Influence of Music on Sensorimotor Coordination and Concentration among Drivers in an Indian City

Abstract

Background: Music is a popular pastime and an essential part of our lives that has the power to change one’s state of mind. The melody, lyrics, and rhythm combine together to create creative symphonies that can either fill one with energy, enthusiasm, and positivity, or take one to a melancholic mood. Music is known for its positive influence and therapeutic qualities but at times it can be distracting as well especially when your other faculties are engaged in doing other work. Driving is one such activity where music, though a joy to listen to, can prove disastrous through distractions. **Materials and Methods:** This study with the help of Vienna Test System examines the psychological impact of different genre of music on a driver’s driving abilities and possible reaction and response amidst exposure to multiple stimuli, which could be correct, omitted, or delayed. The sample included 16 individuals who were drivers. The sample was classified into two groups of equal numbers with one named “young” comprised of people up to the age of 30 years while the other named “old,” were more than 45 years old. The participants were asked to undertake driving test, “with” and “without” the music. Using the Vienna Tests System, acoustic and visual stimuli using soft classical, hard rock, and jazz music were used during the driving test. **Results:** A two-way mixed analysis of variance test and differences by t-test examined the relationship of age and impact of music on individual’s reaction time (RT) and number of correct, omitted, or delayed responses, which was found significant. **Conclusion:** The participants under the group of “with music” clearly resulted in better performance showing lower RT, compared to the situation where no music was played.

**Keywords:** Age differences, driving, Indian drivers, music, Vienna Test System

Introduction

Road crashes are increasingly impacting the lives of the people and the economic well-being of the nations, with such incidents turning into epidemic proportions. The World Health Organization (WHO)[1] reports that around 1.3 million people lose their lives, and 50 million are injured annually worldwide, many of them getting disabled for life. In order to counter the increasing threat of road crashes, the WHO has declared 2011–2020 to be the Decade of Action for Road Safety. The program saw a global launch in more than 100 countries, India being one of them, with the specific goal of preventing five million road traffic deaths globally by 2020.

In India, deaths due to “Road Accidents” have seen an increasing trend with 146,133 fatalities in 2015 over 137,423 in 2013.[2]

Looking at the grim scenario, it is expected that by 2020, road traffic crashes will have moved from ninth to third place in the world ranking of the burden of disease and will hold the second position among developing countries.[3] This is a heavy burden on a developing economy like India which loses around 3% of its gross domestic product due to road traffic deaths and injuries.[4] According to 2014 statistics, 41,526 road crashes occurred in India, out of which 47.69% resulted from speeding, 41.5% from dangerous and careless driving/ overtaking, 5.3% because of bad weather conditions, 2.8% due to mechanical defects in motor vehicle, while 2.6% people lost their lives when driving under the influence of alcohol.[5]

The causal factors for these crashes can be classified under three categories, namely driver related, road related, and
vehicle related. The above-referred statistics of India clearly indicate the primary cause of road fatalities to be driver-related incidents. While the engineering or environmental factors of the roads can be controlled and improved to reduce the road crashes, the biggest cause of worry are the driver-related incidents where contributing factors are varied and beyond external controls, such as age, judgment, driving skill, attention, fatigue, experience, and sobriety, to name just a few.

Driving is a complex human process that works in a closed-loop compensatory feedback system, i.e., a driver makes inputs to the steering wheel, brake, and/or accelerator; receives feedback by monitoring the results of the inputs; and based on response of the results, makes additional inputs.[6] Complexity of the act of driving demands complete attention at every point of time, with ability to react quickly despite different stimuli, in order to ensure safe driving.

There are two basic characteristics of reaction time (RT), i.e., the number of stimuli presented and the expectancy associated with it. If the number of stimuli increases, the RT shall also increase. Other factors affecting driving performance can also be classified broadly as internal and external. The internal factors can be further subdivided into long-term and short-term ones depending on the duration these are presented. The long-term internal factors include age and experience, whereas short-term internal factors include vigilance, stress, fatigue, motivations, and emotional state. The external factors are visibility, road condition, noise, pollution, seating comfort, etc.

Music is one of the external factors, which has the potential to influence driver’s internal factors such as stress, fatigue, attention, and emotions, which can also vary with age.

The present study, therefore, examines the causal effect of different types of music on the RT to multiple stimuli by people of different age groups, i.e., those aged more than 45 years and those of <30 years. The impact of different types of music while driving can be further tested as an expansion of this study.

**Design of the study**

The design of the study was devised so that the influence of various type of music on the RT of the driver can be gauged. The correct, incorrect, omitted, delayed, and on-time correct reactions of the drivers were observed and also noted via Vienna Test System. The total number of drivers appeared for screening in the laboratory was 50, but out of them, 16 drivers willingly participated, i.e., volunteer for this pilot study. Due to the scarcity of resources, additional participants could not be taken. The sample comprised of 16 drivers, equally divided into young and old age group categories. The young drivers were <30 years in age, whereas old age group drivers were of 45 years of age and above. The participants were exposed to four types of conditions, i.e., no music, calm music, jazz, and drum music. The participants were asked to listen to various types of music while performing the task simultaneously on the Vienna Test System. The RT on various tasks was noted down and evaluated. Statistical analysis of two-way mixed analysis of variance (ANOVA) test and t-test analysis were performed.

**Hypothesis**

The study has the following hypotheses:

a. \( H_1 \): It is expected that music exposure will have significant influence on the average RT, correct reactions, incorrect reactions, delayed reactions, omitted reactions, and on-time correct reactions

b. \( H_2 \): It is expected that age will have significant influence on the average RT, correct reactions, incorrect reactions, delayed reactions, omitted reactions, and on-time correct reactions

c. \( H_3 \): It is expected that young drivers as compared to old drivers will have reduced average RT, less incorrect reactions, and less omitted reactions but more correct reactions and more on-time correct reactions.

**Materials and Methods**

Reaction Time test (RT) and Determination test (DT) from Vienna Test System[7] were administered to measure Reaction time and Decision time of the participant. Figure 1 shows the standard response panel of the Vienna Test System; it is a standardized and validated traffic psychological battery for driver behavioral assessment which provides a fair, objective, and valid instrument for establishing fitness to drive. Under this, different dimensions can be measured, for example, mental stability (IVPE-R), readiness to take risks (WRBTV), space/time orientation (ZBA), selective attention (LVT), instrumental aggression (AVIS), eye–hand coordination (2HAND), self-control (VPT3), RT and choice reaction (RT), stress behavior (DT), information processing (AMT), concentration (COG), perceptual speed (ATAVT), obtaining an overview (LVT), and perceptual speed (PP-R). In this study, only two parameters have been taken:

- RT reaction test
- DT decision time.
Reaction time test

RT test is defined as the time that elapses between a signal and the start of the mechanical response movement when the respondent is instructed to react as quickly as possible. Such response times need to be measured in milliseconds.[8]

Determination test

The object of the DT is to measure “reactive stress tolerance” and the associated reaction speed. In order to be clear what this means, it will be helpful to list the component requirements. In this test, the reaction involves pressing or releasing a button as quickly as possible in response to a single light signal (yellow or red light), a tone, or a combination of these two stimuli (yellow and tone or yellow and red). The respondent must react as quickly as possible to various stimuli in ways specified in the test. Figure 2 shows picture showing a sample of visual stimuli in the DT.

Measures – description of the test

Each test consisted of 21 min. The test involved colored and acoustic stimuli. The respondent reacts to each stimulus by pressing buttons on the response panel or by using foot pedals. The DT is used primarily to measure “reactive stress tolerance” and the associated reaction speed. It presents the respondent with the following cognitive challenges:

1. Discriminating colors and sounds
2. Linking relevant characteristics of the stimulus configurations and the controls in accordance with specific assignment rules
3. Selecting the appropriate reaction in accordance with the correct assignment rules.

The stress component of the DT arises from the need to react continuously and as quickly as possible to rapidly changing stimuli.

Procedure

The review of related literature highlights that aging brings a number of sensory, psychomotor, and cognitive changes that may impact driving performance and safety. Research has shown that older drivers tend to be overrepresented in intersection or right-of-way crashes; the chances of getting involved in (right of way type) accidents increases with driver age when compared to other age groups.[9] This may be due to higher-order problems with hazard perception[10] or allocation of attention.[11] Age is a significant factor affecting the RT of participants and that the influence of music can vary between different age groups. In the present study, two different age groups of under 30 and over 45 years of age were taken into consideration. Then, within each age level, individuals were subjected to DT under four different conditions: without music, calm music, drum, and jazz music. The music was played to the participants through headphone. The volume level of music was kept constant among different music and also among different participants.

Practice and test phase

In the test, first, the practice phase is given followed by test phase. The respondent’s task is to react as quickly as possible to visual or acoustic stimuli by pressing the corresponding buttons on the response panel. There are five visual stimuli colored white, yellow, red, green, and blue, which appear in an upper and a lower row. The reaction buttons assigned to these five colors are arranged on the response panel in such a way that the respondent can use both hands.

The following data are collected from the test for the four conditions: average RT, number of on-time correct reactions, number of omitted reactions, number of delayed reactions, number of correct reactions, and number of incorrect reactions. Figure 3 shows the standard response panel of Vienna Test System, whereas Figure 1 shows driver’s performing test on the Vienna Test System. The following three different modes of presentation were presented to the participants:

Reaction mode (fixed presentation time per stimulus)

Each stimulus is presented for a fixed period of time; the next stimulus then follows, irrespective of whether a reaction has been made or not. The number of accurate responses depends on the length of the presentation time. Because presentation time in each test form is fixed, it can be assumed that the test measures primarily the respondent’s ability to adapt his/her behavioral speed so that he/she omits as few stimuli as possible while at the same time maintaining sufficient accuracy of judgment.

Action mode (unlimited presentation time per stimulus, fixed test duration)

The next stimulus appears when a correct response has been made to the current one – that is, the speed of stimulus presentation is determined by the respondent.
Adaptive mode (automatically varied presentation time)

In the adaptive form, the speed of stimulus presentation depends on the respondent’s pace of work. The duration of each stimulus is calculated as the mean of the previous RT. If the response to a stimulus was not correct, the RT is doubled for the purpose of calculating the duration of the next stimulus. This form of presentation ensures that the participant is always working at the limit of his/her ability and that “reactive stress tolerance” is therefore being fairly measured. The speed of stimulus presentation is continuously adapted to the respondent’s working speed. In this test, fixed stimulus duration type: reactions are assigned to stimului sequence as follows:

Test sequence

There are a total of 540 stimuli for this test. Table 2 shows the different phases with different stimului duration. Median RT: This variable expresses the extent to which the respondent reacted faster than the speed at which the items were presented. Individuals with a high percentile rank are, therefore, above-average good at reacting correctly over a lengthy period of time when performing simple tasks under stress conditions.

Results

A mixed between-within ANOVA was conducted to explore the impact of music and age on RT of drivers. The participants were exposed to four different music groups (without, calm, drum, and jazz) and their RT was gauged. Table 3 shows the results of between-within ANOVA. The t-test analysis was also conducted to know the differences among young and old drivers on four different music groups and their subsequent RT (average, correct, incorrect, delayed, omitted, and on-time correct reactions). The results of t-test are given in Table 4.

Average reaction time

A mixed between-within ANOVA was done on average RT. The main effect for music and age was found to be statistically significant. The main effect for music was $[F(1,14) = 66.90, P < 0.01]$, multivariate partial $\eta^2 = 0.94]$, whereas main effect for age was found to be statistically significant $[F(1,14) = 57.80, P < 0.01]$, partial $\eta^2 = 0.81$] [Table 3]. However, the interaction effect for average RT was not statistically significant $[F(1,14) = 2.67, P = 0.10]$ partial $\eta^2 = 0.40]$ [Table 3].

The t-test analysis on average RT found significant differences among young and old drivers in all the music exposure groups. In the “without music” group, the results were statistically significant ($t = 7.44, P < 0.01$), with older drivers showing more average RT ($M = 1.07$) than the young drivers ($M = 0.76$) [Table 4]. In the calm music exposure, statistically significant differences were found among young and old drivers ($t = 7.05, P < 0.01$), with older drivers showing more average RT ($M = 0.98$) than the young drivers ($M = 0.70$) [Table 4]. In the drum music exposure, statistically significant differences were found among young and old drivers ($t = 7.49, P < 0.01$), with older drivers showing more average RT ($M = 0.96$) than the young drivers ($M = 2.67$) [Table 4]. In the jazz music exposure as well, statistically significant differences were found among young and old drivers ($t = 7.40, P < 0.01$), with older drivers showing more average RT ($M = 0.93$) than the young drivers ($M = 0.67$) [Table 4]. Figure 4 shows the mean graphs on average RT of young and old drivers.

Correct reactions

The ANOVA on correct RT found the main effect for music and age to be statistically significant. The main effect for

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### Table 1: Type of different visual, acoustic and motor stimuli during experimental session

| Color                | No music                                      | Jazz music                                    | Drum music                                   |
|----------------------|-----------------------------------------------|-----------------------------------------------|----------------------------------------------|
| White - Round white button | White - Round white button | White - Round white button                      |
| Yellow - Round yellow button | Yellow - Round yellow button | Yellow - Round yellow button                      |
| Red - Round red button | Red - Round red button                          | Red - Round red button                          |
| Green - Round green button | Green - Round green button | Green - Round green button                          |
| Blue - Round blue button | Blue - Round blue button                          | Blue - Round blue button                          |

### Table 2: Number of stimuli and phase duration

| Phase     | Stimuli | Duration (ms) |
|-----------|---------|---------------|
| Practice  | 20      | 3000          |
| First subset | 180     | 1078          |
| Second subset | 180     | 834           |
| Third subset | 180     | 948           |

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music and age was found to be statistically significant. The main effect for music was $F(1,14) = 7.40, P < 0.01$, multivariate partial $\eta^2 = 0.65$, whereas the main effect for age was found to be $F(1,14) = 54.30, P < 0.01$, partial $\eta^2 = 0.80$. However, the interaction effect for correct reactions was found to be statistically insignificant $F(1,14) = 1.40, P = 0.29$, partial $\eta^2 = 0.26$ [Table 3].

The $t$-test analysis on correct reactions found significant differences among young and old drivers in all the music exposure groups. Statistically significant differences were found among young and old drivers on without music ($t = 6.71, P < 0.01$) [Table 4], with young drivers showing more correct reactions ($M = 474$) than the old drivers ($M = 273.25$). In the calm music exposure, statistically significant differences were found among young and old drivers ($t = 7.55, P < 0.01$) [Table 4], with young drivers showing more correct reactions ($M = 491$) than the old drivers ($M = 287.75$). In the drum music exposure, statistically significant differences were found among young and old drivers ($t = 7.72, P < 0.01$) [Table 4], with young drivers showing more correct reactions ($M = 509.38$) than the old drivers ($M = 298.25$). In the jazz music exposure as well, statistically significant differences were found among young and old drivers ($t = 6.63, P < 0.01$) [Table 4], with young drivers showing more correct reactions ($M = 501$)
than the old drivers (M = 305). Figure 5 shows the mean graphs on correct reactions of young and old drivers.

Incorrect reactions

The ANOVA on incorrect reactions found the main effect for age groups to be statistically significant. However, the main effect for music and interaction effect was not found to be statistically significant. The main effect for music was statistically insignificant \([F (1,14) = 0.18, P = 0.33\), multivariate partial \(\eta^2 = 0.04]\), whereas the main effect for age was found to be statistically significant \([F (1,14) = 26.79, P < 0.01\), partial \(\eta^2 = 0.66]\). The interaction effect for “incorrect reactions” was statistically insignificant \([F (1,14) = 1.27, P = 0.33\) partial \(\eta^2 = 0.24]\).

The t-test analysis found significant differences in all the groups. The incorrect reactions found among young and old drivers on without music were statistically significant \((t = 4.58, P < 0.01)\) [Table 4], with older drivers showing more incorrect reactions \((M = 86.50)\) than the young drivers \((M = 34.75)\). In the calm music exposure, statistically significant differences were found among young and old drivers \((t = 3.25, P < 0.01)\) [Table 4], with older drivers showing more incorrect reactions \((M = 93)\) than the young drivers \((M = 30.63)\). In the drum music exposure, statistically significant differences were found among young and old drivers \((t = 5.51, P < 0.01)\) [Table 4], with older drivers showing more incorrect reactions \((M = 97.25)\) than the old drivers \((M = 30.88)\). In the jazz music exposure as well, statistically significant differences were found among young and old drivers \((t = 4.18, P < 0.01)\) [Table 4], with old drivers showing more delayed reactions \((M = 99.75)\) than the young drivers \((M = 28.25)\). Figure 6 shows the mean graphs on incorrect reactions of young and old drivers.

Delayed reactions

The ANOVA results showed that the main effect for music and age was statistically significant. The main effect for music was statistically significant \([F (1,14) = 18.86, P < 0.01\), multivariate partial \(\eta^2 = 0.83]\) and the main effect for age was also statistically significant \([F (1,14) = 42.40, P < 0.01\), partial \(\eta^2 = 0.75]\). The interaction effect for “delayed reactions” was statistically insignificant \([F (1,14) = 1.06, P = 0.40\) partial \(\eta^2 = 0.21]\).

The t-test analysis found statistically significant differences among young and old drivers on without music \((t = 5.75, P < 0.01)\) [Table 4], with older drivers showing more delayed reactions \((M = 168.13)\) than the young drivers \((M = 75.88)\). In the calm music exposure, statistically significant differences were found among young and old drivers \((t = 6.29, P < 0.01)\) [Table 4], with older drivers showing more delayed reactions \((M = 140.88)\) than the young drivers \((M = 47.63)\). In the drum music exposure, statistically significant differences were found among young and old drivers \((t = 6.31, P < 0.01)\) [Table 4], with older drivers showing more delayed reactions \((M = 140.88)\) than the old drivers \((M = 32.63)\). In the jazz music exposure as well, statistically significant differences were found among young and old drivers \((t = 6.19, P < 0.01)\) [Table 4], with old drivers showing more delayed reactions \((M = 130)\) than the young drivers \((M = 35.63)\). Figure 7 shows the mean graphs on delayed reactions of young and old drivers.

Omitted reactions

The results on ANOVA for omitted reactions found that the main effect for music was statistically significant \([F (1,14) = 10.80, P < 0.01\), multivariate partial \(\eta^2 = 0.73]\) and main effect for age was also statistically significant \([F (1,14) = 43.53, P < 0.01\), partial \(\eta^2 = 0.76]\). However, the interaction effect for “omitted reactions”
was found to be statistically insignificant \( F (1,14) = 0.68, P = 0.58 \) partial \( \eta^2 = 0.15 \).

The t-test analysis found significant differences among young and old drivers on without music \( (t = 6.03, P < 0.01) \) [Table 4], with older drivers showing more omitted reactions \( (M = 218.75) \) than the young drivers \( (M = 50.75) \). In the calm music exposure, statistically significant differences were found among young and old drivers \( (t = 6.28, P < 0.01) \) [Table 4], with older drivers showing more omitted reactions \( (M = 202.75) \) than the young drivers \( (M = 32.25) \). In the drum music exposure, statistically significant differences were found among young and old drivers \( (t = 7.66, P < 0.01) \) [Table 4], with older drivers showing more omitted reactions \( (M = 189) \) than the old drivers \( (M = 13.88) \). In the jazz music exposure as well, statistically significant differences were found among young and old drivers \( (t = 5.44, P < 0.01) \) [Table 4], with old drivers showing more omitted reactions \( (M = 180.63) \) than the young drivers \( (M = 24.13) \). Figure 8 shows the mean graphs on omitted reactions of young and old drivers.

**On-time correct reactions**

The ANOVA results found the main effect for music and age as statistically significant. The main effect for music was statistically significant \( F (1,14) = 24.64, P < 0.01 \), multivariate partial \( \eta^2 = 0.86 \) and main effect for age was also statistically significant \( F (1,14) = 13.48, P < 0.01 \), partial \( \eta^2 = 0.91 \). However, the interaction effect for “on-time correct reactions” was found to be statistically insignificant \( F (1,14) = 1.61, P = 0.24 \), partial \( \eta^2 = 0.29 \).

The t-test analysis for the on-time correct reactions found statistically significant differences among young and old drivers on without music \( (t = 10.64, P < 0.01) \) [Table 4], with young drivers showing more on-time correct reactions \( (M = 398.13) \) than the old drivers \( (M = 105.63) \). In the calm music exposure, statistically significant differences were found among young and old drivers \( (t = 10.96, P < 0.01) \) [Table 4], with young drivers showing more on-time correct reactions \( (M = 443.38) \) than the old drivers \( (M = 146.88) \). In the drum music exposure, statistically significant differences were found among young and old drivers \( (t = 12.23, P < 0.01) \) [Table 4], with young drivers showing more on-time correct reactions \( (M = 476.75) \) than the old drivers \( (M = 157.38) \). In the jazz music exposure as well, statistically significant differences were found among young and old drivers \( (t = 10.03, P < 0.01) \) [Table 4], with young drivers showing more on-time correct reactions \( (M = 465.38) \) than the old drivers \( (M = 175) \). Figure 9 shows mean graphs on-time correct reactions of young and old drivers.

**Discussion**

Music is a way of life for majority of population worldwide, forming the backdrop of many other activities in daily routine.\([12,13]\) With an all-pervasive influence of music in daily lives, music research started focusing on listening to music in day-to-day life situations to improve the understanding of how music can influence personal experiences and behavior.\([14,15]\) This is also true in case of driving where people listen to music to attain enjoyment or to feel engaged when driving in a solitude.\([12,16]\) It has also been found that listening to music distracts from driving and can therefore influence safety.\([17]\) The speed with which a person can respond is known to be the “RT.” Usually, the road traffic crash reconstructionists attribute a standard RT of 1.5 s, when analyzing a case.
However, RT has been found to be a complicated behavior, affected by a large number of variables and varies widely among individuals.\textsuperscript{[18]} The influence of music on driving performance has been given some attention recently\textsuperscript{[19]} though its strong relationship with one’s RT was already established many years ago.\textsuperscript{[20]} The aim of this research was to understand the influence of music and age on the RT among drivers.

The participants were divided into young and old age group and were exposed to Vienna Test System. As per the hypothesis (H\textsubscript{0}), the influence of music exposure on average RT, correct reactions, incorrect reactions, delayed reactions, omitted reactions, and on-time correct reactions was expected. The results also supported it as the influence of music was found to be statistically significant on all the RT, i.e., average RT, correct reactions, incorrect reactions, delayed reactions, omitted reactions, and on-time correct reactions, hence the hypothesis was upheld. Various research studies have had the same results. In one of the studies where influence of motor RT was gauged, it was found that music shortened RT, and the influence of variety music was more effective than the classic one.\textsuperscript{[20]} In a simulated driving task study, RT was found to be enhanced when participants were exposed to hard rock music during a nonconscious task of longer duration. However, crashes increased during quiet hard rock music in comparison to quiet industrial noise. Loud volumes were observed as effecting simple vigilance, whereas hard rock music may affect tasks involving concentration and attention, especially among males.\textsuperscript{[21]} The findings of the present study also support the mood-arousal hypothesis which contends that music can lead to a more optimal arousal level benefitting driving performance.\textsuperscript{[13,22]}

As per the hypothesis (H\textsubscript{0}), it was expected that age will have a significant influence on the average RT, correct reactions, incorrect reactions, delayed reactions, omitted reactions, and on-time correct reactions. The results supported the hypothesis (H\textsubscript{0}) except one reaction component of incorrect reactions, where age was not found to be statistically significant. However, average RT, correct reactions, delayed reactions, omitted reactions, and on-time correct reactions revealed significant differences. There have been several research studies where the data clearly support the claim that driving performance changes steadily across age groups.\textsuperscript{[23,24]} In a study where differences of driver’s RT as per age and mental workload were gauged, it was found that mental workload significantly influenced one’s RT. However, the RT among old drivers was found to be more pronounced.\textsuperscript{[25]} The findings of the present study are also in line with previous studies where changes with age on RT have been found. In another study, it was found that elderly adults showed a significantly decreased ability to divide attention when compared with young and middle-aged adults, even when individual differences in single task performance were adequately controlled for.\textsuperscript{[26]}

As per the hypothesis (H\textsubscript{0}), it was expected that young drivers as compared to old drivers will have reduced average RT, less incorrect reactions, and less omitted reactions but more correct reactions and more on-time correct reactions. The results of this research also supported this, as young drivers showed less average RT, incorrect reactions, and omitted reactions while more correct and on-time correct reactions in comparison to old drivers while performing the task. There were some interesting findings as well; the study also highlighted that the number of omitted reactions and the number of delayed reactions were observed to be highest during sessions under “without” music conditions and lowest during the drum music in the case of young drivers and jazz music in the case of older age group. The causal effect for the same maybe attributed to the increased arousal due to music, thereby reducing the stress and boredom which may set due to monotony. Music can maintain a participant’s interest in a long task and also helps to cope up with stressful situations.\textsuperscript{[27]} This study found a strong positive impact of music among both the age groups as in the presence of music, their total RT along with the correct attempts increased, whereas incorrect and omitted reactions decreased, i.e., when exposed to jazz or drum conditions.

### Conclusion

Overall, it can be concluded that the RT of the driver was significantly influenced by both age and type of music. The old age group has shown higher RT as compared to the young age group during all the different types of music exposure. This study highlighted that the number of correct reactions was lowest for without music for both the age groups.

### Limitations

A sample size of at least 30 is required for the results of the analysis to be statistically significant. However, due to paucity of the time, the sample considered in the present study is only 16. For future, more sample size of at least 100 drivers will be taken as participants in order to study the impact with different environmental settings in simulated as well as in field conditions.

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### Conflicts of interest

There are no conflicts of interest.

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