes et al. [38] claimed that as of 2015, systems theory had not been utilized thoroughly in transportation safety research, and suggested many models remain untested in traffic safety due to bias towards preexisting, more popular models. Larsson et al. [39] described a similar gap in transportation safety research and recommended that more research utilize systems theory to better understand the cultural environment that drives our decision and behavioral tendencies. In general, EST and other systems theories have been applied more to broad aspects of life, rather than specific avenues such as transportation research.

Integrated Behavioral Models

Researchers integrate behavioral models to capture a larger percentage of the determinants of behavior. For example, Montaño and Kasprzyk [40] describe a model integrating TRA and TPB with demographic and environmental characteristics, which "are assumed to operate through model constructs and do not independently contribute to explain the likelihood of performing a behavior." This model was adapted by Ward, et al. [1] to create the Integrated Safety Culture Model (ISCM) shown Figure 5. ISCM further integrates cultural values and prototype image into the model described by Montaño and Kasprzyk [40], and was specifically proposed as a "suitable model for the intentional design of traffic safety culture-based strategies" [1]. Although social environment is part of the model diagram, it is not included as a model component. Instead, it is split into levels of individual, family and friends, workplace or school, community, state, and National for the purpose of creating a strategic approach based on model implementation [1].

Figure 5. Integrated Safety Culture Model (Source: NCHRP web-only document 252: "A Strategic Approach to Transforming Traffic Safety Culture to Reduce Death and Injuries" [29])



Integrated models are useful in a variety of circumstances, most commonly when one model does not completely suffice the needs of the research in question. Integrated models can be formed as an alternative to the direct utilization of the TPB and TRA and manipulated to meet behavioral prediction requirements at a granular level. Toledo et al. [41] examined driving behavior through an integrated model consisting of "various decisions, such as accelerating, lane changing, and gap acceptance." In conclusion, integrated models are flexible, and can adapt to

specific studies with the addition or subtraction of factors. Models such as ISCM have the potential to guide research that may provide highway safety stakeholders with specific, actionable information, which can be used for multiple purposes such as community outreach, education, and law enforcement efforts [1]. However, integrated models such as ISTM are difficult to test using survey data due to the large sample of participants needed for reliable and valid analysis.

Literature Review Observations

The behavioral models and associated research reviewed measured behavioral intention through behavioral norms and attitudes [13], control beliefs [14], and risk prototypes and willingness [15]. The volume of research is related to the age of the associated models, with much of the research revolving around TPB, while newer research incorporates PWM as well. Factors of these behavioral models are commonly integrated in highway safety research models [42] , [43], but most survey instruments used in highway safety research are only applicable to a small number of topics (e.g., alcohol-impaired driving, speeding, etc.) and do not fully consider the contribution of relational and cultural elements, such as shown in Figure 4. The research team identified two main gaps in this research — integrating systems theory and personal values in relation to driver behaviors. Research on these relationships will give stakeholders a more complete picture of the behavioral landscape as it pertains to driver behavior. Regarding this, a behavioral model including EST and Social Environment variables from the ISCM will provide a framework where individual, family, and societal characteristics can be explored simultaneously in relation to self-reported driving behaviors and patterns throughout Louisiana’s regions.

Objectives

The original project proposal identified five primary objectives. Objectives remained consistent through the initial conceptualization and the present or final report. Originally presented objectives remain appropriate and represent the foundation for completed project activities. The following condenses individual objectives and identifies consistent steps completed to meet the stated objectives.

Objective 1. Identify the current knowledge about human behavior, driver performance, and traffic safety culture. The research team completed a thorough review of literature, concentrating on three driver behaviors identified in emphasis areas of the July 26,2022 Louisiana Strategic Highway Safety Plan. This strategy was used to enable alignment with current State highway safety priorities.

Objective 2. Assess safety culture in Louisiana, including provisions of scalable guidelines for measuring traffic safety culture. The team developed scalable guidelines based on knowledge and guidance from the literature review, a completed survey, and the analysis of a structural equation path model and other statistical comparisons of significance using survey results.

Objective 3. Compare and contrast behavioral and cultural patterns across regions. Activities were completed for this objective and reflected in the present final report. Regional comparisons evaluated variations in driver behaviors and demographic features. Regional variations compared features across physically and geographically diverse regions (i.e., Houma, Baton Rouge, New Orleans, Monroe, and other metropolitan-based areas) but also across economic (i.e., blue- and white-collar designations) and rurality (i.e., rural, and metropolitan areas of the State)—statistical analysis of survey results, analysis of secondary data, and development of a pathway model.

Objective 4. Measure, identify, describe, and predict daily driver behaviors in conjunction with problematic areas and associated highways in Louisiana, further allowing an understanding of the association between culture and daily driving behaviors among drivers in Louisiana. Within this objective, two identifiable data-driven actions included obtaining quantifiable data about daily driver-based behaviors using camera feeds and comparing regional features through survey research. The first goal of the objective (i.e., measurement of actual driver behaviors) was not fully accomplished, but the latter goal has been achieved (i.e., gain understanding of the association between culture and driving behaviors). Regarding the first

goal, a vendor to provide cameras and data was identified, Internal Review Board (IRB) review was completed, and permits were obtained to collect data, but no data was collected during the project due to unexpected delays in getting permit information and approvals. Regarding the second goal, or attaining features through survey questions, the literature review was completed to prompt questions, previous research models were identified to pinpoint a theoretical direction for the pending survey, and specific questions were identified as initial question options for a later study.

Objective 5. Develop best practice guidelines for strategically changing attitudes, accepting risky driving behaviors, and cultural acceptance of unsafe driving practices.
Correspondingly, provide a standardized survey instrument to be deployed yearly, further allowing an understanding of inter-relationships between crashes and crash types and ongoing cultural changes in Louisiana. The main premises of this objective were the development of a standard survey instrument potentially used yearly and the development of best practice guidelines based on survey data. A survey instrument with satisfactory reliability and validity measured driver values, attitudes, and behaviors, meeting this objective. Analyses identified survey questions that did and did not contribute towards a quality model to predict driver behaviors. Conceptually, the same or similar survey may be used across time (i.e., every 2, 5, or 10 years) to compare changes in cultural features and perceived cultural identification, alongside the ability to relate cultural elements to driver behaviors. The present report's Conclusion and Recommendations section addresses best practice guidelines for strategically changing attitudes, acceptance of risky driving behaviors, and cultural approval of unsafe driving practices.

Scope

Project Overview

LSU CARTS completed a research-based study examining the contribution of culture on driving behaviors. Within Louisiana, motor vehicle crashes and comparably fatalities associated with these occurrences represent a significant public health concern. While some crashes and fatalities are related to infrastructure, weather, or non-driver causative reasons, many crashes are attributed to driver behaviors. Driver behaviors may be attributed to several features, including driver inattention, alongside individual differences. Pertaining to individual differences, the literature has consistently indicated that one's culture significantly contributes towards one's willingness to divert from traditional traffic safety protocols and correspondingly complete risky behaviors (i.e., not wear seatbelt, speed, and drink and drive). The present project seeks to examine the contributions of culture towards driver behaviors and moreover uses multiple innovative approaches to complete this goal.

Project Tasks

From the initial proposal, the task structure has been changed slightly. Programmatic objectives outlined in the original project proposal and presented in the previous section of this report will remain applicable. However, the following task modifications were implemented:

- A feasibility study (Task 8) provided a positive assessment for the use of roadside cameras and sensors to collect naturalistic driving data in Task 9. However, no funds were included in the project budget for collecting data in this manner, so Task 9 was eliminated from the project.
- Similarly, the intention was to hire a company to conduct focus groups for Task 10, so this task was eliminated as well.

No substantive changes were made to the remaining tasks, which include the following:

- Task 1 consisted of a comprehensive literature of relevant literature.
- Task 2 consisted of the collection of data from secondary data sources identified to be of interest to the research project.
- Task 3 consisted of analysis of data collected in Task 2.

- Task 4 consisted of writing an interim report to share information with the Project Review Committee, who provided useful feedback which guided the remainder of the project tasks.
- Task 5 consisted of designing a survey based on the behavioral models first identified in the literature review.
- Task 6 consisted of the collection of survey data in two rounds – first, for a preliminary analysis of the validity and reliability of the survey questions and concepts the questions were designed to measure. A second round of survey data collection was performed to provide data for comprehensive statistical analysis.
- Task 7 consisted of comprehensive analysis of the survey data and included the following methods:
    - Exploratory factor analysis
    - Confirmatory factor analysis
    - Latent variable path modeling
    - Analysis of variance
    - Contingency (chi-square) analysis
- Task 8 consisted of a feasibility study to assess the potential effectiveness of using roadside cameras and sensors to collect naturalistic driving data.

Methodology

Methodology for Secondary Data Identification and Collection

The research team identified thirty-four data sources related to transportation safety, related behavioral issues, socioeconomic indicators, and demographics. These sources included census data, state data on outreach programs, attitudinal and observational surveys from applicable literature, national data from NHTSA, crash report data from Louisiana, data from other literature, and surveys from other states. Sources selected for analysis informed the research team on the current state of knowledge on important highway safety topics and guided efforts in survey development. Appendix E contains a listing of all secondary data sources that were identified and reviewed.

Methodology for Secondary Data Analysis

The secondary data sources varied widely in structure and content, which made analysis and comparisons using a centralized database impractical. The analysis methodology consisted of two parts:

1. A *descriptive analysis,* in which secondary data is analyzed in terms of highway safety research topics (e.g., cell phone distraction, seat belt use, driving under the influence of alcohol, etc.).
2. A *metadata analysis,* in which survey items from data sources were analyzed individually and then grouped by vehicle driver and occupant behaviors and associated behavioral model factors.

Descriptive Analysis

A descriptive analysis of secondary data by topic was conducted to identify intersections between secondary data availability and topics of concern. Primary goals of all survey data sources were assessed (e.g., identifying trends, exploring relationships between groups, predicting future behavior, verifying theoretical models, etc.). A research team member then grouped sources into the following topics of concern listed below:

- Driver distraction
    - Cell phone distraction – 5 sources ([44], [45], [46], [47], [48])
    - Distraction from passengers – 4 sources ([44], [49], [50], [51])
    - Distraction from vehicle infotainment systems – 1 source ([52])
- Restraint use
    - Driver seatbelt use – 4 sources ([44], [45], [53], [48])
    - Passenger seat belt use – 4 sources ([44], [53], [54], [48])
    - Child car seat and child booster seat use – 2 sources ([44], [55])
- Driver Impairment
    - Alcohol-impaired driving – 4 sources ([44], [45], [56], [48])
    - Drug-impaired driving – 3 sources ([48], [57], [58])
    - Polysubstance-impaired driving – 2 sources ([48] ,[59])

The research team used information gained from the topics and sources listed above to guide survey development in terms of item and topic selection.

Metadata Analysis

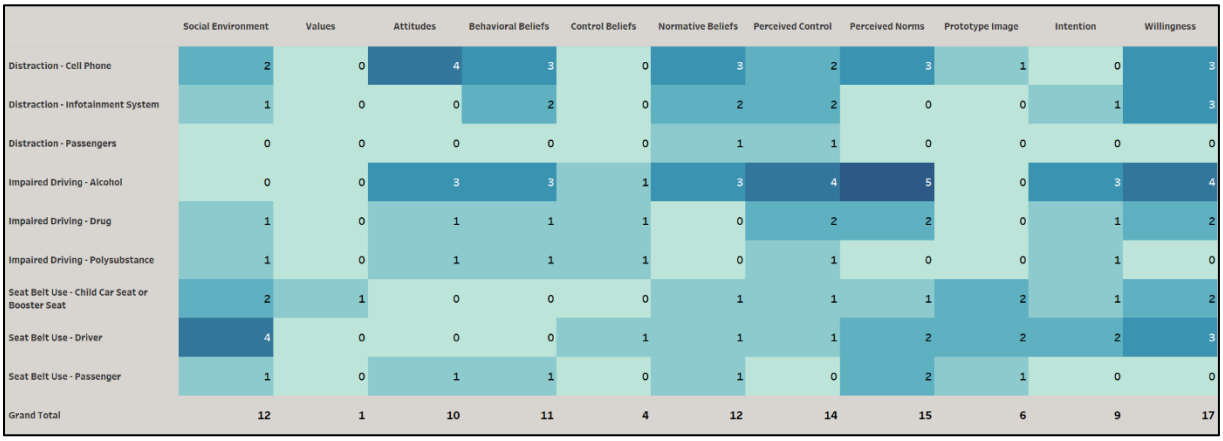
In this step of analysis, a research team member coded information from each data source in the following format:

- Data source name
- Data source location (local file path or URL)
- Year of publication
- Data categories included in source (e.g., internet or paper survey, observational survey, motor vehicle crash data, demographics, socioeconomic indicators, other social indicators, etc.)
- Written summary of data source including who collected the data, frequency of collection, and relevance to this project.

The coded information was then imported into data visualization software to analyze how past surveys line up with possible behavioral research model factors (see Figure 6). The rows of

Figure 6 correspond to highway safety topics. The columns of Figure 6 correspond to factors in relevant behavioral models which are discussed in the literature review. The number in each cell represents the number of survey items in all sources which correspond to a topic and factor.

Figure 6. Survey Item Behaviors and Behavioral Model Factors



	Social Environment	Values	Attitudes	Behavioral Beliefs	Control Beliefs	Normative Beliefs	Perceived Control	Perceived Norms	Prototype Image	Intention	Willingness
Distraction - Cell Phone	2	0	4	3	0	3	2	3	1	0	3
Distraction - Infotainment System	1	0	0	2	0	2	2	0	0	1	3
Distraction - Passengers	0	0	0	0	0	1	1	0	0	0	0
Impaired Driving - Alcohol	0	0	3	3	1	3	4	5	0	3	4
Impaired Driving - Drug	1	0	1	1	1	0	2	2	0	1	2
Impaired Driving - Polysubstance	1	0	1	1	1	0	1	0	0	1	0
Seat Belt Use - Child Car Seat or Booster Seat	2	1	0	0	0	1	1	1	2	1	2
Seat Belt Use - Driver	4	0	0	0	1	1	1	2	2	2	3
Seat Belt Use - Passenger	1	0	1	1	0	1	0	2	1	0	0
Grand Total	12	1	10	11	4	12	14	15	6	9	17

The behaviors and factors with the highest number of survey items were related to TRA and TPB, while a smaller number were related to PWM. Topics of cell phone distraction and alcohol-impaired driving were addressed more often in surveys, with driver distraction from passengers being addressed in only two survey questions collected from the secondary data. In terms of factors, there were very few survey questions related to values, control beliefs, and prototype image.

Methodology for Survey Design

The research team designed a survey for the purpose of testing specific parts of the Integrated Safety Culture Model (ISCM) shown in Figure 5. Testing only parts of the ISCM instead of the whole model was necessary for three reasons:

1. A lengthy survey would need to be designed to test the complex ISCM, which would negatively affect the quality and completeness of survey participant responses.
2. The participant sample size needed for the survey to provide enough data for an adequate statistical analysis would have been larger than the project budget accounted for.
3. As stated in the literature review, evidence has been established in peer-reviewed and published research which supports three parts of the ISCM – the Theory of Reasoned

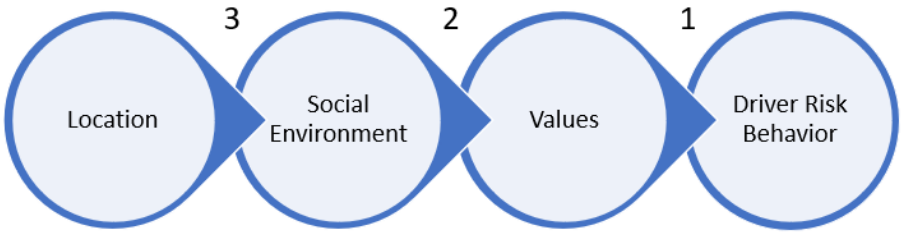
Action [60], the Theory of Planned Behavior [14], and the Prototype Willingness Model [29].

Identification of Constructs and Hypotheses

The deficiency of published research linking the ISCM factors of social environment with values to driver behavior was the primary driver of the survey design. The research team believed providing evidence about this linkage would help us understand overall highway safety culture throughout Louisiana as well as specifics which could be used to guide efforts to combat fatalities and injuries on the State's highways. For this reason, questions were included identifying each respondent's Parish and City of residence. In addition, the research team tested multiple items as part of other "culture" factors in the survey. Although the survey items used were significantly associated with these factors, only the ISCM values and social environment factors were significantly associated with self-reported driver behavior measured by the survey. The full list of survey items is provided in Appendix B.

The theoretical model shown in Figure 7 contains the factors of Social Environment, Values, and self-reported driver behaviors of impaired driving, distracted driving, and seat belt use. The model also includes a location factor which contains information about the region, Parish, and City residence of respondents.

Figure 7. Theoretical Model Used for Design of Research Study



Three hypotheses were tested using this model. The numbers in Figure 7 above refer to the following hypotheses:

1. Driver risk behavior is significantly associated with an individual's values.
2. Values differ significantly depending on individual, family, work, and community social environmental measures.

3. Social environment measures differ significantly between locations in Louisiana.

Evidence supporting all the hypotheses above is provided in the discussion and conclusion sections of this report.

Identification, Adaptation, and Integration of Survey Items[1]

All but one of the survey items used to measure values and driver risk behavior were adapted from Ward et al. [1]. One item used to measure the value of interdependence was adapted from Sharma [61]. Items to measure social environment were created using concepts from Ecological System Theory previously discussed in the literature review [16]. Location items were created to measure respondent's residency by City and Parish.

Methodology for Survey Data Collection

To collect a high-quality random sample of data from survey participants throughout Louisiana, the research team hired Qualtrics Experience Management services. Qualtrics recruited and verified all survey respondents. A variety of incentives for survey participation were available to respondents such as reward points, gift cards, or nominal cash payments. Each respondent was informed of a specific incentive that was agreed upon before attempting the survey. The target population of the survey consists of licensed drivers residing in Louisiana who are 18 years of age or older and who drive a motor vehicle on a regular basis. An informed consent statement was provided at the beginning of the survey and respondents were only allowed to take the survey after agreement.

Survey data collection was conducted in two stages. The purpose of the first stage (pilot survey) was to provide enough data to verify the initial validity and reliability of the survey questions and related theoretical model factors, in addition to assessing the initial distribution of survey respondents by geography and demographic factors. Response collection for the first stage started on Tuesday, December 6, 2022, and was completed Wednesday, December 7, 2022, with 156 complete and validated responses. Qualtrics advised the research team to delay the second

[1] Race is a potentially important measure but was not included in the survey item list. The presence of City in the list was identified by Louisiana State University's Institutional Review Board (IRB) as having a small potential to be used as a means of identifying specific respondents from the survey data results. Adding Race as a survey item in a survey which already included City would have increased this potential, so it was decided to keep the City measure instead of deleting it and adding Race.

stage until after January 1, 2023, to avoid possible negative effects of the December holiday season on survey response quality. The research team agreed to postpone the second stage of the survey. Response collection for the second stage began on Monday, January 2, 2023, and was completed on Wednesday, January 18, 2023, with 1,701 complete and validated responses. As part of validation, responses were removed for the following reasons:

- Failed survey speeding check (115 responses)
- Failed other quality checks such as straight-line or other types of patterned response (134 responses)
- Did not agree to consent form (178 responses)
- Respondent under 18 years of age (50 responses)
- Respondent not a Louisiana resident (77 responses)
- Respondent not a licensed driver (342 responses)
- Respondent did not drive on a regular basis (179 responses)

The median time of survey completion of all validated respondents was 11.85 minutes, and the mean completion time was 15.67 minutes for these respondents.

Methodology for Data Analysis of Survey Results

Survey response data was analyzed in three phases. An Exploratory Factor Analysis (EFA) was performed on the pilot survey data, and results from it were used to guide Confirmatory Factor Analysis (CFA) and Latent Factor Path Model construction with the full data set after all responses were collected.

Exploratory Factor Analysis (EFA)

EFA was performed on the 156 responses from the pilot study to verify that the survey responses provided the information needed to perform a robust statistical analysis and assess the initial distribution of respondents by geography and demographic factors. The MLM estimator[2] was used for EFA, CFA, and Latent Variable Path Model construction due to multivariate non-normality of the data assessed using Mahalanobis Distances [62]. Standardized root mean square

[2] Maximum likelihood estimation with robust standard errors and a Satorra-Bentler scaled test statistic

residual (SRMR), root mean squared error of approximation (RMSEA), Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI) fit indices were used in all three phases to provide evidence of acceptable model fit. Factor loadings factor correlations and average variance extracted were used to assess convergent validity, discriminant validity, and composite reliability of model factors and indicators [63]. The small size of the pilot survey contributed to a slight lack of fit, but since all survey items aligned with relevant factors, the initial model was judged to be acceptable. Output and discussion of the analyses above performed using JMP Pro 16 [64] and MPlus [65] software is included in Appendix F.

Confirmatory Factor Analysis (CFA)

CFA was performed on the 1,701 responses from the full survey to confirm the validity and reliability of the survey items and factors, and to assess the fit of the overall measurement model. CFA results indicated that all survey items aligned with relevant factors and other statistics were in acceptable ranges, indicating an acceptable model. Output and discussion of the analyses above performed using JMP Pro 16 [64] and MPlus [65] is included in Appendix G.

Latent Factor Path Model Construction and Analysis

Latent factors represent concepts that cannot be measured. A latent factor path model was constructed using the latent factors of values, distracted driving behavior, impaired driving behavior, and driver seat belt use identified in the EFA and verified in CFA. Latent variable path models are used to represent and understand the relationships between these unobservable latent factors [66]. The path model fit was acceptable as assessed by the same indices used for EFA and CFA. Relationships between the latent factors provide evidence supporting Hypothesis 1, driver risk behavior is significantly associated with values. Output from the latent factor path model included the generation of a numerical score for the “values” factor, which was subsequently used in analysis of variance of values by social environment variables included in the study. A full discussion of these relationships and further analyses is provided in the report conclusion. Output and discussion of the analyses above performed using MPlus [65] software is included in Appendix H.

Methodology for Feasibility Study Using Cameras and Sensors to Collect Naturalistic Data

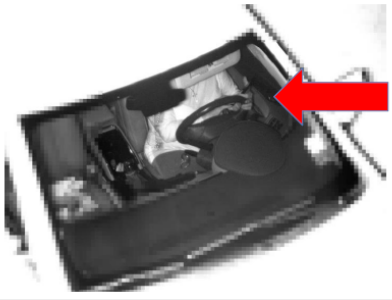
Observational surveys have been completed on a regular basis in Louisiana for years. An example of this is the 2019 Louisiana Seat Belt Observational Survey prepared for the Louisiana Highway Safety Commission (LHSC) [67]. Results from the survey provided information from direct observation – information which would have been hard to measure through other means, such as motor vehicle crash reports. The survey was conducted using a group of trained observers who recorded multiple characteristics about vehicles, drivers, and occupants as the vehicles passed an observation point. The observers were randomly checked by quality control monitors as an extra precaution to make sure that observers were in place and making observations. Finally, resulting data was analyzed for discrepancies indicative of inaccuracy or bias by observers. Although this methodology provides accurate, useful data, observers are limited to the amount of data that can be collected by one observer. For example, a single observer cannot observe seat belt use, driver distractions, red light running, and aggressive driving simultaneously. A second limitation of this method is the absence of means to directly review all observations. Another method that has been explored involved the use of driver-facing cameras to collect data related to driver distraction [68]. Although this may be a valid method to collect data about driver emotion related to distraction, the method may introduce significant observational bias when used for the purpose of collecting data about distracted driving behaviors. Drivers who are aware of monitoring devices placed in their vehicles are less likely to engage in risky driving behaviors [69]. Therefore, this method would not be useful for collecting data about risky driving behaviors. Based on these limitations, the feasibility of a different methodology is being explored.

In the preliminary stage of the feasibility study, the main issue that was discovered involved limitations of standard cameras to see through vehicles windows, especially if the windows are tinted. The difficulty of addressing this issue is demonstrated by Ma et al. [70], and it can involve complex machine learning models on images as well as other methods. For this reason, it was decided to search for consultants or vendors who have experience in this area and investigate costs. A vendor was found who has the capability to perform high-quality data collection using a portable trailer [71]. The trailer includes two cameras and a sensor to capture vehicle speed (see Figure 8).

Figure 8: Trailer with Cameras and Sensor

One of the cameras is positioned to capture an image of driver and front seat passenger at eye level, while the other camera is positioned at a high angle to capture images which may indicate driver distraction hidden from eye level view (see Figure 9). Task 8 of the project originally included identification of sites for collection of data using this method, but since the project budget did not include funds for this part, only the results of the feasibility study are given here.

Figure 9. Sample Images from High-Angle Camera

One hand	Phone in driver's hand. Either actively texting or simply holding.	
Two hands	Phone in both driver's hands. Either actively texting or simply holding.	

Discussion of Results

Survey Participants

The following graphs and narrative will represent the data collected from our survey compared to data collected by the Census Bureau via the American Community Survey [72].

Age

Survey Participants. The largest concentration of participants selected the age groups 25–34 (23%, n = 398) and 35–44 (23%, n = 385). The smallest group of participants belonged to the age group ranging 65 or older (10%, n = 167). Table 1 represents the distribution of participants by age groups.

Table 1. Survey Participants by Age Group

Age Group	Number (N = 1701)	Percentage
18–24	324	19%
25–34	398	23%
35–44	385	23%
45–54	247	15%
55–64	180	11%
65 or older	167	10%

Comparison of Statewide Census Features. Regarding age, the Census Bureau categorizes ages differently than the study's survey did. Where the study's survey grouped ages 0–17, the ACS has ages 0–9 grouped and 10–19 grouped. The study's second age grouping ranged from 18–24; however, the ACS grouped ages 20–24 together. The remaining groupings are the same until the age 65. The study's survey grouped all participants 65+ together, while the ACS separated them into 55–64, 65–74, 75–84, and 85+. Overall, the study's survey data has a slightly skewed normal curve, but the ACS data does not follow the same pattern. Note that for the study's survey, there were no participants below the age of 18. Furthermore, the largest percentages for both surveys belong to the ages 25–34 and 35–44. Interestingly, ages 20–24 are the smallest

percentage of young adults according to ACS data, but the closest age grouping from the study's survey indicated ages 18–24 are the second largest. Figure 10 represents the age distribution based on survey participants, and Figure 11 represents the age distribution based on data from the Census Bureau.

Figure 10. Survey Participant Ages

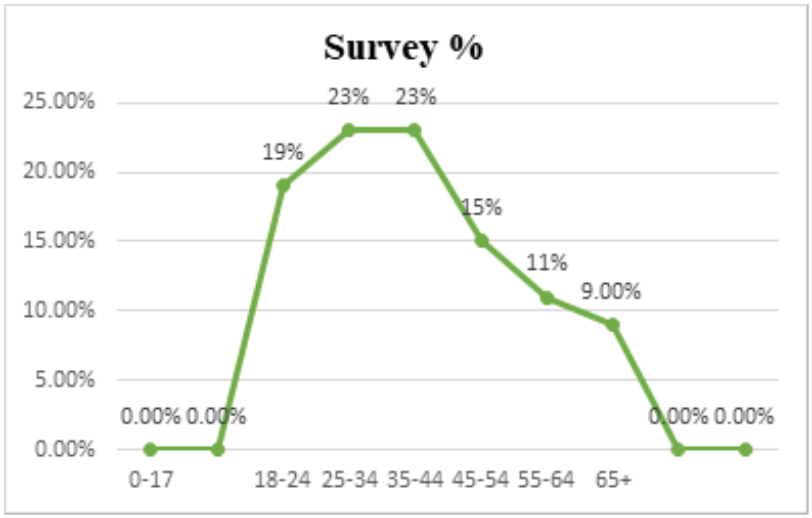
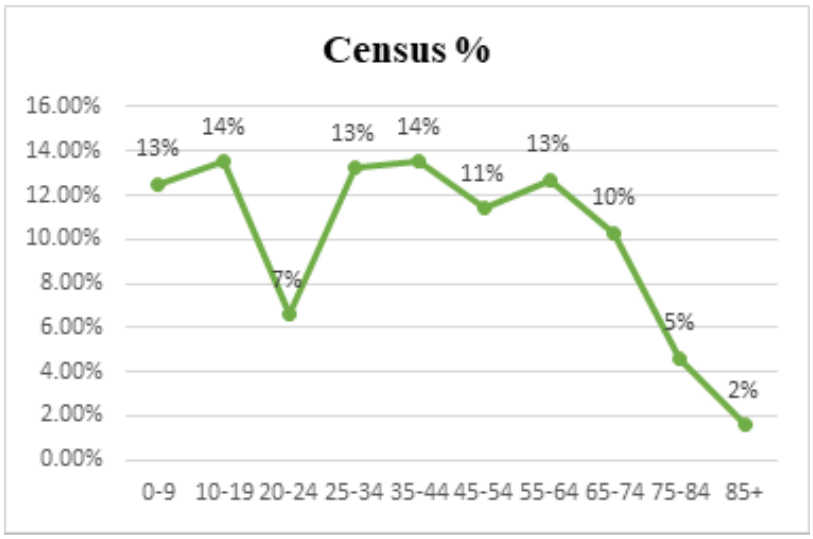


Figure 11. Census Bureau Participant Ages



Gender

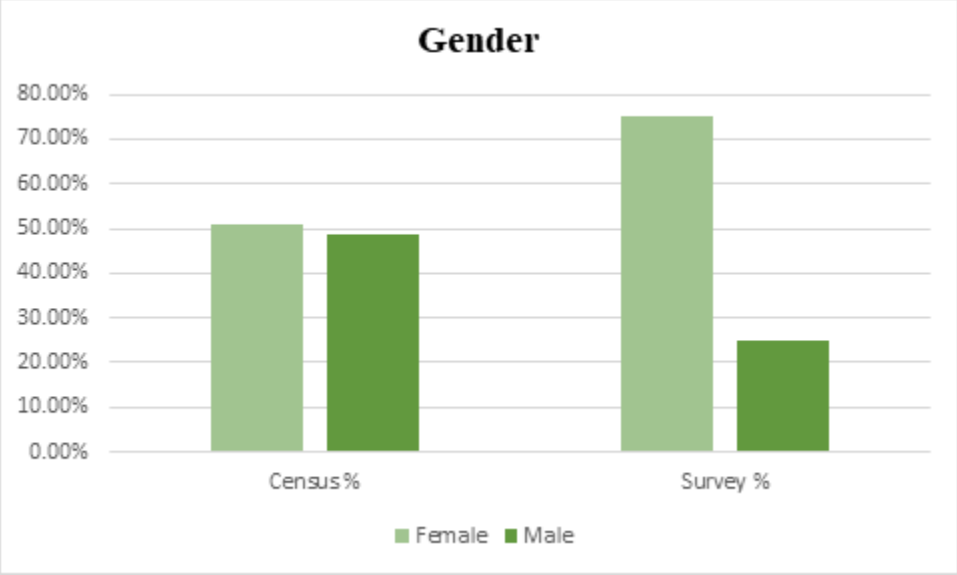
Survey Participants. Of the overall sample, 75% of participants were female, and the remaining 25% were male. Table 2 shows the distribution of males and females based on the participants.

Table 2. Survey Participants by Gender

Gender	Number (N = 1692)	Percentage
Female	1275	75%
Male	417	25%

Comparison of Statewide Census Features. Regarding gender, the ACS indicates that Louisiana has a relatively equal percentage of females and males. The ACS reported 51.1% of the state are female and 48.9% are male. On the other hand, of the study's survey participants, 75% were female and only 25% were male. Below, Figure 12 shows the gender distributions of the survey respondents compared to Census Bureau respondents.

Figure 12. Statewide Census Bureau and Survey Participant Comparison by Gender



Employment Status

Survey Participants. Of the participants, most indicated they were employed full-time (50%, n = 853). The category participants selected the least was unemployed and not seeking work (3%, n = 46). Table 3 delineates the distribution survey participants based on employment status.

Table 3. Survey Participants by Employment Status

Employment Status	Number (N = 1701)	Percentage
Unemployed (not seeking work)	46	3%
Unemployed (actively seeking work)	144	8%
Student	83	5%
Retired	199	12%
Homemaker	138	8%
Employed Part-Time	238	14%
Employed Full-Time	853	50%

Comparison of Statewide Census Features. The ACS categorizes employment status into three categories: in the civilian labor force and employed, in the civilian labor force and unemployed, and not in the labor force. Whereas, the study's survey had many more categories to account for retired participants, students, etc. However, for both surveys, the largest percentage belongs to the employed category (employed full-time for the study's survey). Figure 13 represents the percentage of survey participants according to their employment status. The following graph, Figure 14, represents the percentage of Census Bureau respondents as per their employment status.

Figure 13. Survey Distribution by Employment Status

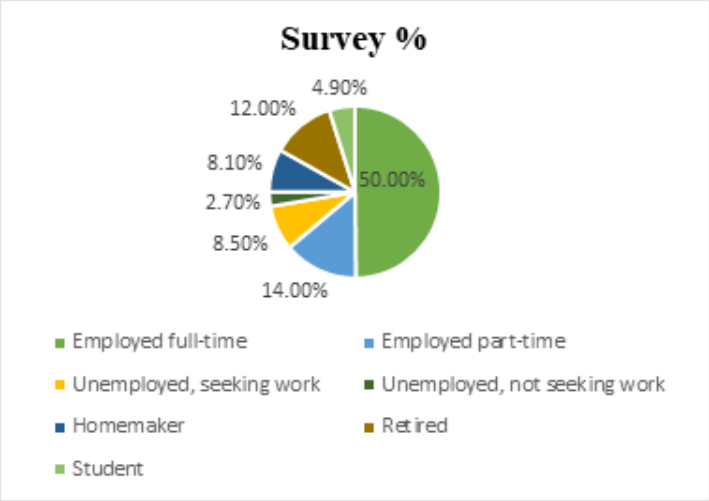
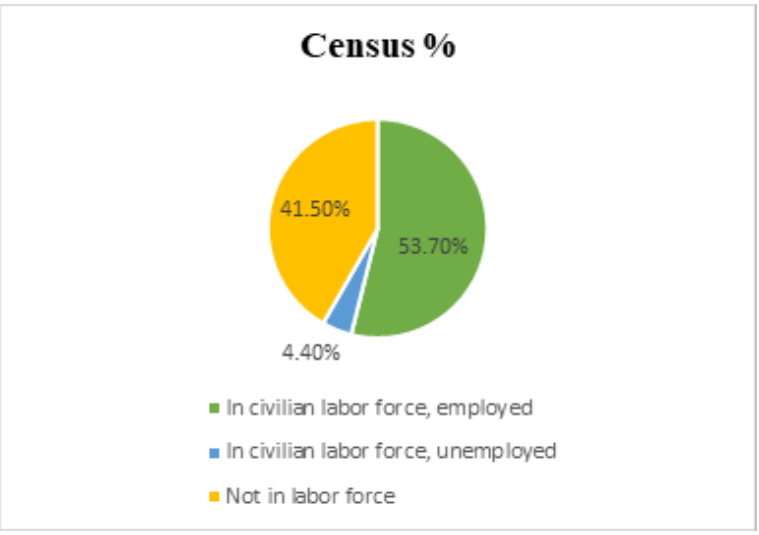


Figure 14. Census Bureau Distribution by Employment Status



Employment Type (Blue-Collar)

Survey Participants. When asked if they consider themselves a blue-collar worker, most participants strongly disagreed (27%, n = 451). Table 4 represents the distribution of blue-collar workers amongst participants.

Table 4. Participant Agreement towards being a Blue-Collar Worker

Employment Type (Blue-Collar)	Number (N = 1655)	Percentage
Strongly Disagree	451	27%
Strongly Agree	263	16%
Somewhat Disagree	257	16%
Somewhat Agree	309	19%
Neither Agree nor Disagree	375	23%

Employment Type (White-Collar)

Survey Participants. When asked if they consider themselves a white-collar worker, most participants somewhat agreed (27%, n = 455). Table 5 presents the distribution of white-collar workers amongst participants.

Table 5. Participant Agreement towards being a White-Collar Worker

Employment Type (White-Collar)	Number (N = 1655)	Percentage
Strongly Disagree	357	22%
Strongly Agree	295	18%
Somewhat Disagree	226	14%
Somewhat Agree	455	27%
Neither Agree nor Disagree	322	19%

Comparison of Statewide Census Features. The ACS labels employment type in five categories, which are presented in the graph below; whereas, the study's survey indicated employment type as simply blue-collar or white-collar. For the study's survey, 60% of participants selected

Strongly Agree, Somewhat Agree, or Neither Agree nor Disagree when asked if they consider themselves blue-collar workers. For a comparative analysis, the categories from the ACS that the study's researchers labeled as "blue-collar workers" are "Natural resources, construction, and maintenance occupations" as well as "Production, transportation, and material moving occupations." Furthermore, 76% of participants from the ACS reported being blue-collar workers compared to the study's 60%. Figure 15 is based on survey participant data and shows the percentage of participants who agree or disagree with being a blue-collar worker. The following graph, Figure 16, shows the percentage of participants who identified their jobs as being blue-collar and the category of their job.

Figure 15. Survey Participant Agreement to being a Blue-Collar Worker

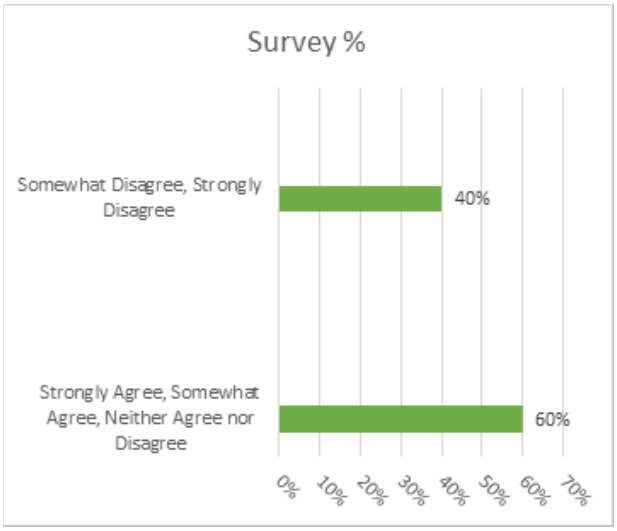
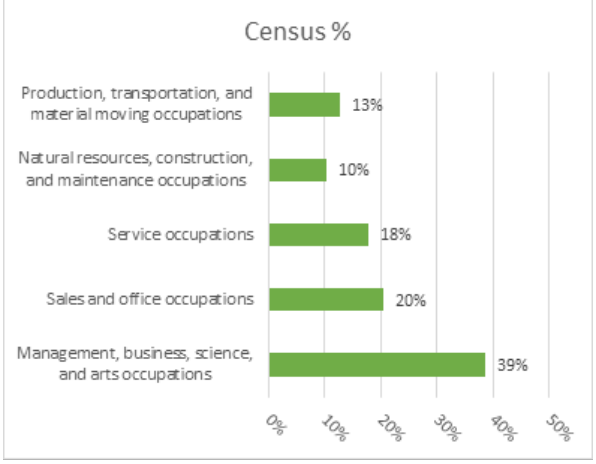


Figure 16. Census Bureau Participant Agreement to being a Blue-Collar Worker



Educational Attainment

Survey Participants. Half of the participants indicated having an education level of high school graduate or equivalent (24%, n = 401) or attending some college but no degree (26%, n = 441). Table 6 outlines the distribution of survey participants and their reported highest level of educational attainment.

Table 6. Survey Participants by Level of Educational Attainment

Education Level	Number (N = 1701)	Percentage
Trade School Certification	88	5%
Some High School	47	3%
Some College (no degree)	441	26%
High School Graduate or Equivalent	401	24%
Graduate Degree	168	10%
Bachelor's Degree	361	21%
Associate degree	195	11%

Comparison of Statewide Census Features. When comparing educational attainment across Louisiana and the study's participants, the distribution is similar. The ACS does not include some education levels in the study's survey, such as Trade School Certification. For both surveys, the top three education levels were the same. Most participants reported having a high school education followed by some college then bachelor's degree. Figure 17 outlines the highest level of educational attainment reported by survey participants, and Figure 18 outlines the highest level of educational attainment reported by Census Bureau respondents.

Figure 17. Survey Participants' Educational Attainment

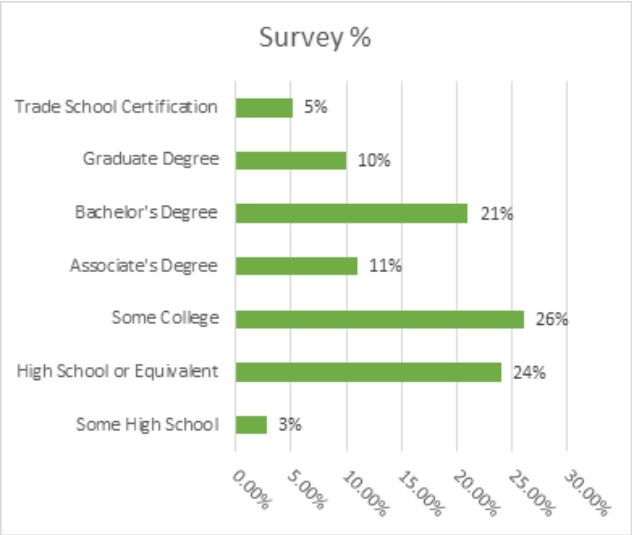
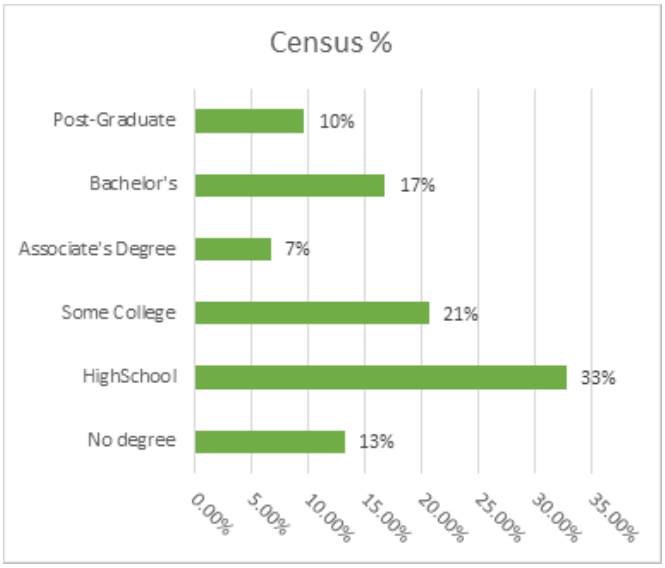


Figure 18. Census Bureau Participants' Educational Attainment



Household Income

Survey Participants. The largest concentration of participants belonged to the highest income bracket earning above $70,000 per year (26%, n = 439), followed by the two lowest brackets, less than $20,000 per year and between $20,000–$30,999 per year (16% for both). Table 7 represents the distribution of household income reported by survey participants.

Table 7. Survey Participants by Household Income

Household Income	Number (N = 1701)	Percentage
Less than $20,000	267	16%
$20,000–$30,999	280	16%
$31,000–$40,999	191	11%
$41,000–$50,999	197	12%
$51,000–$60,999	180	11%
$61,000–$70,999	138	8%
Above $70,000	439	26%

Comparison of Statewide Census Features. The study's survey data and data from the ACS both show the largest percentage of participants make above $70,000 per year. For the study's survey, 26% of participants reported making above $70,000, and for the ACS, 35% of participants reported making above $75,000. The ACS indicated the bracket ranging from $50,000 to $74,000 is the second largest, but this range is much larger than the others. Additionally, the two lowest income brackets also have a sizable percentage of participants. The middle-income brackets range from 12% to about 8% but jump to 15–16% for the two lowest income brackets. Figure 19 and Figure 20 outline the household income distributions reported by survey participants and Census Bureau respondents, respectively.

Figure 19. Survey Household Income Distribution

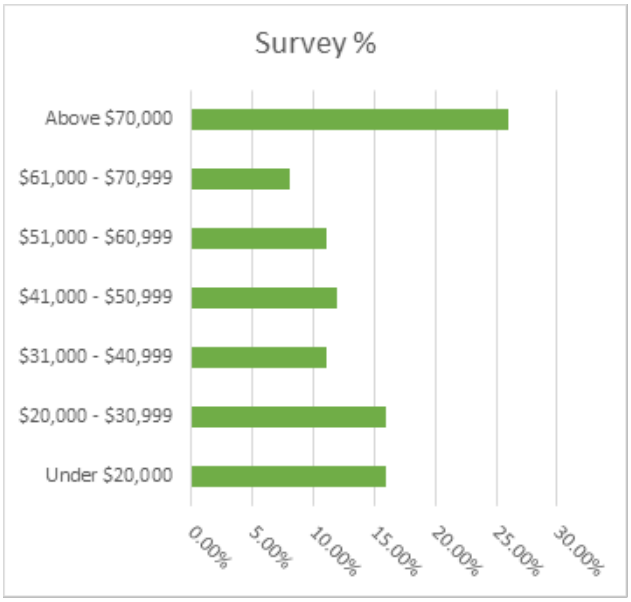
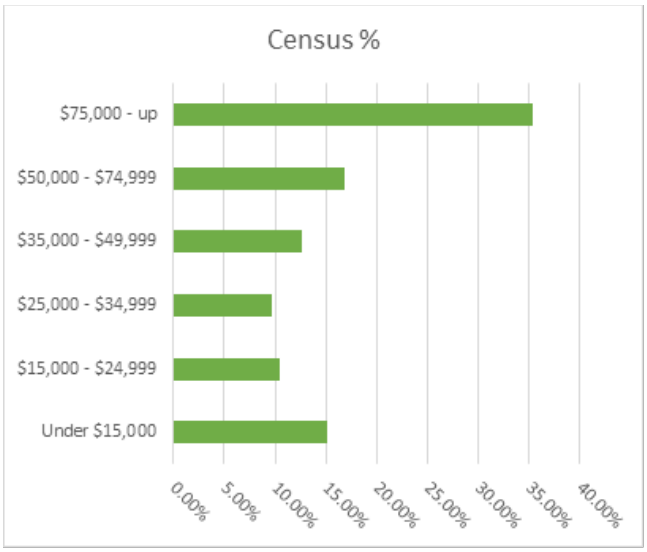


Figure 20. Census Bureau Household Income Distribution



Number of Persons in the Household

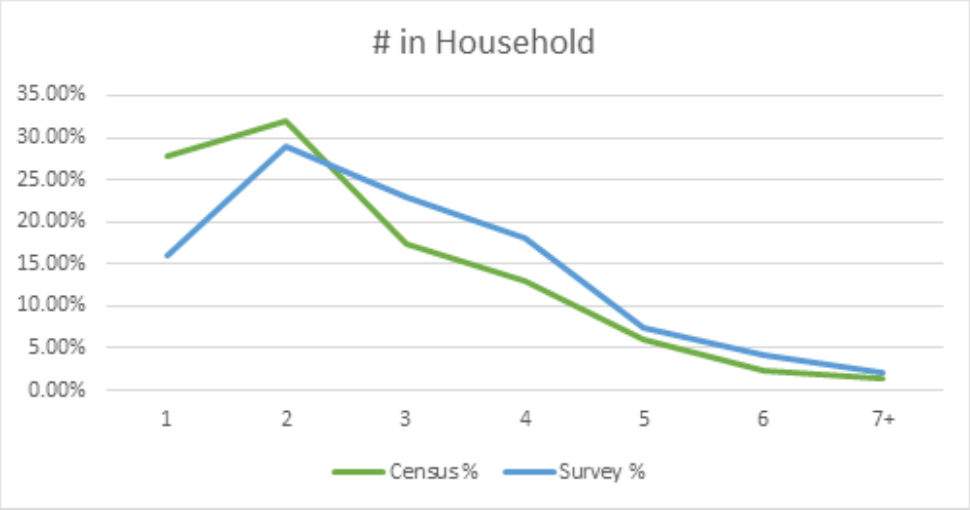
Survey Participants. Most of the participants indicated living with one other individual in their household, making it two total people (29%, n = 498). The smallest group indicated there were 7 or more people living in their household (2%, n = 35). Table 8 represents the number of people per household as indicated by survey participants.

Table 8. Survey Participants by Number of Persons in the Household

Number in the Household	Number (N = 1701)	Percentage
1	272	16%
2	498	29%
3	386	23%
4	313	18%
5	128	8%
6	69	4%
7 or more	35	2%

Comparison of Statewide Census Features. The distributions of the number of people per household have the same trends for both the ACS for Louisiana and for the study's survey. Two-person households are the most common living situation among all participants from both surveys. After two-person households, the most common are single-person households according to the ACS, and according to the study's survey, three-person households are second most common. After three-person households, as the number of people in each household increases, the percentage of participants who reported such living situation decreases. Participants indicated living in a household with 7 or more people less than any of the other categories. Figure 21 compares the number of people per household as indicated by respondents from the survey and the Census Bureau.

Figure 21. Census Bureau and Survey Comparison for Number of Persons in the Household



Duration of City Residency

Survey Participants. Most of the participants have lived in their city of residence for 11 or more years (62%, n = 1056). The table below, Table 9, shows the distribution of participants based on the number of years they have been living in their current city of residence.

Table 9. Survey Participants by Duration of City Residency

Duration	Number (N = 1701)	Percentage
0–3 years	288	17%
4–7 years	208	12%
8–11 years	149	9%
11+ years	1056	62%

Duration of Parish Residency

Survey Participants. Most of the participants have lived in their parish of residence for 11 or more years (66%, n = 1124). Table 10 shows the distribution of participants based on the number of years they have been living in their current parish of residence.

Table 10. Survey Participants by Duration of Parish Residency

Duration	Number (N = 1701)	Percentage
0–3 years	260	15%
4–7 years	176	10%
8–11 years	141	8%
11+ years	1124	66%

Comparison of Statewide Census Features. The study's survey asked participants how long they have been living in their city of residence, and 62% reported living in their city for 11+ years. Similarly, participants from the ACS indicated when they moved to their current residence and 37% reported moving to their city of residence before 2010. For both surveys, the second largest percentage belonged to the shortest duration. Of the participants, 17% reported living in their city of residence for 0–3 years and 27% reported moving to their city in 2019 or later. Where the Census Bureau did not ask specifics about parish residency, they did report on city residency. Figure 22 and Figure 23 compare the durations of city residency based on survey participants and Census Bureau respondents, respectively.

Figure 22. Survey Duration of City Residency Distribution

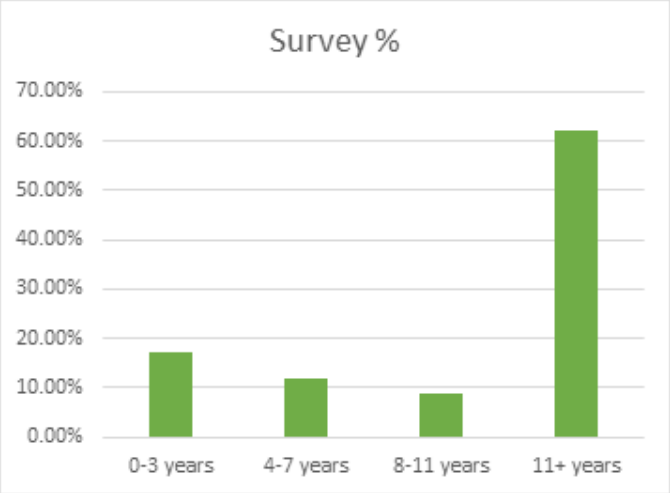
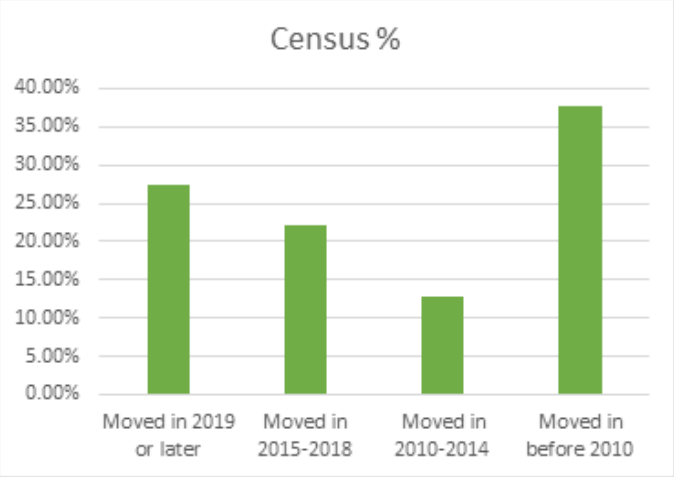


Figure 23. Census Bureau Duration of City Residency Distribution



Analysis of Social Environment vs. Seat Belt Use

Age

There was a statistically significant difference between age and seatbelt use determined by a one-way ANOVA (F (5, 1695) = 6.72, p <.0001). Post hoc tests revealed that older individuals (65 or older) are most likely to use their seatbelt. Survey items focused on the likelihood for the participants to wear their seatbelt in situations like driving for short distances, long distances, when law enforcement is around, when they are the driver, and when they are the passenger.

The largest difference occurred between our youngest and oldest participants. Those aged 65 or older are much more likely to use their seatbelt than participants aged 18–24 (CL, .198—.778, p < .0001). This is followed by those 65 or older and those 25–34 (CL, .150—.710, p = .0002). Also, of the six pairwise comparisons significant, four included participants ages 65 or older. The only age group that did NOT have significant differences with participants 65 or older was the age group directly below, participants aged 55–64. The youngest age group, 18–24, also resulted in a significant difference when compared to participants ages 55–64.

Several other pairwise comparisons resulted in no significance. The middle age groups (25–34, 35–44, and 45–54) did not have many significant differences regarding seatbelt use. It seems the largest differences occur when the individuals are of either extreme age group.

Gender

Regarding gender, there is a significant difference between males (M = 6.37, SD = 1.18) and females (M = 6.58, SD = 1.04) using seatbelts. Females are more likely to use their seatbelts than males, t (1) = −3.46, p = .0005.

Employment Status

When assessing seatbelt use and employment status, there were statistically significant differences (F (6, 1694) = 64.56, p = .0001). Tukey post hoc tests revealed that participants who reported being Retired are most likely to use their seatbelt as determined by a one-way ANOVA.

There were five significant pairwise comparisons and four included Retired participants. The largest difference occurred between Retired participants and participants who reported being Unemployed but Actively Seeking Work (CL, .173—.864, p = .0002). Additional significant differences regarding Retired participants included those Employed Full-Time (.057—.554, p =

.0053), Students (CL, .044—.869, p = .020), and Employed Part-Time (CL, .024—.631, p = .024). The last significant difference was between Homemakers and those Unemployed and Actively Seeking Work. Overall, Retired participants and those who reported being a Homemaker are most likely to use their seatbelt.

Employment Type (Blue-Collar)

When testing Employment Type, there were significant differences regarding seatbelt use as determined by a one-way ANOVA (F (4, 1650) = 3.45, p = .008). Tukey post hoc test revealed that participants who Strongly Disagree that they are a blue-collar worker are most likely to use their seatbelt.

The largest differences were between participants who selected Strongly Disagree that they are a blue-collar worker and those who selected Neither Agree nor Disagree (CL, .039—.451, p = .010) in addition to those who selected Strongly Agree (CL, .014—.471, p = .031). It appears participants who do not see themselves as blue-collar employees are most likely to use their seatbelt. The remaining pairwise comparisons were not significant.

Employment Type (White-Collar)

Interestingly, when participants were asked if they consider their Employment Type to be white-collar, there were no statistically significant differences (F (4, 1650) = 1.67, p = .154).

Educational Attainment

Regarding Educational Attainment and seatbelt use, there were statistically significant differences as determined by a one-way ANOVA (F (6, 1694) = 3.14, p = .005). Post hoc tests showed significant pairwise comparisons also.

Of the three significant pairwise comparisons, two of the largest differences occurred with participants who have received a Graduate Degree. When comparing participants with a Graduate Degree and participants who attended Some College but No Degree, results were significant (CL, .026—.600, p = .022) as well as when comparing participants who have an education level of High School Graduate or Equivalent (CL, .006—.587, p = .042). The remaining significant comparison includes participants who received a bachelor’s degree and those who attended Some College but No Degree (CL, .005—.454, p = .042). Overall, those with a higher level of education are most likely to use their seatbelt.

Household Income

As determined by a one-way ANOVA, Household Income results in significant differences regarding frequency of seatbelt use ($F (6, 1694) = 3.41$, $p = .002$). Post hoc tests revealed two significant pairwise comparisons.

The most significant difference in frequency of seatbelt use occurred between participants reporting their income bracket as $41,000–$50,999 and those who reported making less than $20,000 (CL, .080—.670, $p = .003$). The second largest difference occurred between the two extreme income brackets, those making above $70,000 and those making less than $20,000 (CL, .061—.547, $p = .004$). Except for the income bracket ranging from $41,000–$50,999, the lower the Household Income, the less likely they are to use their seatbelt.

Number of Persons in the Household

A one-way ANOVA revealed there were no significant differences between the number of people in the household and the frequency at which the individual uses their seatbelt.

Duration of City Residency

A one-way ANOVA revealed there were no significant differences between the duration the participant has lived in their city and the frequency at which the individual uses their seatbelt.

Duration of Parish Residency

A one-way ANOVA revealed there were no significant differences between the duration the participant has lived in their parish and the frequency at which the individual uses their seatbelt.

Analysis of Social Environment vs. Impaired Driving

Items asking about impaired driving focused on how often the participant has consumed 1–2 alcoholic drinks within two hours of driving, consumed 3 or more alcoholic drinks within two hours of driving, drove under the influence of marijuana, drove under the influence of prescriptions medications, and how often has the participant driven when their blood alcohol level might have been close to or above the legal limit in the past year.

Age

A one-way ANOVA revealed there are significant differences between age and the frequency at which the participant engages in impaired driving behaviors ($F (5, 1695) = 8.78$, $p < .0001$). Post hoc tests also revealed significance for multiple specific pairwise comparisons.

The most significant difference occurred between the youngest and oldest age groups where participants aged 18–24 are more likely to engage in impaired driving behaviors than all other age groups. The most significant difference was between participants ages 18–24 and participants aged 65 or older (CL, .215—.722, $p < .0001$). The second largest difference also occurred with participants aged 18–24 and the age group directly below the oldest, ages 55–64 (CL, .152—.667, $p < .0001$). Additional significant pairwise comparisons include participants 65 or older and participants 35–44 (CL, .131—.624, $p = .0002$) as well as with participants aged 25–34 (CL, .082—.572, $p = .002$). The remaining significant comparisons appeared to occur between the older age groups and the younger age groups.

Many pairwise comparisons were not significant such as comparing participants ages 18–24 and 25–34.

Gender

There are statistically significant differences between genders when considering how often males ($M = 1.67$, $SD = 1.21$) and females ($M = 1.37$, $SD = .83$) engage in impaired driving. Males are more likely to engage in impaired driving behaviors versus females, $t (1) = 4.76$, $p < .0001$.

Employment Status

A one-way ANOVA revealed statistically significant differences in employment status when considering the frequency at which one engages in impaired driving behaviors ($F (6, 1694) = 8.31$, $p < .0001$). Post hoc tests revealed significant pairwise comparisons as well.

Four pairwise comparisons resulted in significance, and all included the employment status of Employed with the most significant differences including full-time employment and the second two including part-time employment. The two largest differences were between participants reporting being Employed Full-Time and Retired participants (CL, .213—.650, $p < .0001$) along with participants reporting being Employed Full-Time and Homemakers (CL, .141—.650, $p < .0001$). Similarly, the remaining two significant pairwise comparisons were between participants reporting being Employed Part-Time and the same two categories, Retired participants (CL,

.090—.617, p = .002) and Homemakers (CL, .020—.607, p = .03). The remaining comparisons were not statistically significant.

Employment Type (Blue-Collar)

There are significant differences between employment type (blue-collar) and how often one engages in impaired driving behaviors as determined by a one-way ANOVA (F (4, 1650) = 5.07, p = .0005). Overall, those who more closely identify as a blue-collar worker are more likely to engage in impaired driving behaviors.

Tukey pairwise comparisons revealed significance for three specific pairings. Each pairing includes participants who Strongly Agree they are a blue-collar worker. The most significant difference occurred between those who Strongly Agree and those who Neither Agree nor Disagree (CL, .059—.472, p = .004), followed by those who Strongly Disagree (CL, .056—.454, p = .005), and lastly those who Somewhat Disagree (CL, .043—.493, p = .010). The remaining pairwise comparisons did not result in significance.

Employment Type (White-Collar)

There are significant differences between employment type (white-collar) and how often one engages in impaired driving behaviors as determined by a one-way ANOVA (F (4, 1650) = 7.99, p < .0001). Overall, those who selected Strongly Agree for identifying as a white-collar worker are more likely to engage in impaired driving behaviors.

Post hoc tests revealed significant pairwise comparisons. The largest differences occurred between participants who selected Strongly Agree and those who selected Strongly Disagree (CL, .100—.502, p = .0004) as well as between participants who selected Strongly Agree and those who selected Somewhat Disagree (CL, .105—.487, p = .0002). The additional two significant pairwise comparisons were between those who selected Neither Agree nor Disagree and those who selected Strongly Disagree (CL, .073—.466, p = .002) as well as between those who selected Neither Agree nor Disagree and those who selected Somewhat Disagree (CL, .078—.451, p = .001). Those who more closely identify as a white-collar worker are more likely to engage in impaired driving behaviors.

Educational Attainment

A one-way ANOVA revealed there were no significant differences between the participants' Educational Attainment and the frequency at which the participant engages in impaired driving behaviors.

Household Income

Determined by a one-way ANOVA, there are significant differences regarding Household Income and the frequency at which the participant engages in impaired driving behaviors ($F(6, 1694) = 2.38$, $p = .027$). Post hoc tests revealed significance for one pairwise comparison. The most significant difference occurred between participants who reported their income as $51,000–$60,999 and those who reported their income as $41,000–$50,999 (CL, .014—.586, $p = .033$). Overall, participants who reported their income as $51,000–$60,999 are most likely to engage in impaired driving behaviors.

Number of Persons in the Household

A one-way ANOVA revealed there were no significant differences between the number of people in the household and the frequency at which the participant engages in impaired driving behaviors.

Duration of City Residency

A one-way ANOVA revealed a statistically significant difference regarding the duration a participant has lived in their city and the frequency at which the participant engages in impaired driving behaviors ($F(3, 1697) = 4.50$, $p = .004$). Tukey post hoc tests showed one significant pairwise comparison. The significant difference was between those who have lived in their city for 4–7 years and those who have lived in their city for 11+ years (CL, .041—.407, $p = .01$). Those who have lived in their city for 4–7 years are most likely to engage in impaired driving behaviors followed by 8–11 years, 0–3 years, then 11+ years.

Duration of Parish Residency

A one-way ANOVA revealed there were no significant differences between the duration the participant has lived in their parish and the frequency at which the participant engages in impaired driving behaviors.

Analysis of Social Environment vs. Distracted Driving

Items that assessed on distracted driving behaviors focused on how often the participants engaged in distracted driving in the past 12 months, whether they dial a phone number while driving, send a text/email while driving, respond to a text/email while driving, and read texts/emails while driving.

Age

A one-way ANOVA revealed statistically significant differences when considering age and the frequency the participant engages in distracted driving behaviors ($F (5, 1695) = 36.87$, $p < .0001$). Tukey post hoc tests also revealed statically significant pairwise comparisons, and of the 15 comparisons, 11 resulted in a statistically significant difference.

Of the 11 significant pairwise comparisons, nine had a p-value <. 0001.The largest difference occurred between the oldest, 65 or older, and youngest age groups, 18–24 (CL, .886—.160, p <.0001). The only comparisons that did NOT result in significance are as follows: 18–24 and 23–34; 18–24 and 35–44; 55–64 and 65 or older; and 35–44 and 25–34. As the age groups increase or get older, participants are less likely to engage in distracted driving apart from the age groups 25–34 and 35–44 being switched.

Gender

There are statistically significant differences between genders when considering how often males ($M = 2.36$, $SD = 1.54$) and females ($M = 2.17$, $SD = 1.33$) engage in distracted driving. Males are more likely to engage in distracted driving behaviors than females, $t (1) = 2.35$, $p = .0189$.

Employment Status

Regarding employment status and distracted driving, a one-way ANOVA revealed statistically significant differences ($F (6, 1694) = 20.73$, $p < .0001$). Tukey post hoc tests revealed many statistically significant pairwise comparisons as well.

Of the pairwise comparison, the top three all included Retired participants who are least likely to engage in distracted driving behaviors. The significant results are as follows: Students are more likely to drive distracted than Retired participants (CL, .600—1.63, $p < .0001$); participants Employed Full-Time are more like to drive distracted than Retired participants (CL, .716—1.34, p <.0001); and participants Employed Part-Time are more likely to drive distracted than Retired participants (CL, .587—1.34, $p < .0001$). Furthermore, Retired participants had significant differences with all other employment statuses excluding participants who are Unemployed and Not Seeking Work. There are many other significant pairwise comparisons, including the fact that participants Employed Full-Time are more likely to engage in distracted driving that Homemakers (CL, .212—.935, $p < .0001$).

Employment Type (Blue-Collar)

A one-way ANOVA revealed there were no significant differences between the participants' Employment Type (Blue-Collar) and the frequency at which the participant engages in distracted driving behaviors.

Employment Type (White-Collar)

A one-way ANOVA revealed significant differences between the participants' Employment Type (White-Collar) and the frequency at which the participants engage in distracted driving behaviors ($F(4, 1650) = 2.60$, $p = .034$). Tukey post hoc tests did not reveal any significant pairwise comparisons.

Educational Attainment

A one-way ANOVA revealed there were no significant differences between the participants' Educational Attainment and the frequency at which the participants engage in distracted driving behaviors.

Household Income

A one-way ANOVA revealed there were no significant differences between the participants' Household Income and the frequency at which the participants engage in distracted driving behaviors.

Number of Persons in the Household

When comparing the number people in the household and how often the participants engage in distracted driving, a one-way ANOVA revealed significant differences ($F(6, 1694) = 5.74$, $p < .0001$). Post hoc tests revealed two significant pairwise comparisons. Participants who live in a two-person household are less likely to engage in distracted driving than participants from a five-person household (CL, .136—.937, $p = .002$) and participants from a three-person household (CL, .203—.751, $p < .0001$). The remaining pairwise comparisons were not significant.

City Residency

A one-way ANOVA revealed a statistically significant difference regarding the duration the participant has lived in their city and the frequency at which the participant engages in distracted driving behaviors ($F(3, 1697) = 3.89$, $p = .009$). Like impaired driving, Tukey post hoc tests showed one significant pairwise comparison between the same time frames. The most significant

difference was between those who have lived in their city for 4–7 years and those who have lived in their city for 11+ years (CL, .008—.545, p = .041). Those who have lived in their city for 4–7 years are most likely to engage in distracted driving behaviors followed by 8–11 years, 0–3 years, then 11+ years.

Parish Residency

A one-way ANOVA revealed there were no significant differences between the duration the participant has lived in their parish and the frequency at which the participant engages in distracted driving behaviors.

Analysis of Values by Social Environment

Considering an ANOVA is an omnibus test, post hoc tests must be conducted to further analyze the data. The post hoc test used in this analysis was the Tukey HSD as opposed to the Bonferroni test. The Bonferroni test has more power when the number of variables or comparisons is smaller and is considered a conservative test. However, the Tukey HSD is most powerful with more variables or means to compare, and there is a modified version, the Tukey-Kramer test for data sets with unequal sample sizes. The Tukey HSD fits this data set best.

Age

There was a statistically significant difference between age (independent variable) and values (dependent values) determined by a one-way ANOVA ($F(5, 1695) = 5.29$, $p < .0001$). Tukey post hoc tests revealed that older individuals are more likely to rate values like interdependence, universalism, and benevolence as more important than younger individuals.

The age group 65 or older had significant differences with all other age groups excluding ages 55–64. Participants who are 65 or older had the most significant difference in values when compared to participants aged 18–24 (CL, .171—.659, p <.0001). The remaining significant pairwise comparisons are as follows: 65 or older and 45–54 (CL, .100—.613, p = .001); 65 or older and 35–44 (CL, .071—.545, p = .0029); and 65 or older and 25–34 (CL, .046—.518, p = .0084)

Several pairwise comparisons also revealed no significance. When comparing the means of any other age groups (18–24, 25–34, 35–44, and 55–64), there were no significant differences.

Furthermore, the only insignificant comparison with the age group 65 or older was when the age group was compared to ages 55–64.

Gender

There was a statistically significant difference between males (M = 5.70, SD = 1.00) and females (M = 5.92, SD = .85) when rating the importance of values such as interdependence, universalism, and benevolence. Females reported values as more important than males, t (1) = −4.26, p < .0001.

Employment Status

There was a statistically significant difference between employment status and values determined by a one-way ANOVA (F (6, 1694) = 2.628, p = .015). Tukey post hoc tests revealed that, overall, individuals who are Retired are more likely to rate values as more important.

Pairwise comparisons revealed significant differences between participants who reported being Retired and participants who reported being a student as well as participants who reported being Employed Full-Time. The most significant difference occurred when comparing individuals who are Retired and Students (CL, .040—.734, p = .018) followed by the comparison between Retired and Employed Full-Time (CL, .003—.421, p = .043).

The remaining pairwise comparisons revealed no significance. The remaining variables from employment status include Homemaker, Employed Part-Time, Unemployed (actively seeking work), and Unemployed (not actively seeking work), none of which had significant differences in their ratings of values.

Employment Type (Blue Collar)

A one-way ANOVA revealed significant differences when comparing employment type (blue-collar) and the importance of values like interdependence, universalism, and benevolence (F (4, 1650) = 7.20, p < .0001). Tukey post hoc tests revealed participants who Strongly Agree that they are a Blue-Collar worker rate these values higher than those who Somewhat Agree or Disagree with being a Blue-Collar worker.

Pairwise comparisons show the most significant differences were between those who Strongly Agree that they are a Blue-Collar worker and those who selected Somewhat Disagree (CL, .206—.513, p < .0001); Neither Agree nor Disagree (CL, .186—.468, p < .0001); and Somewhat Agree (CL, .148—.442, p < .0001). The remaining significant differences belong to the

comparison between Strongly Agree and Strongly Disagree (CL, .078—.350, p = .0020) as well as between Strongly Disagree and Somewhat Disagree (CL, .009—.283, p = .0368).

The remaining pairwise comparisons resulted in insignificance. These comparisons include differences between those who Strongly Disagree that they are a Blue-Collar worker and those who Somewhat Agree, and then those who selected Neither Agree nor Disagree compared to those who Somewhat Agree.

Employment Type (White-Collar)

Significant differences were revealed using a one-way ANOVA to compare employment type (white-collar) and the importance of values like interdependence, universalism, and benevolence ($F(4, 1650) = 2.91$, $p = .021$). Tukey post hoc tests revealed there was no significance between any specific pair, but only overall significance.

Educational Attainment

A one-way ANOVA revealed there were no significant differences between educational attainment or education level and the importance of values like interdependence, universalism, and benevolence.

Household Income

A one-way ANOVA revealed there were no significant differences between household income and the importance of values like interdependence, universalism, and benevolence.

Number of Persons in the Household

A one-way ANOVA revealed there were no significant differences between the number of people in the household and the importance of values like interdependence, universalism, and benevolence.

Duration of City Residency

A one-way ANOVA revealed significant differences when comparing the duration the participant has lived in the city they are currently living in and the importance of values like interdependence, universalism, and benevolence ($F(3, 1697) = 3.42$, $p = .017$). Tukey post hoc tests revealed participants who have lived in their city for 11+ years rate these values higher than those who have lived in the city for 0–3 years (CL, .014—.322, p = .025). The remaining

pairwise comparisons resulted in insignificance. The other duration options available for participants were 4–7 years and 8–11 years.

Duration of Parish Residency

Significant differences were found using a one-way ANOVA to compare the duration the participant has lived in their parish and the importance of values like interdependence, universalism, and benevolence ($F(3, 1697) = 3.42$, $p = .017$). Tukey post hoc tests revealed participants who have lived in their parish for 11+ years rate these values higher than those who have lived in their parish for 0–3 years (CL, .014—.333, $p = .026$). The remaining pairwise comparisons resulted in insignificance. The other duration options available for participants were 4–7 years and 8–11 years.

Analysis of Factors by SHSP Coalition

The following data were analyzed using Chi-square tests. Chi-square tests assess the difference between the expected data and the actual observed data. If significance is found, the observed frequencies or distributions and the expected distributions are not the same, and there may be a confounding variable affecting the data. The statistics program provided the Pearson Chi-Square statistic which involves looking at the squared differences of observed and expected, and the Likelihood Ratio Chi-Square statistic that involves the ratio or observed to expected. The Likelihood Ratio Chi-Square statistic will be used for this section of the report.

The following results also include tables representing the data. Each table includes the total number and percentage for each SHSP Coalition. For example, Table 33 (found in Appendix C) includes the Acadiana Transportation Safety Coalition in which 54 participants from this coalition indicated they are 18–24 years old. Furthermore, 18.75% of the total participants from this coalition are 18–24. The final column includes the total for the coalition and the respective percentage based off the overall number of participants (N = 1701). The tables containing the full survey results discussed below can be found in Appendix C: Tables by Social Environment by SHSP Coalition.

Age

The distributions of age (Table 33) did not differ by SHSP Coalition, $\chi 2(40, N = 1701) = 36.92$, $p = .61$.

Gender

Gender distribution (Table 34) does not differ by SHSP Coalition, $\chi 2$ (8, N = 1692) = 13.29, p = .102.

Employment Status

The relationship between Employment Status and SHSP Coalition (Table 35) was significant, $\chi 2$ (48, N = 1701) = 71.70, p = .015.

Employment Type (Blue-Collar)

Employment Type (blue-collar) distribution (Table 36) does not differ by SHSP Coalition, $\chi 2$ (32, N = 1655) = 42.75, p = .097.

Employment Type (White-Collar)

The relationship between Employment Type (white-collar) and SHSP Coalition (Table 37) was significant, $\chi 2$ (32, N = 1655) = 49.42, p = .025.

Educational Attainment

The relationship between Educational Attainment and SHSP Coalition (Table 38) was significant, $\chi 2$ (48, N = 1701) = 101.81, p < .0001.

Household Income

Household Income distribution (Table 39) does not differ by SHSP Coalition, $\chi 2$ (48, N = 1701) = 61.40, p = .093.

Number of Persons in the Household

The relationship between the Number of Person in the Household and SHSP Coalition (Table 40) was significant, $\chi 2$ (48, N = 1701) = 69.27, p = .024.

Duration of City Residency

The relationship between the Duration of City Residency and SHSP Coalition (Table 41) was significant, $\chi 2$ (24, N = 1701) = 53.54, p = .0005.

Duration of Parish Residency

The relationship between the Duration of Parish Residency and SHSP Coalition (Table 42) was significant, $\chi 2$ (24, N = 1701) = 56.64, p = .0002.

Seatbelt Use

A one-way ANOVA revealed there were no significant differences for SHSP coalitions and seatbelt use (F (8, 1692) = 1.44, p = .177).

Impaired Driving

A one-way ANOVA revealed there were no significant differences for SHSP coalitions and impaired driving behaviors (F (8, 1692) = 1.04, p = .402).

Distracted Driving

A one-way ANOVA revealed there were no significant differences for SHSP coalitions and distracted driving behaviors (F (8, 1692) = 4.24, p = .907).

Interdependence

A one-way ANOVA revealed there were no significant differences for SHSP coalitions and the importance of interdependence (F (8, 1692) = 1.09, p = .369).

Universalism

A one-way ANOVA revealed there were no significant differences for SHSP coalitions and importance of universalism (F (8, 1692) = 1.92, p = .054).

Benevolence

A one-way ANOVA revealed there were no significant differences for SHSP coalitions and importance of benevolence (F (8, 1692) = 1.04, p = .402).

Analysis of Social Environment by Geography Types

Geography types indicated are City, Rural, Town, and Village.

Age

Age distribution does not differ by Geography Type, c2 (15, N = 1701) = 11.60, p = .710 (Table 11).

Table 11. Age Group by Geography Type

	18–24	25–34	35–44	45–54	55–64	65 or older	Total
City	271	315	305	193	138	128	1351
	20.06%	23.39%	22.58%	14.29%	10.21%	9.47%	79.42%
Rural	2	6	5	4	4	5	26
	7.69%	23.08%	19.23%	15.38%	15.38%	19.23%	1.53%
Town	37	59	57	35	32	25	245
	15.10%	24.08%	23.27%	14.29%	13.06%	10.20%	14.40%
Village	14	17	18	15	6	9	79
	17.72%	21.52%	22.78%	18.99%	7.59%	11.39%	4.64%

Gender

Gender distribution does not differ by Geography Type, χ2 (3, N = 1692) = 3.49, p = .323 (Table 12).

Table 12. Gender by Geography Type

	Female	Male	Total
City	1008	335	1343
	75.06%	24.94%	79.37%
Rural	16	10	26
	61.54%	38.46%	1.54%

	Female	Male	Total
Town	190	55	245
	77.55%	22.45%	14.48%
Village	61	17	78
	78.21%	21.79%	4.61%

Employment Status

The relationship between Employment Status and Geography Type was significant, $\chi 2$ (18, N = 1701) = 28.93, p = .049 (Table 13).

Table 13. Employment Status by Geography Type

	Employed Full-Time	Employed Part-Time	Homemaker	Retired	Student	Unemployed (actively seeking work)	Unemployed (not seeking work)
City	696	193	94	146	70	117	35
	51.52%	14.29%	6.96%	10.81%	5.18%	8.66%	2.59%
Rural	13	2	2	6	0	3	0
	50.00%	7.69%	7.69%	23.08%	0.00%	11.54%	0.00%
Town	108	33	29	35	10	20	10
	44.08%	13.47%	11.84%	14.29%	4.08%	8.16%	4.08%
Village	36	10	13	12	3	4	1
	45.57%	12.66%	16.46%	15.19%	3.80%	5.06%	1.27%

Employment Type (Blue-Collar)

Employment Type (blue-collar) distribution does not differ by Geography Type, $\chi 2$ (12, N = 1655) = 13.75, p = .317 (Table 14).

Table 14. Agreement towards being a Blue-Collar Worker by Geography Type

	Neither agree nor disagree	Somewhat Agree	Somewhat Disagree	Strongly Agree	Strongly Disagree	Total
City	291	236	205	209	375	1316
	22.11%	17.93%	15.58%	15.88%	28.50%	79.52%
Rural	4	6	6	2	8	26
	15.38%	23.08%	23.08%	7.69%	30.77%	1.57%
Town	57	54	32	41	51	235
	24.26%	22.98%	13.62%	17.45%	21.70%	14.20%
Village	23	13	14	11	17	78
	29.49%	16.67%	17.95%	14.10%	21.79%	4.71%

Employment Type (White-Collar)

The relationship between Employment Status and Geography Type was significant, $\chi 2$ (12, N = 1655) = 22.83, p = .0429 (Table 15).

Table 15. Agreement towards being a White-Collar Worker and Geography Type

	Neither agree nor disagree	Somewhat Agree	Somewhat Disagree	Strongly Agree	Strongly Disagree	Total
City	259	352	185	255	265	1316
	19.68%	26.75%	14.06%	19.38%	20.14%	79.52%
Rural	6	7	3	2	8	26
	23.08%	26.92%	11.54%	7.69%	30.77%	1.57%
Town	39	69	32	29	66	235
	16.60%	29.36%	13.62%	12.34%	28.09%	14.20%
Village	18	27	6	9	17	78
	23.08%	34.62%	7.69%	11.54%	23.08%	4.71%

Educational Attainment

The relationship between Educational Attainment and Geography Type was significant, $\chi 2$ (18, N = 1701) = 71.73, p < .0001. It should be noted that 20% of the cells have a count less than 5 (Table 16).

Table 16. Educational Attainment by Geography Type

	Associate degree	Bachelor's Degree	Graduate Degree	High School Graduate or Equivalent	Some College (no degree)	Some High School	Trade School Certification	Total
City	143	318	146	286	360	36	62	1351
	10.58%	23.54%	10.81%	21.17%	26.65%	2.66%	4.59%	79.42%
Rural	4	6	5	6	5	0	0	26
	15.38%	23.08%	19.23%	23.08%	19.23%	0.00%	0.00%	1.53%
Town	37	29	15	83	59	8	14	245
	15.10%	11.84%	6.12%	33.88%	24.08%	3.27%	5.71%	14.40%
Village	11	8	2	26	17	3	12	79
	13.92%	10.13%	2.53%	32.19%	21.52%	3.80%	15.19%	4.64%

Household Income

The relationship between Household Income and Geography Type was significant, $\chi 2$ (18, N = 1701) = 33.53, p = .014. It should be noted that 20% of the cells have a count less than 5 (Table 17).

Table 17. Household Income by Geography Type

	$20,000–-$30,999	$31,000–-$40,999	$41,000–-$50,999	$51,000–-$60,999	$61,000—$70,999	Above $70,000	Less than $20,000	Total
City	221	149	163	136	115	359	208	1351
	16.36%	11.03%	12.07%	10.07%	8.51%	26.57%	15.40%	79.42%
Rural	5	5	0	4	0	9	3	26

	$20,000–-$30,999	$31,000–-$40,999	$41,000–-$50,999	$51,000–-$60,999	$61,000—$70,999	Above $70,000	Less than $20,000	Total
	19.23%	19.23%	0.00%	15.38%	0.00%	34.62%	11.54%	1.53%
Town	39	30	29	22	17	56	52	245
	15.92%	12.24%	11.84%	8.98%	6.94%	22.86%	21.22%	14.40%
Village	15	7	5	18	6	15	13	79
	18.99%	8.86%	6.33%	22.78%	7.59%	18.99%	16.46%	4.64%

Number of Persons in the Household

The distribution for the Number of Persons in the Household does not differ by Geography Type, $\chi 2$ (18, N = 1701) = 21.07, p = .276 (Table 18).

Table 18. Number of Persons in the Household by Geography Type

	1	2	3	4	5	6	7 or more	Total
City	217	407	311	242	98	53	23	1351
	16.06%	30.13%	23.02%	17.91%	7.25%	3.92%	1.70%	79.42%
Rural	4	6	6	8	1	0	1	26
	15.38%	23.08%	23.08%	30.77%	3.85%	0.00%	3.85%	1.53%
Town	41	60	50	50	21	12	11	245
	16.73%	24.49%	20.41%	20.41%	8.57%	4.90%	4.49%	14.40%
Village	10	25	19	13	8	4	0	79
	12.66%	31.65%	24.05%	16.46%	10.13%	5.06%	0.00%	4.64%

Duration of City Residency

The relationship between Duration of City Residency and Geography Type was significant, $\chi 2$ (9, N = 1701) = 27.40, p = .001 (Table 19).

Table 19. Duration of City Residency by Geography Type

	0–3 years	4–7 years	8–11 years	11+ years	Total
City	232	153	111	855	1351
	17.17%	11.32%	8.22%	63.29%	79.42%
Rural	2	0	1	23	26
	7.69%	0.00%	3.85%	88.46%	1.53%
Town	42	39	32	132	245
	17.14%	15.92%	13.06%	53.88%	14.40%
Village	12	16	5	46	79
	15.19%	20.25%	6.33%	58.23%	4.64%

Duration of Parish Residency

The relationship between Duration of Parish Residency and Geography Type was significant, $\chi 2$ (9, N = 1701) = 17.14, p = .047 (Table 20).

Table 20. Duration of Parish Residency by Geography Type

	0–3 years	4–7 years	8–11 years	11+ years	Total
City	212	135	111	893	1351
	15.69%	9.99%	8.22%	66.10%%	79.42%
Rural	2	0	0	24	26
	7.69%	0.00%	0.00%	92.31%	1.53%
Town	34	33	21	157	245
	13.88%	13.47%	8.57%	64.08%	14.40%
Village	12	8	9	50	79
	15.19%	10.13%	11.39%	63.29%	4.64%

Analysis of Social Environment by City Population

The following outlines the results regarding city population. Categories are simply yes or no to indicate if the participant lives in a city with a population above 100,000 or if the participant lives in a city with a population less than 100,000.

Age

Age distribution does not differ by City Population, $\chi 2$ (15, N = 1701) = 11.60, p = .710 (Table 21).

Table 21. Age by City Population

	18–24	25–34	35–44	45–54	55–64	65 or older	Total
No	206	273	271	181	133	113	1177
	17.50%	23.19%	23.02%	15.38%	11.30%	9.60%	69.19%
Yes	118	125	114	66	47	54	524
	22.52%	23.85%	21.76%	12.60%	8.97%	10.31%	30.81%

Gender

Gender distribution does not differ by City Population, $\chi 2$ (1, N = 1692) = .856, p = .355 (Table 22).

Table 22. Gender by City Population

	Female	Male	Total
No	890	281	1171
	76.00%	24.00%	69.21%
Yes	385	136	521
	73.90%	26.10%	30.79%

Employment Status

The relationship between Employment Status and City Population was significant, $\chi 2$ (6, N = 1701) = 19.97, p = .003 (Table 23).

Table 23. Employment Status by City Population

	Employed Full-Time	Employed Part-Time	Homemaker	Retired	Student	Unemployed (actively seeking work)	Unemployed (not seeking work)
No	568	169	109	145	46	105	35
	48.26%	14.36%	9.26%	12.32%	3.91%	8.92%	2.97%
Yes	285	69	29	54	37	39	11
	54.39%	13.17%	5.53%	10.31%	7.06%	7.44%	2.10%

Employment Type (Blue-Collar)

The relationship between Employment Type (blue-collar) and City Population was significant, $\chi 2$ (4, N = 1655) = 13.33, p = .010 (Table 24).

Table 24. Agreement towards being a Blue-Collar Worker by City Population

	Neither agree nor disagree	Somewhat Agree	Somewhat Disagree	Strongly Agree	Strongly Disagree	Total
No	269	224	174	192	283	1142
	23.56%	19.61%	15.24%	16.81%	24.78%	69.00%
Yes	106	85	83	71	168	513
	20.66%	16.57%	16.18%	13.84%	32.75%	31.00%

Employment Type (White-Collar)

The relationship between Employment Type (white-collar) and City Population was significant, $\chi 2$ (4, N = 1655) = 23.76, p = .0001 (Table 25).

Table 25. Agreement towards being a White-Collar Worker by City Population

	Neither agree nor disagree	Somewhat Agree	Somewhat Disagree	Strongly Agree	Strongly Disagree	Total
No	219	323	157	173	270	1142
	19.18%	28.28%	13.75%	15.15%	23.64%	69.00%
Yes	103	132	69	122	87	513
	20.08%	25.73v	13.45%	23.78%	16.96%	31.00%

Educational Attainment

The relationship between Educational Attainment and Geography Type was significant, $\chi 2$ (6, N = 1701) = 70.29, p < .0001 (Table 26).

Table 26. Educational Attainment by City Population

	Associate degree	Bachelor's Degree	Graduate Degree	High School Graduate or Equivalent	Some College (no degree)	Some High School	Trade School Certification	Total
No	127	221	88	326	310	33	72	1177
	10.79%	18.78%	7.48%	27.70%	26.34%	2.80%	6.15%	69.49%
Yes	68	140	80	75	131	14	16	524
	12.98%	26.72%	15.27%	14.31%	25.00%	2.67%	3.05%	30.81%

Household Income

Household Income distribution does not differ by City Population, $\chi 2$ (6, N = 1701) = 5.50, p = .482 (Table 27).

Table 27. Household Income by City Population

	$20,000–-$30,999	$31,000–-$40,999	$41,000–-$50,999	$51,000–-$60,999	$61,000—$70,999	Above $70,000	Less than $20,000	Total
No	194	145	134	133	92	297	193	1177

	$20,000–-$30,999	$31,000–-$40,999	$41,000–-$50,999	$51,000–-$60,999	$61,000—$70,999	Above $70,000	Less than $20,000	Total
	16.48%	12.32%	11.38%	10.37%	7.82%	25.23%	16.40%	69.49%
Yes	86	46	63	58	46	142	83	524
	16.41%	8.78%	12.02%	11.07%	8.78%	27.10%	15.84%	30.81%

Number of Persons in the Household

The relationship between the Number of Persons in the Household and City Population was significant, $\chi 2$ (6, N = 1701) = 15.91, p = .014 (Table 28).

Table 28. Number of Persons in the Household by City Population

	1	2	3	4	5	6	7 or more	Total
No	170	331	276	225	92	56	27	1177
	14.44%	28.12%	23.45%	19.12%	7.82%	4.76%	2.29%	69.49%
Yes	102	167	110	88	36	13	8	524
	19.47%	31.87%	20.99%	16.79%	6.87%	2.48%	1.53%	30.81%

Duration of City Residency

The relationship between Duration of City Residency and City Population was significant, $\chi 2$ (3, N = 1701) = 9.53, p = .023 (Table 29).

Table 29. Duration of City Residency by City Population

	0–3 years	4–7 years	8–11 years	11+ years	Total
No	200	161	107	709	1177
	16.99%	13.68%	9.09%	60.24%	69.19%

	0–3 years	4–7 years	8–11 years	11+ years	Total
Yes	88	47	42	347	524
	16.79%	8.97%	8.02%	66.22%	30.81%

Duration of Parish Residency

The Duration of Parish Residency does not differ by City Population, $\chi 2$ (3, N = 1701) = 4.50, p = .213 (Table 30).

Table 30. Duration of Parish Residency by City Population

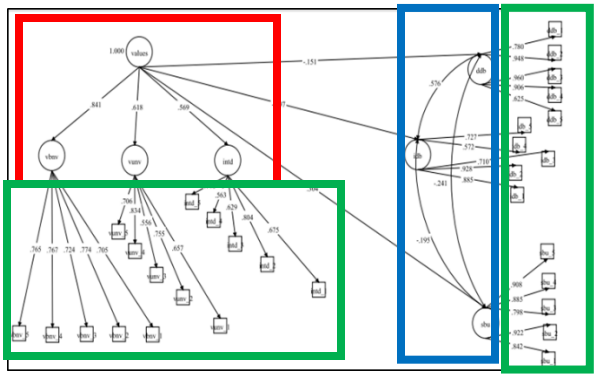
	0–3 years	4–7 years	8–11 years	11+ years	Total
No	167	129	99	782	1177
	14.19%	10.96%	8.41%	66.44%	69.19%
Yes	93	47	42	342	524
	17.75%	8.97%	8.02%	65.27%	30.81%

Conclusions

Path Model Diagrams

Path model diagrams created for the project provide a way to view the results of statistical analysis on survey data and demonstrate conclusions such as how high-level concepts like values were defined and measured, and the relationships between values and driver behaviors. A detailed path model diagram is shown in Figure 24. This diagram includes all observed variables[3], which are represented by squares (in green boxes), and latent variables[4], which are represented by circles or ovals (in red and blue boxes). Arrows in the diagram represent relationships between variables and numbers on the arrows represent estimates, which show the strength of relationships. In Figure 24 and all other path model diagrams in this report, one-way arrows indicate direct relationships and two-way arrows indicate covariances or correlations. Each circle or square has one or more arrows coming to or from it, with an estimate displayed on each arrow. The larger the estimate, the stronger the relationship between the variables connected by the arrow.

Figure 24. Path model showing relationship between values and distracted driving behaviors



[3] Observed variables are direct measurements that are calculated using responses to survey questions. These observed variables are then used to define and provide an overall measurement for latent variables. For example, one of the five observed variables used for the definition and measurement of the latent variable, "interdependence," uses the results of the survey question, "The well-being of my friends and family is important for me," assessed on a 7-point scale from "strongly agree" to "strongly disagree."

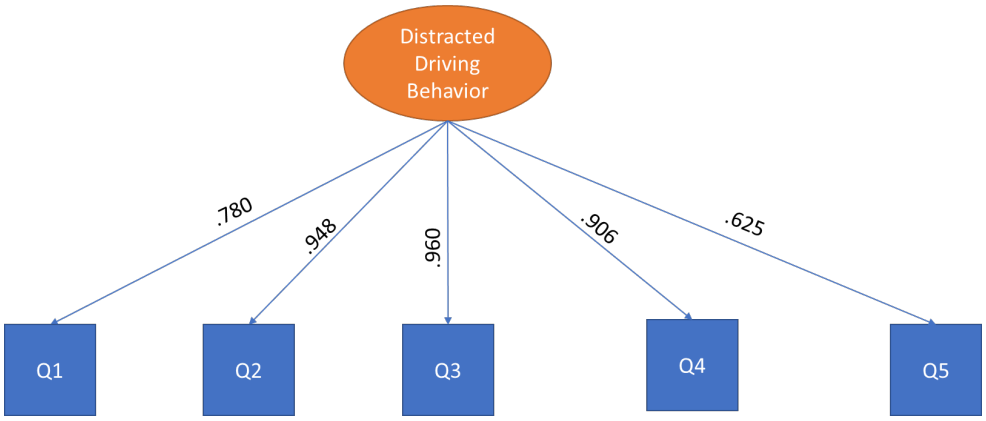
[4] Latent variables (also called latent factors or constructs) are concepts that cannot be measured by direct observation, such as values, interdependence, and benevolence. Latent variables are used to explain one or more observed variables in a model.

In the following two sections, specific parts of the path diagram shown in Figure 24 will be discussed. The section titled, "Measurement," will focus on the ability of project survey questions to adequately measure values and driver behavior. The second section, "Relationships," will focus on significant relationships discovered between values and three distinct driver behaviors.

Measurement

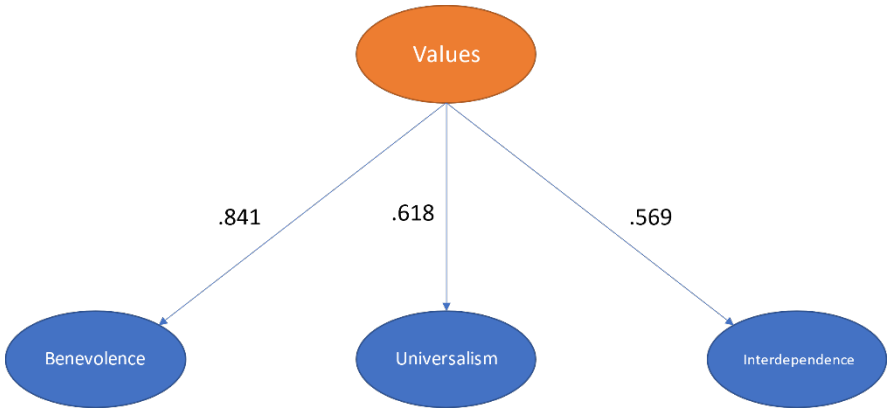
The strength of relationships between project survey questions and latent variables is assessed by the value of standardized factor loading estimates between 0 and 1 for each observed variable and latent variable. Values closest to 1 indicate the strongest relationships. For example, in Figure 25, the value of 0.960 on the arrow between Q3 and "Distracted Driving Behavior" indicates that the overall survey response measurement for question 3 is highly related to "Distracted Driving Behavior." For all survey questions included in the final analysis, all factor loading estimates were significant with values greater than 0.5. This provides evidence that the survey questions contribute to the final analysis model displayed in Figure 24. Factor loading diagrams with associated survey questions for all latent variables are provided in Appendix I of this report.

Figure 25. Factor Loadings of Distracted Driving Behaviors



The latent variable, "Values," is defined using standardized factor loadings of three other latent variables as shown in Figure 26. Factor loadings are interpreted in the same manner as previously discussed, with all loadings significant and the loading of .841 for "Benevolence" as the most significant.

Figure 26. Factor Loadings for Values



Relationships Between Latent Variables

This path model includes several significant relationships between values and distracted driving behaviors, all of which are displayed in Figure 27. To interpret these relationships, unstandardized loadings using the same 7-point scale as the questions are used, with higher scores on questions indicating a respondent's higher level of agreement with the importance of each subcomponent of Values (i.e., Interdependence, Benevolence, and Universalism). The same logic applies to driver behaviors, with higher values corresponding to higher self-reported levels of seat belt use, impaired driving, or distracted driving. Estimates next to one-way arrows shown in bold represent direct relationships from values to Driver Seat Belt Use, Impaired Driving, and Distracted Driving.

Direct Relationship Between Values and Seat Belt Use

The strongest relationship between Values and driver behavior was that between Values and Driver Seat Belt Use. A 1-point increase in the Values score is associated with a 1.006-point *increase* in self-reported seat belt use score.[5] This indicates that respondents with higher levels of self-reported Values also had higher levels of self-reported seat belt use and provides evidence that drivers with more positive values are more likely to wear seat belts.

[5] In general terms, a latent variable *score* represents the weighted average of the responses to the survey questions associated with a latent variable.

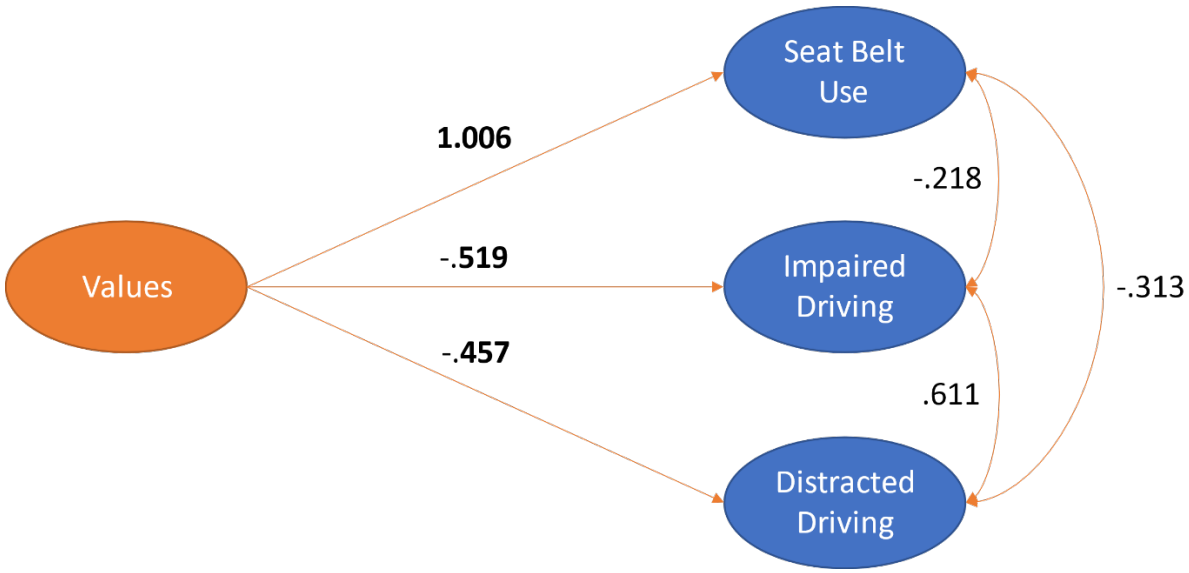
Direct Relationship Between Values and Impaired Driving

There was a negative relationship Values and self-reported impaired driving. A 1-point increase in the Values score is associated with a 0.519-point *decrease* in self-reported impaired driving score. This indicates that respondents with higher levels of self-reported Values had lower levels of self-reported impaired driving and provides evidence that drivers with more positive values are less likely to drive while impaired.

Direct Relationship Between Values and Distracted Driving

There was a negative relationship Values and self-reported distracted driving. A 1-point increase in the Values score is associated with a 0.457-point *decrease* in self-reported distracted driving score. This indicates that respondents with higher levels of self-reported Values had lower levels of self-reported distracted driving and provides evidence that drivers with more positive values are less likely to drive distracted.

Figure 27. Significant Relationships in Path Model



Indirect Relationships

Estimates not in bold text next to two-way arrows in Figure 27 represent indirect relationships between Driver Seat Belt Use, Impaired Driving, and Distracted Driving. The strength of these relationships is interpreted in the same manner as direct relationships using unstandardized estimates. However, these indirect relationships should be interpreted as evidence of possible associations between driver behaviors and not as causal links.

Indirect Relationship Between Driver Seat Belt Use and Impaired Driving

The covariance between self-reported driver seat belt use and impaired driving is −0.218. This indicates that as self-reported seat belt use *increases* by one-point, self-reported impaired driving *decreases* by 0.218 points. It also indicates that the reverse is true — as self-reported impaired driving *decreases* by one-point, self-reported seat belt use *increases* by 0.218 points. This provides evidence that, in some cases, drivers who are impaired may be less likely to wear seat belts than drivers who are not impaired.

Indirect Relationship Between Driver Seat Belt Use and Distracted Driving

The covariance between self-reported driver seat belt use and distracted driving is −0.313. This indicates that as self-reported seat belt use *increases* by one-point, self-reported distracted driving *decreases* by 0.313 points. It also indicates that the reverse is true — as self-reported distracted driving decreases by one-point, self-reported seat belt use *increases* by 0.313 points. This provides evidence that, in some cases, drivers who are distracted may be less likely to wear seat belts than drivers who are not distracted; however, this relationship may also be associated with the covariance between impaired driving and distracted driving discussed below.

Indirect Relationship Between Impaired Driving and Distracted Driving

The largest covariance in driver behaviors was between impaired driving and distracted driving. The covariance between self-reported impaired driving and distracted driving is 0.611. This indicates that as self-reported distracted driving *increases* by one-point, self-reported impaired driving also *increases* by 0.611 points. It also indicates that the reverse is true as self-reported impaired driving *increases* by one-point, self-reported distracted driving also *increases* by 0.611 points. This provides evidence that, in some cases, distracted driving may be associated with impaired driving.

Hypothesis 1 Confirmed: Driver Risk Significantly Associated with Individual's Values

Driver Risk Behavior and Individual Values

The following narrative will discuss this hypothesis in the context of individual driver behaviors. For hypothesis one, the following was proposed: **driver risk behavior is significantly associated with an individual's values**. Within this hypothesis, two factors were presented along with a relationship metric. In this circumstance, driver risk behavior is defined through three specific behaviors: distracted driving, impaired driving, and seatbelt use. Each behavior was assessed using five items from the survey. Distracted driving assessment included behaviors like reading or typing texts/emails while driving. Impaired driving considered behaviors like driving under the influence of marijuana, alcohol, or prescription medications. Seatbelt use assessment included the frequency at which the participant wears their seatbelt, including situations like driving short distances or when law enforcement is around.

Concurrently, individual values are a composite value. This composite value is representative of a combination of benevolence, universalism, and interdependence. Each value was assessed using five items from the survey in which participants rate how important the given values are. Benevolence addressed characteristics like honesty, loyalty, and responsibility. Universalism addressed characteristics like social justice and world peace. Interdependence addressed characteristics like the importance of their friends' and families' well-being and how much they enjoy spending time with their friends and family.

Pertaining to "association," the defined metric is the correlation coefficient that may be presented as positive or negative alongside a comparative probability strength. Regarding driver risk behaviors and individual's values, all the relationships are direct, and the strongest relationship occurred for seatbelt use. Values and seatbelt use had a correlation coefficient of .304, which is the strongest of the three driver risk behaviors. This is also a positive coefficient, which is indicative of a positive relationship. This suggests that the higher an individual rates the chosen values, the more likely they are to wear their seatbelt. On the other hand, the relationships for values with distracted driving and impaired driving are both negative. The correlation coefficient for values and impaired driving behaviors was −0.197 and −0.151 for values and distracted driving. These are both weaker negative relationships. Unlike seatbelt use, the higher an individual rates the values, the less likely they are to engage in distracted and impaired driving behaviors. Vice versa, if the individual rates the values low, they are more likely to engage in impaired and distracted driving behaviors.

Hypothesis 2 Confirmed: Values Differ by Social Environmental Measures

Values Differ by Social Environment

For the second hypothesis, the following was proposed: **values differ significantly on individual, family, work, and community social environmental measures.** Regarding social environmental measures, individual differences were determined by age and gender. Familial differences were determined by the number of people per household and household income. Work differences were determined by employment status, employment type (blue-collar or white-collar), and educational attainment; community differences were determined by the duration in which the individual has lived in their city and their parish.

Regarding individual differences, both the age group of 65+ years old and females were both significant. Results suggest the older an individual is, the more likely they are to rate the given values as more important than younger individuals. Similarly, females tended to rate the given values as more important than males rated them. Considering familial differences, there were no significant associations. For work differences, there was no significant association between educational attainment and values. However, those who reported their employment status as Retired were significantly associated with higher ratings of values, and for employment type, both had significant relationships. Lastly, regarding community differences, for both the duration of city residency and parish residency, those who reported living there for 11+ years were most likely to rate the given values as more important than those who have lived in their current city or parish for less than 11 years.

Hypothesis 3 Confirmed: Environmental Measures Differ Significantly within Regions of Louisiana

Social Environment within Regions of Louisiana

For the final hypothesis, the following was proposed: **social environment measures differ significantly within regions of Louisiana.** The regions used are representative of Strategic Highway Safety Plan Coalitions. Regarding individual measures, specifically age and gender, there were no significant differences across regions of Louisiana. For familial measures, there were no significant differences across regions regarding household income, but there were significant differences regarding the number of people per household. Regarding work measures, the only insignificant category was employment type for blue-collar workers. Employment

status, employment type for white-collar workers, and educational attainment all differed significantly across regions of Louisiana. Lastly, regarding community measures, both the duration of city residency and the duration of parish residency differed significantly across regions of Louisiana.

Recommendations

Implementation

Results from this analysis offer several avenues of targeting strategies for education or outreach around this topic. The following two sections include targeting considerations based on social environment factors and regional differences. These considerations are based on three levels of analysis discussed previously in this report:

1. Significant associations between SHSP regions and social environment factors.
2. Significant associations between social environment factors and higher "values" scores.
3. Significant associations between higher "values" scores and driver risk behaviors.

In terms of targeting the project results to education or outreach implementations, proposed values-based targeting does not aim to change a person's individual values. Instead, it leverages the relationship of one or more of the "values" factors in this project (i.e., interdependence, benevolence, and universalism) to negative driver risk behaviors to change behaviors. For example, the values factor of interdependence might be leveraged by educating specific groups about how the death or injury of one person in a crash has cascading effects in the world. This education would then be targeted using results of the three levels of analysis listed above. According to the survey results there are no statistically significant differences between age groups across SHSP regions. However, "values" scores from respondents in the age groups of 25-34, 55-64, and 65+ were significantly higher than other age groups at a statewide level. The survey analysis also indicates that *higher* "values" scores are associated with *lower* levels of self-reported impaired driving, *lower* self-reported levels of distracted driving, and *higher* levels of self-reported seat belt use. Therefore, the strategy in this example would be targeting the education to age groups of 25-34, 55-64, and 65+ at a *statewide* level, since there are no regional differences in the age groups.

Targeting Strategies for Social Environment Groups: Statewide vs. Regional

Results suggest that certain social environments *do not* significantly differ across SHSP Coalitions. Targeting strategies for these specific groups should be equivalent statewide, seeing as the coalitions have similar populations for some demographics. The demographics or social environments that are not significantly different across regions include age groups (i.e., 18-24, 25–34, 35-54, 55–64, and 65+) and gender. However, values scores within age groups and

gender did vary significantly. Rather than targeting strategies to certain regions, these subgroups can be targeted statewide.

In contrast, results also suggest that certain factors *do* significantly differ across SHSP Coalitions. These factors include employment type (i.e., blue collar, white collar, other); employment status (e.g., employed, unemployed – looking for work, unemployed – not looking for work, etc.); and education level (e.g., high school diploma, associate degree bachelor's degree, etc.). Regarding employment type, our target areas include those with a large percentage of blue-collar workers, such as Acadiana, Northeast Louisiana, and Southwest Louisiana, as indicated by our survey. For employment status, the strategy is to target regions with the largest percentages of retirees, such as Southwest Louisiana, Northwest Louisiana, North Shore, and Acadiana, as indicated by our survey. Educational attainment also significantly differs across regions, specifically three levels. Regarding education, regions with the largest percentage of individuals who indicated attending Some High School, receiving an associate degree, or receiving a Graduate degree are the target groups. The largest percentage of survey participants who attended Some High School were sourced from Northwest and Southwest Louisiana. The largest percentage of survey participants with a Graduate degree belongs to New Orleans, Capital Region, and Central Louisiana, and the largest percentage of survey participants with an associate degree belong to Northwest Louisiana, Northeast Louisiana, and Capital Region. Other demographic categories that differed significantly across regions include household income and the duration the participant has lived in their city or parish. For household income, target regions will include areas with the largest percentage of people in the income range of $41,000–$50,999, which the survey indicated is Acadiana. Lastly, residents who have lived in their city or parish for 11+ years are another target group. The survey indicated the largest percentage of these participants live in South Central Louisiana, Central Louisiana, and Acadiana.

Targeting Recommendations Summary

A summary of targeting recommendations is shown in Table 31 below:

Table 31. Target Strategies Based on Social Environment Category

Social Environment Category	Does Social Environment Significantly Differ Across SHSP Regions?	Target Strategy
Blue-Collar Workers	Yes	**Regional** targeting to blue-collar workers in Acadiana, Northeast Louisiana, and Southwest Louisiana, which had the highest percentages of blue collar workers according to the survey.
Ages 25–34	No	Target **statewide** to this age group.
Ages 55–64	No	Target **statewide** to this age group.
Ages 65 and up	No	Target **statewide** to this age group.
Gender- Female	No	Target **statewide** to female gender.
Employment Status — Retired	Yes	**Regional** targeting to Southwest Louisiana, Northwest Louisiana, North Shore, and Acadiana regions, which were highest in the survey.
Household Income $41,000 – $50,999	Yes	**Regional** targeting to regions with largest percentage in this income range. Acadiana was highest in the survey.
Same City or Same Parish Resident for 4+ Years	Yes	**Regional** targeting to areas which have largest percentage of long-term residents (11+ years). South Central Louisiana, Central Louisiana, and Acadiana regions were highest in the survey.
Education — Some High School (note: low sample size compared to other groups)	Yes	**Regional** targeting to areas which have largest percentage of this category. New Orleans, Capital

Social Environment Category	Does Social Environment Significantly Differ Across SHSP Regions?	Target Strategy
		Region, and Central Louisiana were highest in the survey.
Education — Graduate Degree	Yes	**Regional** targeting to areas which have the largest percentage of this category. New Orleans, Capital Region, and Central Louisiana were highest in the survey.
Education — Associate Degree	Yes	**Regional** targeting to areas which have largest percentage of this category. Northwest Louisiana, Northeast Louisiana, and Capital Region were highest in the survey.
Long-term residents (11+ years)	Yes	**Regional** targeting to South Central Louisiana, Central Louisiana, and Acadiana, which were highest in the survey.

Conduct a survey every two years to examine the ongoing effects of culture and values on driving behaviors and similar attitudes.

In the appendix, a detailed narrative outlines recommended implementation of a survey initiative comparable to LSU's Manship annual political survey and state of Colorado DOT's annual Driver Behavior Survey. A combination of these survey formats may extend initiatives from the present project to a long-term enterprise. Importantly, many efforts and significant financial resources have been dedicated toward traffic safety and reduction of fatalities in Louisiana. Unfortunately, important metrics such as number of fatalities associated with risky driving behaviors remain high. Prospectively, an understanding of value-based behaviors, coupled with crash data may better direct policy, legislation, and outreach as opposed to current approaches. Notably, specific details regarding implementation are listed in Appendix J.

Other Considerations

Consider safety culture in the context of crash data.

Table 32 presents the variables considered in the scope of this research compared to the variables used in CARTS crash analysis. The survey and crash data both include age and gender as identifiers. Age is separated differently, and there are no other similarities. The table aims to identify the crash data categories that are most closely related or most applicable to the survey variables. For example, the survey included the variable of employment status, but the crash data does not include employment status.

Crash data does include other categories like the day of the week, time of day, the type of roadway, and the type of vehicle involved in a crash. Furthermore, these categories may help piece together an employment status. For example, if a person crashes during morning rush hour on a busy street, they are more likely to be headed to work than if they experience a crash at 3 a.m. on an open highway. If an individual drives a work truck, it is safe to assume that the company employs them. Policymakers should note that the crash data has many additional categories and data tables per category. Lastly, the table also includes whether the project variable resulted in significance regarding driver behaviors. Factors included and excluded in crash data are determined by many factors, including federal and state regulations, alongside consideration of time requirements for officers to complete the applicable reports. The present data supports the proposal that cultural factors affect driver behavior and concurrently assume that driver behaviors affect crash rates. Prospectively, when crash reporting data is later evaluated, developers must address culture in selecting data to be included. Table 32 below represents the variables that were covered in the survey compared to the variables consistently evaluated by CARTS. It is recognized that input parameters for CARTS data involve multiple processes and approval levels. Within the next cycle of these processes, data may be modified according to comments reflected in Table 32. This would allow further analyses by values.

Table 32. Variables Considered in Present Research Study Compared to CARTS

Culture Survey Variables	CARTS Categories (fatalities and injuries)
The survey categorized **ages** into groups of 18–24, 25–34, 35–44, 45–54, 55–64, and 65+. Age was statistically different for SBU, IDB, and DDB.	Direct tables are available for the cultural variable of age. Ages are separated in CARTS by 0–14, 15–17, 18–20, and so on by twos. Each generation separates other tables.

Culture Survey Variables	CARTS Categories (fatalities and injuries)
The survey included males and females. It should be noted that about 10 participants selected a third option of "other." Gender was statistically different for SBU, IDB, and DDB.	CARTS compares males and females across all categories.
Within the survey, **employment status** was demarcated by employed full-time, part-time, unemployed, unemployed and looking for work, retired, student, and homemaker. Employment status was statistically different for SBU, IDB, and DDB	Crash data presents several factors or features of employment status, including Month/Day of Week/Time of Day/Holiday Periods. It would be difficult for an officer to collect employment status while assessing a crash.
The survey categorized **employment types** into blue-collar and white-collar workers. Employment type (blue-collar) was statistically different for SBU and IDB, but not DDB.	CARTS did not present employment type but included factors typified of employment type, such as Weather Conditions/Roadway Surface Conditions/Environment. (Applicable to both employment types)
The survey categorized **employment types** into blue-collar and white-collar workers. Employment type (white-collar) was statistically different for IDB and DDB, but not SBU.	CARTS did not present employment type but included factors typified of employment types, such as Vehicle Type/Commercial Vehicles in Crashes/Body Type/Bicycle Crashes/Motorcycle/Large Truck and Bus/Railroad. (Applicable to both employment types). Later crash data may consider the inclusion of wage and white/blue data.
Some high school represented **educational attainment** in the survey, alongside high school or equivalent, trade school, some college but no degree, associate degree, bachelor's degree, and graduate degree. Educational attainment was statistically different for SBU, but not IDB and DDB.	Crash data does not indicate educational attainment but includes factors like youth and senior drivers. For youth drivers, the age stops at 24, and it might be safe to assume that most drivers younger than 24 are in school and vice versa for older drivers.
Researchers separated **household income** in the survey by separating income into less than $20,000 per year, $20,000-$30,999, $31,000-$40,999,	The crash data does not present household income but includes factors typified of household income, such as vehicle type and location of the crash. An officer may

Culture Survey Variables	CARTS Categories (fatalities and injuries)
$41,000-$50,999, $51,000-$60,999, $61,000-$70,999, and above $70,000+. Household income was statistically different for IDB and SBU, but not DDB.	not ask directly for income, but several questions may address this variable.
The number of persons in the household was listed in the survey as 1, 2, 3, 4, 5, 6, and 7 or more. The number of people per household was statistically different for DDB, but not SBU or IDB.	CARTS data does not include the number of people in each household but does include factors like where the crash was, if it is rural or urban, and who was in the vehicle. An individual may crash close to home and give an indication of the number of residents, or they may have roommates in the vehicle with them.
The survey demarcated **city residency** by duration, including 0-3 years, 4-7, 8-11, and 11+.City residency was statistically different for IDB and DDB, but not SBU	While the crash data does not include the duration the individual lived in the city, there are direct tables addressing crashes by city.
The survey demarcated **parish residency** by duration, including 0-3 years, 4-7, 8-11, and 11+. Parish residency was not statistically different for SBU, IDB, and DDB.	While the crash data does not include the individual's duration in the city, there are direct tables addressing crashes by the parish.

Promote culture, including individual differences and socioeconomic variances, as continuing factors warranting further studies to understand the relationship between culture and driver behaviors, namely seatbelt use, distracted driving, and impaired driving.

Statistically significant differences were found for age, gender, and employment status across seatbelt use, impaired driving, and distracted driving. In contrast, other cultural values varied significantly in their statistical difference across driver behaviors, specifically number of persons in household, educational background, duration of city and parish residency, and blue-collar and white-collar employment. Often, culture in the context of transportation is considered an extension of social equity or strictly socioeconomic differences. Rather, the present study suggests both individual differences (i.e., age and gender) and socioeconomic factors (i.e., employment status) showed mean differences, reflecting a need to consider both in the context of understanding driver behaviors. Importantly, “values” scores were consistently shown to vary by socioeconomic measure, further emphasizing the need to not only consider income or social status of someone, but also their comparative absence or presence of benevolence, universalism,

and interdependence. As an example, although difficult to measure and separate by individuals, outreach and planning must consider not only how much someone makes or their income but also their interest in doing good (i.e., benevolence: “By being safe, I am contributing to society”); the belief that safety represent a community-based obligation (i.e., universalism: “By being safe, I am contributing to the betterment of society”); and the assumption that everyone must concurrently accept or promote safety practices (i.e., interdependence: “We must all practice safe driving behaviors for the highways to be safe”). Regarding implementation, future studies, including surveys, must differentiate between demographic variables and personal features based on values. More specifically, future surveys must consider how individual survey responses relate to the constructs of benevolence, universalism, and interdependence. Researchers must become familiar with these terms and furthermore, consider the interrelationship between values and demographic variables.

Recognize that safety is not exclusively a demographic variable, but rather a way of thinking which stems from values and concurrently these values will direct safe driving behaviors.

In the context of transportation safety, individuals often drive unsafely. Still, they do not consider their behaviors "unsafe," such as buzzed driving or operating a cell phone while driving. Concurrently, the present study showed that driver’s risky behaviors are significantly related to their values. Until unsafe behaviors become unmasked and not a part of the cultural norm, drivers will continue to be dangerous while driving. Internal values must be considered as concurrent factors affecting behaviors. For example, safety often becomes seasonal, with messaging becoming more focused during the Christmas holidays. Safety must not be isolated to seasonal attention or concentrated on specific groups for behavior change. Still, relatively safe practices must become encompassed into the daily routine based on both social expectations for individual behaviors (i.e., it is not acceptable to drive buzzed) and, lastly, these behaviors must be consistent (i.e., a person drives safely annually, not just based on seasonal behavioral changes). It may be proposed that, if safe behaviors are not seasonal, but rather in concurrence with their individual values, safe driving behaviors would be consistent. As such, safety strategies and educational outreach must consider not only timeliness but also consistency. Drivers must be aware and reminded of safe driving standards year around, not just during holidays. A focus on holiday-only educational outreach limits safety awareness. Importantly, safety outreach must transition from safety awareness to behavioral changes. Through value changes, prospective behavioral changes may occur.

Isolate and realize that "cultural-based behaviors" and "social equity" are diverse constructs and should be treated appropriately.

Importantly, it is vital to recognize the similarities and, more importantly, the differences between safety culture and social equity. With safety culture, the goal is to generalize individuals' beliefs and attitudes toward risk and risk management. However, social equity includes providing appropriate resources, experiences, and opportunities. Social equity and safety culture are important aspects of ensuring safety, and funding for future initiatives should be afforded. As reflected in the present research, significant differences were not found in driver behaviors according to SHSP districts. Still, differences were found by demographic variables (reflective of individual-based differences: unique culture). While improvements in infrastructure may balance social equity across districts, financial allocations will likely not change behaviors or cultural foundations. Educational outreach, surveys, studies, and further research endeavors must extend focus beyond simply social equity. Social equity most often focuses on social aspects of behaviors while culture-based behaviors focus on the role of an individual within a societal structure. As opposed to focusing solely on geographic features, it is recommended to examine attitudes, values, employment, and other behaviors identified in the present project which have been shown to affect safe driving practices.

Recognize that driver behaviors (seatbelt use, impaired driving, and distracted driving) are not independent constructs, and values will direct these behaviors.

While individual educational campaigns may improve seatbelt use, such campaigns must consider other driver behaviors. The present results suggest several interesting relationships among these variables, such as when distracted driving increases, so does impaired driving. Conversely, as distracted driving and impaired driving increase, seatbelt use decreases. Safe driving behaviors encompass all three dimensions. Seatbelt use, impaired driving, and distracted driving are not mutually exclusive constructs. Rather, public education, new driver education, and legislation must recognize that these constructs are inter-related, and the present model demonstrates and confirms their inter-relatedness. Concurrently, the present study showed significantly different relationships between values and driver behaviors, with a positive relationship between values and seatbelt use (i.e., as ownership of value increases, seatbelt use increases) and negative relationships with distracted and impaired driving (i.e., as one distances themselves from value, the probability that someone will refrain from distracted or impaired driving decreases). Essentially, values directed risky driver behaviors differently, as reflected in their directional or correlational relationships. It is recognized that public education funding most often originates from a topical focus, such as distracted driving vs. seatbelt use. Fundamentally,

the present project demonstrates that one behavioral change will affect another behavioral change. For example, it may be expected that a successful effort to increase seatbelt use will similarly decrease distracted driving and impaired driving behaviors. After implementation of an educational outreach effort, such as seatbelt use, most often follow up statistics and recommendations will focus only on seatbelt use, admittedly in concurrence with programmatic objectives. Conversely, it is recommended that multiple driver behaviors should be concurrently evaluated, specifically seatbelt use, impaired driving, and distracted driving, considering these behaviors in the present project have shown to be interrelated.

References

[1] N. Ward, J. Otto, and S. Herbel, "A Strategic Approach to Transforming Traffic Safety Culture to Reduce Deaths and Injuries," NCHRP, vol. 17, no. 69, p. 11, 2014.

[2] M. Davidov, "Cultural moderation of the effects of parenting: Answered and unanswered questions," Child Development Perspectives, vol. 15, no. 3, pp. 189–195, 2021.

[3] S. Schmidt, R. Heffernan, and T. Ward, "Why we cannot explain cross-cultural differences in risk assessment," Aggression and Violent Behavior, vol. 50, p. 101346, 2020.

[4] R. Wang and B. Langhammer, "Predictors of quality of life for chronic stroke survivors in relation to cultural differences: a literature review," Scandinavian journal of caring sciences, vol. 32, no. 2, pp. 502–514, 2018.

[5] L. Bowen, S. L. Budden, and A. P. Smith, "Factors underpinning unsafe driving: A systematic literature review of car drivers," Transportation research part F: traffic psychology and behaviour, vol. 72, pp. 184–210, 2020.

[6] B. K. Sovacool, J. Kester, L. Noel, and G. Z. de Rubens, "Are electric vehicles masculinized? Gender, identity, and environmental values in Nordic transport practices and vehicle-to-grid (V2G) preferences," Transportation research part D: transport and environment, vol. 72, pp. 187–202, 2019.

[7] Z. Haghdoust, G. Masoumi, D. Khorasani Zavareh, A. Ebadi, and S. Moslehi, "A Systematic Literature Review of Driver's Sociocultural Factors Predisposing to Road Traffic Crashes," Medical Journal of The Islamic Republic of Iran (MJIRI), vol. 36, no. 1, pp. 165–178, 2022.

[8] P. Sârbescu and A. Rusu, "Personality predictors of speeding: Anger-Aggression and Impulsive-Sensation Seeking. A systematic review and meta-analysis," Journal of safety research, vol. 77, pp. 86–98, 2021.

[9] S. O'Donovan, C. van den Huevel, M. Baldock, and R. W. Byard, "Factors involved in the assessment of paediatric traffic injuries and deaths," Medicine, Science and the Law, vol. 58, no. 4, pp. 210–215, 2018.

[10] D. C. Schwebel, "Why "accidents" are not accidental: Using psychological science to understand and prevent unintentional child injuries," American Psychologist, vol. 74, no. 9, p. 1137, 2019.

[11] X. Song, Y. Yin, H. Cao, S. Zhao, M. Li, and B. Yi, "The mediating effect of driver characteristics on risky driving behaviors moderated by gender, and the classification model of driver's driving risk," Accident Analysis & Prevention, vol. 153, p. 106038, 2021.

[12] C. E. Watson and R. A. Austin, "Differences in rural and urban drivers' attitudes and beliefs about seat belts," Accident Analysis & Prevention, vol. 151, p. 105976, 2021.

[13] M. Fishbein, & Ajzen, I., Belief, attitude, intention and behavior: An introduction to theory and research. Reading, MA: Addison-Wesley, 1975.

[14] I. Ajzen, "The theory of planned behavior," Organizational behavior and human decision processes, vol. 50, no. 2, pp. 179–211, 1991.

[15] F. X. Gibbons and M. Gerrard, "Predicting young adults' health risk behavior," Journal of personality and social psychology, vol. 69, no. 3, p. 505, 1995.

[16] U. Bronfenbrenner, Ecological systems theory. Jessica Kingsley Publishers, 1992.

[17] J. Gastil, "Thinking, drinking, and driving: Application of the theory of reasoned action to DWI prevention 1," Journal of Applied Social Psychology, vol. 30, no. 11, pp. 2217–2232, 2000.

[18] D. Yagil, "Reasoned Action and Irrational Motives: A Prediction of Drivers' Intention to Violate Traffic Laws 1," Journal of Applied Social Psychology, vol. 31, no. 4, pp. 720–739, 2001.

[19] J. P. Espada, K. W. Griffin, M. T. Gonzálvez, and M. Orgilés, "Predicting alcohol-impaired driving among Spanish youth with the theory of reasoned action," The Spanish journal of psychology, vol. 18, 2015.

[20] L. Åberg, L. Larsen, A. Glad, and L. Beilinsson, "Observed vehicle speed and drivers' perceived speed of others," Applied psychology: An international review, 1997.

[21] S. Kippax, "Flaws in the theory of reasoned action," 1993.

[22] B. H. Sheppard, J. Hartwick, and P. R. Warshaw, "The theory of reasoned action: A meta-analysis of past research with recommendations for modifications and future research," Journal of consumer research, vol. 15, no. 3, pp. 325–343, 1988.

[23] I. Ajzen, "From Intentions to Actions: A Theory of Planned Behavior. IN Action Control from Cognition to Behavior, J. Kuhl and J. Beckmann, ed," ed: New York: Springer Verlag, 1985.

[24] D. Parker, A. S. Manstead, S. G. Stradling, J. T. Reason, and J. S. Baxter, "Intention to commit driving violations: An application of the theory of planned behavior," Journal of applied psychology, vol. 77, no. 1, p. 94, 1992.

[25] H. W. Warner and L. Åberg, "Drivers' decision to speed: A study inspired by the theory of planned behavior," Transportation Research Part F: Traffic Psychology and Behaviour, vol. 9, no. 6, pp. 427–433, 2006.

[26] F. Sniehotta, "An experimental test of the theory of planned behavior," Applied Psychology: Health and Well-Being, vol. 1, no. 2, pp. 257–270, 2009.

[27] R. Sussman and R. Gifford, "Causality in the theory of planned behavior," Personality and Social Psychology Bulletin, vol. 45, no. 6, pp. 920–933, 2019.

[28] J. De Groot and L. Steg, "General beliefs and the theory of planned behavior: The role of environmental concerns in the TPB," Journal of Applied Social Psychology, vol. 37, no. 8, pp. 1817–1836, 2007.

[29] M. Gerrard, F. X. Gibbons, A. E. Houlihan, M. L. Stock, and E. A. Pomery, "A dual-process approach to health risk decision making: The prototype willingness model," Developmental review, vol. 28, no. 1, pp. 29–61, 2008.

[30] E. L. Harbeck and A. I. Glendon, "Driver prototypes and behavioral willingness: Young driver risk perception and reported engagement in risky driving," Journal of safety research, vol. 66, pp. 195–204, 2018.

[31] C. Preece, A. Watson, S.-A. Kaye, and J. Fleiter, "Understanding the psychological precursors of young drivers' willingness to speed and text while driving," Accident Analysis & Prevention, vol. 117, pp. 196–204, 2018.

[32] M. A. Elliott, R. McCartan, S. E. Brewster, D. Coyle, L. Emerson, and K. Gibson, "An application of the prototype willingness model to drivers' speeding behaviour," European Journal of Social Psychology, vol. 47, no. 6, pp. 735–747, 2017.

[33] B. Scott-Parker, M. K. Hyde, B. Watson, and M. J. King, "Speeding by young novice drivers: What can personal characteristics and psychosocial theory add to our understanding?," Accident Analysis & Prevention, vol. 50, pp. 242–250, 2013.

[34] B. Demir, T. Özkan, and S. Demir, "Pedestrian violations: Reasoned or social reactive? Comparing theory of planned behavior and prototype willingness model," Transportation research part F: traffic psychology and behaviour, vol. 60, pp. 560–572, 2019.

[35] J. Todd, E. Kothe, B. Mullan, and L. Monds, "Reasoned versus reactive prediction of behaviour: A meta-analysis of the prototype willingness model," Health psychology review, vol. 10, no. 1, pp. 1–24, 2016.

[36] M. Cassarino and G. Murphy, "Reducing young drivers' crash risk: are we there yet? An ecological systems-based review of the last decade of research," Transportation research part F: traffic psychology and behaviour, vol. 56, pp. 54–73, 2018.

[37] T. George and C. Elizabeth, "An Inquiry into Contextual Factors Impacting the Occupational Health, Safety, and Well-Being of New Zealand Truck Drivers: An Ecological Systems Approach," Auckland University of Technology, 2018.

[38] B. Hughes, S. Newstead, A. Anund, C. Shu, and T. Falkmer, "A review of models relevant to road safety," Accident Analysis & Prevention, vol. 74, pp. 250–270, 2015.

[39] P. Larsson, S. W. Dekker, and C. Tingvall, "The need for a systems theory approach to road safety," Safety science, vol. 48, no. 9, pp. 1167–1174, 2010.

[40] D. E. Montano and D. Kasprzyk, "Theory of reasoned action, theory of planned behavior, and the integrated behavioral model," Health behavior: Theory, research and practice, vol. 70, no. 4, p. 231, 2015.

[41] T. Toledo, H. N. Koutsopoulos, and M. Ben-Akiva, "Integrated driving behavior modeling," Transportation Research Part C: Emerging Technologies, vol. 15, no. 2, pp. 96–112, 2007.

[42] C. J. Lee, J. Geiger-Brown, and K. H. Beck, "Intentions and willingness to drive while drowsy among university students: An application of an extended theory of planned behavior model," Accident Analysis & Prevention, vol. 93, pp. 113–123, 2016.

[43] A. Rivis, C. Abraham, and S. Snook, "Understanding young and older male drivers' willingness to drive while intoxicated: The predictive utility of constructs specified by the theory of planned behaviour and the prototype willingness model," British journal of health psychology, vol. 16, no. 2, pp. 445–456, 2011.

[44] L. S. U. C. f. A. R. i. T. Safety, "Crash Data Warehouse," ed, 2010–2021.

[45] (2014). Driver Attitudes, Knowledge, and Awareness Survey 2012.

[46] P. Schroeder, L. Kostyniuk, and M. Mack, "2011 national survey of speeding attitudes and behaviors," United States. National Highway Traffic Safety Administration. Office of …, 2013.

[47] F. A. Wilson and J. P. Stimpson, "Trends in fatalities from distracted driving in the United States, 1999 to 2008," American journal of public health, vol. 100, no. 11, pp. 2213–2219, 2010.

[48] K. Suzuki, K. Tang, W. Alhajyaseen, K. Suzuki, and H. Nakamura, "An international comparative study on driving attitudes and behaviors based on questionnaire surveys," IATSS Research, 2021.

[49] K. E. Heck and R. M. Carlos, "Passenger distractions among adolescent drivers," Journal of safety research, vol. 39, no. 4, pp. 437–443, 2008.

[50] P. M. Carter, C. R. Bingham, J. S. Zakrajsek, J. T. Shope, and T. B. Sayer, "Social norms and risk perception: Predictors of distracted driving behavior among novice adolescent drivers," Journal of Adolescent Health, vol. 54, no. 5, pp. S32–S41, 2014.

[51] B. Simons-Morton, N. Lerner, and J. Singer, "The observed effects of teenage passengers on the risky driving behavior of teenage drivers," Accident Analysis & Prevention, vol. 37, no. 6, pp. 973–982, 2005.

[52] D. L. Strayer, J. M. Cooper, R. M. Goethe, M. M. McCarty, D. Getty, and F. Biondi, "Visual and cognitive demands of using in-vehicle infotainment systems," 2017.

[53] (2017). Ohio Statewide Telephone Survey of Seat Belt Use, Alcohol-Impaired Driving, Distracted Driving, Speeding, and Overall Traffic Safety.

[54] L. F. Beck, M.-j. Kresnow, and G. Bergen, "Belief about seat belt use and seat belt wearing behavior among front and rear seat passengers in the United States," Journal of safety research, vol. 68, pp. 81–88, 2019.

[55] J. Enriquez, "Occupant Restraint Use in 2020: Results From the NOPUS Controlled Intersection Study," 2021.

[56] A. Berning, R. Compton, and K. Wochinger, "Results of the 2013–2014 national roadside survey of alcohol and drug use by drivers," Journal of Drug Addiction, Education, and Eradication, vol. 11, no. 1, p. 47, 2015.

[57] I. P. Albery, J. Strang, M. Gossop, and P. Griffiths, "Illicit drugs and driving: prevalence, beliefs and accident involvement among a cohort of current out-of-treatment drug users," Drug and Alcohol Dependence, vol. 58, no. 1–2, pp. 197–204, 2000.

[58] M. D. Robertson and O. H. Drummer, "Responsibility analysis: a methodology to study the effects of drugs in driving," Accident Analysis & Prevention, vol. 26, no. 2, pp. 243–247, 1994.

[59] P. Mura et al., "Comparison of the prevalence of alcohol, cannabis and other drugs between 900 injured drivers and 900 control subjects: results of a French collaborative study," Forensic science international, vol. 133, no. 1–2, pp. 79–85, 2003.

[60] M. Fishbein and I. Ajzen, Predicting and changing behavior: The reasoned action approach. Psychology press, 2011.

[61] P. Sharma, "Measuring personal cultural orientations: Scale development and validation," Journal of the Academy of Marketing Science, vol. 38, pp. 787–806, 2010.

[62] C. J. Mecklin and D. J. Mundfrom, "An appraisal and bibliography of tests for multivariate normality," International Statistical Review, vol. 72, no. 1, pp. 123–138, 2004.

[63] C. Fornell and D. F. Larcker, "Evaluating structural equation models with unobservable variables and measurement error," Journal of marketing research, vol. 18, no. 1, pp. 39–50, 1981.

[64] B. Jones and J. Sall, "JMP statistical discovery software," Wiley Interdisciplinary Reviews: Computational Statistics, vol. 3, no. 3, pp. 188–194, 2011.

[65] B. Muthén and L. Muthén, "Mplus," in Handbook of item response theory: Chapman and Hall/CRC, 2017, pp. 507–518.

[66] R. B. Kline, "Latent variable path analysis in clinical research: A beginner's tour guide," Journal of clinical psychology, vol. 47, no. 4, pp. 471–484, 1991.

[67] D. H. SCHNEIDER, "2019 LOUISIANA SEAT BELT OBSERVATION SURVEY RESULTS LHSC Project No. 2019-20-10," 2019.

[68] T. S. Smith, C. Dore, A. Rahman, X. Sun, and L. Short, "Analysis of Facial Emotion Recognition While Texting and Driving," University of Louisiana at Lafayette.

[69] J. S. Hickman and R. J. Hanowski, "Use of a video monitoring approach to reduce at-risk driving behaviors in commercial vehicle operations," Transportation research part F: traffic psychology and behaviour, vol. 14, no. 3, pp. 189–198, 2011.

[70] D. Ma, Y. Bai, R. Wan, C. Wang, B. Shi, and L.-Y. Duan, "See Through the Windshield from Surveillance Camera," in Proceedings of the 27th ACM International Conference on Multimedia, 2019, pp. 1481–1489.

[71] Acusensus. "Acusensus." (accessed 3/9/2023, 2023).

[72] U. S. C. Bureau. "American Community Survey 1-Year Estimates." https://www.census.gov/programs-surveys/acs/news/data-releases/2021/release-schedule.html (accessed 2/1/2023, 2023).

[73] J. Moeckli and J. D. Lee, "The making of driving cultures," Improving Traffic Safety Culture in the United States, vol. 38, no. 2, pp. 185–192, 2007.

[74] "TRANSPORTATION/DEV DEPT: Provides relative to the Louisiana Highway Regulatory Act. (8/1/22)," 2022 Regular Session ed. Louisiana State Legislature: Louisiana State Legislature Website, 2022, p. 4.

[75] C. D. Stapleton, "Basic Concepts and Procedures of Confirmatory Factor Analysis," 1997.

[76] P. Bhandari, "Construct validity, definition, types & examples," ed: Scribbr, 2022.

[77] T. A. Brown, Confirmatory factor analysis for applied research. Guilford publications, 2015.

[78] R. B. Kline, Principles and practice of structural equation modeling. Guilford publications, 2015.

[79] Y. Lee, K. A. Kozar, and K. R. Larsen, "The technology acceptance model: Past, present, and future," Communications of the Association for information systems, vol. 12, no. 1, p. 50, 2003.

[80] (2019). 2019 Louisiana Health Report Card.

[81] B. H. L.L.C. "Louisiana State Epidemiological Workgroup Online Data System." https://www.bach-harrison.com/lasocialindicators/Default.aspx (accessed 2/24/2022, 2022).

[82] C. f. D. C. a. Prevention. "Behavioral Risk Factor Surveillance System." U.S. Department of Health & Human Services. https://www.cdc.gov/brfss/index.html (accessed 2/24/2022, 2022).

[83] T. A. o. R. D. Archives. "Louisiana Religion." https://www.thearda.com/ (accessed 2/24/2022, 2022).

[84] L. D. o. Education. "Multiple Statistics by School System for Total Public Students (2021)." Louisiana Department of Education. https://www.louisianabelieves.com/resources/library/student-attributes (accessed 2/24/2022, 2022).

[85] C. H. C. Institute. "City Key." East Baton Rouge Parish Library. https://www.brcitykey.com/demographicdata?id=21&sectionId=936 (accessed 2/15/2023, 2023).

[86] J. Rowland, F. Rivara, P. Salzberg, R. Soderberg, R. Maier, and T. Koepsell, "Motorcycle helmet use and injury outcome and hospitalization costs from crashes in Washington State," American journal of public health, vol. 86, no. 1, pp. 41–45, 1996.

[87] (2020). CALIFORNIA TRAFFIC SAFETY SURVEY 2020: DATA ANALYSIS AND COMPARISON WITH 2010–2019 SURVEY DATA RESULTS.

[88] (2020). Texas Statewide Traffic Safety Awareness Survey: 2020 Results.

[89] K. Sprattler, "Distracted Driving - Survey of the States," Governors' Highway Safety Association, 2013.

[90] W. Kim, V. Anorve, and B. Tefft, "American Driving Survey, 2014–2017," 2019.

[91] State alcohol-impaired-driving estimates: 2019 data (Traffic Safety Facts. Report No. DOT HS 813 106), N. C. f. S. a. Analysis, 2021, August 2021.

[92] 2019 Traffic Safety Culture Index, A. F. f. T. Safety, 2019 2020.

[93] Traffic safety facts 2019: A compilation of motor vehicle crash data (Report No. DOT HS 813 141), N. C. f. S. a. Analysis, 2021, August.

[94] S. A. a. M. H. S. Admministration. "2020 National Survey of Drug Use and Health (NSDUH) Releases." U.S. Department of Health and Human Services.

https://www.samhsa.gov/data/release/2020-national-survey-drug-use-and-health-nsduh-releases (accessed 2/25, 2022).

[95] P. R. Center. "Religious Landscape Study." Pew Research Center. https://www.pewforum.org/religious-landscape-study/ (accessed 2/25, 2022).

[96] R. G. Attewell, K. Glase, and M. McFadden, "Bicycle helmet efficacy: a meta-analysis," Accident Analysis & Prevention, vol. 33, no. 3, pp. 345–352, 2001.

[97] R. H. Heck and S. L. Thomas, An introduction to multilevel modeling techniques: MLM and SEM approaches using Mplus. Routledge, 2015.

[98] K. G. Jöreskog, "A general approach to confirmatory maximum likelihood factor analysis," Psychometrika, vol. 34, no. 2, pp. 183–202, 1969.

Acronyms, Abbreviations, and Symbols

Term	Description
AASHTO	American Association of State Highway and Transportation Officials
AMB_INT	Ambiguity Intolerance
CFA	Confirmatory Factor Analysis
DDB	Distracted Driving Behavior
DOTD	Department of Transportation & Development
EFA	Exploratory Factor Analysis
EST	Ecological Systems Theory
FA	Factor Analysis
FHWA	Federal Highway Administration
GEN_EQ	Gender Equality
IDB	Impaired Driving Behavior
IND	Independence
INTD	Interdependence
IRB	Institutional Review Board
ISCM	Integrated Safety Culture Model
LADOTD	Louisiana Department of Transportation & Development
LHSC	Louisiana Highway Safety Commission
LTRC	Louisiana Transportation Research Center
MASC	Masculinity
NHTSA	National Highway Transportation Safety Administration
POW	Power
PRU	Prudence
PMW	Prototype Willingness Model
RSK_AVS	Risk Aversion
SBU	Seatbelt Use
SEM	Structural Equation Modeling
SHSP	Strategic Highway Safety Program

Term	Description
SLT	Social Learning Theory
SOC_INEQ	Social Inequality
TAC	Technology Acceptance
TLI	Tucker and Lewis's Index
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
TRD	Tradition
TTI	Texas Transportation Institute
TUKEY HSD	Tukey Honestly Significant Difference
VACH	Value-Achievement
VBNV	Value-Benevolence
VCON	Value-Conformity
VHED	Value-Hedonism
VSTM	Value-Stimulation
VUNV	Value-Universalism

Appendix A: Glossary Terms

Term	Definition
Achievement	One's belief in success, ambition, being capable, and influence on people and events. [1]
Ambiguity Intolerance	The degree to which people can tolerate ambiguity and uncertain situations. [61]
Benevolence	One's belief in helpfulness, honesty, forgiveness, loyalty, and responsibility. [1]
Confirmatory Factor Analysis	Tool used to test how effectively measurable variables represent specific factors. [75]
Conformity	One’s belief in obedience, honoring parents and elders, self-discipline, and politeness. [1]
Construct	Theoretical concept, theme, or idea based on empirical observations. It is a variable that is not usually directly measurable. [76]
Convergent Validity	Indicates the degree of agreement between measurements of the same trait obtained by different approaches supposed to measure the same trait. [77]
Discriminant Validity	Indicates the degree to which a test is not related to other tests that measure different factors. [77]
Exploratory Factor Analysis	Tool used to reduce data to smaller set of summary variables and identify the structure of the relationship between the variable and respondent. [77]
Factor Loadings	Indicate how much a factor explains a variable. Loadings can range from –1 to 1. [77]
Factor Validity	The degree to which the covariance of measured items matches the real covariance or behaviors in real life. [77]

Term	Definition
Gender Equality	The extent to which people perceive men and women as equal in terms of social roles, capabilities, rights, and responsibilities. [61]
Hedonism	One's belief in gratification of desires, enjoyment in life, and self-indulgence. [1]
Independence	Cultural orientation associated with a strong self-concept, sense of freedom, autonomy, and personal achievement. [61]
Interdependence	Cultural orientation associated with acting as a part of one or more in-groups, a strong group identity, a sense of belongingness, reliance on others, giving importance to group-goals over own individual goals, and collective achievement. [61]
Latent Variable	A variable that is not directly observable or measurable. [77]
Manifest Variable	A variable that can be directly measured or observed. [77]
Masculinity	The expression of assertiveness, self-confidence, aggression, and ambition. [61]
Moderator	Variable that affects the relationship between a dependent variable and independent variables. [78]
Orthogonal Rotation	A rotation method that assumes factors are independent or uncorrelated with each other. [77]
Power	Acceptance of individuals regarding differences in the power wielded by various members in any organization. [61]
Prudence	Cultural orientation representing planning, perseverance, thrift, and future orientation. [61]
Quartimin Rotation	A rotation method that minimizes the number of factors needed to explain each variable. [77]

Term	Definition
Risk Aversion	The degree to which individuals feel uncomfortable with taking risks, and intolerance of ambiguity, the degree to which individuals feel uncomfortable when confronted with ambiguity. [61]
Social Inequality	The degree of inequality among people in a society which the individual accepts as normal. [61]
Square Loading	The proportion of variance explained by a particular component. [77]
Stimulation	One's belief in a varied and challenging life, being daring, and leading an exciting life.[1]
Structural Equation Modeling	Statistical analysis technique used to analyze structural relationships. [78]
Technology Acceptance	An individual’s acceptance of information systems. [79]
Tradition	Cultural orientation representing respect for traditional values including hard work, non-materialism, benevolence, social consciousness, morality, and respect for one’s heritage. [61]
Tucker Lewis Index	Fit index that ranges from 0 to 1 with values greater than .90 indicating good fit. [78]
Universalism	One’s belief in broad mindedness, beauty of nature and arts, social justice, a world at peace, equality, wisdom, unity with nature, and environmental protection.[1]

Appendix B: Copy of Survey Used in Study

Highway Safety Culture Assessment Survey — Final

Start of Block: Consent Form

CONSENT Louisiana Highway Safety Culture Assessment Survey — Investigating the Relationship of Driver Culture and Values with Risky Driving Behaviors

1. Study Title: Louisiana Highway Safety Culture Assessment Survey — Investigating the Relationship of Driver Culture and Values with Risky Driving Behaviors
2. The purpose of this study is to collect data regarding driver culture, values, and potential risky driving behaviors. The data will be collected by having participants complete an online survey through Qualtrics. The survey will ask participants questions regarding their cultural beliefs, values, and driving behaviors, which is estimated to take between 10–15 minutes to complete. Participant information will remain anonymous, meaning that no personal identifying information will be published unless disclosure is required by law.
3. Inclusion Criteria: You are eligible to participate in the study if you are aged 18 or older and have a valid driver's license.
4. Exclusion criteria: You are ineligible to participate in the study if you are under the age of 18 or are a non-driver.
5. The only study risk is the inadvertent release of sensitive information found in the survey questionnaire. This risk is very minimal given the design of the survey questionnaire and security procedures put in place by the online survey provider and the research team. Every effort will be made to maintain the confidentiality of your responses. Data files will be kept on computers to which only the investigator has access in locked offices within secured buildings. Please contact the IRB office if you have questions.
6. The following investigators are available for questions regarding this study. Dr. Helmut Schneider, (225) 578-2516, and David Whitchurch, (225) 578-0367.
7. Subjects may choose not to participate or to withdraw from the study at any time without penalty or loss of any benefit to which they might otherwise be entitled.

8. Results of the study may be published, but no names or identifying information will be included in the publication. Subject identity will remain confidential unless disclosure is required by law.
9. This study has been approved by the LSU IRB. For questions concerning participant rights, please contact the IRB Chair, Alex Cohen, 578-8692, or irb@lsu.edu.
10. By continuing this survey, you are giving consent to participate in this study.
11. Your information collected as part of the research, even if identifiers are removed, may be used or distributed for future research.
12. You will be compensated the amount you agreed upon before you entered into the survey.

Agreement to Participate:

By clicking the button below, you agree that you have read and understood the information above and you are voluntarily agreeing to participate in the associated survey. This survey will take approximately 10–15 minutes to complete. If you meet the criteria listed above and would like to take the survey, select the appropriate choice below to start.

- Yes, I give permission (1)
- No, I do not give permission (2)

End of Block: Consent Form

Start of Block: Individual Characteristics

AGE What is your age?

- Under 18 (1)
- 18–24 (2)
- 25–34 (3)
- 35–44 (4)
- 45–54 (5)
- 55–64 (6)
- 65 or older (7)

RES Are you a current resident in the state of Louisiana?

- Yes (1)
- No (2)

LIC Do you have a driver’s license?

- Yes (1)
- No (2)

DRV Do you drive a motorized vehicle on public roads on a regular basis?

- Yes (1)
- No (2)

GEN What is your gender?

- Male (1)
- Female (2)
- Non-binary/third gender (3)
- Prefer not to say (4)

EDU What is your current level of education?

- Some high school (1)
- High school graduate or equivalent (2)
- Trade school certification (3)
- Some college (no degree) (4)
- Associate degree (5)
- Bachelor's degree (6)
- Graduate degree (7)

EMP_STAT What is your current employment status?

- Employed full-time (1)
- Employed part-time (2)
- Unemployed (actively seeking work) (3)
- Unemployed (currently not seeking work) (4)
- Retired (5)
- Student (6)
- Homemaker (7)

EMP_TYPE Please rate the extent to which you agree or disagree with the following statements:

(The two statements below were measured on a 7-point Likert scale with anchors of strongly disagree and strongly agree.)

- I would consider myself a blue-collar worker.
- I would consider myself a white-collar worker.

NUM_IN_HH What is the number of people currently living in your household, including yourself?

- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 or more (7)

HH_INC What is your annual household income?

- Less than $20,000 (1)
- $20,000–$30,999 (2)

- $31,000–$40,999 (3)
- $41,000–$50,999 (4)
- $51,000–$60,999 (5)
- $61,000–$70,999 (6)
- Above $71,000 (7)

PAR What parish do you live in? (Start typing a few letters to see list)

CITY What city do you live in? (Start typing a few letters to see list)

PAR_RES How long have you been a resident of this parish?

- 0–3 years (1)
- 4–7 years (2)
- 8–11 years (3)
- 11+ years (4)

CITY_RES How long have you been a resident of this city?

- 0–3 years (1)
- 4–7 years (2)
- 8–11 years (3)
- 11+ years (4)

End of Block: Individual Characteristics

Start of Block: Cultural Items

IND Please rate the extent to which you agree or disagree with the following statements:

(The five statements below were measured on a 7-point Likert scale with anchors of strongly disagree and strongly agree.)

- I would rather depend on myself than others.
- My personal identity, independent of others, is important to me.
- I rely on myself most of the time, rarely on others.

- It is important that I do my job better than others.
- I enjoy being unique and different from others in many respects.

INTD Please rate the extent to which you agree or disagree with the following statements:

(The five statements below were measured on a 7-point Likert scale with anchors of strongly disagree and strongly agree.)

- The well-being of my friends and family is important for me.
- I feel good when I cooperate with my family and friends.
- It is my duty to take care of my family and friends, whatever it takes.
- Family and friends should stick together, even if they do not agree.
- I enjoy spending time with my family and friends.

POW Please rate the extent to which you agree or disagree with the following statements:

(The four statements below were measured on a 7-point Likert scale with anchors of strongly disagree and strongly agree.)

- I easily conform to the wishes of someone in a higher position than mine.
- It is difficult for me to refuse a request if someone senior asks me.
- I tend to follow orders without asking any questions.
- I find it hard to disagree with authority figures.

SOC_INEQ Please rate the extent to which you agree or disagree with the following statements:

(The four statements below were measured on a 7-point Likert scale with anchors of strongly disagree and strongly agree.)

- A person's social status reflects their place in society.
- It is important for everyone to know their rightful place in society.
- It is difficult to interact with people from a different social status than mine.
- Unequal treatment for different people is an acceptable way of life for me.

RSK_AVS Please rate the extent to which you agree or disagree with the following statements:

(The five statements below were measured on a 7-point Likert scale with anchors of strongly disagree and strongly agree.)

- I tend to avoid talking to strangers.
- I prefer a routine way of life to an unpredictable one full of change.
- I would not describe myself as a risk-taker.
- I do not like taking too many chances to avoid making a mistake.
- I am very cautious about how I drive.

AMB_INT Please rate the extent to which you agree or disagree with the following statements:

(The five statements below were measured on a 7-point Likert scale with anchors of strongly disagree and strongly agree.)

- I find it difficult to function without clear directions and instructions.
- I prefer specific instructions to broad guidelines.
- I tend to get anxious easily when I don't know an outcome.
- I feel stressed when I cannot predict consequences.
- I feel safe when I am in my familiar surroundings.

MASC Please rate the extent to which you agree or disagree with the following statements:

(The five statements below were measured on a 7-point Likert scale with anchors of strongly disagree and strongly agree.)

- Women are generally more caring than men.
- Men are generally physically stronger than women.
- Men are generally more ambitious than women.
- Women are generally more modest than men.
- Men are generally more logical than women.

GEN_EQ Please rate the extent to which you agree or disagree with the following statements:

(The five statements below were measured on a 7-point Likert scale with anchors of strongly disagree and strongly agree.)

- It is ok for men to be emotional sometimes.

- Men do not have to be the sole bread winner in a family.
- Men can be as caring as women.
- Women can be as ambitious as men.
- Men and women can be equally aggressive.

TRD Please rate the extent to which you agree or disagree with the following statements:

(The five statements below were measured on a 7-point Likert scale with anchors of strongly disagree and strongly agree.)

- I am proud of my culture.
- Respect for tradition is important for me.
- I value a strong link to my past.
- Traditional values are important for me.
- I care a lot about my family history.

PRU Please rate the extent to which you agree or disagree with the following statements:

(The five statements below were measured on a 7-point Likert scale with anchors of strongly disagree and strongly agree.)

- I believe in planning for the long term.
- I work hard for success in the future.
- I am willing to give up today's fun for success in the future.
- I do not give up easily, even if I do not succeed on my first attempt.
- I plan everything carefully.

End of Block: Cultural Items

Start of Block: Values

VUNV Please rate the extent to which the following are important to you:

(The five items below were measured on a 7-point Likert scale with anchors of strongly disagree and strongly agree.)

- Social justice
- A world at peace

- Wisdom
- Equality
- Environmental protection

VCON Please rate the extent to which the following are important to you:

(The four items below were measured on a 7-point Likert scale with anchors of strongly disagree and strongly agree.)

- Obedience
- Honoring parents and elders
- Self-discipline
- Politeness

VBNV Please rate the extent to which the following are important to you:

(The five items below were measured on a 7-point Likert scale with anchors of strongly disagree and strongly agree.)

- Helpfulness
- Honesty
- Forgiveness
- Loyalty
- Responsibility

VHED Please rate the extent to which the following are important to you:

(The three items below were measured on a 7-point Likert scale with anchors of strongly disagree and strongly agree.)

- Gratification of desires
- Enjoyment in life
- Self-indulgence

VSTM Please rate the extent to which the following are important to you:

(The four items below were measured on a 7-point Likert scale with anchors of strongly disagree and strongly agree.)

- A daring life
- An exciting life
- A varied life
- A challenging life

VACH Please rate the extent to which the following are important to you:

(The four items below were measured on a 7-point Likert scale with anchors of strongly disagree and strongly agree.)

- Success
- Capability
- Ambition
- Influence on people and events

End of Block: Values

Start of Block: Risk Behavior

DDB How often do you:

(The four statements below were measured on a 7-point Likert scale with anchors of never and always.)

- Dial a phone number into your cellphone while driving?
- Send a text/email on your cellphone while driving?
- Respond to a text/email on your cellphone while driving?
- Read texts/emails on your cellphone while driving?

IDB How often do you:

(The four statements below were measured on a 7-point Likert scale with anchors of never and always.)

- Consume 1–2 alcoholic drinks within 2 hours before driving?
- Consume 3 or more alcoholic drinks within 2 hours before driving?
- Drive under the influence of marijuana?
- Drive under the influence of prescription medications?

SBU How often do you:

(The five statements below were measured on a 7-point Likert scale with anchors of never and always.)

- Wear your seatbelt when you are traveling short distances?
- Wear your seatbelt when you are traveling long distances?
- Wear your seatbelt if you know there is law enforcement in the area?
- Wear your seatbelt if you are a passenger in the car?
- Wear your seatbelt if you are the driver in the car?

DDB Thinking back over the past 12 months, how often have you engaged in distracted driving?

- Never (1)
- Rarely (2)
- Sometimes (3)
- About half the time (4)
- Most of the time (5)
- Frequently (6)
- Always (7)

IDB In the past year, how often have you driven when your blood alcohol level might have been close to or possibly over the legal limit?

- Never (1)
- Rarely (2)

- Sometimes (3)
- About half the time (4)
- Most of the time (5)
- Frequently (6)
- Always (7)

End of Block: Risk Behavior

Appendix C: Tables for Social Environment by SHSP Coalition

Table 33. SHSP Coalition by Age

SHSP Coalition	18–24	25–34	35–44	45–54	55–64	65 or older	Total
Acadiana Transportation Safety Coalition	54	60	77	43	29	25	288
	18.75%	20.83%	26.74%	14.93%	10.07%	8.68%	16.93%
Capital Region Transportation Safety Coalition	76	84	65	37	29	30	321
	23.68%	26.17%	20.25%	11.53%	9.03%	9.35%	18.87%
Central Louisiana Safety Coalition	19	26	28	21	13	10	117
	16.24%	22.22%	23.93%	17.95%	11.11%	8.55%	6.88%
New Orleans Regional Traffic Safety Coalition	48	70	60	38	24	31	271
	17.71%	25.83%	22.14%	14.02%	8.86%	11.44%	15.93%
North Shore Regional Safety Coalition	35	31	38	24	29	19	176
	19.89%	17.61%	21.59%	13.64%	16.48%	10.80%	15.93%
Northeast Louisiana Highway Safety Partnership	27	26	32	25	10	10	130
	20.77%	20.00%	24.62%	19.23%	7.69%	7.69%	7.64%
Northwest Louisiana Regional Safety Coalition	30	48	43	31	22	24	198
	15.15%	24.24%	21.72%	15.66%	11.11%	12.12%	11.64%
South Central Regional Safety Coalition	15	24	18	15	12	5	89
	16.85%	26.97%	20.22%	16.85%	13.48%	5.62%	5.23%
Southwest Louisiana Regional Safety Coalition	20	29	24	13	12	13	111
	18.02%	26.13%	22.63%	11.71%	10.81%	11.71%	6.53%

Table 34. SHSP Coalition by Gender

SHSP Coalition	Female	Male	Total
Acadiana Transportation Safety Coalition	216	71	287
	75.26%	24.74%	16.96%
Capital Region Transportation Safety Coalition	250	69	319
	78.37%	21.63%	18.85%
Central Louisiana Safety Coalition	94	23	117
	80.34%	19.66%	6.91%
New Orleans Regional Traffic Safety Coalition	198	71	269
	73.61%	26.39%	15.90%
North Shore Regional Safety Coalition	121	55	176
	68.75%	31.25%	10.40%
Northeast Louisiana Highway Safety Partnership	87	40	127
	68.50%	31.50%	7.51%
Northwest Louisiana Regional Safety Coalition	152	45	197
	77.16%	22.84%	11.64%
South Central Regional Safety Coalition	73	16	89
	82.02%	17.89%	5.26%
Southwest Louisiana Regional Safety Coalition	84	27	111
	75.68%	24.32%	6.56 %

Table 35. SHSP Coalition by Employment Status

	Employed Full-Time	Employed Part-Time	Homemaker	Retired	Student	Unemployed (actively seeking work)	Unemployed (not seeking work)
Acadiana Transportation Safety Coalition	141	41	19	35	11	30	11
	48.96%	14.24%	6.60%	12.15%	3.82%	10.42%	3.82%
Capital Region Transportation Safety Coalition	172	41	20	33	23	21	11
	53.58%	12.77%	6.23%	10.28%	7.17%	6.54%	3.43%
Central Louisiana Safety Coalition	62	15	15	13	4	6	2
	52.99%	12.82%	12.82%	11.11%	3.42%	5.12%	1.71%
New Orleans Regional Traffic Safety Coalition	155	35	14	32	13	21	1
	57.20%	12.92%	5.17%	11.81%	4.80%	7.75%	.37%
North Shore Regional Safety Coalition	85	31	10	23	7	14	6
	48.30%	17.61%	5.68%	13.07%	3.98%	7.95%	3.41%
Northeast Louisiana Highway Safety Partnership	56	28	11	11	7	10	7
	43.08%	21.54%	8.46%	8.46%	5.38%	7.69%	5.38%
Northwest Louisiana Regional Safety Coalition	90	28	18	25	10	23	4
	45.45%	14.14%	9.09%	12.63%	5.05%	11.62%	2.02%
South Central Regional Safety Coalition	42	7	17	8	4	9	2
	47.19%	7.87%	19.10%	8.99%	4.49%	10.11%	2.25%
Southwest Louisiana Regional Safety Coalition	50	12	14	19	4	10	2
	45.05%	10.81%	12.61%	17.15%	3.60%	9.01%	1.80%

Table 36. SHSP Coalition by Employment Type (blue-collar)

	Neither agree nor disagree	Somewhat Agree	Somewhat Disagree	Strongly Agree	Strongly Disagree	Total
Acadiana Transportation Safety Coalition	64	50	40	58	65	277
	23.10%	18.05%	14.44%	20.94%	12.47%	16.74%
Capital Region Transportation Safety Coalition	67	45	48	50	100	310
	21.61%	14.52%	15.48%	16.13%	32.26%	18.73%
Central Louisiana Safety Coalition	28	24	19	19	25	115
	24.35%	20.87%	16.52%	16.52%	21.74%	6.95%
New Orleans Regional Traffic Safety Coalition	58	40	45	39	88	270
	21.48%	14.81%	16.67%	14.44%	32.59%	16.31%
North Shore Regional Safety Coalition	39	30	34	21	46	170
	22.94%	17.65%	20.00%	12.36%	27.06%	10.27%
Northeast Louisiana Highway Safety Partnership	29	23	16	22	33	123
	23.58%	18.70%	13.01%	17.89%	26.83%	7.43%
Northwest Louisiana Regional Safety Coalition	44	56	27	21	46	194
	22.68%	18.87%	13.92%	10.82%	23.71%	11.72%
South Central Regional Safety Coalition	23	14	13	13	24	87
	26.44%	16.09%	14.94%	14.94%	27.59%	5.26%
Southwest Louisiana Regional Safety Coalition	23	27	15	20	24	109
	21.10%	24.77%	13.76%	18.35%	22.02%	6.59%

Table 37. SHSP Coalition by Employment Type (white-collar)

	Neither agree nor disagree	Somewhat Agree	Somewhat Disagree	Strongly Agree	Strongly Disagree	Total
Acadiana Transportation Safety Coalition	62	70	42	33	70	277
	22.38%	25.27%	15.16%	11.91%	25.27%	16.74%
Capital Region Transportation Safety Coalition	62	84	38	59	67	310
	20.00%	27.10%	12.26%	19.03%	21.61%	18.73%
Central Louisiana Safety Coalition	26	34	16	15	24	115
	22.61%	29.57%	13.91%	13.04%	20.87%	6.95%
New Orleans Regional Traffic Safety Coalition	47	72	34	77	40	270
	17.41%	26.67%	12.59%	28.52%	14.81%	16.31%
North Shore Regional Safety Coalition	28	55	20	31	36	170
	16.47%	32.35%	11.76%	18.24%	21.18%	10.27%
Northeast Louisiana Highway Safety Partnership	21	26	21	22	33	123
	17.07%	21.14%	17.07%	17.89%	26.83%	7.43%
Northwest Louisiana Regional Safety Coalition	41	57	24	33	39	194
	21.13%	29.38%	12.37%	17.01%	20.10%	11.72%
South Central Regional Safety Coalition	15	28	14	10	20	87
	17.24%	32.18%	16.09%	11.49%	22.99%	5.26%
Southwest Louisiana Regional Safety Coalition	20	29	17	15	28	109
	18.35%	26.61%	15.60%	13.76%	25.69%	6.59%

Table 38. SHSP Coalition by Educational Attainment

	Associate degree	Bachelor's Degree	Graduate Degree	High School Graduate or Equivalent	Some College (no degree)	Some High School	Trade School Certification	Total
Acadiana Transportation Safety Coalition	28	61	20	89	64	8	18	288
	9.72%	21.18%	6.94%	30.90%	22.22%	2.78%	6.25%	16.93%
Capital Region Transportation Safety Coalition	43	68	38	65	89	5	13	321
	13.40%	21.18%	11.84%	20.25%	27.73%	1.56%	4.05%	18.87%
Central Louisiana Safety Coalition	13	13	14	36	33	2	6	117
	11.11%	11.11%	11.97%	30.77%	28.21%	1.71%	5.13%	6.88%
New Orleans Regional Traffic Safety Coalition	32	80	43	40	56	9	11	271
	11.81%	29.52%	15.87%	14.76%	20.66%	3.32%	4.06%	15.93%
North Shore Regional Safety Coalition	16	41	13	45	45	4	12	176
	9.09%	23.30%	7.39%	25.57%	25.57%	2.27%	6.82%	10.35%
Northeast Louisiana Highway Safety Partnership	17	21	9	28	41	2	11	130
	13.08%	16.15%	6.92%	21.54%	31.54%	2.31%	8.46%	7.64%
Northwest Louisiana Regional Safety Coalition	30	41	18	33	55	9	12	198
	15.15%	20.71%	9.09%	16.67%	27.78%	4.55%	6.06%	11.64%
South Central Regional Safety Coalition	7	18	7	32	20	2	3	89
	7.87%	20.22%	7.87%	35.96%	22.47%	2.25%	3.37%	5.23%
Southwest Louisiana Regional Safety Coalition	9	18	6	33	38	5	2	111
	8.11%	16.22%	5.41%	29.73%	34.23%	4.50%	1.80%	6.53%

Table 39. SHSP Coalition by Household Income

	$20,000–-$30,999	$31,000–-$40,999	$41,000–-$50,999	$51,000–-$60,999	$61,000—$70,999	Above $70,000	Less than $20,000	Total
Acadiana Transportation Safety Coalition	52	39	47	22	26	62	40	288
	18.06%	13.54%	16.32%	7.64%	9.03%	21.53%	13.89%	16.93%
Capital Region Transportation Safety Coalition	52	32	30	33	25	100	49	321
	16.20%	9.97%	9.35%	10.28%	7.79%	31.15%	15.26%	18.87%
Central Louisiana Safety Coalition	18	18	10	15	11	26	19	117
	15.38%	15.38%	8.55%	12.82%	9.40%	22.22%	16.24%	6.88%
New Orleans Regional Traffic Safety Coalition	38	29	30	36	24	81	33	271
	14.02%	10.70%	11.07%	13.28%	8.86%	29.89%	12.18%	15.93%
North Shore Regional Safety Coalition	28	14	17	20	11	57	29	176
	15.91%	7.95%	9.66%	11.36%	6.25%	32.39%	16.48%	10.35%
Northeast Louisiana Highway Safety Partnership	22	15	17	17	6	21	32	130
	16.92%	11.54%	13.08%	13.08%	4.62%	16.15%	24.62%	7.64%
Northwest Louisiana Regional Safety Coalition	33	17	24	17	17	50	40	198
	16.67%	8.59%	12.12%	8.59%	8.59%	25.25%	20.20%	11.64%
South Central Regional Safety Coalition	15	10	11	9	6	23	15	89
	16.85%	11.24%	12.36%	10.11%	6.74%	25.84%	16.85%	5.23%
Southwest Louisiana Regional Safety Coalition	22	17	11	11	12	19	19	111
	19.82%	15.32%	9.91%	9.91%	10.81%	17.12%	17.12%	6.53%

Table 40. SHSP Coalition by Number of Persons in the Household

	1	2	3	4	5	6	7 or more	Total
Acadiana Transportation Safety Coalition	29	75	71	57	25	19	12	288
	10.07%	26.04%	24.65%	19.79%	8.68%	6.60%	4.17%	16.93%
Capital Region Transportation Safety Coalition	54	100	62	61	28	9	7	321
	16.82%	31.15%	19.31%	19.00%	8.72%	2.80%	2.18%	18.87%
Central Louisiana Safety Coalition	16	29	37	20	10	3	2	117
	13.68%	24.79%	31.61%	17.09%	8.55%	2.56%	1.71%	6.99%
New Orleans Regional Traffic Safety Coalition	53	82	65	46	15	6	4	271
	19.56%	30.26%	23.99%	16.97%	5.54%	2.21%	1.48%	15.93%
North Shore Regional Safety Coalition	30	49	40	41	8	5	3	176
	17.05%	27.84%	22.73%	23.30%	4.55%	2.84%	1.70%	10.35%
Northeast Louisiana Highway Safety Partnership	23	47	27	20	7	5	1	130
	17.69%	36.15%	20.77%	15.38%	5.38%	3.85%	.77%	7.64%
Northwest Louisiana Regional Safety Coalition	34	63	38	34	16	9	4	198
	17.17%	31.82%	19.19%	17.17%	8.08%	4.55%	2.02%	11.64%
South Central Regional Safety Coalition	7	29	19	16	10	8	0	89
	7.87%	32.58%	21.35%	17.98%	11.24%	8.99%	0.00%	5.23%
Southwest Louisiana Regional Safety Coalition	26	24	27	18	9	5	2	111
	23.42%	21.62%	24.32%	16.22%	8.11%	4.50%	1.80%	6.53%

Table 41. SHSP Coalition by Duration of City Residency

	0–3 years	4–7 years	8–11 years	11+ years	Total
Acadiana Transportation Safety Coalition	37	35	24	192	288
	12.85%	12.15%	8.33%	66.67%	16.93%
Capital Region Transportation Safety Coalition	75	42	26	178	321
	23.36%	13.08%	8.10%	55.45%	18.87%
Central Louisiana Safety Coalition	12	19	14	72	117
	10.26%	16.24%	11.97%	61.54%	6.88%
New Orleans Regional Traffic Safety Coalition	42	22	22	185	271
	15.50%	8.12%	8.12%	68.27%	15.93%
North Shore Regional Safety Coalition	33	25	26	92	176
	18.75%	14.20%	14.77%	52.27%	10.35%
Northeast Louisiana Highway Safety Partnership	28	16	6	80	130
	21.54%	12.31%	4.62%	61.54%	7.64%
Northwest Louisiana Regional Safety Coalition	31	30	11	126	198
	15.66%	15.15%	5.56%	63.64%	11.64%
South Central Regional Safety Coalition	8	7	11	63	89
	8.99%	7.87%	12.36%	70.79%	5.23%
Southwest Louisiana Regional Safety Coalition	22	12	9	67	111
	19.82%	10.81%	8.11%	61.26%	6.53%

Table 42. SHSP Coalition by Duration of Parish Residency

	0–3 years	4–7 years	8–11 years	11+ years	Total
Acadiana Transportation Safety Coalition	40	28	20	200	288
	13.89%	9.72%	6.94%	69.44%	16.93%
Capital Region Transportation Safety Coalition	72	33	26	190	321
	22.43%	10.28%	8.10%	59.19%	18.87%
Central Louisiana Safety Coalition	8	13	10	86	117
	6.84%	11.11%	8.55%	73.50%	6.88%
New Orleans Regional Traffic Safety Coalition	43	25	22	181	271
	15.87%	9.23%	8.12%	66.79%	15.93%
North Shore Regional Safety Coalition	23	19	27	107	176
	13.07%	10.80%	15.34%	60.80%	10.35%
Northeast Louisiana Highway Safety Partnership	23	15	6	86	130
	17.69%	11.54%%	4.62%	66.15%	7.64%
Northwest Louisiana Regional Safety Coalition	30	24	13	131	198
	15.15%	12.12%	6.57%	66.16%	11.64%
South Central Regional Safety Coalition	2	6	9	72	89
	2.25%	6.74%	10.11%	80.90%	5.23%
Southwest Louisiana Regional Safety Coalition	19	13	8	71	111
	17.12%	11.17%	7.21%	63.96%	6.53%

Appendix D: Tables from Literature Review

Table 43. Theory of Reasoned Action Factors

Factor Name	Definition	Example
Behavioral Beliefs	Belief about the consequences of a behavior.	If I go more than ten miles per hour over the posted speed limit, I will probably get a ticket.
Evaluation of Outcomes	Evaluation of the advantages/disadvantages associated with performing a behavior.	Reducing my chance of getting a speeding ticket would be <great---good---ok---not good---bad>.
Normative Beliefs	Belief about whether peers approve or disapprove of the behavior.	Most people are ok with me speeding if I don't go more than 10 mph over the posted limit.
Motivation to Comply	Motivation to do what principal others think I should do.	My spouse doesn't mind if I speed if I'm careful, so I'm ok with it.
Attitude toward Behavior	Mental state including values, beliefs, feelings, and propensity to engage in a behavior. It is a function of behavioral beliefs and evaluation of behavioral outcomes.	If I go more than 10 mph over the posted limit, I will probably get a ticket which I can't afford, so I won't drive that fast.
Subjective Norms	Individual perception of others' beliefs about a behavior. It is a function of normative beliefs and motivation to comply.	Since most people I know, including my spouse, are ok with going up to 10 mph over the posted limit, it's ok to do it.
Behavioral Intention	A person's readiness to perform a behavior. It is a function of attitude toward behavior and subjective norms.	When I speed, I will always limit it to less than 10 mph over the posted limit.
(Risk) Behavior	An action (having negative consequences), maneuver, or operation which can be measured (e.g., surveys) or observed (e.g., direct observation or cameras).	Speeding, less than 10 mph over the posted limit.

Table 44. Theory of Planned Behavior Additional Factors

Factor Name	Definition	Example
Perceived Behavioral Control	The extent to which a person feels able to enact a behavior. It is a function of a person's control beliefs and perceived power.	For me to control how often I exceed the speed limit will be <easy---neither easy nor hard---hard>.
Control Beliefs (not shown in Figure 2)	Beliefs about the presence of factors that may facilitate or impede performance of a behavior.	If I wanted to, I could easily stop driving over the speed limit at any time.
Perceived Power (not shown in Figure 2)	Beliefs about the power of situational and internal factors which inhibit or facilitate the performing of a behavior.	I have <complete---some---no> control over the speed of my vehicle when I drive.

Table 45. Prototype Willingness Model Additional Factors

Factor Name	Definition	Example
Risk Prototypes	Representations of persons who engage in risk behaviors.	The typical person my age who regularly drives faster than the speed limit is <fun---ok---boring>.
Behavioral Willingness	Acceptance of engaging in risky behavior.	I would <definitely---possibly---never> drive faster than the speed limit if I were running late for a meeting.

Appendix E: Secondary Data Sources

Table 46. C1: Secondary Data Sources

Data Source Scope	Data Source Name (Year)	Data Source Provider
Louisiana	Louisiana Health Report Card (2019) [80]	Louisiana Department of Health
	Louisiana State Epidemiological Workgroup Online Data System (2019–2020) [81]	Louisiana Department of Health – Office of Behavioral Health
	Behavioral Risk Factor Surveillance System (2019) [82]	Centers for Disease Control and Prevention
	Louisiana Religion (2016) [83]	Association of Religion Data Archives: 2016 Religion Census
	Multiple Statistics by School System for Total Public Students (2021) [84]	Louisiana Department of Education
	City Key: Louisiana Demographics (2021) [85]	East Baton Rouge Parish Library
	Louisiana Crash Data (2010–2021) [44]	Louisiana State University Center for Analytics & Research in Transportation Safety
Washington	Driver Attitudes, Knowledge, and Awareness Survey (2014) [45]	Washington Traffic Safety Commission
	Motorcycle helmet use and injury outcome and hospitalization costs from crashes in Washington State (1996) [86]	American Journal of Public Health
Ohio	Ohio Statewide Telephone Survey of Seat Belt Use, Alcohol-Impaired Driving, Distracted Driving, Speeding, and Overall Traffic Safety (2017) [53]	Ohio Department of Public Safety
California	California Traffic Safety Survey (2020) [87]	The California Office of Traffic Safety

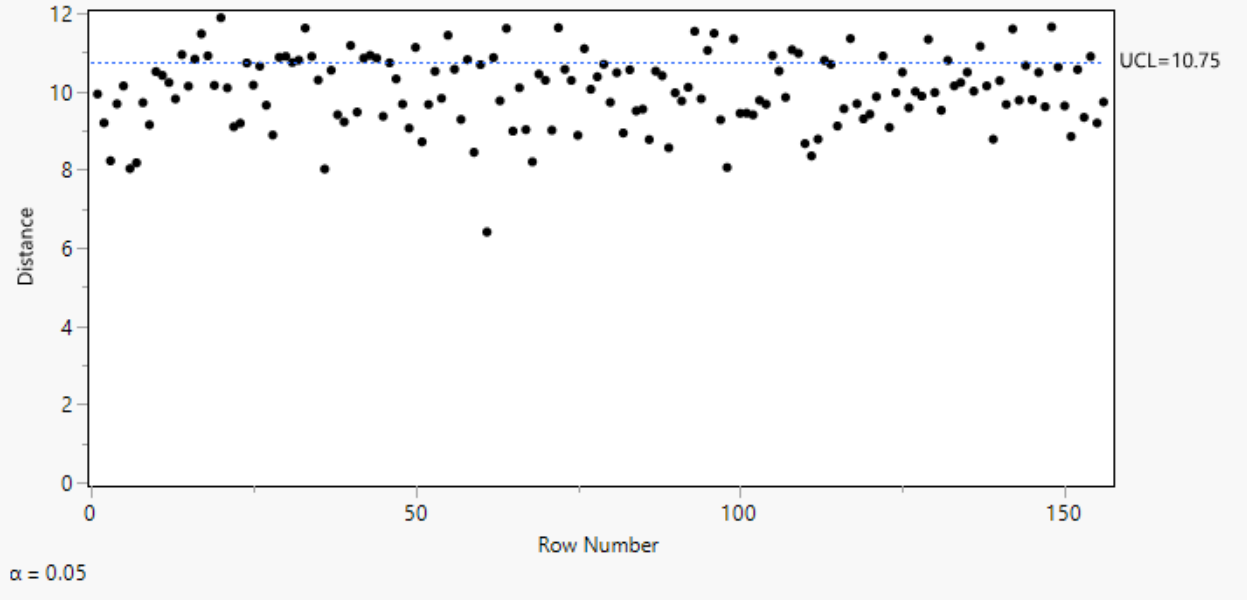
Data Source Scope	Data Source Name (Year)	Data Source Provider
	Passenger distractions among adolescent drivers (2006) [49]	Journal of Safety Research
Texas	Texas Statewide Traffic Safety Awareness Survey (2020) [88]	Texas Department of Transportation
United States	National Survey of Speeding Attitudes and Behaviors(2011) [46]	National Highway Traffic Safety Administration
	Distracted Driving – Survey of the States (2013) [89]	Governors Highway Safety Association
	National Roadside Study of Alcohol and Drug Use by Drivers (2014) [56]	National Highway Traffic Safety Administration
	American Driving Survey (2017) [90]	AAA Foundation for Traffic Safety
	National Occupant Protection Use Survey (2020) [55]	National Highway Traffic Safety Administration
	American Community Survey 1-Year Estimates (2021) [72]	U.S. Census Bureau
	State Alcohol-Impaired-Driving Estimates (2019) [91]	National Highway Traffic Safety Administration
	Traffic Safety Culture Index (2019) [92]	AAA Foundation for Traffic Safety
	Traffic Safety Facts (2019) [93]	National Highway Traffic Safety Administration
	National Survey on Drug Use and Health (2020) [94]	Substance Abuse and Mental Health Services Administration
	Religious Landscape Study (2014) [95]	Pew Research Center
	Social Norms and Risk Perception: Predictors of Distracted Driving Behavior Among Novice Adolescent Drivers (2014) [50]	Journal of Adolescent Health

Data Source Scope	Data Source Name (Year)	Data Source Provider
	Visual and cognitive demands of using in-vehicle infotainment systems (2017) [52]	Transportation Research Board
	Belief about seat belt use and seat belt wearing behavior among front and rear seat passengers in the United States (2019) [54]	Journal of Safety Research
	The observed effects of teenage passengers on the risky driving behavior of teenage drivers (2005) [51]	Accident Analysis & Prevention
	Trends in fatalities from distracted driving in the United States, 1999 to 2008 (2008) [47]	American Journal of Public Health
International	An international comparative study on driving attitudes and behaviors based on questionnaire surveys (2021) [48]	IATSS Research
	Illicit drugs and driving: prevalence, beliefs and accident involvement among a cohort of current out-of-treatment drug users (2000) [57]	Drug and Alcohol Dependence
	Comparison of the prevalence of alcohol, cannabis and other drugs between 900 injured drivers and 900 control subjects: results of a French collaborative study (2003) [59]	Forensic Science International
	Bicycle helmet efficacy: a meta-analysis (2001) [96]	Accident Analysis & Prevention
	Responsibility analysis: A methodology to study the effects of drugs in driving (1994) [58]	Accident Analysis & Prevention

Appendix F: Exploratory Factor Analysis (EFA)

Mahalanobis distances were calculated and plotted for each observation using JMP Pro 16 [64]. The 45 observations above the upper control limit line (UCL = 10.75) in Figure 28 are not multivariate normal. These observations represent 28.85% of the initial data. Due to this non-normality of the data, the MLM estimation method was used, which is robust to non-normality [97].

Figure 28. Mahalanobis Distances



Standardized factor loadings are shown in Figure 30, with item loadings > 0.5 supporting convergent validity for all factors. The absence of any cross loadings > 0.4 supports discriminant validity for all factors. Reliability of measurement for each factor was assessed using Joreskog rho, a composite reliability calculation shown in Figure 29 [98].Values greater than 0.7 provide evidence of acceptable reliability [98], and all factors met this criterion (Table 47). Univariate sample and fit statistics from MPlus [65] are shown in Figure 31 and Figure 32. Fit values of SRMR < 0.08, RMSEA < 0.06, CFI > 0.95, and TLI > 0.95 are generally accepted indicators of acceptable model fit [37, 38]. The SRMR fit statistic is within the acceptable range, RMSEA 90% confidence interval of 0.057 to 0.08 and CFI = 0.945 are slightly above acceptable ranges, and Tucker-Lewis Index (TLI) of 0.907 is below the acceptable range. However, the small number of observations in the sample may have contributed to the out-of-range values.

Figure 29. Composite Reliability Calculation

$$CR = \frac{(\sum \lambda_i)^2}{(\sum \lambda_i)^2 + (\sum \epsilon_i)}$$

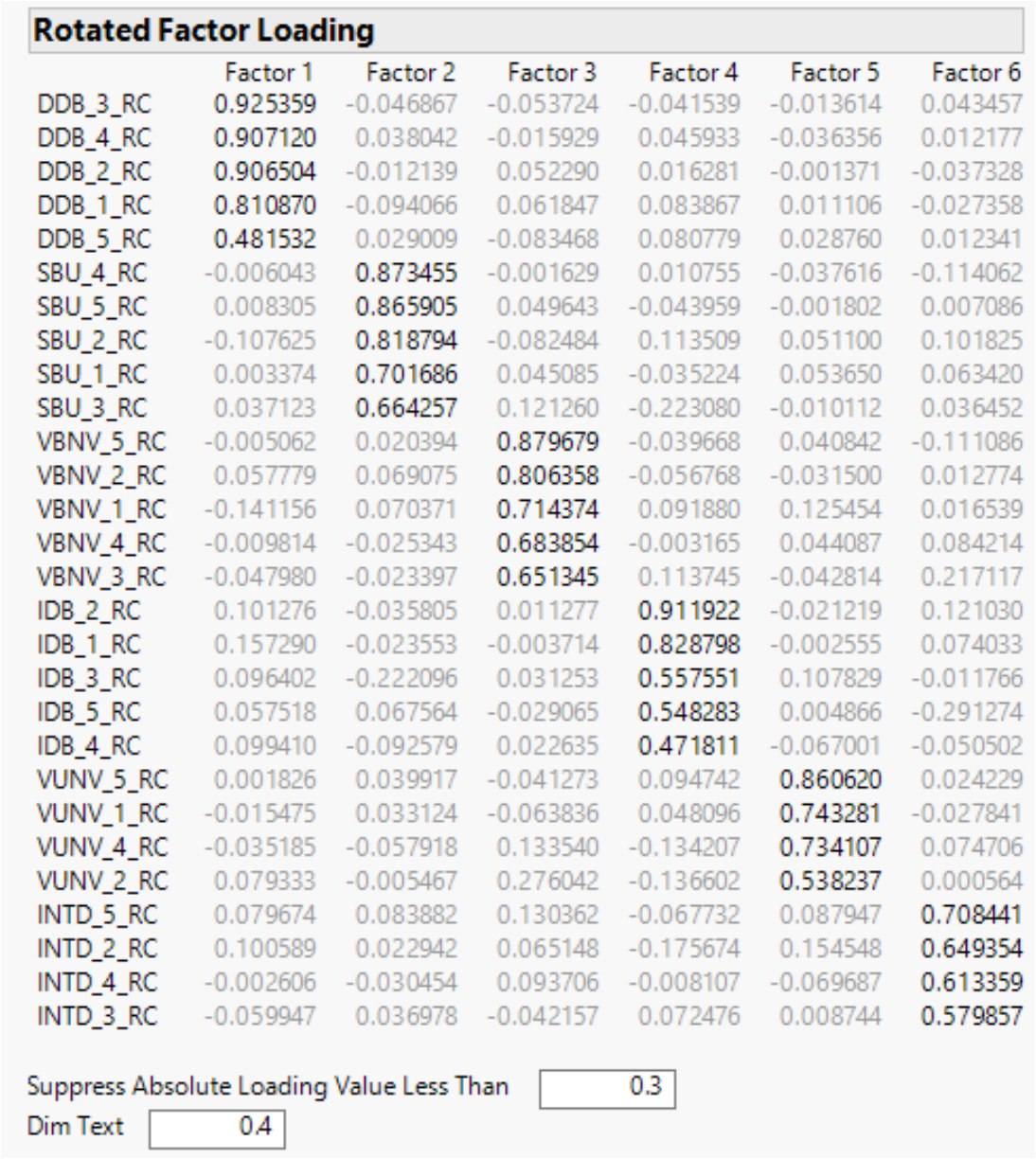
Whereby, λ (lambda) is the standardized factor loading for item *i* and ε is the respective error variance for item *i*. The error variance (ε) is estimated based on the value of the standardized loading (λ) as:

$$\epsilon_i = 1 - \lambda_i^2$$

Table 47. Composite Reliability of Factors

	Joreskog Rho
Factor 1 (Distracted Driving)	0.91
Factor 2 (Driver Seat Belt Use)	0.891
Factor 3 (Values — Benevolence)	0.865
Factor 4 (Impaired Driving)	0.806
Factor 5 (Values — Universalism)	0.815
Factor 6 (Values — Interdependence)	0.734

Figure 30. Standardized Factor Loadings



Rotated Factor Loading

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
DDB_3_RC	0.925359	-0.046867	-0.053724	-0.041539	-0.013614	0.043457
DDB_4_RC	0.907120	0.038042	-0.015929	0.045933	-0.036356	0.012177
DDB_2_RC	0.906504	-0.012139	0.052290	0.016281	-0.001371	-0.037328
DDB_1_RC	0.810870	-0.094066	0.061847	0.083867	0.011106	-0.027358
DDB_5_RC	0.481532	0.029009	-0.083468	0.080779	0.028760	0.012341
SBU_4_RC	-0.006043	0.873455	-0.001629	0.010755	-0.037616	-0.114062
SBU_5_RC	0.008305	0.865905	0.049643	-0.043959	-0.001802	0.007086
SBU_2_RC	-0.107625	0.818794	-0.082484	0.113509	0.051100	0.101825
SBU_1_RC	0.003374	0.701686	0.045085	-0.035224	0.053650	0.063420
SBU_3_RC	0.037123	0.664257	0.121260	-0.223080	-0.010112	0.036452
VBNV_5_RC	-0.005062	0.020394	0.879679	-0.039668	0.040842	-0.111086
VBNV_2_RC	0.057779	0.069075	0.806358	-0.056768	-0.031500	0.012774
VBNV_1_RC	-0.141156	0.070371	0.714374	0.091880	0.125454	0.016539
VBNV_4_RC	-0.009814	-0.025343	0.683854	-0.003165	0.044087	0.084214
VBNV_3_RC	-0.047980	-0.023397	0.651345	0.113745	-0.042814	0.217117
IDB_2_RC	0.101276	-0.035805	0.011277	0.911922	-0.021219	0.121030
IDB_1_RC	0.157290	-0.023553	-0.003714	0.828798	-0.002555	0.074033
IDB_3_RC	0.096402	-0.222096	0.031253	0.557551	0.107829	-0.011766
IDB_5_RC	0.057518	0.067564	-0.029065	0.548283	0.004866	-0.291274
IDB_4_RC	0.099410	-0.092579	0.022635	0.471811	-0.067001	-0.050502
VUNV_5_RC	0.001826	0.039917	-0.041273	0.094742	0.860620	0.024229
VUNV_1_RC	-0.015475	0.033124	-0.063836	0.048096	0.743281	-0.027841
VUNV_4_RC	-0.035185	-0.057918	0.133540	-0.134207	0.734107	0.074706
VUNV_2_RC	0.079333	-0.005467	0.276042	-0.136602	0.538237	0.000564
INTD_5_RC	0.079674	0.083882	0.130362	-0.067732	0.087947	0.708441
INTD_2_RC	0.100589	0.022942	0.065148	-0.175674	0.154548	0.649354
INTD_4_RC	-0.002606	-0.030454	0.093706	-0.008107	-0.069687	0.613359
INTD_3_RC	-0.059947	0.036978	-0.042157	0.072476	0.008744	0.579857

Suppress Absolute Loading Value Less Than 0.3

Dim Text 0.4

Figure 31. EFA Univariate Sample Statistics

UNIVARIATE SAMPLE STATISTICS

UNIVARIATE HIGHER-ORDER MOMENT DESCRIPTIVE STATISTICS

Variable/ Sample Size	Mean/ Variance	Skewness/ Kurtosis	Minimum/ Maximum	% with Min/Max	Percentiles 20%/60%	40%/80%	Median
VUNV_1	5.423	-0.929	1.000	3.21%	4.000	5.000	6.000
156.000	2.372	0.380	7.000	31.41%	6.000	7.000	
VUNV_2	6.167	-1.246	3.000	2.56%	5.000	6.000	6.000
156.000	1.011	1.087	7.000	47.44%	7.000	7.000	
VUNV_4	6.109	-1.746	1.000	0.64%	6.000	6.000	6.500
156.000	1.507	2.981	7.000	50.00%	7.000	7.000	
VUNV_5	5.904	-1.019	2.000	1.28%	5.000	6.000	6.000
156.000	1.420	0.506	7.000	41.03%	7.000	7.000	
INTD_2	6.186	-1.705	1.000	0.64%	6.000	6.000	6.000
156.000	0.869	5.220	7.000	42.95%	7.000	7.000	
INTD_3	5.731	-0.795	2.000	1.92%	5.000	6.000	6.000
156.000	1.466	0.181	7.000	33.97%	6.000	7.000	
INTD_4	5.712	-1.115	1.000	1.28%	5.000	6.000	6.000
156.000	1.603	1.537	7.000	33.33%	6.000	7.000	
INTD_5	6.224	-1.449	2.000	0.64%	6.000	6.000	7.000
156.000	1.007	2.068	7.000	51.28%	7.000	7.000	
VBNV_1	6.013	-1.045	3.000	2.56%	5.000	6.000	6.000
156.000	1.013	0.665	7.000	36.54%	6.000	7.000	
VBNV_2	6.378	-1.569	3.000	1.28%	6.000	6.000	7.000
156.000	0.838	2.020	7.000	59.62%	7.000	7.000	
VBNV_3	6.032	-1.235	2.000	1.28%	5.000	6.000	6.000
156.000	1.159	1.440	7.000	41.03%	7.000	7.000	
VBNV_4	6.179	-1.584	1.000	0.64%	5.000	6.000	6.000
156.000	1.006	3.828	7.000	47.44%	7.000	7.000	
VBNV_5	6.340	-1.025	4.000	2.56%	6.000	6.000	6.000
156.000	0.506	1.163	7.000	45.51%	7.000	7.000	
DDB_1	2.231	1.650	1.000	39.10%	1.000	2.000	2.000
156.000	2.408	2.066	7.000	3.21%	2.000	3.000	
DDB_2	2.199	1.581	1.000	42.95%	1.000	1.000	2.000
156.000	2.390	1.819	7.000	2.56%	2.000	3.000	
DDB_3	2.186	1.517	1.000	41.67%	1.000	1.000	2.000
156.000	2.151	1.809	7.000	1.92%	2.000	3.000	
DDB_4	2.314	1.372	1.000	38.46%	1.000	2.000	2.000
156.000	2.344	1.246	7.000	1.92%	2.000	3.000	
DDB_5	2.378	1.584	1.000	21.79%	1.000	2.000	2.000
156.000	1.543	3.293	7.000	1.92%	2.000	3.000	
IDB_1	1.590	2.442	1.000	71.79%	1.000	1.000	1.000
156.000	1.421	5.868	7.000	0.64%	1.000	2.000	
IDB_2	1.423	2.975	1.000	80.77%	1.000	1.000	1.000
156.000	1.154	8.697	7.000	0.64%	1.000	1.000	
IDB_3	1.545	2.700	1.000	81.41%	1.000	1.000	1.000
156.000	1.838	6.578	7.000	2.56%	1.000	1.000	
IDB_4	1.750	2.275	1.000	70.51%	1.000	1.000	1.000
156.000	2.277	4.356	7.000	3.85%	1.000	2.000	
IDB_5	1.346	3.806	1.000	82.05%	1.000	1.000	1.000
156.000	0.919	16.362	7.000	1.28%	1.000	1.000	
SBU_1	6.314	-1.964	1.000	0.64%	6.000	7.000	7.000
156.000	1.844	2.821	7.000	74.36%	7.000	7.000	
SBU_2	6.571	-2.609	2.000	1.28%	7.000	7.000	7.000
156.000	1.142	6.030	7.000	82.69%	7.000	7.000	
SBU_3	6.667	-3.021	2.000	0.64%	7.000	7.000	7.000
156.000	0.850	8.690	7.000	85.26%	7.000	7.000	
SBU_4	6.526	-2.717	1.000	0.64%	7.000	7.000	7.000
156.000	1.531	6.357	7.000	83.33%	7.000	7.000	
SBU_5	6.673	-3.236	2.000	1.28%	7.000	7.000	7.000
156.000	0.912	10.174	7.000	86.54%	7.000	7.000	

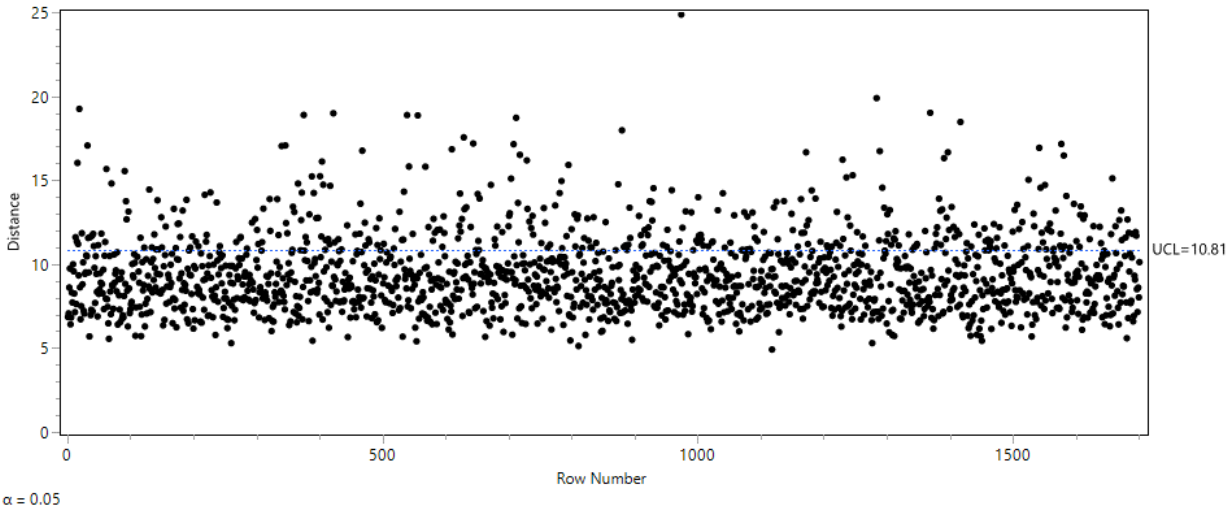
Figure 32. EFA Model Fit Information

```
MODEL FIT INFORMATION

Number of Free Parameters                       209

Loglikelihood

          H0 Value                          -5360.409
          H1 Value                          -5166.119

Information Criteria

          Akaike (AIC)                      11138.819
          Bayesian (BIC)                    11776.239
          Sample-Size Adjusted BIC          11114.688
            (n* = (n + 2) / 24)

Chi-Square Test of Model Fit

          Value                               388.581
          Degrees of Freedom                      225
          P-Value                              0.0000

RMSEA (Root Mean Square Error Of Approximation)

          Estimate                             0.068
          90 Percent C.I.                      0.057  0.080
          Probability RMSEA <= .05             0.006

CFI/TLI

          CFI                                  0.945
          TLI                                  0.907

Chi-Square Test of Model Fit for the Baseline Model

          Value                             3347.016
          Degrees of Freedom                    378
          P-Value                            0.0000

SRMR (Standardized Root Mean Square Residual)

          Value                                0.032
```

Appendix G: Confirmatory Factor Analysis (CFA)

Mahalanobis distances were calculated and plotted for each observation using JMP Pro 16 [64]. The 45 observations above the upper control limit line (UCL=10.81) in Figure 33 are not multivariate normal. These observations represent 24.28% of the initial data. Due to this non-normality of the data, the MLM estimation method was used, which is robust to non-normality [97].

Figure 33. Mahalanobis Distances



Standardized factor loadings are shown in Figure 35, with item loadings > 0.5 supporting convergent validity for all factors. The absence of any cross loadings > 0.39 supports discriminant validity for all factors. Reliability of measurement for each factor was assessed using Joreskog rho, a composite reliability calculation shown in Figure 34. Values greater than 0.7 provide evidence of acceptable reliability [98], and all factors met this criterion (Table 48). Univariate sample and fit statistics from MPlus [65] are shown in Figure 36 and Figure 37. Fit values of SRMR < 0.08, RMSEA < 0.06, CFI > 0.95, and TLI > 0.95 are generally accepted indicators of acceptable model fit [37, 38]. All fit statistics provide evidence of acceptable model fit, with SRMR = 0.016, RMSEA 90% confidence interval of 0.041 to 0.047, CFI = 0.976, and TLI = 0.96.

Figure 34. Composite Reliability Calculation

$$CR = \frac{(\sum \lambda_i)^2}{(\sum \lambda_i)^2 + (\sum \epsilon_i)}$$

Whereby, λ (lambda) is the standardized factor loading for item *i* and ε is the respective error variance for item *i*. The error variance (ε) is estimated based on the value of the standardized loading (λ) as:

$$\epsilon_i = 1 - \lambda_i^2$$

Table 48. Composite Reliability of Factors

	Joreskog Rho
Factor 1 (Distracted Driving)	0.94
Factor 2 (Driver Seat Belt Use)	0.921
Factor 3 (Values — Benevolence)	0.869
Factor 4 (Impaired Driving)	0.853
Factor 5 (Values — Universalism)	0.824
Factor 6 (Values — Interdependence)	0.791

Figure 35. Standardized factor Loadings

Rotated Factor Loading

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
SBU_5	0.920882	-0.019661	0.033510	-0.025684	-0.015052	0.002863
SBU_2	0.916689	-0.010362	0.005234	0.012828	0.000609	-0.013346
SBU_4	0.904611	-0.008789	0.034851	-0.059045	-0.004836	0.029947
SBU_1	0.834247	-0.027527	0.022499	0.036340	-0.008867	-0.009773
SBU_3	0.764879	0.052022	-0.105247	0.062687	0.030141	0.000250
DDB_3	-0.004699	0.993449	-0.058902	-0.010238	0.004544	-0.004789
DDB_2	-0.007121	0.982319	-0.066645	-0.027468	0.006559	-0.019077
DDB_4	0.003123	0.912073	-0.013736	-0.014800	-0.006387	0.005092
DDB_1	-0.051317	0.679717	0.149599	0.022250	-0.007203	0.006952
DDB_5	0.016872	0.553377	0.134185	0.036116	-0.028898	0.006786
IDB_2	0.008847	-0.042461	0.963273	-0.006671	-0.014583	0.008094
IDB_1	0.042892	0.056995	0.852873	-0.030430	-0.022114	0.025563
IDB_5	0.011556	0.036371	0.701422	-0.037778	0.009218	0.001755
IDB_3	-0.081936	0.077449	0.637578	-0.010848	0.043085	-0.015328
IDB_4	-0.004603	-0.012340	0.583306	0.039910	0.006254	-0.030884
VBNV_4	-0.044833	0.029666	-0.015501	0.795854	-0.035707	0.023361
VBNV_2	0.047091	-0.034141	-0.039089	0.795303	0.007319	-0.085913
VBNV_3	-0.001326	-0.015404	0.064917	0.725852	-0.037453	0.062072
VBNV_5	0.007301	-0.029883	-0.025060	0.715836	0.041707	0.032033
VBNV_1	0.032590	0.047981	-0.007863	0.627840	0.108048	0.035064
VUNV_4	-0.020006	0.028661	-0.057366	0.104921	0.782925	0.001537
VUNV_5	-0.014026	-0.049944	0.055125	-0.029078	0.747626	0.013607
VUNV_1	0.014252	0.024870	-0.000811	-0.078891	0.730647	-0.001647
VUNV_2	0.024910	-0.027793	0.009184	0.111525	0.671911	0.011910
INTD_5	0.026601	0.007997	-0.045459	0.003887	0.015804	0.758505
INTD_2	0.052334	0.028146	-0.032943	-0.012514	0.082259	0.735648
INTD_3	-0.001493	0.012159	0.001839	-0.015578	-0.002176	0.667986
INTD_4	-0.049971	-0.044838	0.042159	0.047434	-0.057971	0.622960

Suppress Absolute Loading Value Less Than 0.3

Dim Text 0.4

Figure 36. EFA Univariate Sample Statistics

UNIVARIATE SAMPLE STATISTICS

UNIVARIATE HIGHER-ORDER MOMENT DESCRIPTIVE STATISTICS

Variable/ Sample Size	Mean/ Variance	Skewness/ Kurtosis	Minimum/ Maximum	% with Min/Max	Percentiles 20%/60%	40%/80%	Median
INTD_2	6.163	-1.641	1.000	0.47%	6.000	6.000	6.000
1701.000	1.021	3.749	7.000	45.09%	7.000	7.000	
INTD_3	5.741	-1.182	1.000	1.06%	5.000	6.000	6.000
1701.000	1.676	1.397	7.000	34.69%	6.000	7.000	
INTD_4	5.797	-1.230	1.000	1.00%	5.000	6.000	6.000
1701.000	1.714	1.346	7.000	37.80%	6.000	7.000	
INTD_5	6.240	-1.887	1.000	0.53%	6.000	6.000	7.000
1701.000	1.007	5.003	7.000	50.09%	7.000	7.000	
VUNV_1	5.286	-0.845	1.000	2.76%	4.000	5.000	6.000
1701.000	2.314	0.210	7.000	24.69%	6.000	7.000	
VUNV_2	6.065	-1.507	1.000	0.47%	5.000	6.000	6.000
1701.000	1.266	2.518	7.000	43.97%	7.000	7.000	
VUNV_4	6.135	-1.650	1.000	0.47%	6.000	6.000	6.000
1701.000	1.278	2.937	7.000	48.50%	7.000	7.000	
VUNV_5	5.797	-1.296	1.000	1.12%	5.000	6.000	6.000
1701.000	1.738	1.553	7.000	37.15%	6.000	7.000	
VBNV_1	6.035	-1.451	1.000	0.53%	5.000	6.000	6.000
1701.000	1.046	3.223	7.000	37.27%	6.000	7.000	
VBNV_2	6.431	-2.211	1.000	0.29%	6.000	7.000	7.000
1701.000	0.781	6.889	7.000	60.32%	7.000	7.000	
VBNV_3	6.080	-1.359	1.000	0.18%	5.000	6.000	6.000
1701.000	1.167	1.883	7.000	43.92%	7.000	7.000	
VBNV_4	6.279	-1.732	1.000	0.24%	6.000	6.000	7.000
1701.000	0.935	3.792	7.000	52.15%	7.000	7.000	
VBNV_5	6.383	-1.879	1.000	0.18%	6.000	6.000	7.000
1701.000	0.683	5.508	7.000	53.44%	7.000	7.000	
DDB_1	2.145	1.635	1.000	41.50%	1.000	1.000	2.000
1701.000	2.061	2.305	7.000	1.88%	2.000	3.000	
DDB_2	2.236	1.461	1.000	42.80%	1.000	1.000	2.000
1701.000	2.365	1.519	7.000	2.41%	2.000	3.000	
DDB_3	2.233	1.468	1.000	42.15%	1.000	1.000	2.000
1701.000	2.303	1.620	7.000	2.47%	2.000	3.000	
DDB_4	2.277	1.438	1.000	39.62%	1.000	2.000	2.000
1701.000	2.281	1.609	7.000	2.53%	2.000	3.000	
DDB_5	2.425	1.450	1.000	20.63%	1.000	2.000	2.000
1701.000	1.584	2.538	7.000	1.53%	2.000	3.000	
IDB_1	1.485	2.977	1.000	75.31%	1.000	1.000	1.000
1701.000	1.221	9.299	7.000	0.88%	1.000	2.000	
IDB_2	1.332	3.813	1.000	85.19%	1.000	1.000	1.000
1701.000	1.031	15.011	7.000	1.00%	1.000	1.000	
IDB_3	1.440	3.192	1.000	83.95%	1.000	1.000	1.000
1701.000	1.510	9.737	7.000	1.94%	1.000	1.000	
IDB_4	1.609	2.662	1.000	75.96%	1.000	1.000	1.000
1701.000	1.934	6.464	7.000	3.06%	1.000	2.000	
IDB_5	1.327	3.842	1.000	84.07%	1.000	1.000	1.000
1701.000	0.930	15.908	7.000	0.94%	1.000	1.000	
SBU_1	6.316	-2.259	1.000	2.53%	6.000	7.000	7.000
1701.000	2.129	4.208	7.000	75.90%	7.000	7.000	
SBU_2	6.573	-3.170	1.000	1.70%	7.000	7.000	7.000
1701.000	1.397	9.813	7.000	84.01%	7.000	7.000	
SBU_3	6.658	-3.602	1.000	1.29%	7.000	7.000	7.000
1701.000	1.114	13.243	7.000	86.89%	7.000	7.000	
SBU_4	6.524	-2.935	1.000	1.59%	7.000	7.000	7.000
1701.000	1.466	8.305	7.000	81.07%	7.000	7.000	
SBU_5	6.606	-3.321	1.000	1.35%	7.000	7.000	7.000
1701.000	1.261	10.949	7.000	84.42%	7.000	7.000	

Figure 37. EFA Model Fit Information

```
MODEL FIT INFORMATION

Number of Free Parameters                       209

Loglikelihood

          H0 Value                       -60221.616
          H1 Value                       -59742.019

Information Criteria

          Akaike (AIC)                   120861.232
          Bayesian (BIC)                 121997.977
          Sample-Size Adjusted BIC       121334.009
            (n* = (n + 2) / 24)

Chi-Square Test of Model Fit

          Value                             959.194
          Degrees of Freedom                    225
          P-Value                            0.0000

RMSEA (Root Mean Square Error Of Approximation)

          Estimate                           0.044
          90 Percent C.I.                    0.041  0.047
          Probability RMSEA <= .05           1.000

CFI/TLI

          CFI                                0.976
          TLI                                0.960

Chi-Square Test of Model Fit for the Baseline Model

          Value                          31333.071
          Degrees of Freedom                   378
          P-Value                            0.0000

SRMR (Standardized Root Mean Square Residual)

          Value                              0.016
```

Appendix H: Confirmatory Factor Analysis (CFA)

Univariate sample and fit statistics from MPlus [65] are shown in Figure 38 and Figure 39. Fit values of SRMR < 0.08, RMSEA < 0.06, CFI > 0.95, and TLI > 0.95 are generally accepted indicators of acceptable model fit [(37), (38)]. All fit statistics provide evidence of acceptable model fit, with SRMR = 0.039, RMSEA 90% confidence interval of 0.032 to 0.036, CFI = 0.964, and TLI = 0.96.

A path model diagram displaying standardized estimates used to assess factor loadings is shown in Figure 40. A path model diagram displaying unstandardized estimates used to interpret relationships between factors is shown in Figure 41.

Figure 38. EFA Univariate Sample Statistics

UNIVARIATE SAMPLE STATISTICS

UNIVARIATE HIGHER-ORDER MOMENT DESCRIPTIVE STATISTICS

Variable/ Sample Size	Mean/ Variance	Skewness/ Kurtosis	Minimum/ Maximum	% with Min/Max	Percentiles 20%/60%	40%/80%	Median
INTD_2	6.163	-1.641	1.000	0.47%	6.000	6.000	6.000
1701.000	1.021	3.749	7.000	45.09%	7.000	7.000	
INTD_3	5.741	-1.182	1.000	1.06%	5.000	6.000	6.000
1701.000	1.676	1.397	7.000	34.69%	6.000	7.000	
INTD_4	5.797	-1.230	1.000	1.00%	5.000	6.000	6.000
1701.000	1.714	1.346	7.000	37.80%	6.000	7.000	
INTD_5	6.240	-1.887	1.000	0.53%	6.000	6.000	7.000
1701.000	1.007	5.003	7.000	50.09%	7.000	7.000	
VUNV_1	5.286	-0.845	1.000	2.76%	4.000	5.000	6.000
1701.000	2.314	0.210	7.000	24.69%	6.000	7.000	
VUNV_2	6.065	-1.507	1.000	0.47%	5.000	6.000	6.000
1701.000	1.266	2.518	7.000	43.97%	7.000	7.000	
VUNV_4	6.135	-1.650	1.000	0.47%	6.000	6.000	6.000
1701.000	1.278	2.937	7.000	48.50%	7.000	7.000	
VUNV_5	5.797	-1.296	1.000	1.12%	5.000	6.000	6.000
1701.000	1.738	1.553	7.000	37.15%	6.000	7.000	
VBNV_1	6.035	-1.451	1.000	0.53%	5.000	6.000	6.000
1701.000	1.046	3.223	7.000	37.27%	6.000	7.000	
VBNV_2	6.431	-2.211	1.000	0.29%	6.000	7.000	7.000
1701.000	0.781	6.889	7.000	60.32%	7.000	7.000	
VBNV_3	6.080	-1.359	1.000	0.18%	5.000	6.000	6.000
1701.000	1.167	1.883	7.000	43.92%	7.000	7.000	
VBNV_4	6.279	-1.732	1.000	0.24%	6.000	6.000	7.000
1701.000	0.935	3.792	7.000	52.15%	7.000	7.000	
VBNV_5	6.383	-1.879	1.000	0.18%	6.000	6.000	7.000
1701.000	0.683	5.508	7.000	53.44%	7.000	7.000	
DDB_1	2.145	1.635	1.000	41.50%	1.000	1.000	2.000
1701.000	2.061	2.305	7.000	1.88%	2.000	3.000	
DDB_2	2.236	1.461	1.000	42.80%	1.000	1.000	2.000
1701.000	2.365	1.519	7.000	2.41%	2.000	3.000	
DDB_3	2.233	1.468	1.000	42.15%	1.000	1.000	2.000
1701.000	2.303	1.620	7.000	2.47%	2.000	3.000	
DDB_4	2.277	1.438	1.000	39.62%	1.000	2.000	2.000
1701.000	2.281	1.609	7.000	2.53%	2.000	3.000	
DDB_5	2.425	1.450	1.000	20.63%	1.000	2.000	2.000
1701.000	1.584	2.538	7.000	1.53%	2.000	3.000	
IDB_1	1.485	2.977	1.000	75.31%	1.000	1.000	1.000
1701.000	1.221	9.299	7.000	0.88%	1.000	2.000	
IDB_2	1.332	3.813	1.000	85.19%	1.000	1.000	1.000
1701.000	1.031	15.011	7.000	1.00%	1.000	1.000	
IDB_3	1.440	3.192	1.000	83.95%	1.000	1.000	1.000
1701.000	1.510	9.737	7.000	1.94%	1.000	1.000	
IDB_4	1.609	2.662	1.000	75.96%	1.000	1.000	1.000
1701.000	1.934	6.464	7.000	3.06%	1.000	2.000	
IDB_5	1.327	3.842	1.000	84.07%	1.000	1.000	1.000
1701.000	0.930	15.908	7.000	0.94%	1.000	1.000	
SBU_1	6.316	-2.259	1.000	2.53%	6.000	7.000	7.000
1701.000	2.129	4.208	7.000	75.90%	7.000	7.000	
SBU_2	6.573	-3.170	1.000	1.70%	7.000	7.000	7.000
1701.000	1.397	9.813	7.000	84.01%	7.000	7.000	
SBU_3	6.658	-3.602	1.000	1.29%	7.000	7.000	7.000
1701.000	1.114	13.243	7.000	86.89%	7.000	7.000	
SBU_4	6.524	-2.935	1.000	1.59%	7.000	7.000	7.000
1701.000	1.466	8.305	7.000	81.07%	7.000	7.000	
SBU_5	6.606	-3.321	1.000	1.35%	7.000	7.000	7.000
1701.000	1.261	10.949	7.000	84.42%	7.000	7.000	

Figure 39. EFA Model Fit Information

```
MODEL FIT INFORMATION

Number of Free Parameters                       93

Loglikelihood

          H0 Value                       -60544.871
          H1 Value                       -59742.019

Information Criteria

          Akaike (AIC)                   121275.743
          Bayesian (BIC)                 121781.567
          Sample-Size Adjusted BIC       121486.117
            (n* = (n + 2) / 24)

Chi-Square Test of Model Fit

          Value                            1008.294*
          Degrees of Freedom                    341
          P-Value                            0.0000
          Scaling Correction Factor          1.5925
            for MLM

*   The chi-square value for MLM, MLMV, MLR, ULSMV, WLSM and WLSMV cannot be used
    for chi-square difference testing in the regular way.  MLM, MLR and WLSM
    chi-square difference testing is described on the Mplus website.  MLMV, WLSMV,
    and ULSMV difference testing is done using the DIFFTEST option.

RMSEA (Root Mean Square Error Of Approximation)

          Estimate                           0.034
          90 Percent C.I.                    0.032  0.036
          Probability RMSEA <= .05           1.000

CFI/TLI

          CFI                                0.964
          TLI                                0.960

Chi-Square Test of Model Fit for the Baseline Model

          Value                          18663.505
          Degrees of Freedom                   378
          P-Value                            0.0000

SRMR (Standardized Root Mean Square Residual)

          Value                              0.039
```

Figure 40. Path Model with Standardized Estimates

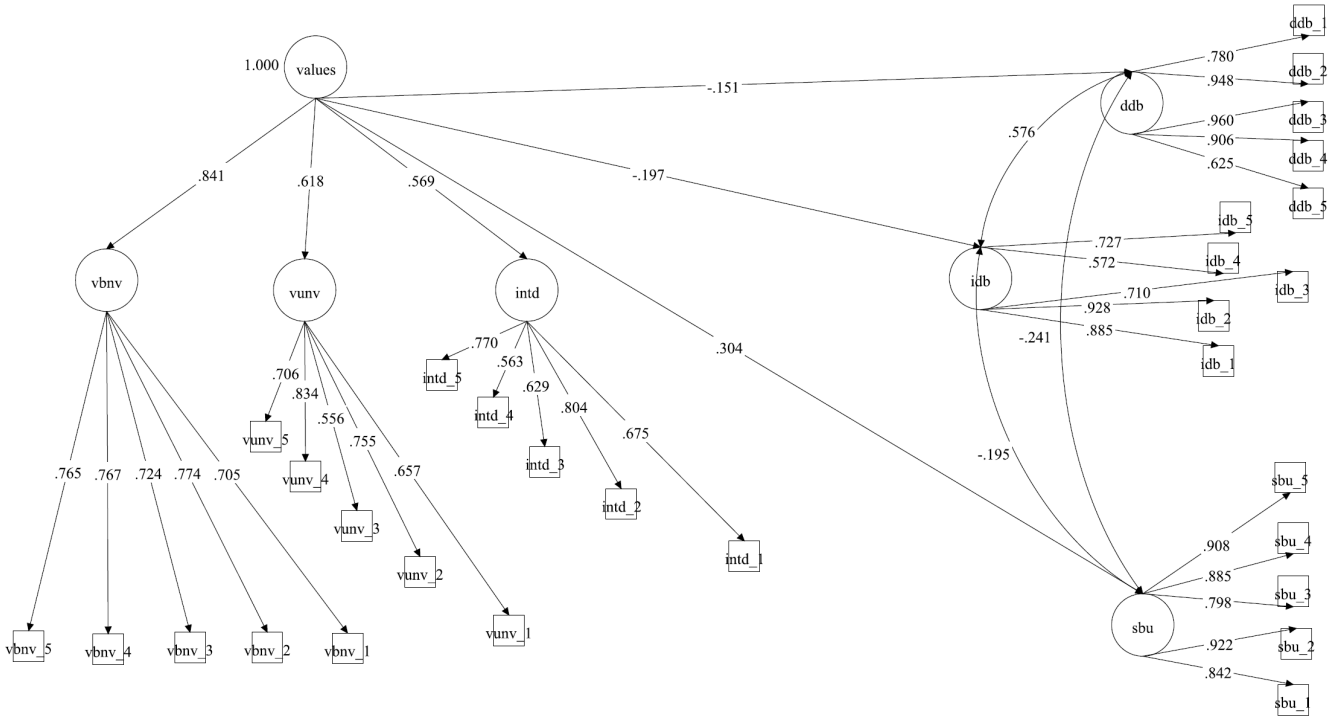
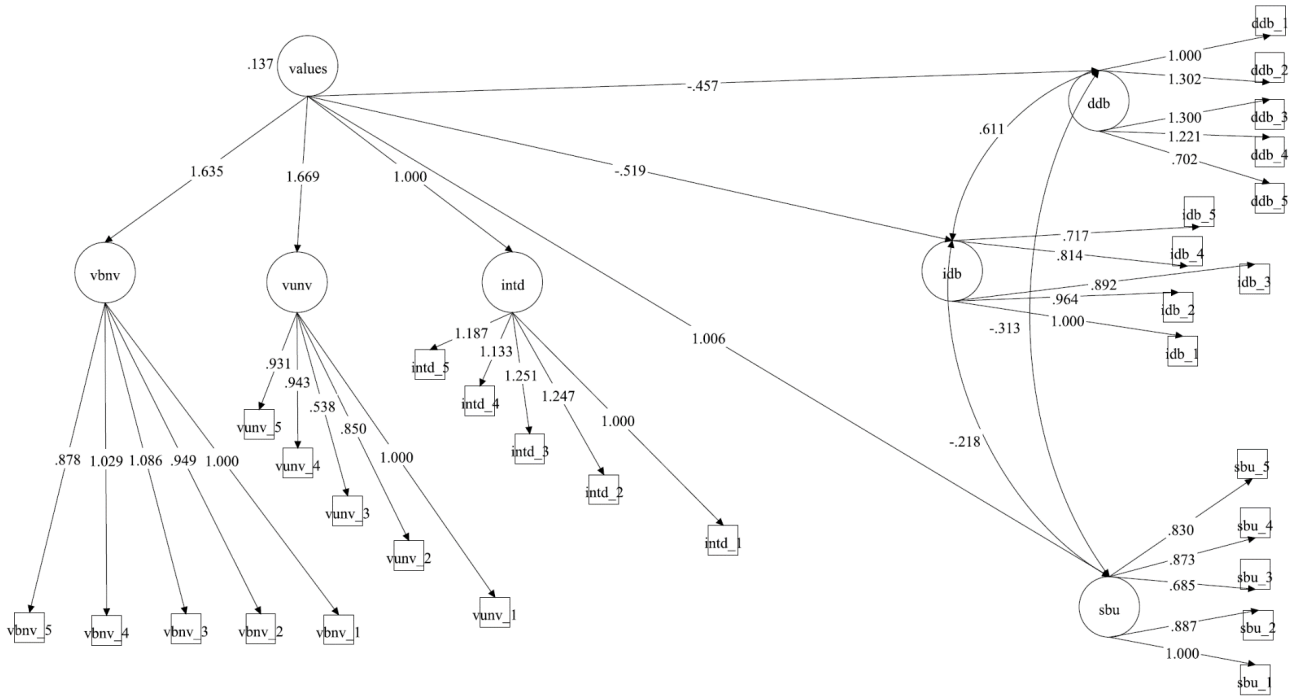


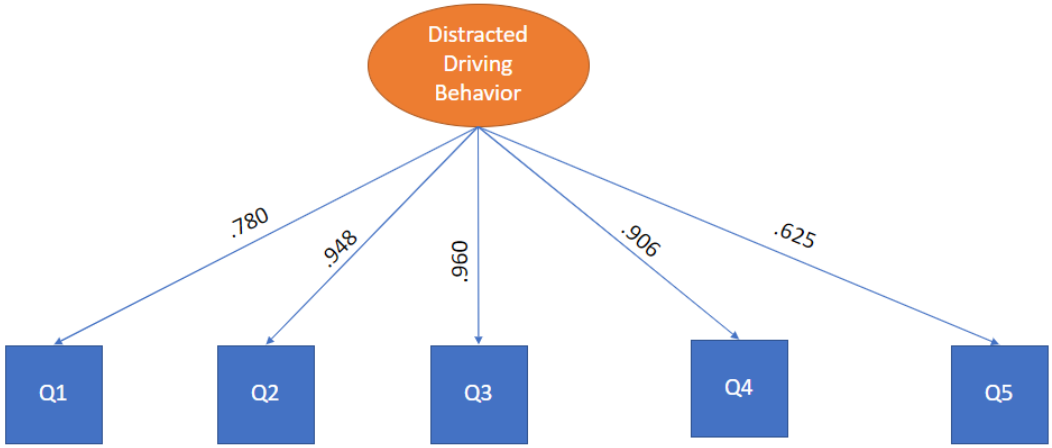
Figure 41. Path Model with Unstandardized Estimates



Appendix I: Factor Loadings with Survey Item Questions

The following survey items were measured using a 7-point Likert scale ranging from Never (1) to Always (7).

Figure 42. Distracted Driving Factor Loadings



Q1: How often do you dial a phone number into your cellphone while driving?

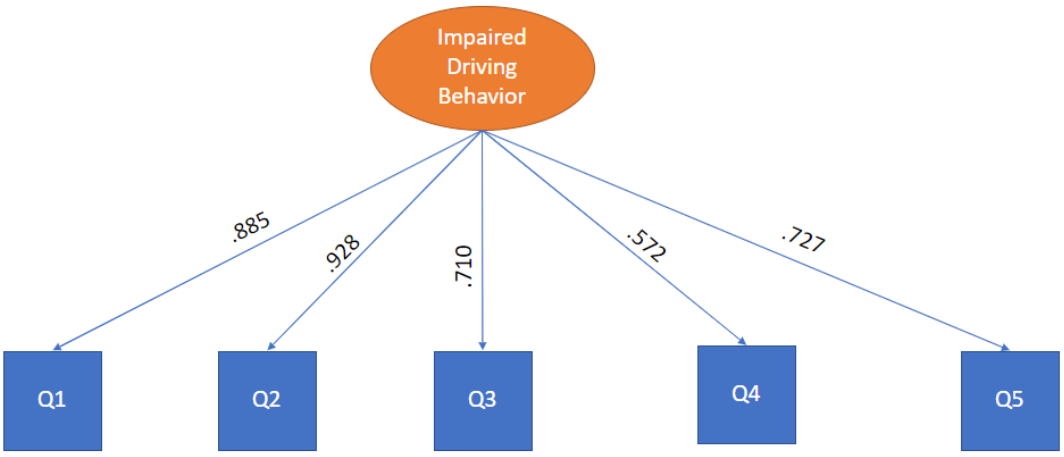
Q2: How often do you send a text/email on your cellphone while driving?

Q3: How often do you respond to a text/email on your cellphone while driving?

Q4: How often do you read texts/emails on your cellphone while driving?

Q5: Thinking back over the past 12 months, how often have you engaged in distracted driving?

Figure 43. Impaired Driving Factor Loadings



Q1: How often do you consume 1–2 alcoholic drinks within 2 hours before driving?

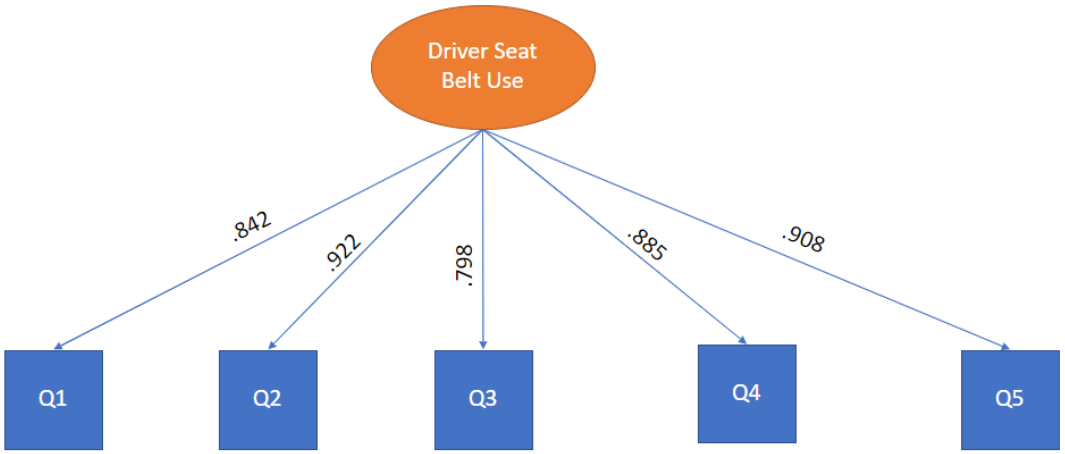
Q2: How often do you consume 3 or more alcoholic drinks within 2 hours before driving?

Q3: How often do you drive under the influence of marijuana?

Q4: How often do you drive under the influence of prescription medications?

Q5: In the past year, how often have you driven when your blood alcohol level might have been close to or possibly over the legal limit?

Figure 44. Driver Seatbelt Use Factor Loadings



Q1: How often do you wear your seatbelt when you are traveling short distances?

Q2: How often do you wear your seatbelt when you are traveling long distances?

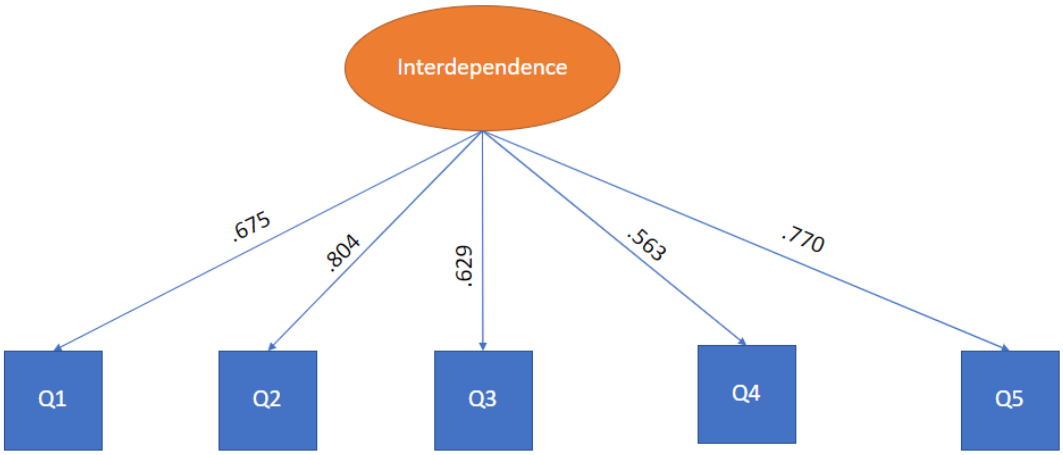
Q3: How often do you wear your seatbelt if you know there is law enforcement in the area?

Q4: How often do you wear your seatbelt if you are a passenger in the car?

Q5: How often do you wear your seatbelt if you are the driver in the car?

The following survey items were measured using a 7-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (7).

Figure 45. Interdependence Factor Loadings



Q1: The well-being of my friends and family is important for me.

Q2: I feel good when I cooperate with my friends and family.

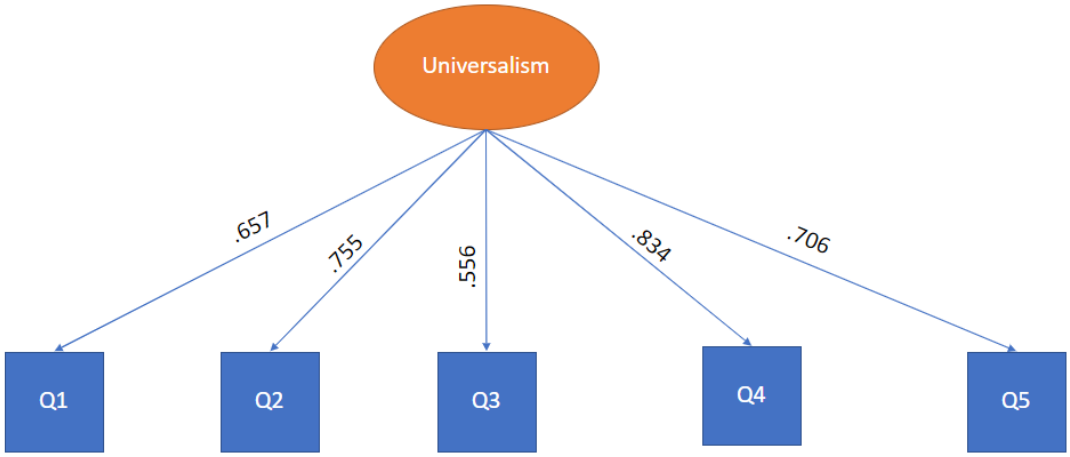
Q3: It is my duty to take care of my family and friends, whatever it takes.

Q4: Family and friends should stick together, even if they do not agree.

Q5: I enjoy spending time with my family and friends.

The following survey items were measured using a 7-point Likert scale ranging from Not at all Important (1) to Extremely Important (7).

Figure 46. Universalism Factor Loadings



Q1: Social justice

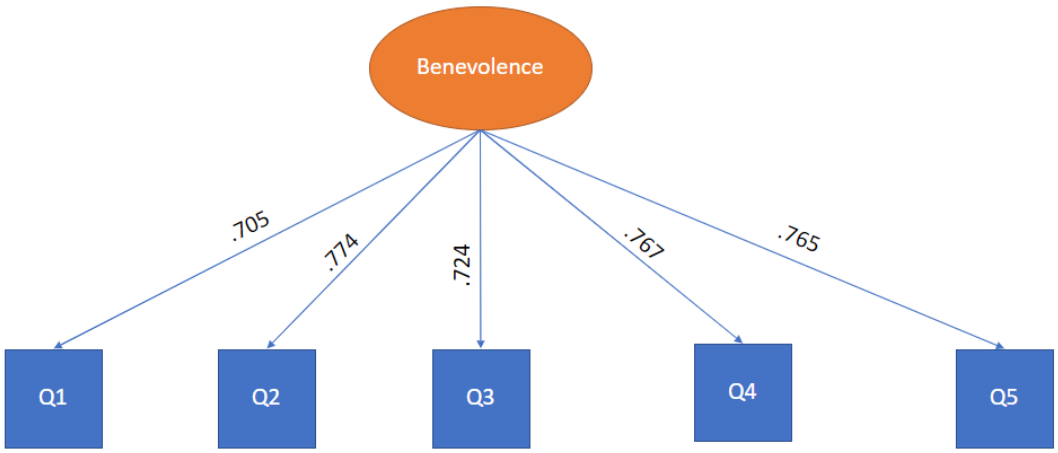
Q2: A world at peace

Q3: Wisdom

Q4: Equality

Q5: Environmental protection

Figure 47. Benevolence Factor Loadings



Q1: Helpfulness

Q2: Honesty

Q3: Forgiveness

Q4: Loyalty

Q5: Responsibility

Appendix J: Culture Survey Implementation

Objective of Survey

The objective of the survey will be to identify trends, attitudes, and behaviors when driving among the residents of Louisiana. By conducting this survey, data can be assessed regarding safety culture, behavioral patterns, and problematic areas, which can be used to develop guidelines and procedures to further ensure their safety on the road.

Recommended Distribution or Collection of Data

The Louisiana Survey conducted by the LSU Manship School of Mass Communication and the Colorado Driver Behavior Survey conducted by the Colorado Department of Transportation are the identified prototypes in this report.

Considering the processes used in the prototype surveys, it would be recommended that the survey be administered in multiple forms and multiple languages, specifically English and Spanish. Both prototype surveys administered their survey in two forms, online and in another form, specifically telephone or mail. However, the LSU Manship Louisiana Survey used software to aid in the interviewing process, and both used third party companies to aid in data collection. The Louisiana Survey works with the Marketing Systems Group and YouGov; whereas, the Colorado Driver Behavior Survey works with Dynata. Within the present study, LSU CARTS used Qualtrics.

Prospectively, the various distribution formats and mediums may be compared by costs, quality of data, ease of transfer of data into other formats, and ability for the agency to focus or pinpoint Louisiana drivers.

Recommended Sample Sizes

Both surveys select their samples in two ways. The Louisiana Survey contacted residents via telephone and online. The Louisiana Survey uses landline and cellphone numbers that were provided by a third-party company, Marketing Systems Group. A panel of online respondents

was collected using another third-party surveying company, YouGov, but 2022 appears to be the first year YouGov was used. In prior years, the survey was administered only via landline or cellphone numbers. On average, the Louisiana survey has about 1,000 respondents per year.

The Colorado Driver Behavior Survey contacted residents via mail and online. Via mail, 5,000 residential addresses were selected, but addresses in non-Front Range counties were oversampled. Up to 85% of Colorado residents live on the Front Range, therefore, these non-Front Range counties often have much fewer residents. Residents who did not respond to the initial survey were sent a follow-up with an online link to the survey. Online responses were provided by a third-party company, Dynata, who screened respondents to ensure criteria are met for age and location. On average, the Colorado Driver Behavior Survey has about 500–1,000 respondents per year.

As such, potential sample sizes would range from 750 to 1,000. Samples should include a wide range of participants not only by demographics, but also by geography. It will be important to include a wide range of participants outside of the Baton Rouge and New Orleans areas.

Identified Prototypes

The following sections will delineate the identified prototype surveys, the Louisiana Survey by LSU's Public Policy Research Lab, and the Colorado Driver Behavior Survey by the Colorado Department of Transportation.

LSU Manship Report[6]

With this culture grant, the aim is to mimic the processes used for administering the Louisiana Survey. LSU's Public Policy Research Lab began conducting a yearly survey in 2003 to evaluate public opinion in Louisiana. For example, each survey assesses core items of public opinion like the direction of the state, the most important issues in the state, and public revenue priorities for spending and earning. Therefore, the questions may not be the same each year, but the concepts are. It has been administered once each year since 2003 and twice in 2006. The PPRL is

[6] LSU Manship School of Mass Communication. (2022). *Louisiana Survey.* https://www.lsu.edu/manship/research/centers-labs/rcmpa/research/la_survey.php

sponsored by the Reilly Center for Media and Public Affairs, a part of LSU's Manship School of Mass Communication. The Reilly Family Foundation also supports the project, but the website does not specify how they support it.

The PPRL operates as one of the most well-respected university research institutions in the Southeastern Conference and contains 54 computer-assisted interview call stations, each with an advanced computer-assisted telephone interviewing system (CATI) and supporting software.[7] The CATI and supporting software aid in reducing the cost and time of conducting the surveys as well as ensuring the data is accurate. They are also able to conduct the surveys in English and Spanish.

In the past, the surveys were usually administered within the first few months of the year and were administered via telephone and online. The telephone-based survey used landline and cellphone numbers provided by Marketing Systems Group. The landline numbers were called, and the cellphone numbers were initially texted an online survey link and were only called back to follow up if they did not use the survey link. The online survey is administered by YouGov, which recruits people online to join panels of respondents and answer online surveys. Furthermore, the telephone sample is probability-based, and the online sample is non-probability based.

As an example, the telephone-based surveys for 2022 were conducted from February 21 to March 14, 2022, and successfully polled 508 adult residents.[8] The online surveys for 2022 were conducted from March 1 to March 21, 2022, and successfully polled 623 adult residents. The final reports include the survey responses and tables identifying changes in opinion throughout the years. Example items from the 2022 Louisiana Survey are below as well as an example chart.

> Question 1: To begin with, would you say things are generally going in the right direction, or do you think things are going in the wrong direction here in Louisiana?
>
> Question 5: We are also interested in how people are getting along financially these days. Would you say that you and your family are better off financially, worse off, or about the same as you were a year ago?

[7] LSU Public Policy Research Lab. (n.d.). *Surveys*. https://pprllsu.com/services/surveys/

[8] LSU Reilly Center for Media and Public Affairs. (2022). *The Louisiana Survey 2022*. https://www.lsu.edu/manship/research/centers-labs/rcmpa/research/la_survey_reports_pdf/2022_louisiana_survey_full_report.pdf

Question 24: Would you say that the number of hurricanes that have impacted Louisiana have increased, decreased, or stayed about the same as in the past?

Question 48: Please choose the statement that comes closer to your own views – even if neither is exactly right.

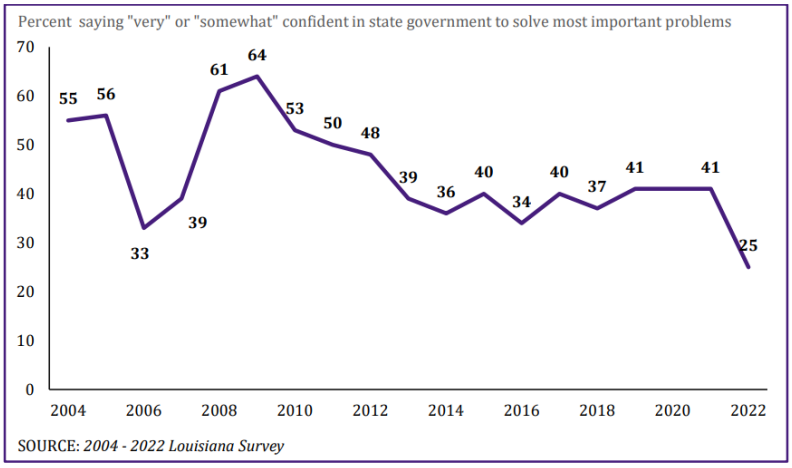
If election rules were changed to make it easier to register and vote, that would also make elections less secure.

It would not make elections any less secure if election rules were changed to make it easier to register and vote.

Question 64: Do you currently subscribe to internet service at home?

Chart: Confidence that state government can solve important problems remains low (Figure 48).

Figure 48. Confidence in State Government



Colorado Driver Behavior Survey[9]

The Colorado Driver Behavior Survey is like the Culture Survey in which it specifically focuses on driving behaviors such as distracted driving, seat belt use, driving under the influence, and speeding. The Driver Behavior Survey also outlines the demographics of the respondents, like the Culture Survey, such as gender, race, age, educational attainment, and household income. The survey is administered once a year, typically within the first few months of the year. The survey is conducted by the Colorado Department of Transportation in conjunction with Corona Insights, a market research and strategic consulting business.

Surveys are administered in two forms, mail or online. Those who did not reply by mail were sent a follow-up reminder with the option to do the survey online. The surveys were sent in English and Spanish, and the adult with the most recent birthday was asked to complete the survey to involve a variety of participants. The panel of online respondents supplemented the mail responses in which they targeted demographics that typically have lower response rates like younger residents, black residents, indigenous residents, and other people of color. This online panel and its responses were provided by Dynata, a data company. Initially, 5,000 residential addresses were selected, and non-Front Range counties were oversampled. The survey data was weighted to reflect the population in terms of age, gender, region, and race/ethnicity based on the US Census' American Community Survey.

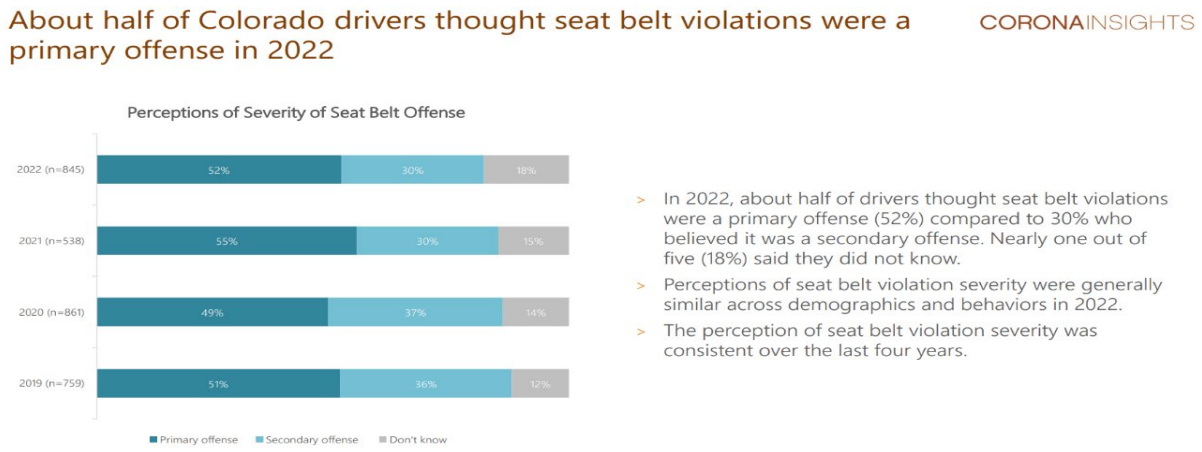
As an example, in 2022[10], the Colorado Driver Behavior Survey was administered and collected from March 4 to April 24. A total of 866 residents responded with 556 responding via mail, 116 via online from the mailed link, and 194 via online panel. The final reports include the survey responses in graphs, and some include responses from previous years' surveys. Example graphs of the results from the 2022 Colorado Driver Behavior Survey are below.

[9] Colorado Department of Transportation. (n.d.). *Safety: Driver Surveys.* Retrieved on May 24, 2023, from https://www.codot.gov/safety/safetydata/driver-surveys

[10] Corona Insights. (2022). *A Report to the Colorado Department of Transportation: 2022 Driving Behavior Survey*. Retrieved on May 24, 2023, from https://www.codot.gov/safety/assets/surveys/2022-driving-behavior-survey.pdf

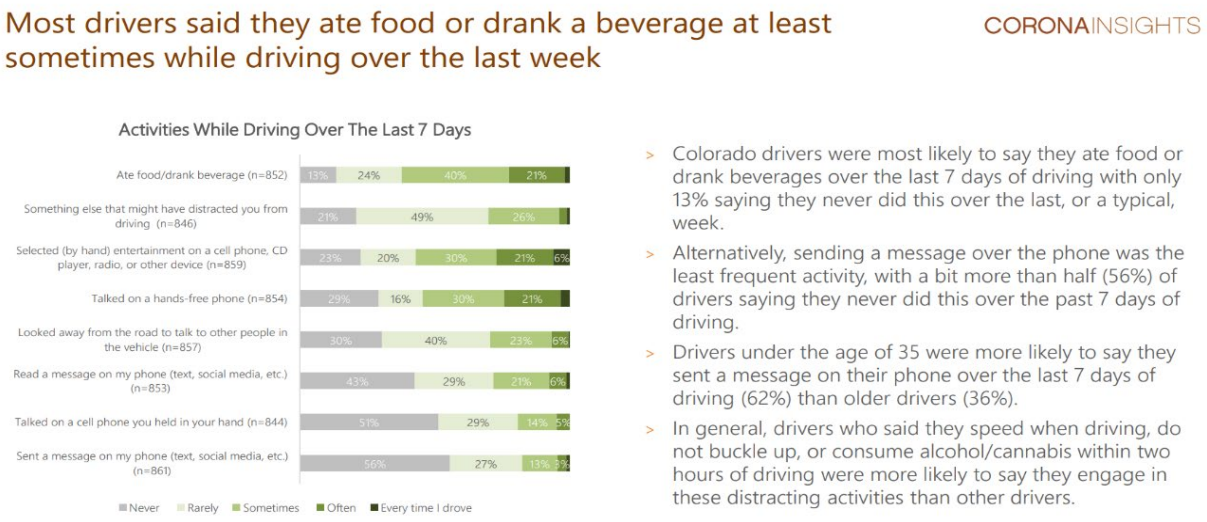
Question 5: Before reading this survey, did you think seat belt violations were a primary offense or a secondary offense? (Figure 49)

Figure 49. Perceptions of Severity of Seat Belt Offense



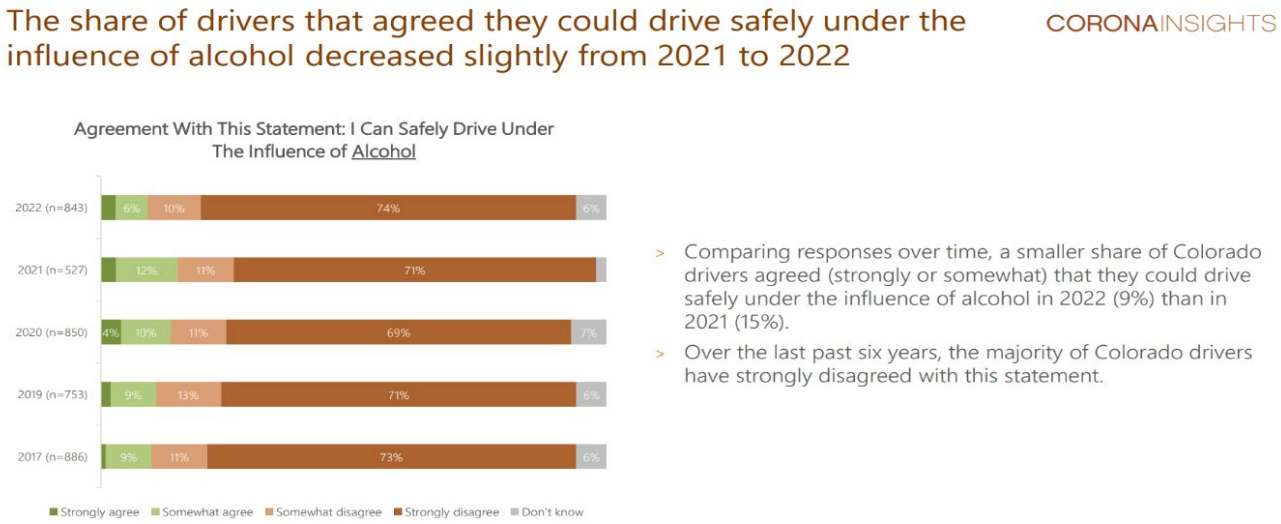
Question 8: During the past 7 days, how often, if ever, did you do each of the following while you were driving? If you did not drive in the last 7 days, please tell us about a typical week. (Figure 50)

Figure 50. Activities While Driving



Question 15: How strongly do you agree or disagree with the following statements? (Figure 51)

Figure 51. Perception of Safely Driving Under Influence



Estimated Costs

Survey cost will vary based on sample size required, responsible agency for administering the survey, and the company that distributes the survey (i.e., Qualtrics or others). The following estimated costs are proposed:

Distribution Costs (Qualtrics or others)	$25,000
Agency administrative Costs (LSU or others)	$50,000
Administrative fees (about 35% of total costs) (75,000 X .35)	$26,250.00
Estimated Total Costs	$101,250

Estimated Implementation Options

It would be recommended for the study to be administered every two years.