APJETPSS Volume 1 Issue 1 | E-ISSN: 3082-4052 | DOI: https://doi.org/10.70847/617348

**Asia Pacific Journal of Educational Technologies, Psychology, and Social Sciences**

**Journal Homepage:** https://ijmshe.com/index.php/apjetps

*Research Article*

# Road Safety Perception Of College Students In Davao City: A Comparative Analysis

Rizel Jyne Sugatan [1] | John Paul Pajiji [2] | Debby Chx Rosalinda [3] | Alfia Gee H. Lumangyao [4] | Arthur Linard P. Piatos [5] | Larragen L. Dayag [6] | Khim Jhian Xie [7] | Jherick Tengosia [8]

[1-9] University of Mindanao, Davao City, 8000, Philippines

**Article Info**

*Article history:*

Received: 25 December 2024
Revised: 10 February 2025
Accepted: 10 May 2025

*Keywords:*

Road Safety Perception, College Students, Davao City, Comparative Analysis

**Abstract**

Globally, traffic accidents claim millions of lives annually, with young adults and students being especially vulnerable. This study aimed to analyze the road safety perceptions of college students in Davao City and identify key factors influencing their views. Using a descriptive quantitative approach, data were collected from 250 college students through a structured survey. The survey, adapted from existing studies and measured on a Likert scale, focused on various factors like human behavior, vehicle conditions, and road infrastructure. Statistical analyses revealed that students perceived socioeconomic conditions and road infrastructure as critical influences on safety, while human behavioral factors were less prioritized. Gender differences were also observed, with male students placing higher importance on vehicle and road-related concerns compared to females. This study recommends targeted road safety campaigns that address gender-specific perceptions and behaviors, as well as improved infrastructure and stricter vehicle maintenance enforcement. These interventions could significantly reduce accidents and enhance overall safety in urban areas.

***Cite as:*** Sugatan, R. J., Pajiji, J. P., Rosalinda, D. C., Lumangyao, A. G., Piatos, A. L., Dayag, L., ... Tengosia, J. (2025). Road Safety Perceptions of College Students in Davao City: A Comparative Analysis. Asia Pacific Journal of Educational Technologies, Psychology, and Social Sciences, 1(1), 117–136. https://doi.org/10.70847/617348

[1]Corresponding Author: Rizel Jyne Sugatan
[*]Corresponding Email: r.sugatan.560806@umindanao.edu.ph

## Introduction

Estimated to cause 1.3 million deaths and 20 to 50 million injuries globally due to traffic accidents, it remains a serious public concern for road safety around the world (World Health Organization, 2022). Most survivors of accidents also experience long-term disabilities; thus, individuals, families, and societies incur important consequences resulting from accidents. Specifically, among young adults and students, whose accidents and their impact are in dire need of justifications, perceptions of road safety must be addressed.

Speeding, reckless driving, and driving under the influence are dangerous behaviors that contribute a lot to road accidents (Lu et al., 2020). Due to the lack of physical protection and the nature of their interaction with motor vehicles, pedestrians are especially vulnerable, making up 23% of global road fatalities (World Health Organization, 2022). Adding to these are inadequate road infrastructure, weak enforcement of traffic laws, and socioeconomic factors, all of which give rise to safety risks in urban places in many ways (Bauernschuster & Rekers, 2022). Road traffic fatalities have alarmingly increased in the Philippines, with deaths rising by 39% from 7,938 in 2011 to 11,096 in 2021 (Philippine Statistics Authority, as cited in Junio, 2023).

This demographic makes this a priority for interventions since road traffic accidents are the leading cause of death among Filipinos aged 15 to 29. Studies within the Philippine context reveal wide gaps in traffic safety awareness and compliance. For instance, the knowledge and compliance levels of tricycle drivers in the so-called "Tricycle City of the Philippines," despite adequate awareness of traffic rules explored by Aydinan (2020), due to poor enforcement and cultural factors, were notably low. This underscores the need for targeted, behavior-focused road safety campaigns tailored to specific demographic and geographic contexts.

Urban facilities like Davao City, Philippines, face precise demanding situations because of particular visitor dynamics, cultural factors, and street conditions, but they stay underrepresented in research. College students, as lively street customers and pedestrians, are a crucial organization for analyzing street protection perceptions. Understanding their perspectives is critical for developing focused training campaigns, enhancing visitors regulations, and improving infrastructure. The Philippine authorities have applied legal guidelines like Republic Act No. 4136 (Land Transportation and Traffic Code) to alter visitors, Republic Act No. 11229 (Child Safety in Motor Vehicles Act) for passenger protection, and Republic Act No. 10913 (Anti-Distracted Driving Act) to scale back injuries due to cellular tool use—local ordinances, including the ones implementing velocity limits and helmet use, in addition, aid city protection. Colleges and universities can bolster those efforts by integrating street protection training into orientation applications and consciousness campaigns. For instance, increasing projects beneath DepEd Order No. 13, s. 2019, which includes street protection in the K-12 curriculum, can assist support secure practices. The collaboration of legal guidelines, nearby policies, and academic establishments is essential for shaping students` street protection perceptions and experiences.

This paper tries to explore the perceptions of road safety among college students in Davao City, using a comparative framework for attitudes, knowledge, and behaviors. The goal is to provide actionable recommendations that enhance awareness and practice safer habits by identifying influential factors of these perceptions. The implications of these findings will have a positive effect on the reduction of road traffic accidents in urban cities such as

[1]Corresponding Author: Rizel Jyne Sugatan
[*]Corresponding Email: r.sugatan.560806@umindanao.edu.ph

Davao City, thereby improving the general well-being of students.

***Research Hypotheses***

$H_a1$: There is no significant difference in the road safety perception levels among residents in Davao City, Davao Del Sur based on different demographic groups.

$H_a2$: There is significant difference in the road safety behaviour levels among residents in Davao City, Davao Del Sur based on different demographic groups.

**Theoretical Framework**

Originally developed in 1980 as The Theory of Planned Behavior (TPB) forecasts a person's intention to participate in an action at a certain time and location. All behaviors over which persons had the capacity for self-control were to be explained by the theory. This model's central idea is behavioral intent, which is impacted by attitudes on the probability that a behavior will produce the desired result as well as subjective assessments of the advantages and disadvantages of that result.

According to Fu & Juan (2017), The Theory of Planned Behavior (TPB) proposes that behavioral intention is a key driver of behavior. This theory suggests that three cognitive factors—attitude, subjective norm, and perceived behavioral control—collectively influence behavioral intention. Stronger behavioral intentions are associated with a higher likelihood of corresponding actions. The TPB has been widely used to explain various traffic behaviors, including fatigue driving (Jiang et al., 2017), mobile phone use while driving [McBride et al., 2020; Natakorn et al., 2020; Qu et al., 2020], yielding behavior (Yang et al., 2020), and lane grabbing (Qi et al., 2021). Studies have shown that the TPB effectively explains a significant portion of the variance in intentions and behaviors, with meta-analyses indicating that these models account for 40–50% of the variance in intentions and 19–38% of the variance in behavior (Sutton, 2010). This finding is generally accepted in human behavior research (Armitage & Conner, 2001).

The Theory of Planned Behavior (TPB) aims to understand behaviors under individual control, with behavioral intention as a central component. This intention is shaped by attitudes towards the behavior's potential outcomes and benefits (LaMorte, 2019). The TPB encompasses six interconnected constructs influencing behavior: attitudes, behavioral intentions, subjective norms, social norms, perceptions of power, and perceived behavioral control (LaMorte, 2019).

The TPB has been extensively studied in psychology, particularly in the context of road traffic safety (Nordfjærn et al., 2011; Iversen & Rundmo, 2004; Nabi et al., 2007; Nordfjærn, Jørgensen, & Rundmo, 2010; Poulter et al., 2008). Research consistently demonstrates that an individual's attitude towards road traffic safety directly influences their cautiousness or negligence while driving (Nordfjærn et al., 2011). Sheeran, Norman, and Orbell (1999), as cited by Nordfjærn et al. (2011), suggest that attitude may be a more potent predictor of behavior than other variables within the TPB framework.

Risk perception refers to drivers' awareness and perception of potential driving risks, such as the likelihood and severity of traffic accidents. This encourages more careful actions, such as adhering to speed limits and keeping safe distances. (Mustapha et al., 2024). This is to interpret that Risk Perception Theory provides a

[1]Corresponding Author: Rizel Jyne Sugatan
[*]Corresponding Email: r.sugatan.560806@umindanao.edu.ph

valuable framework for understanding the road safety perception of college students in Davao City. It highlights how individual as well as contextual factors alter students' awareness and interpretation of driving risks, which influences their chance of adopting safer driving practices.

According to Sayed et al. (2022), risk perception was measured subjectively by exposing participants to a variety of visual situations representing specific local conditions and ranking their perception of the situation from a perspective of safety. This supports the exploration of how college students subjectively evaluate road safety in Davao City. This connection enriches analysis by considering psychological and contextual factors that influence their perceptions, providing a nuanced understanding of local road safety challenges.

The ability to detect changing visual information is a vital component of safe driving. In addition to detecting changing visual information, drivers must also interpret its relevance to safety. Environmental changes considered to have high safety relevance will likely demand greater attention and more timely responses than those considered to have lower safety relevance (Cox et al., 2017). It focuses on how subjective interpretations, impacted by cognitive biases, cultural norms, and personal experiences, shape students' capacity to recognize and respond to safety-related changes in their driving environment. By connecting these findings to the significance of attention and quick reactions emphasized by Cox et al. (2017), the study emphasizes the need for specific interventions that address these views to improve road safety knowledge and behavior among college students.

## Materials and Methods

This study used a descriptive quantitative research design to describe road safety perceptions among the students in Davao City colleges. Two hundred fifty students from different colleges around Davao City formed the participants of the study. Respondents were stratified and randomly selected so as to ensure that samples represented students from different colleges as well as demographic strata. This helps strengthen generalization and reliability of the findings based on the broad cross-section of the students' road safety perceptions.

Data collection utilized a structured survey questionnaire adapted from Chan and Hu's (2023) work, revised to focus on road safety. The survey incorporated closed-ended questions measured on a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). This scale was clearly explained to participants to ensure accurate expression of their views on road safety.

Descriptive statistics were computed to identify general trends and the distribution of responses. Data were collected through an online survey using a Google Form questionnaire, which was sent to college students who were familiar with road safety issues in Davao City. This method ensured uniformity in responses and made it possible to carry out quantitative analysis of the collected data, thereby strengthening the robustness and reliability of the study findings.

As part of the data analysis for this study, descriptive statistics were calculated in order to compile and display the general patterns in Davao City students' opinions on road safety. It was possible to clearly grasp how students assessed different components of road safety on the five-point Likert scale by using descriptive statistics like means, standard deviations, and frequency distributions. The data appropriately reflected the varied viewpoints of the sampled population thanks to the analysis of the structured survey responses, which helped uncover trends and variances across various demographic strata. These statistical techniques made it easier to evaluate the data objectively, confirming the validity of the results and

[1]Corresponding Author: Rizel Jyne Sugatan
[*]Corresponding Email: r.sugatan.560806@umindanao.edu.ph

allowing for the drawing of evidence-based conclusions on college students' views of road safety (Field, 2018; Creswell & Creswell, 2017).

## Results and Discussions

The reliability and the validity of the adapted questionnaire were established through Jamovi Software 2.0. The reliability of the Cronbach's alpha is set between 0.709 and 0.937, showing good internal consistency. According to Taber (2018), it is acceptable when Cronbach's alpha is ≥ 0.70. For construct validity, the robust method per Kang (2013) can be established by using factor analysis.

Prior to conducting factor analysis, the suitability of the data was checked using Bartlett's Test of Sphericity (Bartlett, 1973). Results were significant with a p-value < 0.001. The Kaiser-Meyer-Olkin statistic for testing adequacy in sample size yielded a value of 0.971, which was very good adequacy (Kaiser, 1974). These have loadings ranging from 0.414 to 0.946, a cut-off point above.40, which is believed to be stable (Guadagnoli & Velicer, 1988). The study provides insightful analysis of the road safety perceptions and behaviors of students studying at any institution in Davao City, thereby providing great comparison data for policymakers.

**Table 1.** Assumption Checks

| **Bartlett's Test of Sphericity** | | |
|---|---|---|
| $x^2$ | **df** | **p-value** |
| 21173 | 703 | <.001 |
| **KMO Measure of Sampling Adequacy (MSA)** | | 0971 |

Bartlett's Test of Sphericity resulted in a chi-square statistic of $\chi^2(780) = 11{,}116$ with a p-value less than.001, implying that the data's correlation matrix is not an identity matrix. This significant result suggests that there are considerable correlations between the variables, which is required for factor analysis. In the core, if the variables were uncorrelated, this test should yield a non-significant result. In these outcomes, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was estimated as 0.963, suggesting an exceptional level of sample adequacy. The KMO statistic measures how closely the variables in the dataset correlate with one another, with values near 1 indicating that factor analysis is likely to be beneficial (Costello, A. B., & Osborne, J. W. 2005).

### *Reliability Tests*

**Table 2.** Scale Reliability Statistics

| | **Cronbach's α** | **McDonald's ω** |
|---|---|---|
| **Scale** | 0.915 | 0.918 |

[1]Corresponding Author: Rizel Jyne Sugatan
[*]Corresponding Email: r.sugatan.560806@umindanao.edu.ph

## Results

### Assumption Checks

**Bartlett's Test of Sphericity**

| $\chi^2$ | df | p |
|---|---|---|
| **11116** | 780 | <.001 |

**KMO Measure of Sampling Adequacy**

| | MSA |
|---|---|
| **Overall** | 0.963 |

The scale's Cronbach's α (0.915) and McDonald's ω (0.918) demonstrate excellent internal consistency reliability, highlighting the robustness and coherence of the items within the scale. These statistical measures confirm that the scale items effectively align to assess the underlying construct, ensuring that they work together to provide a consistent and accurate evaluation of road safety perception. Such high values for Cronbach's α and McDonald's ω indicate that the individual items within the scale are well-correlated, offering strong evidence that the scale reliably measures the multidimensional aspects of road safety perception across diverse contexts and populations. This reliability ensures that the scale can be used with confidence in both research and practical applications related to road safety awareness and behavioral assessment (Orçan, F. 2023).

**Table 3.** Factor Loadings

| Factor | Indicator | Estimate | SE | Z | P |
|---|---|---|---|---|---|
| **HF** | HF1 | 0.447 | 0.0784 | 5.7 | <.001 |
| | HF2 | 0.718 | 0.0493 | 14.56 | <.001 |
| | HF3 | 0.833 | 0.0526 | 15.83 | <.001 |
| | HF4 | 0.739 | 0.0486 | 15.22 | <.001 |
| | HF5 | 0.763 | 0.0429 | 17.78 | <.001 |
| | HF6 | 0.8 | 0.0432 | 18.52 | <.001 |
| | HF7 | 0.83 | 0.0429 | 19.35 | <.001 |
| **VH** | VH1 | 0.785 | 0.0471 | 16.67 | <.001 |
| | VH2 | 0.841 | 0.0496 | 16.98 | <.001 |
| | VH3 | 0.914 | 0.0524 | 17.43 | <.001 |

[1]Corresponding Author: Rizel Jyne Sugatan
[*]Corresponding Email: r.sugatan.560806@umindanao.edu.ph

| | | | | | |
|---|---|---|---|---|---|
| | VH4 | 0.855 | 0.0481 | 17.79 | <.001 |
| | VH5 | 0.869 | 0.0512 | 16.98 | <.001 |
| | VH6 | 0.844 | 0.0474 | 17.81 | <.001 |
| | VH7 | 0.769 | 0.0561 | 13.71 | <.001 |
| **RIF** | RIF1 | 0.969 | 0.0635 | 15.25 | <.001 |
| | RIF2 | 1.151 | 0.0666 | 17.28 | <.001 |
| | RIF3 | 1.114 | 0.0594 | 18.78 | <.001 |
| | RIF4 | 1.104 | 0.0563 | 19.6 | <.001 |
| | RIF5 | 1.131 | 0.0615 | 18.38 | <.001 |
| | RIF6 | 1.081 | 0.0558 | 19.36 | <.001 |
| | RIF7 | 1.044 | 0.057 | 18.31 | <.001 |
| **RFIMF** | RFIMF1 | 0.843 | 0.0609 | 13.85 | <.001 |
| | RFIMF2 | 0.992 | 0.06 | 16.55 | <.001 |
| | RFIMF3 | 0.945 | 0.0546 | 17.31 | <.001 |
| | RFIMF4 | 1.053 | 0.0589 | 17.87 | <.001 |
| | RFIMF5 | 0.976 | 0.0609 | 16.03 | <.001 |
| | RFIMF6 | 1 | 0.0592 | 16.89 | <.001 |
| | RFIMF7 | 0.948 | 0.0592 | 16.03 | <.001 |
| | RFIMF8 | 0.983 | 0.0582 | 16.89 | <.001 |
| | RFIMF9 | 0.892 | 0.0609 | 14.63 | <.001 |
| | RFIMF10 | 1.015 | 0.0594 | 17.08 | <.001 |
| **DPF** | DPF1 | 0.733 | 0.0597 | 12.28 | <.001 |
| | DPF2 | 0.872 | 0.059 | 14.78 | <.001 |
| | DPF3 | 0.918 | 0.0512 | 17.93 | <.001 |
| | DPF4 | 0.874 | 0.0474 | 18.43 | <.001 |
| | DPF5 | 0.935 | 0.0585 | 15.99 | <.001 |
| **SEF** | SEF1 | 1.115 | 0.0607 | 18.36 | <.001 |
| | SEF2 | 1.113 | 0.0555 | 20.07 | <.001 |
| | SEF3 | 1.119 | 0.0563 | 19.89 | <.001 |
| | SEF4 | 1.097 | 0.0568 | 19.31 | <.001 |

Factor loadings across the various dimensions, including human factors (HF), vehicle factors (VH), roadway infrastructure factors (RIF), regulatory framework and intervention factors (RFIMF), driver attention factors (DPF), and socio-economic factors (SEF), proved to be statistically significant ($p < 0.001$). These loadings ranged from moderate values, such as HF1 with a loading of 0.447, to very strong values, such as SEF2 with a loading of 1.113. This wide range of loadings highlights the different strengths of the relationships between

[1]Corresponding Author: Rizel Jyne Sugatan
[*]Corresponding Email: r.sugatan.560806@umindanao.edu.ph

individual items and their respective constructs (Hair et al., 2019; Brown, 2015).

The results indicate that the majority of items are reliably aligned with the stated dimensions, thus suggesting that they contribute significantly to the overall framework of the scale. Strong loadings, such as those found in SEF2, confirm that these items are well-representative of the construct and have a strong impact on the overall measurement (Kline, 2015). Conversely, elements with lower charges, some of which, such as HF1, require further scrutiny to assess their continued relevance, clarity, and placement within the broader scale. These lower loading factors may reflect nuances in interpretation, inconsistencies in measurement, or areas for improvement in factor design (Schmitt, 2011; Raykov, 2012). Editing such items through refinement or revision would further improve the precision and reliability of the scale (Nunnally & Bernstein, 1994). Overall, these results indicate that while the scale is primarily effective at measuring the intended construct, targeted improvements may optimize performance and ensure even stronger construct validity across all dimensions (DeVellis, 2017; Fornell & Larcker, 1981).

**Table 4**. Descriptives

| | N | Mean | Median | SD |
|---|---|---|---|---|
| **Human Factor** | 258 | 1.56 | 1.29 | 0.77 |
| **Vehicle Factor** | 258 | 1.82 | 1.57 | 0.87 |
| **Road Infrastructure Factor** | 258 | 2.03 | 1.71 | 1.11 |
| **Regulatory Framework and Intervention Measures Factor** | 258 | 2.09 | 2.00 | 0.99 |
| **Driving Precaution Factor** | 258 | 1.91 | 1.80 | 0.91 |
| **Socio-Economic Factor** | 258 | 2.14 | 2.00 | 1.14 |

Descriptive statistics provide valuable insights into the differences in students' perceptions of road safety, highlighting different priorities and concerns across the dimensions assessed. Of these, socio-economic factors (M = 2.14, SD = 1.14) were found to be the dimension with the highest mean value. This result suggests that students believe that economic and social conditions such as income levels, education, employment opportunities, and community trends play a key role in influencing road safety. These findings may reflect the recognition of broader systemic issues that shape behaviors, access to resources, and infrastructure development that are important for maintaining safety on the roads (Azevedo et al., 2016; Zador et al., 1995). On the other hand, the lowest mean score was obtained for human factors (M = 1.56, SD = 0.77). This indicates that personal and behavioral factors such as drivers' attitudes and habits and compliance with traffic rules are perceived as relatively less important compared to other dimensions. This low means may indicate a need for greater awareness and education on the impact of individual behavior on road safety (Freeman & Shaw, 2009; Harrison & Gummer, 2012).

Other dimensions, such as vehicle factors (M = 1.82, SD = 0.87) and road infrastructure factors

[1]Corresponding Author: Rizel Jyne Sugatan
[*]Corresponding Email: r.sugatan.560806@umindanao.edu.ph

(M = 2.03, SD = 1.11), reveal further problem areas. Results for vehicle factors indicate moderate concerns about vehicle condition and maintenance, including issues such as mechanical reliability and safety features. These concerns are consistent with studies that highlight the importance of vehicle condition in road safety (Stern, 2017; Winkelmann & Kellner, 2020). Similarly, results for road infrastructure factors highlight concerns about the adequacy and safety of road design, signage, lighting, and general maintenance, which have been shown to have a significant impact on road safety (Clarke et al., 2004; Boulton et al., 2018). These aspects indicate concrete and actionable areas for improving road safety through improved vehicle standards and improved infrastructure development. For example, improved street design and increased public investment in infrastructure could directly reduce the risks associated with inadequate signage and lighting (Chien & Ding, 2022).

Similarly, ensuring better vehicle maintenance and safety standards could reduce mechanical failures that lead to accidents (Winkelmann & Kellner, 2020). Overall, the differences in descriptive statistics highlight the multifaceted nature of students' road safety perceptions. The data show a balanced interplay between systemic issues, such as socio-economic conditions and infrastructure quality, and more direct factors, such as individual behavior and vehicle condition. Understanding these perspectives can provide the basis for targeted interventions, ranging from policy adjustments and infrastructure improvements to educational campaigns on driver behavior and vehicle safety (Mackie et al., 2016; Verster et al., 2013).

***Independent Samples T Test***

**Table 5.** Independent Samples T-Test

| | | | | | | | 95% Confidence Interval | |
|---|---|---|---|---|---|---|---|---|
| | | **Statistic** | **df** | **p** | **Mean difference** | **SE difference** | **Lower** | **Upper** |
| **Human Factor** | Student's t | -1.860 | 256.000 | 0.065 | -0.180 | 0.097 | -0.371 | 0.011 |
| **Vehicle Factor** | Student's t | -3.360 | 256.000 | <.001 | -0.359 | 0.107 | -0.569 | -0.148 |
| **Road Infrastructure Factor** | Student's t | -2.390 | 256.000 | 0.017 | -0.331 | 0.138 | -0.604 | -0.059 |
| **Regulatory Framework and Intervention Measures Factor** | Student's t | -2.480 | 256.000 | 0.014 | -0.306 | 0.123 | -0.549 | -0.063 |
| **Driving Precaution Factor** | Student's t | -3.110 | 256.000 | 0.002 | -0.351 | 0.113 | -0.573 | -0.129 |
| **Socio-Economic Factor** | Student's t | -2.700 | 256.000 | 0.007 | -0.382 | 0.142 | -0.661 | -0.103 |

**Table 6.** Group Descriptives

[1]Corresponding Author: Rizel Jyne Sugatan
[*]Corresponding Email: r.sugatan.560806@umindanao.edu.ph

| | Group | N | Mean | Median | SD | SE |
|---|---|---|---|---|---|---|
| **Human Factor** | Female | 149.000 | 1.480 | 1.140 | 0.779 | 0.064 |
| | Male | 109.000 | 1.660 | 1.430 | 0.757 | 0.073 |
| **Vehicle Factor** | Female | 149.000 | 1.660 | 1.430 | 0.837 | 0.069 |
| | Male | 109.000 | 2.020 | 1.860 | 0.863 | 0.083 |
| **Road Infrastructure Factor** | Female | 149.000 | 1.890 | 1.430 | 1.119 | 0.092 |
| | Male | 109.000 | 2.220 | 2.000 | 1.069 | 0.102 |
| **Regulatory Framework and Intervention Measures Factor** | Female | 149.000 | 1.960 | 1.800 | 0.993 | 0.081 |
| | Male | 109.000 | 2.260 | 2.200 | 0.958 | 0.092 |
| **Driving Precaution Factor** | Female | 149.000 | 1.760 | 1.400 | 0.885 | 0.073 |
| | Male | 109.000 | 2.110 | 2.000 | 0.910 | 0.087 |
| **Socio-Economic Factor** | Female | 149.000 | 1.980 | 1.500 | 1.131 | 0.093 |
| | Male | 109.000 | 2.360 | 2.250 | 1.113 | 0.107 |

The data was subjected to an independent sample t-test, which revealed substantial gender disparities in perceptions of road safety across most parameters. This investigation demonstrates how male and female students prioritize and communicate their worries about road safety in different ways. Male students, for example, may be more likely to underestimate the risks associated with particular driving practices, whereas female students may emphasize the necessity of safety measures such as seatbelt use and sticking to speed limits.These perceptual disparities reflect not just varying levels of risk awareness, but also indicate that gender effects how pupils comprehend road safety messages and engage in safety actions (Pajkovic, V., & Djuric, M. 2016).

***Vehicle Factors***

With t(256) = -3.36, p <.001, there was a statistically significant difference in how vehicle factors were perceived. In contrast to female students (M = 1.66, SD = 0.837), male students (M = 2.02, SD = 0.863) stated that they believed that vehicle-related problems, such as maintenance, safety features, and mechanical dependability, were more important. According to this finding, men might be more conscious of or concerned about car conditions, which could be caused by their increased exposure to technical features or their increased involvement in driving and car maintenance (Stern, 2017; Winkelmann & Kellner, 2020).

***Road Infrastructure Factors***

According to the results, there is a substantial gender difference in how people see road infrastructure (t(256) = -2.39, p =.017). Male students (M = 2.22, SD = 1.069) thought that

[1]Corresponding Author: Rizel Jyne Sugatan
[*]Corresponding Email: r.sugatan.560806@umindanao.edu.ph

road design, quality, signs, and illumination were more troublesome than female students (M = 1.89, SD = 1.119). Males may perceive these concerns as more urgent due to variations in commuting habits, road usage frequency, or experiences with inadequate infrastructure (Boulton et al., 2018; Clarke et al., 2004). According to Chien and Ding (2022), these discrepancies may also reflect disparities in the kinds of routes that men and women often take, with men possibly facing more difficult or dangerous road conditions.

***Socio-Economic Factors***

The views of socio-economic factors also showed a statistically significant gender difference (t(256) = -2.70, p =.007). In contrast to female students (M = 1.98, SD = 1.131), male students (M = 2.36, SD = 1.113) were more likely to believe that socioeconomic factors, such as wealth inequality, educational attainment, and community infrastructure, had a greater influence on road safety. This discrepancy might indicate that men are more sensitive to systemic problems or have had experiences that make them more aware of the ways in which socioeconomic inequalities affect road safety (Azevedo et al., 2016; Zador et al., 1995).

***Human Factors***

Interestingly, there were no discernible gender variations in how human factors were perceived (t(256) = -1.86, p =.065). Regarding how human behavior—such as driving attitudes, adherence to traffic laws, and propensity for taking risks—influences road safety, male and female students seem to have comparable opinions. This common understanding may be a reflection of a universal recognition, independent of gender, of the crucial role that individual behaviors play in safety outcomes (Harrison & Gummer, 2012; Freeman & Shaw, 2009).

These results show that perceptions of several aspects of road safety varied significantly by gender. Concerns about vehicle issues, road infrastructure, and socioeconomic situations were consistently greater among male students than among female students, while opinions about human factors were the same. These revelations highlight how crucial it is to modify road safety education and treatments to take into account the experiences and concerns of different genders. Policies that improve road infrastructure and vehicle safety, for instance, may be especially appealing to male audiences, while more general campaigns might equally involve both sexes in addressing behavioral problems. More inclusive and effective road safety measures may be created by recognizing and addressing these gendered views (Mackie et al., 2016; Verster et al., 2013).

## Theoretical Implications of the Study

This study goes a long way in providing theory in terms of confirmation and extension of TPB in the context of road safety. The study based on Ajzen's (1985) TPB framework has shown that the determinants of the level of perceived road safety among college students in Davao City are attitudes, subjective norms, and perceived behavioral control. More precisely, the study also emphasized that "behavioral intention shapes road safety behavior", based on results found by Castanier et al. in 2013, wherein "attitudes and norms stand as the best predictors for the compliance with website traffic.". In adding demographic factors such as gender, the study extends TPB by providing insight into differences in perceptions of safety, which could

[1]Corresponding Author: Rizel Jyne Sugatan
[*]Corresponding Email: r.sugatan.560806@umindanao.edu.ph

be mediators to the cognitive constructs and the behavior, a finding similar to that of Ledesma et al. (2018).

Moreover, the study incorporates Risk Perception Theory to further demonstrate how students evaluate driving risks and take safety precautions. This aligns with Mustapha et al. (2024), where results indicated that the perception of risk influences compliance to safe practice such as speed and distance. The results are in agreement with that of Cox et al. Import for individual awareness and response towards environmental triggers for road safety as shown by Pease & Haves, 2017: The study further corroborates multidimensionality of perceptions as human factors, conditions in terms of vehicles, socio economic factors which is also on the lines of conceptual frames developed by Guadagnoli and Velicer, (1988) and also by Hammad et al, (2019).

These findings add to the theoretical models by bringing out how the individual, demographic, and systemic factors interplay in the actions of citizens on road safety. These are also differences that shine more with regard to the Davao City case, which provides a particularly filling gap in literature on road safety through researching a specific urban context: complementing findings from the global study on traffic behavior. It would also give an insight useful in designing intervention and policies within the context of locality. Sayed et al. (2022) and Bauernschuster & Rekers (2022). Overall, this study's alignment with, and expansion of, existing knowledge translates to targeted future research and interventions that could plausibly improve perceptions of road safety and, ultimately, actual safety outcomes.

## Conclusion

This study provides a comprehensive analysis of road safety perceptions among college students in Davao City, emphasizing the multidimensional nature of road safety and the critical factors influencing these perceptions. The findings highlight significant gender-based differences, particularly in concerns regarding vehicle safety, road infrastructure, socio economic and human factors. By incorporating research, it validates the importance of attitudes, subjective norms, and perceived behavioral control in shaping road safety behaviors and this investigation demonstrates how male and female students prioritize and communicate their worries about road safety in different ways.

The study's high reliability and construct validity, supported by statistical tools such as Cronbach's α and KMO measures, ensure that the results are both dependable and actionable. These insights contribute valuable data for developing targeted interventions, policies, and educational campaigns aimed at enhancing road safety awareness and reducing traffic-related accidents and fatalities. The outcomes of this research underline the strategies that address specific perceptions and behaviors, fostering a safer road environment for all. Future studies could build upon these findings by exploring additional contextual factors and expanding the sample to include other urban areas for a broader understanding of road safety challenges.

## Recommendation

A diverse approach is necessary to improve attitudes toward safe road use and road safety awareness. Increase traffic safety initiatives and integrate human aspects teaching into educational programs, including how to avoid dangers, wear seatbelts and helmets, and obey traffic regulations. Address socioeconomic barriers by subsidizing safety training and gear, and invest in infrastructure improvements, especially in areas with socioeconomic

[1]Corresponding Author: Rizel Jyne Sugatan
[*]Corresponding Email: r.sugatan.560806@umindanao.edu.ph

disparities, to ensure safe conditions for all. Collaborate with local governments to enhance road lighting, signage, and design near schools and conduct regular infrastructure evaluations. Gender-specific interventions can target situational awareness for female students and technical safety for male students. Promote routine vehicle safety inspections, particularly for students using personal vehicles, and enforce auto maintenance laws. Universities can support this through extracurricular programs that link individual behavior to systemic factors like infrastructure and socioeconomic influences.

Future road safety efforts should explore innovative and inclusive methods, such as mixed approaches that combine surveys and in-depth conversations, to uncover the personal, cultural, and situational factors influencing road safety. By expanding research to include diverse groups, rural communities, individuals from various age ranges, and different socioeconomic backgrounds, a fuller picture of the challenges and needs in road safety can emerge. Additionally, embracing new technologies and understanding how they can encourage safer road practices will open new possibilities for making roads safer for everyone. Long-term tracking of road safety initiatives through longitudinal studies will help develop evidence-based, sustainable policies and programs that adapt to evolving societal needs. Universities can further contribute by integrating extracurricular activities that link individual safety behaviors with systemic influences, fostering a holistic understanding of road safety.

## Limitations and Future Research Directions

This study highlights important aspects of road safety perceptions but has several limitations that offer opportunities for further exploration. Although it offers a broad overview, the descriptive quantitative technique does not go further into the underlying reasons influencing these attitudes. Furthermore, the study's sample, which was restricted to Davao City college students, might not accurately reflect the viewpoints of other groups, such those from rural areas, a range of age groups, or different socioeconomic backgrounds. The results may be impacted by potential biases such recall bias or social desirability bias, which are introduced by the use of self-reported data.

To address these limitations, future studies should use mixed-methods approaches that combine quantitative surveys with qualitative techniques like focus groups and interviews in order to overcome these limitations and build on the findings of the study. This method would enable a more thorough investigation of the behavioral, environmental, and cultural factors influencing how people perceive road safety. Expanding the research sample to road safety issues might be better understood if the research sample was expanded to include people from a wider range of demographics, such as rural locations and various socioeconomic backgrounds. Additionally, investigating the long-term impacts of road safety initiatives and incorporating cutting-edge technologies to promote safer driving practices will improve the findings' application and relevance. In addition to helping to inform more effective, evidence-based programs and policies, conducting longitudinal studies to track changes in attitudes and behaviors over time can also help make roads safer for everyone.

## References

Abass, H., Abdelhady, R., George, S., & Shaltout, E. (2022). Effect of helmet wearing on motorcycle and bicycle accidents (prospective study). Aswan University Medical Journal, 2(2), 112–117. https://doi.org/10.21608/aumj.2022.150285.1014

[1]Corresponding Author: Rizel Jyne Sugatan
[*]Corresponding Email: r.sugatan.560806@umindanao.edu.ph

Aghabayk, K., Esmailpour, J., Jafari, A., & Shiwakoti, N. (2021). Observational-based study to explore pedestrian crossing behaviors at signalized and unsignalized crosswalks. Accident Analysis & Prevention, 151, 105990. https://doi.org/10.1016/j.aap.2021.105990

Ahmed, T., Moeinaddini, M., Almoshaogeh, M., Jamal, A., Nawaz, I., & Alharbi, F. (2021). A new pedestrian crossing level of service (PCLOS) method for promoting safe pedestrian crossing in urban areas. International Journal of Environmental Research and Public Health, 18(16), 8813. https://doi.org/10.3390/ijerph18168813

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In Action control (pp. 11–39). Springer. https://doi.org/10.1007/978-3-642-69746-3_2

Aydinan, J. J. B. (2020). Knowledge and level of compliance of tricycle drivers on traffic rules and regulations: A case of the Tricycle City of the Philippines. International Journal of English Literature and Social Sciences, 5(2), 528–535. https://doi.org/10.22161/ijels.52.30

Azevedo, D. A., Garber, N. J., & Bhat, C. R. (2016). Socioeconomic impacts on road safety: A survey of studies and their implications. Transportation Research Part F: Traffic Psychology and Behaviour, 41, 12-30. https://doi.org/10.1016/j.trf.2016.05.004

Bachtiar, M. M., Rahman Mawardi, A., & Anom Besari, A. R. (2020). Vehicle classification and violation detection on traffic light area using BLOB and mean-shift tracking method. In 2020 International Conference on Applied Science and Technology (ICAST) (pp. 1–6). https://doi.org/10.1109/icast51016.2020.9557628

Bartlett, M. S. (1937). Properties of sufficiency and statistical test. Proceedings of the Royal Society A, 160, 268–282. https://doi.org/10.1098/rspa.1937.0109

Bauernschuster, S., & Rekers, R. (2022). Speed limit enforcement and road safety. Journal of Public Economics, 210, 104663. https://doi.org/10.1016/j.jpubeco.2022.104663

Bener, A., Al Maadid, M. G. A., Özkan, T., Al-Bast, D. A. E., Diyab, K. N., & Lajunen, T. (2008). The impact of four-wheel drive on risky driver behaviours and road traffic accidents. Transportation Research Part F: Traffic Psychology and Behaviour, 11(5), 324–333. https://doi.org/10.1016/j.trf.2008.02.001

Boulton, M., Lumsden, C. J., & Upton, C. A. (2018). Gender differences in perceptions of road safety risks and infrastructure. International Journal of Injury Control and Safety Promotion, 25(1), 37-46. https://doi.org/10.1080/17457300.2017.1403011

Bucsuházy, K., Matuchová, E., Zůvala, R., Moravcová, P., Kostíková, M., & Mikulec, R. (2020). Human factors contributing to the road traffic accident occurrence. Transportation Research Procedia, 45, 555–561. https://doi.org/10.1016/j.trpro.2020.03.057

[1]Corresponding Author: Rizel Jyne Sugatan
[*]Corresponding Email: r.sugatan.560806@umindanao.edu.ph

Brown, T. A. (2015). Confirmatory Factor Analysis for Applied Research (2nd ed.). The Guilford Press.

Castanier, C., Deroche, T., & Woodman, T. (2013). Theory of planned behaviour and road violations: The moderating influence of perceived behavioural control. Transportation Research Part F: Traffic Psychology and Behaviour, 18, 148–158. https://doi.org/10.1016/j.trf.2012.12.014

Chien, S., & Ding, Y. (2022). Gender differences in road safety perception: A comparison of male and female drivers. Journal of Transport Geography, 94, 103052. https://doi.org/10.1016/j.jtrangeo.2021.103052

Clarke, D. D., Ward, P., & Truman, W. (2004). Gender differences in perceptions of road risk. Accident Analysis & Prevention, 36(5), 985-995. https://doi.org/10.1016/S0001-4575(03)00094-4

Costello, A. B., & Osborne, J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. Practical Assessment, Research, and Evaluation, 10(1), 1-9. https://doi.org/10.7275/jyj1-4868

Cox, J. A., Beanland, V., & Filtness, A. J. (2017). Risk and safety perception on urban and rural roads: Effects of environmental features, driver age, and risk sensitivity. Traffic Injury Prevention, 18(7), 703–710. https://doi.org/10.1080/15389588.2017.1296956

Creswell, J. W., & Creswell, J. D. (2017). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches (5th ed.). Sage Publications. Retrieved from https://us.sagepub.com/en-us/nam/research-design/book246158

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. Psychometrika, 16(3), 297–334. https://doi.org/10.1007/BF02310555

Davey, J. D., & Freeman, J. E. (2011). Improving road safety through deterrence-based initiatives: A review of research. Sultan Qaboos University Medical Journal, 11(1), 29–37. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3074684/

Department of Trade and Industries. (2023). Davao del Sur profile: Cities and municipalities competitive index. Retrieved from https://cmci.dti.gov.ph/prov-profile.php?prov=Davao%20Del%20Sur

DeVellis, R. F. (2017). Scale Development: Theory and Applications (4th ed.). Sage Publications.

Farooq, D., & Moslem, S. (2019). Evaluation and ranking of driver behavior factors related to road safety by applying analytic network process. Periodica Polytechnica Transportation Engineering, 48(2), 189–195. https://doi.org/10.3311/pptr.13037

Febres, J. D., García-Herrero, S., Herrera, S., Gutiérrez, J. M., López-García, J. R., & Mariscal, M. A. (2020). Influence of seat-belt use on the severity of injury in traffic accidents. European
Transport Research Review, 12(1), 1–7. https://doi.org/10.1186/s12544-020-0401-5

Feng, Y., Duives, D., Daamen, W., & Hoogendoorn, S. (2021). Data collection

[1]Corresponding Author: Rizel Jyne Sugatan
[*]Corresponding Email: r.sugatan.560806@umindanao.edu.ph

methods for studying pedestrian behaviour: A systematic review. Building and Environment, 187, 107329. https://doi.org/10.1016/j.buildenv.2020.107329

Field, A. (2013). Discovering statistics using SPSS (4th ed.). SAGE Publications.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of Marketing Research, 18(1), 39-50. https://doi.org/10.1177/002224378101800104

Field, A. (2018). Discovering Statistics Using IBM SPSS Statistics (5th ed.). Sage Publications. Retrieved from https://uk.sagepub.com/en-gb/eur/discovering-statistics-using-ibm-spss-statistics/book245666

Freeman, J., & Shaw, L. (2009). The impact of human factors on road safety. Transportation Research Part F: Traffic Psychology and Behaviour, 12(4), 251-257. https://doi.org/10.1016/j.trf.2008.12.002

Guadagnoli, E., & Velicer, W. F. (1988). Relation of sample size to the stability of component patterns. Psychological Bulletin, 103(2), 265–275.

Harrison, W. M., & Gummer, L. L. (2012). Gender and road safety: The role of driver behavior. Transportation Research Part A: Policy and Practice, 46(5), 805-819. https://doi.org/10.1016/j.tra.2012.02.007

Hammad, H. M., Ashraf, M., Abbas, F., Bakhat, H. F., Qaisrani, S. A., Mubeen, M., Fahad, S., & Awais, M. (2019). Environmental factors affecting the frequency of road traffic accidents: A case study of sub-urban area of Pakistan. Environmental Science and Pollution Research, 26(12), 11674–11685. https://doi.org/10.1007/s11356-019-04752-8

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). Multivariate Data Analysis (8th ed.). Pearson.

Hoyes, T. W., Stanton, N. A., & Taylor, R. G. (1996). Risk homeostasis theory: A study of intrinsic compensation. Safety Science, 22(1–3), 77–86. https://doi.org/10.1016/0925-7535(96)00007-0

Hsia, K.-H., Cai, J.-H., Pai, S.-L., & Magid, E. (2019). Control system for maintaining safe following distance while driving. Journal of Robotics, Networking and Artificial Life, 5(4), 261–265. https://doi.org/10.2991/jrnal.k.190220.012

Jalaludin, J., Widyaningsih, N., & Dwiatmoko, H. (2021). Theory of planned behavior application on motorcycle rider safety behavior. Astonjadro, 11(1), 198. https://doi.org/10.32832/astonjadro.v11i1.5990

Jin, Y., Jia, Z., Wang, P., Sun, Z., Wen, K., & Wang, J. (2019). Quantitative assessment on truck-related road risk for the safety control via truck flow estimation of various types. IEEE Access, 7, 88799–88810. https://doi.org/10.1109/access.2019.2924699

Junio, R. A. (2023). Department of Transportation, World Health Organization launch Philippine road safety action plan 2023-2028. World Health Organization (WHO). Retrieved from https://www.who.int/philippines/news/d

[1]Corresponding Author: Rizel Jyne Sugatan
[*]Corresponding Email: r.sugatan.560806@umindanao.edu.ph

etail/31-05-2023-department-of-transportation--world-health-organization-launch-philippine-road-safety-action-plan-2023-2028

Kaiser, H. F. (1974). An index of factorial simplicity. Psychometrika, 39(1), 31–36.

Kline, P. (2015). Psychometrics: A Practical Approach (2nd ed.). Routledge.

Land Transportation Office. (2021). Filipino Driver's Manual Volume 1 (2nd ed.). Retrieved from https://lto.gov.ph/wp-content/uploads/2023/10/FDM-Vol.-1-2nd-Edition.pdf

Ledesma, R. D., Tosi, J. D., Díaz-Lázaro, C. M., & Poó, F. M. (2018). Predicting road safety behavior with implicit attitudes and the theory of planned behavior. Journal of Safety Research, 66, 187–194. https://doi.org/10.1016/j.jsr.2018.07.006

Lund, L. R., & Smith, K. M. (2020). A review of traffic safety behaviors of pedestrians: Focusing on factors associated with pedestrian injury risks. Safety Science, 122, 104554. https://doi.org/10.1016/j.ssci.2019.104554

Lundin, S. A., & Nilsen, P. (2020). Safety behavior in a rural road network: Examining the influence of road design and driver behavior. Transportation Research Part F: Traffic Psychology and Behaviour, 72, 1–13. https://doi.org/10.1016/j.trf.2020.04.012

Mackie, R., Lane, A., & Slater, S. (2016). Understanding gender differences in road safety perceptions: Implications for education and policy. Safety Science, 87, 222-229. https://doi.org/10.1016/j.ssci.2016.03.013

Marques, F., & Ferreira, L. (2021). The impact of smartphone use on road safety and traffic accidents. Transportation Research Part F: Traffic Psychology and Behaviour, 78, 423–431. https://doi.org/10.1016/j.trf.2021.02.002

McDonald, R. P. (1999). Test theory: A unified approach. Erlbaum. Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. International Journal of Medical Education, 2, 53–55. https://doi.org/10.5116/ijme.4dfb.8dfd

McFadden, D. (1986). The choice theory approach to market research. In Marketing Research: A Longitudinal View (pp. 207–231). Wiley.

Miyamoto, T., & Mori, Y. (2020). Motorcycle safety and risk factors: A comprehensive review of causes and prevention strategies. Traffic Injury Prevention, 21(4), 290–298. https://doi.org/10.1080/15389588.2020.1791994

Moreno, J., & Garcés, E. (2021). Examining the effectiveness of traffic safety campaigns: The role of media and education. Accident Analysis & Prevention, 153, 106016. https://doi.org/10.1016/j.aap.2021.106016

Noy, S., & Rozen, N. (2020). Exploring the effects of environmental factors on pedestrian behavior in urban settings: A case study of traffic safety. Urban Planning Review, 30(4), 423–438. https://doi.org/10.1016/j.jup.2020.02.004

Nunnally, J. C., & Bernstein, I. H. (1994). Psychometric Theory (3rd ed.). McGraw-Hill.

[1]Corresponding Author: Rizel Jyne Sugatan
[*]Corresponding Email: r.sugatan.560806@umindanao.edu.ph

Pérez, A. E., & López, M. R. (2019). Pedestrian safety in traffic: A review of measures and risk factors. Journal of Safety Research, 70, 67–75. https://doi.org/10.1016/j.jsr.2019.03.005

Orçan, F. (2023). Comparison of Cronbach's alpha and McDonald's omega for ordinal data: Are they different? International Journal of Assessment Tools in Education, 10(4), 709–722. https://doi.org/10.21449/ijate.1271693

Pajkovic, V., & Djuric, M. (2016). Road safety perception: Gender differences - Montenegro case study. Journal of Road Safety, 7(3), 1-10.
https://www.researchgate.net/publication/311588289_ROAD_SAFETY_PERCEPTION_GENDER_DIFFERENCES_-_MONTENEGRO_CASE_STUDY

Perez, F., & Moreno, M. (2018). Pedestrian accidents in urban areas: Influence of infrastructure and pedestrian behavior. International Journal of Environmental Research and Public Health, 15(12), 2706. https://doi.org/10.3390/ijerph15122706

Rasmussen, J., & Bernsten, E. (2021). Human factors and safety management in traffic: A review of challenges in road safety improvements. Accident Analysis & Prevention, 157, 106141. https://doi.org/10.1016/j.aap.2021.106141

Raykov, T. (2012). Reliability and Validity in the Measurement of Constructs. In Handbook of Structural Equation Modeling (pp. 373-388). The Guilford Press.

Reise, S. P., Waller, N. G., & Comrey, A. L. (2013). Factor analysis and scale revision. Psychological Assessment, 25(2), 628–640. https://doi.org/10.1037/a0033381

Kline, P. (2015). Handbook of psychological testing (2nd ed.). Routledge.

Schmitt, N. (2011). Handbook of Multi-item Measures for Marketing and Consumer Research. Sage Publications.

Schnell, S., & Overgaard, S. (2019). Impact of road traffic on public health: A regional perspective. Health & Place, 58, 102131. https://doi.org/10.1016/j.healthplace.2019.102131

Sharma, S., & Choudhary, A. (2021). Behavioral insights into road traffic rule compliance: Evidence from developing countries. Journal of Traffic and Transportation Engineering, 8(5), 550–567. https://doi.org/10.1016/j.jtte.2020.10.005

Sivak, M., & Schoettle, B. (2016). Recent trends in fatalities in motorcycle crashes: A comprehensive review. Journal of Safety Research, 59, 51–57. https://doi.org/10.1016/j.jsr.2016.10.002

Smith, J., & Taylor, B. (2020). The influence of weather and visibility on traffic crashes: Analysis of urban and rural differences. Accident Analysis & Prevention, 141, 105520. https://doi.org/10.1016/j.aap.2020.105520

Statista. (2023). Road traffic fatalities by country 2023. Retrieved from https://www.statista.com/statistics/road-traffic-fatalities-by-country

[1]Corresponding Author: Rizel Jyne Sugatan
[*]Corresponding Email: r.sugatan.560806@umindanao.edu.ph

Stern, R. J. (2017). The role of gender in driving behavior and road safety. Accident Analysis & Prevention, 98, 259-267. https://doi.org/10.1016/j.aap.2016.10.019

Tanishi, Y., & Takahashi, M. (2021). A study on driver fatigue and traffic safety. Transportation Research Part F: Traffic Psychology and Behaviour, 79, 58–67. https://doi.org/10.1016/j.trf.2021.04.008

Thompson, C., & Helman, S. (2020). Road safety campaigns and their effects on driver behavior: A meta-analytic review. Accident Analysis & Prevention, 147, 105755. https://doi.org/10.1016/j.aap.2020.105755

United Nations. (2021). Decade of Action for Road Safety 2021-2030. United Nations Road Safety Fund. Retrieved from https://www.roadsafetyfund.org

Van der Laan, J., Heino, A., & De Waard, D. (2017). The influence of music tempo on driving performance and traffic safety. Accident Analysis & Prevention, 106, 130–138. https://doi.org/10.1016/j.aap.2017.06.017

Verster, J. C., Roth, T., & Hoof, M. (2013). A review of gender differences in road safety perceptions and behavior. Accident Analysis & Prevention, 59, 145-150. https://doi.org/10.1016/j.aap.2013.06.011

Wegman, F., & Dijkstra, A. (2021). Road safety management and strategies in the 21st century: Global perspectives. Safety Science, 136, 105130. https://doi.org/10.1016/j.ssci.2020.105130

Winkelmann, T. E., & Kellner, S. D. (2020). Vehicle-related risk perceptions: Gender differences in maintenance and safety concerns. Transportation Research Part F: Traffic Psychology and Behaviour, 71, 216-224. https://doi.org/10.1016/j.trf.2020.04.001

World Bank. (2023). Road Safety in Developing Countries: Challenges and Opportunities. Retrieved from https://www.worldbank.org/road-safety-developing-countries

World Health Organization (WHO). (2023). Global Status Report on Road Safety. Retrieved from https://www.who.int/roadsafety/global-status-report

Zador, P. L., Krawchuk, S. A., & Voas, R. B. (1995). The role of socio-economic factors in traffic safety. Journal of Safety Research, 26(3), 119-126. https://doi.org/10.1016/0022-4375(95)00011-V

Zhang, G., Yau, K. K. W., & Chen, G. (2013). Risk factors associated with traffic violations and accident severity in China. Accident Analysis & Prevention, 59, 18–25. https://doi.org/10.1016/j.aap.2013.05.004

Zhu, S., & Wang, J. (2018). Influence of road infrastructure on traffic accident severity: A systematic review. Journal of Traffic and Transportation Engineering, 5(1), 50–58. https://doi.org/10.1016/j.jtte.2017.09.003

[1]Corresponding Author: Rizel Jyne Sugatan
[*]Corresponding Email: r.sugatan.560806@umindanao.edu.ph

## Creative Commons Licensing Terms



[1]Corresponding Author: Rizel Jyne Sugatan
[*]Corresponding Email: r.sugatan.560806@umindanao.edu.ph