Hunan Daxue Xuebao/Journal of Hunan University Natural Sciences
ISSN : 1674-2974 | CN 43-1061 / N

DOI: 10.5281/zenodo.12704163
Vol: 61 | Issue: 07 | 2024

GENDER BASED TRAFFIC REACTION TIME ANALYSIS OF DRIVERS WITH RESPECT TO GENDER AND AGE GROUPS OF MALE AND FEMALE DRIVERS IN INDIAN MIXED TRAFFIC CONDITIONS

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Abstract

As and when the world grows in the name of development, the human population and the vehicle population increase manifold. With this the accident rates and the din of human confusion also increases. The driver reaction times play a major role in limiting or avoiding the accidents on the roads especially in the Indian Mixed Traffic Conditions. Therefore, a comprehensive test was conducted on 2000 samples of drivers in Bengaluru City to arrive at the reaction times of the drivers driving three-wheelers, cars (Light Motor Vehicles), Buses (Heavy Motor Vehicles) and riding two-wheelers. The reaction times thus obtained was segregated and coded based on gender and the age groups of the drivers and analysed using the "Easyfit" software to arrive at the statistical parameters. The results upon analysis was studied and conclusions were drawn. The major conclusions were that the females have faster reaction times than that of male drivers and amongst the age groups, the females in all other ages except the age over 65 had slower reaction times than male drivers. ***General*** *The world population continues to grow, albeit at a slower rate compared to previous decades. By 2022, it had surpassed 7.8 billion and was projected to reach over 9 billion by 2050. This growth presents challenges in terms of resource management, urbanization, and sustainability. The population's dependency on transportation as a means of movement for various needs necessitates safe and efficient transportation facilities. There's a notable shift in transportation towards sustainable and efficient modes. Electric vehicles (EVs) are gaining traction, driven by advancements in battery technology and environmental concerns. Additionally, there's increased emphasis on public transportation, cycling infrastructure, and urban planning aimed at reducing reliance on private vehicles. However, challenges such as infrastructure development, traffic congestion, and balancing accessibility with environmental impact remain prevalent globally. Amongst these entities the safety of the drivers and the passengers becomes the foremost criterion to be addressed due to the din of increased vehicle population. Increased road traffic and population creates such emotions as anxiety, fear, confusion etc. which will have an impact on the perception and volition times of the driver. The modern vehicles which come with distractions in the dashboard ergonomics add up further delays in the reaction times of the drivers when in need during emergencies. Amidst this, there is this trend of vehicles shifting from manual gearbox system to automatic gearbox which is a major factor in shifting the reaction times of the drivers during emergencies. An analysis into this phenomenon of driver behaviour with respect to gender would give an insight into the changing trends of the perception and volition times of the drivers together to be called as Driver Reaction Times (DRTs).*

ISSN：1674-2974 | CN 43-1061 / N

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1. INTRODUCTION

1.1 World Traffic Scenario

The world traffic scenario is marked by significant congestion in urban areas, particularly in rapidly growing economies. According to the United Nations, over half of the world's population now resides in urban areas, a trend expected to continue in the coming decades [1]

According to the World Bank, traffic congestion costs the world economy billions of dollars annually. With the increasing number of vehicles on roads, air pollution and greenhouse gas emissions from vehicles are also major concerns. However, advancements in technology like autonomous vehicles and smart traffic management systems offer hope for mitigating these challenges. Technology is playing an increasingly crucial role in shaping traffic management and vehicle operations. Innovations such as intelligent transportation systems, autonomous vehicles, and ride-sharing platforms are poised to revolutionize how people and goods move within urban areas [2].

1.2 Global Road Accident Scenario

Globally, traffic accidents remain a leading cause of death and injury, particularly among young people. The World Health Organization (WHO) estimates that around 1.35 million people die each year due to road traffic crashes, with millions more sustaining non-fatal injuries [3].

1.3 Indian Traffic Scenario

Indian traffic scenario is characterized by a burgeoning population, rapid urbanization, and inadequate infrastructure. Major cities such as Mumbai, Delhi, and Bangalore face severe congestion issues, leading to productivity losses and increased pollution levels. According to the Ministry of Road Transport and Highways, India has witnessed a steady rise in the number of registered motor vehicles over the years, exacerbating traffic woes.

1.4 Indian Road Accident Scenario

India accounts for a disproportionately high number of road traffic fatalities globally. According to the Ministry of Road Transport and Highways, over 150,000 people die annually in road accidents in India, making it one of the leading causes of death in the country [4].

Factors such as reckless driving, inadequate enforcement of traffic laws, poor road conditions, and lack of awareness contribute to the high accident rate. The government has been implementing various road safety initiatives, but there is still much work to be done to reduce the incidence of accidents and ensure safer roads for alike.

Overall, addressing traffic congestion and improving road safety are critical challenges facing both the world and India, requiring concerted efforts from governments, policymakers, and citizens alike.

1.5 Driver Reaction Times in Indian Mixed Traffic Conditions

In India, navigating through mixed traffic conditions is akin to participating in an intricate dance, where vehicles of various sizes, speeds, and modes of transport merge and diverge in a seemingly chaotic but structured manner. Amidst this vibrant symphony of motion, driver reaction times play a pivotal role in ensuring safety and efficiency on the roads. Indian roads are characterized by a mix of vehicles ranging from cars and motorcycles to bicycles, pedestrians, and animals. Negotiating through this diverse traffic requires drivers to have quick reflexes and adaptability to sudden changes in their surroundings [5]

Firstly, it's essential to understand the unique dynamics of Indian mixed traffic. Unlike controlled environments in many developed countries, Indian roads are a melting pot of diverse vehicles, ranging

DOI: 10.5281/zenodo.12704163
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from traditional bullock carts to modern cars and motorcycles. Add to this mix the presence of pedestrians, cyclists, and animals, and you have a scenario where quick decision-making is paramount. Traffic rules and regulations in India are often loosely enforced, leading to unpredictable behavior among road users. Drivers must be prepared to anticipate the actions of others and react swiftly to avoid accidents [6]

Driver reaction times are significantly influenced by several factors inherent to Indian traffic conditions. One such factor is the sheer volume of vehicles. In bustling urban centers like Mumbai or Delhi, the density of traffic can be overwhelming, leaving drivers with minimal time to react to sudden changes in their surroundings.

Additionally, the diverse nature of vehicles on Indian roads adds another layer of intricacy. For instance, a driver of a sedan must adapt their reaction time when sharing the road with a slower-moving auto-rickshaw or a bullock cart. The varying acceleration rates and manoeuvrability of these vehicles necessitate quick adjustments to prevent accidents.

Furthermore, the unpredictable behaviour of pedestrians adds an element of uncertainty to Indian traffic. Jaywalking is a common sight, and pedestrians often dart across busy roads without warning. Drivers must be vigilant at all times, ready to react instantly to avoid potential collisions.

Despite these challenges, Indian drivers exhibit a remarkable adaptability honed by years of navigating such conditions. Experience plays a crucial role in improving reaction times, as seasoned drivers learn to anticipate potential hazards and react swiftly.

Navigating through this dynamic environment requires drivers to possess not only quick reflexes but also a deep understanding of their surroundings. By addressing both individual and systemic aspects, India can work towards creating safer and more efficient roads for all road users.

1.6 Gender based Reaction Times of Indian Drivers

Gender-based differences in driver reaction times in Indian mixed traffic conditions are an intriguing subject, influenced by a multitude of social, cultural, and physiological factors. While research on this specific topic may be limited, broader studies on gender differences in driving behaviour provide some insights.

Firstly, it's essential to acknowledge that driving behaviour is shaped by societal norms and expectations regarding gender roles. In many parts of India, traditional gender roles dictate that men are often expected to take on the role of primary drivers, especially for long-distance or professional driving tasks. This societal expectation may lead to differences in experience levels between male and female drivers, potentially impacting their reaction times. Men are typically perceived as more assertive and confident behind the wheel, while women may face stereotypes of being more cautious or less skilled drivers. These societal perceptions can impact self-confidence and, consequently, driving behavior [7].

Physiologically, there may be differences in spatial awareness, hand-eye coordination, and risk-taking tendencies between genders, which can influence reaction times. While these differences may not be inherently better or worse in either gender, they can manifest in distinct driving styles.

Gender-based differences in driver reaction times in Indian mixed traffic conditions are an intriguing subject, influenced by a multitude of social, cultural, and physiological factors. While research on this specific topic may be limited, broader studies on gender differences in driving behaviour provide some insights. While research on gender differences in driving reaction times is not specific to Indian traffic conditions, existing studies suggest that men and women may exhibit slight variations in spatial

ISSN：1674-2974 | CN 43-1061 / N

DOI: 10.5281/zenodo.12704163
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awareness, hand-eye coordination, and risk perception. These differences, albeit subtle, can influence how quickly drivers react to stimuli on the road [8].

The driving performance changes steadily across age groups: both mean reaction time and inter individual variability progressively increase with age and in relation to driving, aging is a progressive phenomenon and may lead to variety of driving performance; age-related studies of driving performance should put more emphasis on investigating changes across the whole driver age range rather than only comparing younger and older drivers. [9]. The results of the study could be used in practice for professional drivers, wherein the mean reaction time is used as a benchmark in several calculations in transport, for forensic and educational purposes, and for planning traffic and modelling different traffic situations [10]. Casual driving conditions for young drivers may be particularly complex and stressful for elderly people who should thus be informed about the effects of normal aging upon driving [11].

Physiologically, there may be differences in spatial awareness, hand-eye coordination, and risk-taking tendencies between genders, which can influence reaction times. While these differences may not be inherently better or worse in either gender, they can manifest in distinct driving styles.

In the context of Indian mixed traffic conditions, where quick decision-making is crucial, these gender-based differences may play a role. For example, men may be more likely to take assertive actions in response to traffic situations, potentially exhibiting faster reaction times in certain scenarios. On the other hand, women may demonstrate a more cautious approach, prioritizing safety over speed, which could also impact their reaction times. It's essential to note that these observations are generalizations and may not apply universally to all individuals. Factors such as individual driving experience, personality traits, and situational context also play significant roles in determining driver behaviour and reaction times.

2. THE STUDY

The study area considered was the Bengaluru City wherein the classic condition of Indian Mixed Traffic (IMT) plied. The first step was to classify the vehicles such as two-wheelers, three-wheelers, cars/LMVs and the buses/HMVs. The diversified information of the drivers was taken by handpicking a plethora of drivers driving all the four classes of vehicles mentioned and the age groups spread across from 18 years, which is the legal age of driving over and above 65 years of age. The individual drivers were approached and detailed information were taken with regard to the gender, age, educational qualifications, occupation, marital status of the driver, drivers having children or not, health issues, if any and the type of gearbox driver by the drivers. The driver reaction times would then be obtained by using the application “Washington Education Reaction Time Tester” which has found its way into many scientific studies to obtain the drivers reaction times. Thus, a link between the independent parameters of the drivers and the driver reaction times was obtained which was to be analysed for the research. This relationship between the independent and dependent parameters was then analysed statistically to arrive at the statistical parameters connected with the entities.

3. METHODOLOGY

The method adopted was that of reaction time testing of the drivers of the drivers for the classified traffic in the Indian Mixed Traffic Conditions. The 2000 sample drivers were distributed as 500 each for two-wheelers, three-wheelers, cars/LMVs and buses/HMVs. The reaction time tester was embedded in a mobile application and the drivers would need to attempt the reaction time test five times to obtain the average value of their reaction to a stimulus which was the change in colour of the signal light from red to green.

Hunan Daxue Xuebao/Journal of Hunan University Natural Sciences
ISSN : 1674-2974 | CN 43-1061 / N

DOI: 10.5281/zenodo.12704163
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Thus, as soon as the signal turned green, the drivers needed to press the “Go” button to obtain how quickly they have reacted to the change in signal colour.

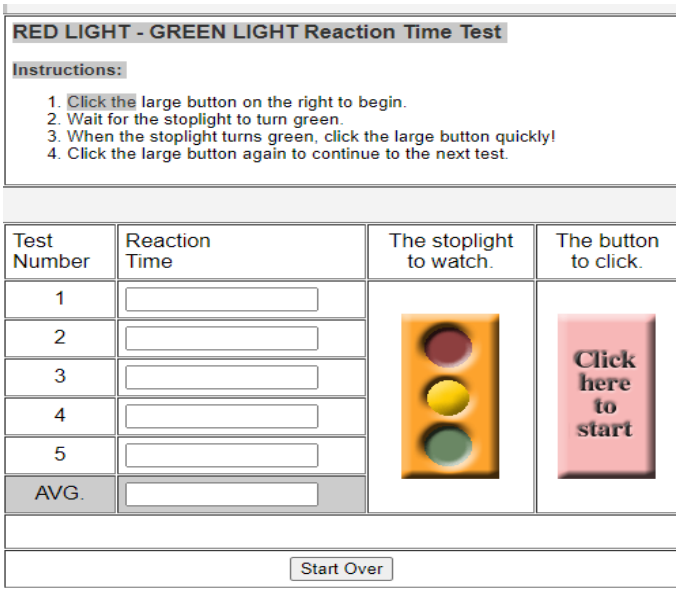

Figure 1: Reaction Time Tester

Now, that the reaction times of the drivers were obtained along with their independent characteristic information, the data was ready to be analysed in the software “Easy Fit” which is a statistical tool to arrive at the statistical parameters of the relationships.

The data feed which was to be analysed was first to be coded into a binary format with males being coded as ‘0’ and females coded as ‘1’. The independent parameters are then coded between ‘0’ to ‘n’ between the first and the last parameter. The data feed now was sorted within the excel sheet and then transferred to the software tool.

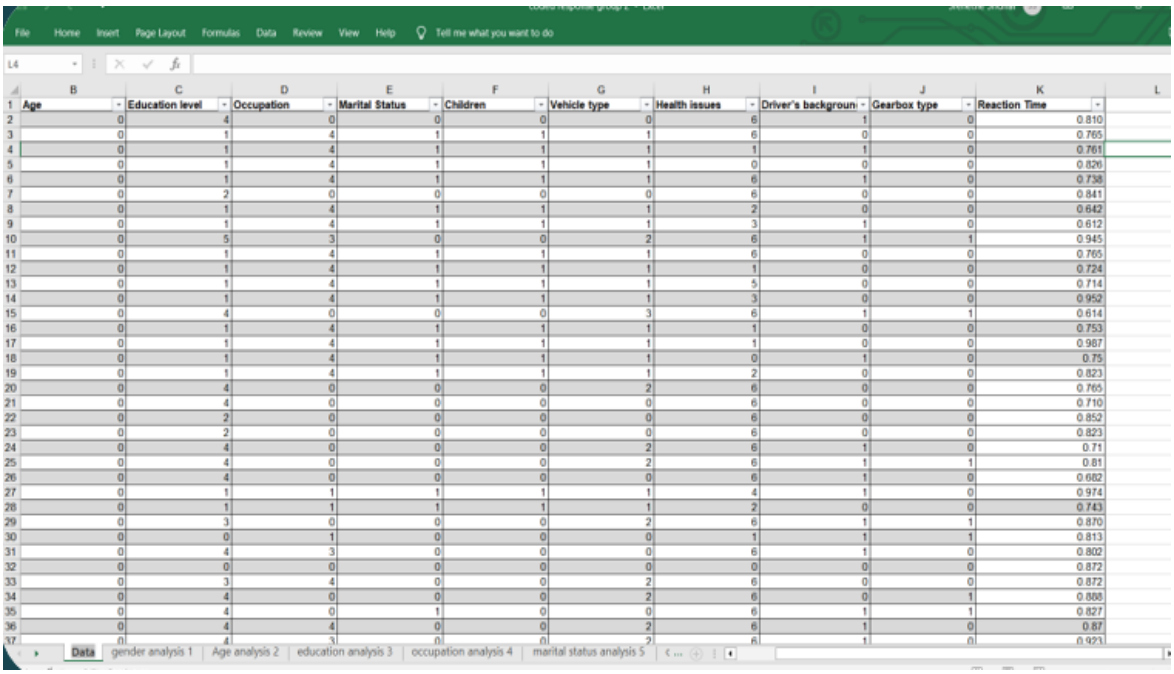

Figure 2: Data Coded

ISSN : 1674-2974 | CN 43-1061 / N

DOI: 10.5281/zenodo.12704163
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The coded was then fed into the software as feed. The data was analysed using descriptive statistics and the distributions were thus fit. The statistical parameters range, mean, variance, standard deviation, coefficient of variation, standard error, skewness and Kurtosis were arrived at. The results obtained were analysed to arrive at the conclusions. The screenshot of the descriptive results is as shown.

Descriptive Statistics

Statistic	Value
Sample Size	591
Range	2.657
Mean	1.3426
Variance	0.21622
Std. Deviation	0.465
Coef. of Var.	0.34635
Std. Error	0.01913
Skewness	0.10995
Kurtosis	-0.52569

Percentile	Value
Min	0.323
5%	0.574
10%	0.69827
25% (Q1)	0.982
50% (Median)	1.362
75% (Q3)	1.674
90%	2.0158
95%	2.069
Max	2.98

Figure 3: Sample of descriptive and statistical parameters

4. RESULTS

4.1 Gender vs Reaction Time

Descriptive Statistics: Gender (Male) vs Reaction Times

Table 4.1 Gender (Male) vs Reaction Time

Statistic	Value
Sample Size	591
Range	2.657
Mean	1.3426
Variance	0.21622
Std. Deviation	0.465
Coef. of Var.	0.34635
Std. Error	0.01913
Skewness	0.10995
Kurtosis	-0.52569

Table 4.2 Gender (Female) vs Reaction Time

Statistic	Value
Sample Size	94
Range	1.943
Mean	1.0741
Variance	0.23171
Std. Deviation	0.48137
Coef. of Var.	0.44816
Std. Error	0.04965
Skewness	0.33316
Kurtosis	-0.83605

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4.2 Age vs Reaction Time

Table 4.3 18-24(Male) vs Reaction Time

Statistic	Value
Sample Size	341
Range	1.18
Mean	0.79014
Variance	0.05486
Std. Deviation	0.23422
Coef. of Var.	0.29643
Std. Error	0.01268
Skewness	0.95283
Kurtosis	1.1525

Table 4.4: 18-24(Female) vs Reaction Time

Statistic	Value
Sample Size	55
Range	0.654
Mean	0.66262
Variance	0.02462
Std. Deviation	0.15691
Coef. of Var.	0.2368
Std. Error	0.02116
Skewness	-0.49106
Kurtosis	-0.31069

Table 4.5: 25-36(Male) vs Reaction Time

Statistic	Value
Sample Size	81
Range	1.117
Mean	0.96667
Variance	0.06841
Std. Deviation	0.26156
Coef. of Var.	0.27058
Std. Error	0.02906
Skewness	0.09801
Kurtosis	-0.06762

Table 4.6: 25-36(Female) vs Reaction Time

Statistic	Value
Sample Size	20
Range	0.708
Mean	0.7993
Variance	0.06123
Std. Deviation	0.24744
Coef. of Var.	0.30957
Std. Error	0.05533
Skewness	-0.22992
Kurtosis	-1.7051

Table 4.7: 36-45(Male) vs Reaction Time

Statistic	Value
Sample Size	297
Range	1.404
Mean	1.0847
Variance	0.07309
Std. Deviation	0.27035
Coef. of Var.	0.24923
Std. Error	0.01569
Skewness	-0.65697
Kurtosis	0.19099

Table 4.8: 36-45(Female) vs Reaction Time

Statistic	Value
Sample Size	47
Range	1.223
Mean	1.021
Variance	0.12317
Std. Deviation	0.35095
Coef. of Var.	0.34375
Std. Error	0.05119
Skewness	-0.72903
Kurtosis	-0.65441

ISSN : 1674-2974 | CN 43-1061 / N

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Table 4.9: 46-65(Male) vs Reaction Time

Statistic	Value
Sample Size	362
Range	2.075
Mean	1.4211
Variance	0.03657
Std. Deviation	0.19123
Coef. of Var.	0.13456
Std. Error	0.01005
Skewness	-0.47077
Kurtosis	7.0941

Table 4.10: 46-65(Female) vs Reaction Time

Statistic	Value
Sample Size	22
Range	2.292
Mean	1.6248
Variance	0.22009
Std. Deviation	0.46914
Coef. of Var.	0.28874
Std. Error	0.10002
Skewness	-1.4357
Kurtosis	4.3604

Table 4.11 56-65(Male) vs Reaction Time

Statistic	Value
Sample Size	253
Range	1.537
Mean	1.719
Variance	0.04096
Std. Deviation	0.20238
Coef. of Var.	0.11773
Std. Error	0.01272
Skewness	0.44655
Kurtosis	2.8952

Table 4.12 56-65(Male) vs Reaction Time

Statistic	Value
Sample Size	47
Range	1.62
Mean	1.3861
Variance	0.05489
Std. Deviation	0.23429
Coef. of Var.	0.16903
Std. Error	0.03417
Skewness	-1.6738
Kurtosis	8.2447

Table 4.13: >65(Male) vs Reaction Time

Statistic	Value
Sample Size	207
Range	2.14
Mean	2.004
Variance	0.04966
Std. Deviation	0.22286
Coef. of Var.	0.1112
Std. Error	0.01549
Skewness	-0.14333
Kurtosis	8.9933

Table 4.14: >65(Male) vs Reaction Time

Statistic	Value
Sample Size	7
Range	0.382
Mean	2.0139
Variance	0.01703
Std. Deviation	0.13051
Coef. of Var.	0.06481
Std. Error	0.04933
Skewness	1.1035
Kurtosis	1.5104

5. RESULT ANALYSIS

5.1 Gender versus Reaction Times

5.1.1Male Drivers

Sample Size: 591

- This indicates a relatively large sample size, which is beneficial for statistical analysis as it provides more reliable estimates of population parameters

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Range: 2.657 seconds

- The range gives us an idea of the spread of reaction times within the sample, from the minimum to the maximum observed value.

Mean: 1.3426 seconds

- The mean (average) reaction time is 1.3426 seconds. It is a measure of central tendency, suggesting that on average, male drivers in the sample react in approximately 1.34 seconds.

Variance: 0.21622

- Variance measures the spread of the data points around the mean. A higher variance indicates that data points are spread out more widely from the mean.

Standard Deviation: 0.465

- The standard deviation is the square root of the variance. It represents the average amount of variation or dispersion of data points from the mean. In this case, it is 0.465 seconds.

Coefficient of Variation: 0.34635

- The coefficient of variation (CV) is a measure of relative variability, calculated as the standard deviation divided by the mean. A lower CV suggests less variability relative to the mean.

Standard Error: 0.01913

- The standard error measures the accuracy of the sample mean as an estimate of the population mean. It decreases with larger sample sizes and provides an idea of the precision of the mean estimate.

Skewness: 0.10995

- Skewness measures the asymmetry of the probability distribution of a real-valued random variable about its mean. A skewness value around zero (like 0.10995) indicates a relatively symmetric distribution.

Kurtosis: -0.52569

Kurtosis measures the "tailedness" of the probability distribution. A negative kurtosis (like -0.52569) indicates a platykurtic distribution, meaning the distribution has thinner tails and a flatter peak compared to a normal distribution.

5.1.2 Female Drivers

1. **Sample Size: 94**
    - This indicates a moderate-sized sample, which is sufficient for estimating population parameters with reasonable accuracy.
2. **Range: 1.943 seconds**
    - The range gives us an idea of the spread of reaction times within the sample, from the minimum to the maximum observed value.
3. **Mean: 1.0741 seconds**
    - The mean (average) reaction time is 1.0741 seconds. It represents the central tendency of the reaction times among female drivers in the sample.

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4. **Variance: 0.23171**
   - Variance measures the spread of the data points around the mean. A higher variance indicates that data points are spread out more widely from the mean.
5. **Standard Deviation: 0.48137**
   - The standard deviation is the square root of the variance. It quantifies the amount of variation or dispersion of data points from the mean. In this case, it is 0.48137 seconds.
6. **Coefficient of Variation: 0.44816**
   - The coefficient of variation (CV) is the ratio of the standard deviation to the mean, expressed as a percentage. It indicates the relative variability of reaction times. Here, a CV of 0.44816 suggests moderate variability relative to the mean.
7. **Standard Error: 0.04965**
   - The standard error measures the precision of the sample mean as an estimate of the population mean. It decreases with larger sample sizes and provides an idea of the accuracy of the mean estimate.
8. **Skewness: 0.33316**
   - Skewness measures the asymmetry of the probability distribution of a real-valued random variable about its mean. A positive skewness (0.33316) indicates that the distribution of reaction times is slightly skewed to the right.
9. **Kurtosis: -0.83605**
   - Kurtosis measures the "tailedness" of the probability distribution. A negative kurtosis (like -0.83605) indicates a platykurtic distribution, meaning the distribution has thinner tails and a flatter peak compared to a normal distribution.

Age versus Reaction Times

5.2.1 Age (18-24) versus male reaction times

1. **Sample Size: 341**
   - This indicates a moderately large sample size, which provides good reliability for estimating population parameters.
2. **Range: 1.18 seconds**
   - The range gives us an idea of the spread of reaction times within the sample, from the minimum to the maximum observed value.
3. **Mean: 0.79014 seconds**
   - The mean (average) reaction time is 0.79014 seconds. It represents the central tendency of reaction times among male drivers in the sample.
4. **Variance: 0.05486**
   - Variance measures the spread of the data points around the mean. A lower variance indicates that data points are clustered closely around the mean.

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5. **Standard Deviation: 0.23422**
   - The standard deviation is the square root of the variance. It quantifies the amount of variation or dispersion of data points from the mean. In this case, it is 0.23422 seconds.
6. **Coefficient of Variation: 0.29643**
   - The coefficient of variation (CV) is the ratio of the standard deviation to the mean, expressed as a percentage. It indicates the relative variability of reaction times. Here, a CV of 0.29643 suggests moderate variability relative to the mean.
7. **Standard Error: 0.01268**
   - The standard error measures the precision of the sample mean as an estimate of the population mean. It decreases with larger sample sizes and provides an idea of the accuracy of the mean estimate.
8. **Skewness: 0.95283**
   - Skewness measures the asymmetry of the probability distribution of a real-valued random variable about its mean. A positive skewness (0.95283) indicates that the distribution of reaction times is skewed to the right, meaning there are some longer reaction times compared to the average.
9. **Kurtosis: 1.1525**
   - Kurtosis measures the "tailedness" of the probability distribution. A kurtosis greater than 0 (like 1.1525) indicates leptokurtic distribution, meaning the distribution has heavier tails and a sharper peak compared to a normal distribution.

Since specific age-related data (like age groups or individual ages) are not provided, a direct analysis of how reaction times vary with age cannot be conducted with this dataset alone. However, we can make some general interpretations and recommendations:

- **Mean Reaction Time**: The average reaction time for male drivers is 0.79014 seconds.
- **Variability**: The standard deviation (0.23422 seconds) and coefficient of variation (0.29643) indicate moderate variability in reaction times among male drivers.
- **Distribution Shape**: The skewness (0.95283) indicates a right-skewed distribution, suggesting that there are some male drivers with longer reaction times compared to the average.
- **Kurtosis**: The kurtosis (1.1525) suggests a leptokurtic distribution, which means the distribution has heavier tails and a sharper peak than a normal distribution.

5.2.2 Age (18-24) versus female reaction times

1. **Sample Size: 55**
   - This indicates a relatively small sample size, which may limit the precision of estimates but still provides insights.
2. **Range: 0.654 seconds**
   - The range gives us an idea of the spread of reaction times within the sample, from the minimum to the maximum observed value.

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3. **Mean: 0.66262 seconds**
   - The mean (average) reaction time is 0.66262 seconds. It represents the central tendency of reaction times among male drivers in the sample.
4. **Variance: 0.02462**
   - Variance measures the spread of the data points around the mean. A lower variance indicates that data points are clustered closely around the mean.
5. **Standard Deviation: 0.15691**
   - The standard deviation is the square root of the variance. It quantifies the amount of variation or dispersion of data points from the mean. In this case, it is 0.15691 seconds.
6. **Coefficient of Variation: 0.2368**
   - The coefficient of variation (CV) is the ratio of the standard deviation to the mean, expressed as a percentage. It indicates the relative variability of reaction times. Here, a CV of 0.2368 suggests relatively low variability relative to the mean.
7. **Standard Error: 0.02116**
   - The standard error measures the precision of the sample mean as an estimate of the population mean. It decreases with larger sample sizes and provides an idea of the accuracy of the mean estimate.
8. **Skewness: -0.49106**
   - Skewness measures the asymmetry of the probability distribution of a real-valued random variable about its mean. A negative skewness (-0.49106) indicates that the distribution of reaction times is skewed to the left, meaning there are some shorter reaction times compared to the average.
9. **Kurtosis: -0.31069**
   - Kurtosis measures the "tailedness" of the probability distribution. A negative kurtosis (-0.31069) indicates a platykurtic distribution, which means the distribution has thinner tails and a flatter peak compared to a normal distribution.

Since specific age-related data (such as age groups or individual ages) are not provided, a direct analysis of how reaction times vary with age cannot be conducted with this dataset alone.

However, we can make some general interpretations based on the provided statistics:

- **Mean Reaction Time**: The average reaction time for female drivers is 0.66262 seconds.
- **Variability**: The standard deviation (0.15691 seconds) and coefficient of variation (0.2368) indicate relatively low variability in reaction times among female drivers in this sample.
- **Distribution Shape**: The negative skewness (-0.49106) suggests a left-skewed distribution, indicating that there are some female drivers with shorter reaction times compared to the average.
- **Kurtosis**: The negative kurtosis (-0.31069) indicates a platykurtic distribution, meaning the distribution has thinner tails and a flatter peak compared to a normal distribution.

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DOI: 10.5281/zenodo.12704163
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5.2.3 Age (25-36) versus male reaction times

1. **Sample Size: 81**
   - This sample size provides a moderate amount of data to analyze reaction times within this age group.
2. **Range: 1.117 seconds**
   - The range indicates the spread of reaction times within the sample, from the minimum to the maximum observed value.
3. **Mean: 0.96667 seconds**
   - The mean (average) reaction time is 0.96667 seconds. It represents the central tendency of reaction times among male drivers aged 25-36 years.
4. **Variance: 0.06841**
   - Variance measures the spread of the data points around the mean. A higher variance indicates that data points are spread out more widely from the mean.
5. **Standard Deviation: 0.26156**
   - The standard deviation is the square root of the variance. It quantifies the amount of variation or dispersion of data points from the mean. In this case, it is 0.26156 seconds.
6. **Coefficient of Variation: 0.27058**
   - The coefficient of variation (CV) is the ratio of the standard deviation to the mean, expressed as a percentage. It indicates the relative variability of reaction times. Here, a CV of 0.27058 suggests moderate variability relative to the mean.
7. **Standard Error: 0.02906**
   - The standard error measures the precision of the sample mean as an estimate of the population mean. It decreases with larger sample sizes and provides an idea of the accuracy of the mean estimate.
8. **Skewness: 0.09801**
   - Skewness measures the asymmetry of the probability distribution of a real-valued random variable about its mean. A skewness value close to zero (0.09801) indicates that the distribution of reaction times is approximately symmetric.
9. **Kurtosis: -0.06762**
   - Kurtosis measures the "tailedness" of the probability distribution. A kurtosis value close to zero (-0.06762) indicates a distribution close to mesokurtic, which means it has tails and a peak similar to a normal distribution.

Analysis with Respect to Age (25-36 years):

1. **Mean Reaction Time**: The average reaction time for male drivers aged 25-36 years is 0.96667 seconds.
2. **Variability**: The standard deviation (0.26156 seconds) and coefficient of variation (0.27058) indicate moderate variability in reaction times within this age group.
3. **Distribution Shape**: The skewness (0.09801) suggests a nearly symmetric distribution of reaction times among male drivers aged 25-36 years.

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4. **Kurtosis**: The kurtosis (-0.06762) indicates a distribution close to normal (mesokurtic), with no significant outliers or extreme values compared to a normal distribution.

5.2.4 Age (25-36) versus female reaction times

1. **Sample Size**: 20
   - This sample size is relatively small, which limits the precision of estimates and generalizability to the broader population.
2. **Range**: 0.708 seconds
   - The range indicates the spread of reaction times within the sample, from the minimum to the maximum observed value.
3. **Mean**: 0.7993 seconds
   - The mean (average) reaction time is 0.7993 seconds. It represents the central tendency of reaction times among female drivers aged 25-36 years.
4. **Variance**: 0.06123
   - Variance measures the spread of the data points around the mean. A higher variance indicates that data points are spread out more widely from the mean.
5. **Standard Deviation**: 0.24744
   - The standard deviation is the square root of the variance. It quantifies the amount of variation or dispersion of data points from the mean. In this case, it is 0.24744 seconds.
6. **Coefficient of Variation**: 0.30957
   - The coefficient of variation (CV) is the ratio of the standard deviation to the mean, expressed as a percentage. It indicates the relative variability of reaction times. Here, a CV of 0.30957 suggests moderate variability relative to the mean.
7. **Standard Error**: 0.05533
   - The standard error measures the precision of the sample mean as an estimate of the population mean. It decreases with larger sample sizes and provides an idea of the accuracy of the mean estimate.
8. **Skewness**: -0.22992
   - Skewness measures the asymmetry of the probability distribution of a real-valued random variable about its mean. A negative skewness (-0.22992) indicates that the distribution of reaction times is slightly skewed to the left, meaning there are some shorter reaction times compared to the average.
9. **Kurtosis**: -1.7051
   - Kurtosis measures the "tailedness" of the probability distribution. A negative kurtosis (-1.7051) indicates a platykurtic distribution, which means the distribution has thinner tails and a flatter peak compared to a normal distribution.

Analysis with Respect to Age (25-36 years):

1. **Mean Reaction Time**: The average reaction time for female drivers aged 25-36 years is 0.7993 seconds.

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2. **Variability**: The standard deviation (0.24744 seconds) and coefficient of variation (0.30957) indicate moderate variability in reaction times within this age group.
3. **Distribution Shape**: The skewness (-0.22992) suggests a slightly left-skewed distribution of reaction times among female drivers aged 25-36 years.
4. **Kurtosis**: The negative kurtosis (-1.7051) indicates a platykurtic distribution, meaning the distribution has thinner tails and a flatter peak compared to a normal distribution, and it is more pronounced than usual.

5.2.5 Age (36-45) versus male reaction times

Based on the provided statistical data for driver reaction times of male drivers aged between 36 and 45 years:

1. **Sample Size**: 297
   - This sample size is reasonably large, providing robustness to estimates and allowing for generalizability within the age group.
2. **Range**: 1.404 seconds
   - The range indicates the spread of reaction times within the sample, from the minimum to the maximum observed value.
3. **Mean**: 1.0847 seconds
   - The mean (average) reaction time is 1.0847 seconds. It represents the central tendency of reaction times among male drivers aged 36-45 years.
4. **Variance**: 0.07309
   - Variance measures the spread of the data points around the mean. A higher variance indicates that data points are spread out more widely from the mean.
5. **Standard Deviation**: 0.27035
   - The standard deviation is the square root of the variance. It quantifies the amount of variation or dispersion of data points from the mean. In this case, it is 0.27035 seconds.
6. **Coefficient of Variation**: 0.24923
   - The coefficient of variation (CV) is the ratio of the standard deviation to the mean, expressed as a percentage. It indicates the relative variability of reaction times. Here, a CV of 0.24923 suggests moderate variability relative to the mean.
7. **Standard Error**: 0.01569
   - The standard error measures the precision of the sample mean as an estimate of the population mean. It decreases with larger sample sizes and provides an idea of the accuracy of the mean estimate.
8. **Skewness**: -0.65697
   - Skewness measures the asymmetry of the probability distribution of a real-valued random variable about its mean. A negative skewness (-0.65697) indicates that the distribution of reaction times is skewed to the left, meaning there are some shorter reaction times compared to the average.

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9. **Kurtosis**: 0.19099
    - Kurtosis measures the "tailedness" of the probability distribution. A positive kurtosis (0.19099) indicates a slightly leptokurtic distribution, meaning the distribution has heavier tails and a sharper peak compared to a normal distribution.

Analysis with Respect to Age (36-45 years):

1. **Mean Reaction Time**: The average reaction time for male drivers aged 36-45 years is 1.0847 seconds.
2. **Variability**: The standard deviation (0.27035 seconds) and coefficient of variation (0.24923) indicate moderate variability in reaction times within this age group.
3. **Distribution Shape**: The skewness (-0.65697) suggests a left-skewed distribution of reaction times among male drivers aged 36-45 years, indicating some shorter reaction times compared to the average.
4. **Kurtosis**: The positive kurtosis (0.19099) indicates a slightly leptokurtic distribution, meaning there are some outliers or more extreme values in the distribution compared to a normal distribution.

5.2.6 Age (36-45) versus female reaction times

1. **Sample Size**: 47
    - This sample size is moderate, providing a reasonable amount of data to analyze reaction times within this age group.
2. **Range**: 1.223 seconds
    - The range indicates the spread of reaction times within the sample, from the minimum to the maximum observed value.
3. **Mean**: 1.021 seconds
    - The mean (average) reaction time is 1.021 seconds. It represents the central tendency of reaction times among female drivers aged 36-45 years.
4. **Variance**: 0.12317
    - Variance measures the spread of the data points around the mean. A higher variance indicates that data points are spread out more widely from the mean.
5. **Standard Deviation**: 0.35095
    - The standard deviation is the square root of the variance. It quantifies the amount of variation or dispersion of data points from the mean. In this case, it is 0.35095 seconds.
6. **Coefficient of Variation**: 0.34375
    - The coefficient of variation (CV) is the ratio of the standard deviation to the mean, expressed as a percentage. It indicates the relative variability of reaction times. Here, a CV of 0.34375 suggests moderate variability relative to the mean.
7. **Standard Error**: 0.05119
    - The standard error measures the precision of the sample mean as an estimate of the population mean. It decreases with larger sample sizes and provides an idea of the accuracy of the mean estimate.

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8. **Skewness**: -0.72903
    - Skewness measures the asymmetry of the probability distribution of a real-valued random variable about its mean. A negative skewness (-0.72903) indicates that the distribution of reaction times is skewed to the left, meaning there are some shorter reaction times compared to the average.
9. **Kurtosis**: -0.65441
    - Kurtosis measures the "tailedness" of the probability distribution. A negative kurtosis (-0.65441) indicates a platykurtic distribution, which means the distribution has thinner tails and a flatter peak compared to a normal distribution.

Analysis with Respect to Age (36-45 years):

1. **Mean Reaction Time**: The average reaction time for female drivers aged 36-45 years is 1.021 seconds.
2. **Variability**: The standard deviation (0.35095 seconds) and coefficient of variation (0.34375) indicate moderate variability in reaction times within this age group.
3. **Distribution Shape**: The skewness (-0.72903) suggests a left-skewed distribution of reaction times among female drivers aged 36-45 years, indicating some shorter reaction times compared to the average.
4. **Kurtosis**: The negative kurtosis (-0.65441) indicates a platykurtic distribution, meaning the distribution has thinner tails and a flatter peak compared to a normal distribution.

5.2.7 Age (46-55) versus male reaction times

1. **Sample Size**: 47
    - This sample size is moderate, providing a reasonable amount of data to analyze reaction times within this age group.
2. **Range**: 1.62 seconds
    - The range indicates the spread of reaction times within the sample, from the minimum to the maximum observed value.
3. **Mean**: 1.3861 seconds
    - The mean (average) reaction time is 1.3861 seconds. It represents the central tendency of reaction times among male drivers aged 46-65 years.
4. **Variance**: 0.05489
    - Variance measures the spread of the data points around the mean. A lower variance indicates that data points are clustered closely around the mean.
5. **Standard Deviation**: 0.23429
    - The standard deviation is the square root of the variance. It quantifies the amount of variation or dispersion of data points from the mean. In this case, it is 0.23429 seconds.
6. **Coefficient of Variation**: 0.16903
    - The coefficient of variation (CV) is the ratio of the standard deviation to the mean, expressed as a percentage. It indicates the relative variability of reaction times. Here, a CV of 0.16903 suggests relatively low variability relative to the mean.

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7. **Standard Error**: 0.03417
    - The standard error measures the precision of the sample mean as an estimate of the population mean. It decreases with larger sample sizes and provides an idea of the accuracy of the mean estimate.
8. **Skewness**: -1.6738
    - Skewness measures the asymmetry of the probability distribution of a real-valued random variable about its mean. A negative skewness (-1.6738) indicates that the distribution of reaction times is highly skewed to the left, meaning there are some much shorter reaction times compared to the average.
9. **Kurtosis**: 8.2447
    - Kurtosis measures the "tailedness" of the probability distribution. A high kurtosis (8.2447) indicates a leptokurtic distribution, which means the distribution has heavy tails and a sharper peak compared to a normal distribution.

Analysis with Respect to Age (46-55 years):

1. **Mean Reaction Time**: The average reaction time for male drivers aged 46-55 years is 1.3861 seconds.
2. **Variability**: The standard deviation (0.23429 seconds) and coefficient of variation (0.16903) indicate relatively low variability in reaction times within this age group.
3. **Distribution Shape**: The skewness (-1.6738) suggests a highly left-skewed distribution of reaction times among male drivers aged 46-55 years, indicating that there are some drivers with significantly shorter reaction times compared to the average.
4. **Kurtosis**: The high kurtosis (8.2447) indicates a leptokurtic distribution with heavy tails and a sharper peak compared to a normal distribution. This suggests there may be some outliers with very short reaction times.

5.2.8 Age (46-55) versus female reaction times

1. **Sample Size**: 47
    - This sample size is moderate, providing a reasonable amount of data to analyze reaction times within this age group.
2. **Range**: 1.62 seconds
    - The range indicates the spread of reaction times within the sample, from the minimum to the maximum observed value.
3. **Mean**: 1.3861 seconds
    - The mean (average) reaction time is 1.3861 seconds. It represents the central tendency of reaction times among female drivers aged 46-55 years.
4. **Variance**: 0.05489
    - Variance measures the spread of the data points around the mean. A lower variance indicates that data points are clustered closely around the mean.

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5. **Standard Deviation**: 0.23429
    - The standard deviation is the square root of the variance. It quantifies the amount of variation or dispersion of data points from the mean. In this case, it is 0.23429 seconds.
6. **Coefficient of Variation**: 0.16903
    - The coefficient of variation (CV) is the ratio of the standard deviation to the mean, expressed as a percentage. It indicates the relative variability of reaction times. Here, a CV of 0.16903 suggests relatively low variability relative to the mean.
7. **Standard Error**: 0.03417
    - The standard error measures the precision of the sample mean as an estimate of the population mean. It decreases with larger sample sizes and provides an idea of the accuracy of the mean estimate.
8. **Skewness**: -1.6738
    - Skewness measures the asymmetry of the probability distribution of a real-valued random variable about its mean. A highly negative skewness (-1.6738) indicates that the distribution of reaction times is strongly skewed to the left, meaning there are some much shorter reaction times compared to the average.
9. **Kurtosis**: 8.2447
    - Kurtosis measures the "tailedness" of the probability distribution. A high kurtosis (8.2447) indicates a leptokurtic distribution, which means the distribution has heavy tails and a sharper peak compared to a normal distribution.

Analysis with Respect to Age (46-55 years):

1. **Mean Reaction Time**: The average reaction time for female drivers aged 46-55 years is 1.3861 seconds.
2. **Variability**: The standard deviation (0.23429 seconds) and coefficient of variation (0.16903) indicate relatively low variability in reaction times within this age group.
3. **Distribution Shape**: The skewness (-1.6738) suggests a strongly left-skewed distribution of reaction times among female drivers aged 46-55 years, indicating that there are some drivers with significantly shorter reaction times compared to the average.
4. **Kurtosis**: The high kurtosis (8.2447) indicates a leptokurtic distribution with heavy tails and a sharper peak compared to a normal distribution. This suggests there may be some outliers with very short reaction times.

5.2.9 Age (56-65) versus male reaction times

1. **Sample Size**: 253
    - This sample size is large, providing robustness to estimates and allowing for generalizability within the age group.
2. **Range**: 1.537 seconds
    - The range indicates the spread of reaction times within the sample, from the minimum to the maximum observed value.

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3. **Mean**: 1.719 seconds
    - The mean (average) reaction time is 1.719 seconds. It represents the central tendency of reaction times among male drivers aged 56-65 years.
4. **Variance**: 0.04096
    - Variance measures the spread of the data points around the mean. A lower variance indicates that data points are clustered closely around the mean.
5. **Standard Deviation**: 0.20238
    - The standard deviation is the square root of the variance. It quantifies the amount of variation or dispersion of data points from the mean. In this case, it is 0.20238 seconds.
6. **Coefficient of Variation**: 0.11773
    - The coefficient of variation (CV) is the ratio of the standard deviation to the mean, expressed as a percentage. It indicates the relative variability of reaction times. Here, a CV of 0.11773 suggests relatively low variability relative to the mean.
7. **Standard Error**: 0.01272
    - The standard error measures the precision of the sample mean as an estimate of the population mean. It decreases with larger sample sizes and provides an idea of the accuracy of the mean estimate.
8. **Skewness**: 0.44655
    - Skewness measures the asymmetry of the probability distribution of a real-valued random variable about its mean. A positive skewness (0.44655) indicates that the distribution of reaction times is skewed to the right, meaning there are some longer reaction times compared to the average.
9. **Kurtosis**: 2.8952
    - Kurtosis measures the "tailedness" of the probability distribution. A high kurtosis (2.8952) indicates a leptokurtic distribution, which means the distribution has heavy tails and a sharper peak compared to a normal distribution.

Analysis with Respect to Age (56-65 years):

1. **Mean Reaction Time**: The average reaction time for male drivers aged 56-65 years is 1.719 seconds.
2. **Variability**: The standard deviation (0.20238 seconds) and coefficient of variation (0.11773) indicate relatively low variability in reaction times within this age group.
3. **Distribution Shape**: The skewness (0.44655) suggests a slightly right-skewed distribution of reaction times among male drivers aged 56-65 years, indicating that there are some drivers with longer reaction times compared to the average.
4. **Kurtosis**: The high kurtosis (2.8952) indicates a leptokurtic distribution with heavy tails and a sharper peak compared to a normal distribution. This suggests there may be some outliers with very long reaction times.

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5.2.10 Age (56-65) versus female reaction times

1. **Sample Size: 22**
   - This sample size is relatively small, which may limit the precision of estimates and generalizability.
2. **Range: 2.292 seconds**
   - The range indicates the spread of reaction times within the sample, from the minimum to the maximum observed value.
3. **Mean: 1.6248 seconds**
   - The mean (average) reaction time is 1.6248 seconds. It represents the central tendency of reaction times among female drivers aged 56-65 years.
4. **Variance: 0.22009**
   - Variance measures the spread of the data points around the mean. A higher variance indicates that data points are spread out more widely from the mean.
5. **Standard Deviation: 0.46914**
   - The standard deviation is the square root of the variance. It quantifies the amount of variation or dispersion of data points from the mean. In this case, it is 0.46914 seconds.
6. **Coefficient of Variation: 0.28874**
   - The coefficient of variation (CV) is the ratio of the standard deviation to the mean, expressed as a percentage. It indicates the relative variability of reaction times. Here, a CV of 0.28874 suggests moderate variability relative to the mean.
7. **Standard Error: 0.10002**
   - The standard error measures the precision of the sample mean as an estimate of the population mean. With a small sample size, the standard error is relatively high, indicating less precision in estimating the population mean.
8. **Skewness: -1.4357**
   - Skewness measures the asymmetry of the probability distribution of a real-valued random variable about its mean. A strongly negative skewness (-1.4357) indicates that the distribution of reaction times is highly skewed to the left, meaning there are some much shorter reaction times compared to the average.
9. **Kurtosis: 4.3604**
   - Kurtosis measures the "tailedness" of the probability distribution. A high kurtosis (4.3604) indicates a leptokurtic distribution, which means the distribution has heavy tails and a sharper peak compared to a normal distribution.

Analysis with Respect to Age (56-65 years):

1. **Mean Reaction Time**: The average reaction time for female drivers aged 56-65 years is 1.6248 seconds.
2. **Variability**: The standard deviation (0.46914 seconds) and coefficient of variation (0.28874) indicate moderate variability in reaction times within this age group.

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3. **Distribution Shape**: The skewness (-1.4357) suggests a strongly left-skewed distribution of reaction times among female drivers aged 56-65 years, indicating that there are some drivers with significantly shorter reaction times compared to the average.
4. **Kurtosis**: The high kurtosis (4.3604) indicates a leptokurtic distribution with heavy tails and a sharper peak compared to a normal distribution. This suggests there may be some outliers with very short or very long reaction times.

5.2.11Age (>65) versus male reaction times

1. **Sample Size: 207**
   - This sample size is moderately large, which provides a robust dataset for analysis within the age group.
2. **Range: 2.14 seconds**
   - The range indicates the spread of reaction times within the sample, from the minimum to the maximum observed value.
3. **Mean: 2.004 seconds**
   - The mean (average) reaction time is 2.004 seconds. It represents the central tendency of reaction times among male drivers aged over 65 years.
4. **Variance: 0.04966**
   - Variance measures the spread of the data points around the mean. A lower variance indicates that data points are clustered closely around the mean.
5. **Standard Deviation: 0.22286**
   - The standard deviation is the square root of the variance. It quantifies the amount of variation or dispersion of data points from the mean. In this case, it is 0.22286 seconds.
6. **Coefficient of Variation: 0.1112**
   - The coefficient of variation (CV) is the ratio of the standard deviation to the mean, expressed as a percentage. It indicates the relative variability of reaction times. Here, a CV of 0.1112 suggests relatively low variability relative to the mean.
7. **Standard Error: 0.01549**
   - The standard error measures the precision of the sample mean as an estimate of the population mean. It decreases with larger sample sizes and provides an idea of the accuracy of the mean estimate.
8. **Skewness: -0.14333**
   - Skewness measures the asymmetry of the probability distribution of a real-valued random variable about its mean. A slight negative skewness (-0.14333) indicates a minor left-skewed distribution of reaction times, meaning there are slightly longer reaction times compared to the average.
9. **Kurtosis: 8.9933**
   - Kurtosis measures the "tailedness" of the probability distribution. A very high kurtosis (8.9933) indicates a very leptokurtic distribution, which means the distribution has heavy tails and a sharper peak compared to a normal distribution.

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Analysis with Respect to Age (>65 years):

1. **Mean Reaction Time**: The average reaction time for male drivers aged over 65 years is 2.004 seconds.
2. **Variability**: The standard deviation (0.22286 seconds) and coefficient of variation (0.1112) indicate relatively low variability in reaction times within this age group.
3. **Distribution Shape**: The skewness (-0.14333) suggests a minor left-skewed distribution of reaction times among male drivers aged over 65 years, indicating a slight tendency towards longer reaction times.
4. **Kurtosis**: The very high kurtosis (8.9933) indicates a very leptokurtic distribution with heavy tails and a sharper peak compared to a normal distribution. This suggests there may be some outliers with very long reaction times.

5.2.12 Age (>65) versus female reaction times

1. **Sample Size: 7**
   - This sample size is very small, which limits the precision of estimates and generalizability.
2. **Range: 0.382 seconds**
   - The range indicates the spread of reaction times within the sample, from the minimum to the maximum observed value.
3. **Mean: 2.0139 seconds**
   - The mean (average) reaction time is 2.0139 seconds. It represents the central tendency of reaction times among female drivers aged over 65 years.
4. **Variance: 0.01703**
   - Variance measures the spread of the data points around the mean. A lower variance indicates that data points are clustered closely around the mean.
5. **Standard Deviation: 0.13051**
   - The standard deviation is the square root of the variance. It quantifies the amount of variation or dispersion of data points from the mean. In this case, it is 0.13051 seconds.
6. **Coefficient of Variation: 0.06481**
   - The coefficient of variation (CV) is the ratio of the standard deviation to the mean, expressed as a percentage. It indicates the relative variability of reaction times. Here, a CV of 0.06481 suggests low variability relative to the mean.
7. **Standard Error: 0.04933**
   - The standard error measures the precision of the sample mean as an estimate of the population mean. With a very small sample size, the standard error is relatively high, indicating less precision in estimating the population mean.
8. **Skewness: 1.1035**
   - Skewness measures the asymmetry of the probability distribution of a real-valued random variable about its mean. A positive skewness (1.1035) indicates that the distribution of reaction times is skewed to the right, meaning there are some longer reaction times compared to the average.

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9. **Kurtosis: 1.5104**
    - Kurtosis measures the "tailedness" of the probability distribution. A kurtosis of 1.5104 indicates a distribution with heavier tails than a normal distribution, but not extremely heavy.

Analysis with Respect to Age (>65 years):

1. **Mean Reaction Time**: The average reaction time for female drivers aged over 65 years is 2.0139 seconds.
2. **Variability**: The standard deviation (0.13051 seconds) and coefficient of variation (0.06481) indicate low variability in reaction times within this age group.
3. **Distribution Shape**: The skewness (1.1035) suggests a strongly right-skewed distribution of reaction times among female drivers aged over 65 years, indicating that there are some drivers with significantly longer reaction times compared to the average.
4. **Kurtosis**: The kurtosis (1.5104) indicates a distribution with heavier tails than a normal distribution, suggesting there may be some outliers with longer reaction times compared to the majority.

6. CONCLUSIONS

- The reaction times of male drivers in the sample are centred around 1.3426 seconds on an average.
- The average reaction time for female drivers is 1.0741 seconds which implies female drivers are quicker in the overall sense.
- In the age-wise characterization, male drivers aged 18-24 have average reaction times 0.7901 seconds.
- The skewness (0.95283) in the age group of 18-24 indicates a right-skewed distribution, suggesting that there are some male drivers with longer reaction times compared to the average.
- For the age group 18-24, given the right-skewed distribution, it's important to consider that some male drivers may have longer reaction times, which could impact safety on the road.
- The mean (average) reaction time in the age group of 18-24 for females is 0.6626 seconds implying quicker reaction times than male drivers.
- Male drivers aged 25-36 years show relatively consistent reaction times around the mean of 0.9666 seconds.
- The average reaction time for female drivers aged 25-36 years is 0.7993 seconds which implies quicker than the male reaction times.
- The average reaction time for male drivers aged 36-45 years is 1.0847 seconds.
- Female drivers aged 36-45 years exhibit an average reaction time of 1.021 seconds, representing the typical quicker response time within this age group.
- The average reaction time for male drivers aged 46-55 years is 1.3861 seconds.
- The average reaction time for female drivers aged 46-55 years is 1.3861 seconds.
- The average reaction time for male drivers aged 56-65 years is 1.719 seconds.
- The average reaction time for female drivers aged 56-65 years is 1.6248 seconds which is quicker than the male reaction times.
- The average reaction time for male drivers aged over 65 years is 2.004 seconds.
- The average reaction time for female drivers aged over 65 years is 2.0139 seconds implying higher reaction times than males.

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7. FUTURE SCOPE

This paper intended to arrive at the driver reaction times in the Indian Mixed Traffic Conditions considering the basic independent parameters of drivers which are the gender and age group. The driver reaction time in the actual scenario depends on a number of other independent parameters like educational qualifications of drivers, vocation of the drivers, whether the driver is married or unmarried, the driver having children or not, the rural or urban background of driver, health aspect of the driver, type of gearbox driven by the driver etc.

Keeping in view the limitations of contents and length of journal paper only two parameters like gender and age of the drivers were taken into consideration. However, in the future studies, the above mentioned parameters could also be taken to arrive at a comprehensive data and it analysis to understand the near-perfect reaction times of the drivers in the Indian Mixed Traffic Conditions.

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