

Research Paper

Psychological Analysis Report of Accident & Traffic Data in Bengaluru

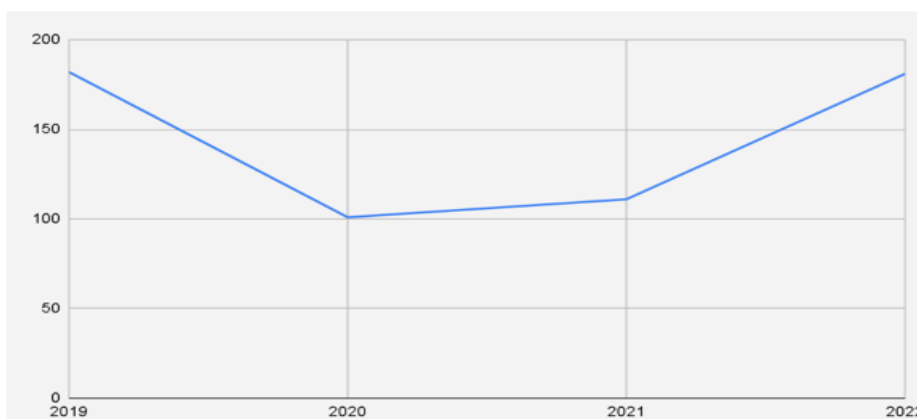
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ABSTRACT

The following document talks about the analysis of the accident data provided by the Bengaluru Metropolitan Transport Corporation (BMTc) Accident Department and the solutions that can be suggested to them regarding their training and development techniques or methods. The study focuses on the use of data pointers such as age, type of accident (minor, major, fatal) and the time/demographics of the accident during the years of 2018 to 2022, and deals with the usage of Contextual Mediated accident model to create inferences and suggestions about the profile(s) of drivers involved in the accident.

Keywords: Accident, BMTc, Bengaluru, Contextual Mediated Model, Proximal, Distal, Outcome

Accidents are one of the leading causes of death in the world. In India, road accidents are a frequent occurrence with a number of 4,12,432 (as of 2021). According to New Indian Express, the number of accidents as of 2019 and 2020 as 810 and 655 respectively. These include accidents involving two-wheeler vehicles, pedestrians, goods moving vehicles and large tankers or even small cars and autos as well.



(Fig.1: Accident rate and numbers for the past four years)

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Received: May 28, 2023; Revision Received: June 07, 2023; Accepted: June 09, 2023

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There has been a massive change in accident trends and types of accidents occurring specially in the last two to three years (2019, 2020, and 2021) with the start of COVID-19 as well as the end of COVID-19. The accidents data are still giving clarity on the different accident trends despite the change in numbers of the accident rate. The COVID-19 pandemic had resulted in a decline in the number of accidents during 2020 and 2021. However, the trends in numbers & types of accidents remain consistent.

Psychologically speaking, the propensity to crash is directly or indirectly affected by the personality predictors or behavioral predictors of a particular accident. Initial research entries saw that there was an insignificant and weak association between accident involvement and personality factors or characteristics (as suggested in the models that are given in the following paper). There came several models and hypothesis involving the relationship between psychological intervention such as behavioral changes and accidents.

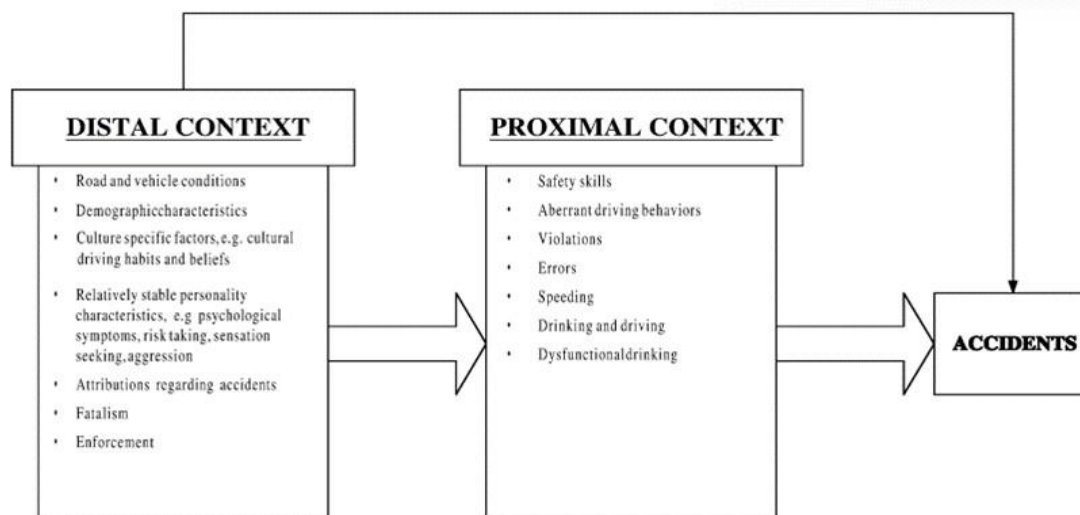
Various models of accident occurrence and its propensity were discussed in the detailed research hypothesis of Nebi Sümer (Sümer, 2003). Keeping a psychological and a methodological point of view Leonard Evans (Evans, 1991) indicates about accident proneness hypothesis, suggesting that the average crash rate is directly proportional to propensity comparison. From the model given by Evans, there have been various other research indicating the personality factors and the relationship with accidents such as James Elander, Robert West and Davina J French (Elander, West, & French, 1993) who suggested the question of why only a small number of accident variation is explained by personality factors. Evolving from that model, researchers arrived at the acceptance of various accidental factors such as distal or peripheral factors and mediating or proximal factors.

According to various researchers (Parker & Malone, 2004) (Stradling & Michelle Meadows, 2004) accident factors can be characterized and hence even categorized. There are two major factors, namely, the distal and proximal factors, and the ratio of accidents that occur are based on these two factors. Apart from the demographic, personality, lifestyle, and attitude (distal factors), there are also the mediating factors which involve driving characteristics which include driving style and safety margins or even margin of error.

Arriving from the same school of thought as that of James Elander, Robert West and Davina J French (Elander, West, & French, 1993) is the Contextual Mediated Model. The main purpose of the proposed contextual model is to distinguish the distal and proximal contextual factors that are related to accident involvement in a mediating framework and classify the correlates of risky driving according to their contextual closure to accident involvement.

Contextual classification of causal factors is also expected to help researchers construct casual models in examining the predictive power of personality and behavioral variables.

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(Fig.2: Relationship between distal/proximal context to the accident variables) (Sümer, 2003)

- a) Distal context: This deals with the overall external factors of driving and road safety. It also involved the socio-cultural and economic factors as well, from the social driving convention to the condition of the road and vehicle in use. The factor also involves the prior mindset of the driving condition, accidents rate and the law enforcement towards road safety such as helmets, seat belts, etc.,
- b) Proximal Context: This context deals with the internal factors of driving, involving more behavioral factors and personality characteristics. This involves the safety and security measures, unsafe habits, substance abuse problems, violations, and improper driving habits, etc.,

Taking these two conditions together, it is easier to conclude about the mode of accident, the relationship between the environmental, behavioral factor and the accident rate and the causal factors for the accidents on a psychological or psychometric level. But the common consensus among driving individuals is that the external causes or the distal context are more in number and are the causal factor for the proximal factor. Hence it makes most of the proximal context invalid and does not add value towards the behavioral factor causing the accident.

Moving ahead, another model suggested something different whilst adding on to sensation seeking. Per-Arne Rimmö and Lars Åberg (Rimmö & Åberg, 1999) proposed a mediational model if aberrant driving behaviors mediate the relationship between sensation seeking and accidents. They found that sensation seeking had significant indirect effects on accident involvement via driving behaviors (i.e., violations and mistakes) although it did not have any direct effects.

Now taking into effect the sensation factor of driving, there comes numerous factors such as:

- a) Ecological Factors such as the lighting, shadow effect, depth of road, sunlight, heat, cold, etc., which are more natural causal factors of sensations
- b) Internal Factors such as loss of eyesight, peripheral vision, behavioral indifferences (such as anger, confusion, etc.,) or more which can be either –
 1. Physical Difficulties
 2. Mental Difficulties

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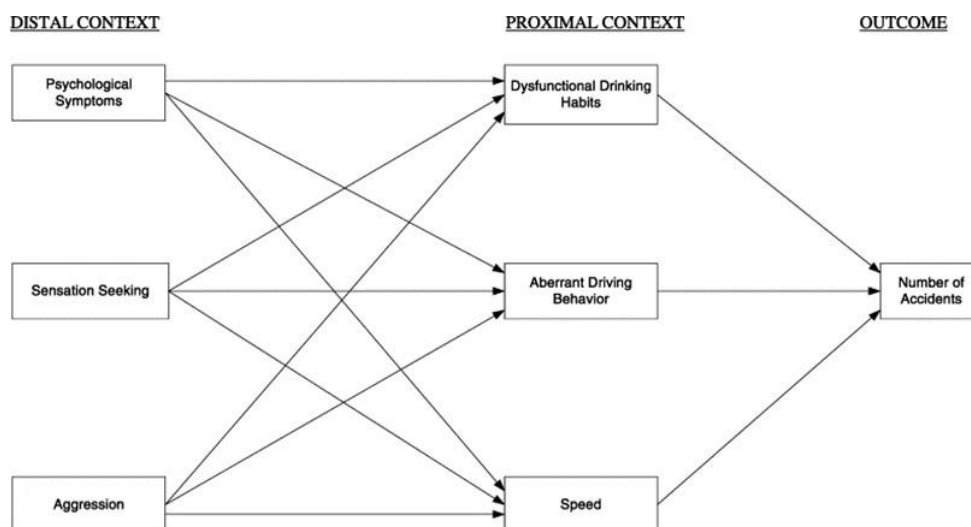
- c) External Factors/Socio-Cultural or Socio-Economic factor which can include the norms, rules and/or regulations that are guiding the driving habits, etc., which are all sensation giving from the external environment.

Even though the sensation does offer to be hindrances, there are also sensation seekers who are willing to risk for the sake of the experience and in roads such as in India it is a grave situation taking into consideration the number of accidents happening due to road safety negligence. With all these factors in mind, it is important that we add in the values of sensation, sensation seeking, distal and proximal factors to judge the effectiveness of tracking, analyzing, and researching on the relationship between the behavioral factors and the rate of accidents.

Hence for this report we will be looking at the use of the Proposed Contextual Mediated Model of Nebi Sümer and look at how the model can be used to incorporate the report generation and suggestion given towards BMTC.

Proposed Contextual Mediated Model

Following the footsteps of the contextual mediated model, the proposed contextual mediated model also follows the footsteps of the use of Distal Context and Proximal Context to measure the outcome (i.e., the number of accidents). According to Nebi, the model also now included the analysis of psychological or psychopathological factors as well as the feeling of aggression in the driving style and affecting the number of accidents.



(Fig.3: Proposed Contextual Mediated Model for Accident Analysis) (Sümer, 2003)

1. Sensation Seeking: Coming along the same lines as before, it is the most widely studied factor and adds on to the proximal factors such as with speed (Horvath & Zuckerman, 1993), frequent overtaking, and lane changing (McMillen, Smith, & Parker, 1989), and driver behaviors, especially with violations (Rimmö & Åberg, 1999). According to B A Jonah (Jonah, 1997), sensation seeking also influences alcohol or substance abuse and risky driving behavior or even vice-versa, both which then have more effect in the collision rate.

2. Psychological Seeking: Some past studies revealed that those with elevated levels of psychopathological symptoms were more likely to involve in both traffic and other types of accidents (McDonald & Davey, 1996), other studies did not reveal a significant relationship

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or showed very weak association. Ming Tsuang and her group of researchers during their research of psychiatric aspects of traffic accidents (Tsuang, Boor, & Fleming, 1985) concluded that although the findings considering the link between psychopathological symptoms and accidents involvement were mixed because of the methodological problems in the studies, people with high personality disorders (or psychological symptoms) seemed to be more vulnerable to accidents. In their literature review, McDonald and Davey found that the prevalence of personality disorders, especially antisocial personality disorder and hostility, was greater in accidents victims than it was for the general population. Contrary to the expectations, however, they found that anxiety and repressive disorders were not common among accident victims, although stress, as the natural correlate of these disorders, was found to be strongly associated with accident involvement. There is no unambiguous evidence suggesting that specific psychological symptoms cause road crashes. However, past studies have not examined whether general psychopathological state including various symptoms such as anxiety, depression, and hostility influences accident involvement via its effects on more proximal risky driving behaviors. Therefore, psychological symptoms were included as a distal element in this study.

3. Aggression: As the final distal context variable, aggression has been studied extensively as a major cause for traffic conditions in Indian roads. Aggressive driving has also been found to be associated with feelings of anger, frustration, hostile appraisals of other drivers (Gulian, Matthews, Glendon, & Davies, 1989), and is even the empirical proof for accidents and road closure in Indian roads as well.

4. Proximal Analysis: This includes the previous discussed topics, but diving deeper majorly into the following:

- a. Dysfunctional drinking habits - It is also said that alcohol or even substance abuse is one of the leading cause and effect for aggressive nature and road traffic closure as well, also leading towards the next two Proximal factors which are below.
- b. Aberrant driving behavior
- c. Speed

Study Area

This study is focused on the city of Bengaluru. The city is a rich & diverse land of immense global potential in terms of information technology and computer sciences. Bangalore is the third most populated city & the capital of the state of Karnataka in India. The city is stretched to 1741 square kilometers and is at an elevation of 3020 feet above sea level. Because of the elevation, the city's temperature remains to be cool, moderate and pleasant all throughout the year. The Tropical Savanna Climate doesn't let the temperature drop below eleven degrees in winters and till now. The maximum recorded temperature is 38.9 degrees. Usually, the weather maintains itself between 20 degrees to 36 degrees. As of March 2022, there are 1.04 crores of vehicles – off which 69.31 lakh are two wheelers, 21.97 lakh are cars, 6,763 are BMTC public buses. There are various different reputation about the roads and infrastructure of the transportation pathways of Bengaluru, mostly due to the traffic intensity and potholes, broken roads and lack of proper resources in various roadways of the city. The city was chosen for this study to understand the ratio of accidents to the various factors in the diverse road sets of the city and understand how to come up with suggestions and inferences to avoid accidents in the future.

Analysis and Inferences

This study analyzed the trends of accidents during the past years and to understand/infer the root-cause of the accidents and eventually arrive at recommending workable solutions to avoid accidents in the future. The data that at hand consists of the following information:

1. Age (of the driver)
2. Type of Accident
 - a. Major, Minor and Fatal
 - b. At Fault or Not At Fault
3. Time of Accident & Demographics

Each type of data is a clear indication about the type of psychological relationship that the rate of accidents and the data pointer can have and what can be the probable suggestions that can aid in the avoidance of the occurrence of accidents.

Age:

Age is an especially important psychological factor in anyone's life. It is important to analyze the cognitive responses as the age increases, especially those involving working in stimulus rich environments such as public transportation.

Based on Professor Dr. Daniel L. Murman, cognition, to the working class of the people can have an effect in numerous factors - particular to the attention span, memory and learning ability and the spatial perception & judgement.

I. Attention Span:

Attention span in general is known to decrease as the age increases. Attention span is also seen in two ways - selective attention and divided attention. Selective attention span is the attention span of just one selective task(s) at a time and divided attention span is the time given to multiple tasks at the same time. A subject and person's performance is said to be less when there are multiple tasks, and multiple stimuli involved together. Studies have also indicated that increase in age reduces the capacity of an individual to be involved in multiple different tasks and hence, due to low divided attention span, have declining performance rates for the different tasks. Apart from the above stipulated points, the relationship between accident rate and sensation seeking (Ayvaşık, Er, & Sümer, 2017) is also seen to be more increasing with decreasing or even varying age, making it also an important characteristic to measure.

II. Memory and Learning Ability:

Psychological & sociological studies have shown the trend of decreasing learning abilities with increasing age and declining rate of retrieval of newly learnt material/resources. Subjects or individuals of lower age have higher capacity of remembering which can range up to 10 items based on the ability or rate of divided attention. This proves an inconvenience to the people of old age who do not have the capability to learn more than 4 to 5 items at a time and are also incapable of being able to retrieve the learnt ability faster than the younger generation.

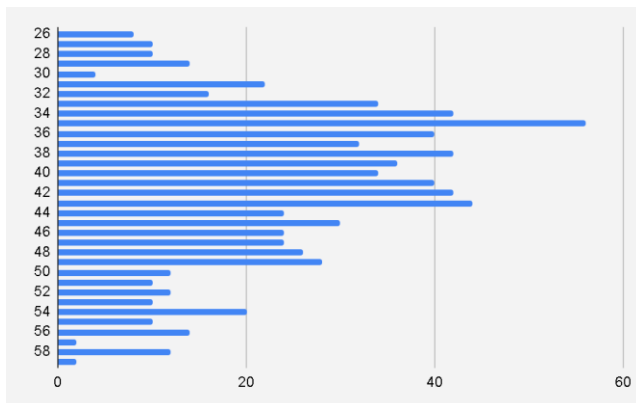
III. Spatial Judgement, Visual Spatial Processing & Visual Perceptual Judgement:

There is an age-related decline in the aspect of visual spatial processing, which is more needed for jobs such as transportation, driving, construction, etc., which require the use of personal judgement of the mind with respect to shapes, sizes, width and length of roads or

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materials, assembly and designing and related tasks. Though it is proven that visual recognition of distinct items, things, shapes are more with increasing age, the visual perception judgement of various things are seen to be in a declining rate, which can prove to be dangerous when people with increased age factors are working under a stimuli rich environment that requires a consistent and constant visual spatial judgement.

Based on the data that was given, the age distribution frequency is as given below:



(Fig.4: Age Distribution and Frequency Table of drivers involved in accidents)

The age frequency can be broken down into blocks, based on the distinct types of people and their psychological mindset towards work, cognitive or motor functions, sociological factors, etc., which can affect the ratio of accidents. The blocks are of different age frames together which are as follows:

A. Block A (20 to 35):

Block A (27.48%) is still considered a ripe age, with more focus on working capability. They are known to have higher amounts of cognition and can reach up to the peak of their learning ability and memory buildup during this age group. The propensity to be involved in multiple different activities is more during the age group, also leading towards higher rates of divided attention span amongst the subjects.

Sociological studies also indicate that the major working class also are a part of this age group, hence are also introduced and exposed to various working conditions and environments.

B. Block B (36 to 45):

Block B (47.39%) is more experienced and can be categorized as the senior drivers. They consist of the drivers who have a moderate rate of attention, both selective and divided, and have a like moderate level of learning capability or memory capacity as that of Block A. Unlike Block A, the drivers here in this block are all experienced and do not take part in different activities. Other than activities, various familial factors such as death in the family, marriage, childbirth, etc., can all play a major factor in this age group, and the propensity for various mental blockages while driving is also higher in this age group. With the scope of availability of data this possibility of research can be further developed in the coming studies and can play a vital role in understanding the sociological influences with the accidents (as the data would become available).

C. Block C (46 and above):

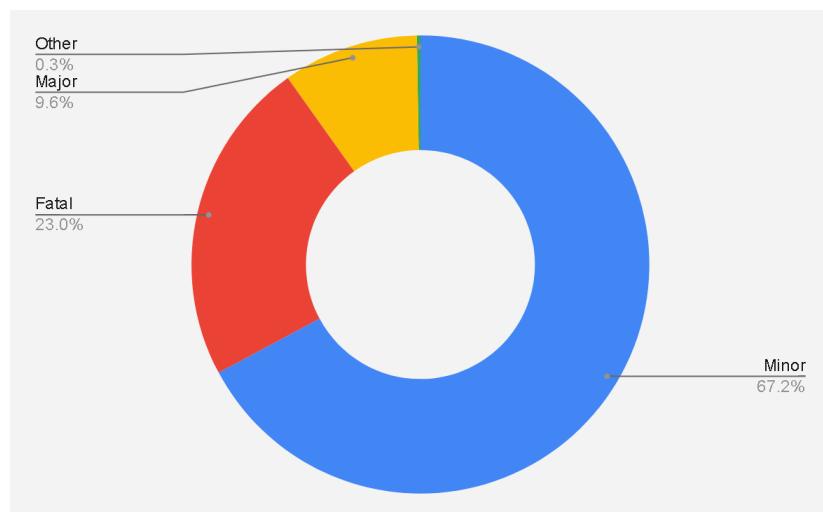
Block C (26.82%) can be categorized as the super senior drivers in the sample population. The people in this particular population have much higher experience than the others, with higher visual recognition of roads, routes and vehicles but have a declining or lower rate of visual spatial processing or visual perceptual judgement based on the size of roads, distance between vehicles, speed, etc., This can be because of various physiological problems, illness, eyesight problems, handicaps of any sorts, etc., or various mental factors, irritation or problems.

Type of Accidents:

Several types of accidents can have diverse types of mental effects on the drivers (Marasini, Caleffi, Machado, & Pereira, 2022) (Leslie & Rooney, 2012). These are considered as psychological “non-economic” damages towards the drivers, where accident involved parties may go through the following different mental damages or illness:

- Grief
- Flashbacks
- Depression
- Detachment
- Difficulty in Concentration
- Irritability
- Emotional Instability
- Aggression
- Emotional Distress
- Mental Anguish
- Psychological Damages
- Post Traumatic Stress Disorder (PTSD)
- Anxiety

Accidents can be categorized based on the intensity of the repercussion of a particular accident on the people and the environment around. Based on the given data and the structuring under this data pointer, the diverse types of accidents are as follows:



(Fig.5: Distribution Graph of different type of accidents)

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a. Minor

This involves those accidents that involve accidents which are just minor in nature, involving scratches, vehicular damage, and nothing which causes any danger to any person or life.

The person involved in this accident would be going through the following mental damage:

- i. Grief
- ii. Flashback
- iii. Depression
- iv. Irritability
- v. Inability to concentrate

This does not require massive amounts of effort to solve or treat and just needs minor reasoning and spaces for clearing the air around the driver.

b. Major

Major accidents are those accidents which have caused physical or mental damage to any person involved in the accident and caused damage to the environment as well. Along with the above mental blockage or repercussion, the following repercussion would be:

- a. Mental Anguish
- b. Emotional Distress
- c. Depression
- d. Detachment
- e. Anxiety

This requires a moderate level of care and comfort and would sometimes majorly require minor consultancy with doctors or psychologists and does not involve massive amounts of effort.

c. Fatal

Fatal accidents, as the name suggests, are accidents which have counted for any fatality caused by the accident. This involves deaths caused directly (or indirectly too) by accidents involving vehicles.

Fatal accidents can prove to be the biggest instigators of mental damages and psychological damage to the survivors and drivers which can range to anything in the following (including the above given as well):

- i. PTSD
- ii. Anxiety
- iii. Depression
- iv. Emotional Instability

The people involved in fatal accidents must undergo treatments or consultancy with psychologists or psychiatrists who can help solve PTSD in a much effective manner possible. These types of accidents can sometimes even prove to be ineffective against treatments for a longer period and would require additional efforts to rebound back into working condition.

Apart from just type of accident, there may also be the different type of people in the accident who will either be:

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- At Fault or who are causal factor of the accident.
- Not at Fault or those who are not the reason or the causal factor of the accident.

(This can also involve the crew members of the bus as well, who may or may not be involved)

Despite whether a person is at fault (AF) or not at fault (NAF), the psychological repercussions of the accident would apply to them depending upon the rate of accident intensity and its effect on the person or subject. While a person who is not at fault would tend to face less of a psychological flashback in minor (or sometimes even major) accidents, fatal accidents tend to have similar psychological repercussions for those who are not at fault and specially for those who are at fault as well. This is also a cause for various other accidents as well and acts as a causal factor too.

Time of Accident and Demographics:

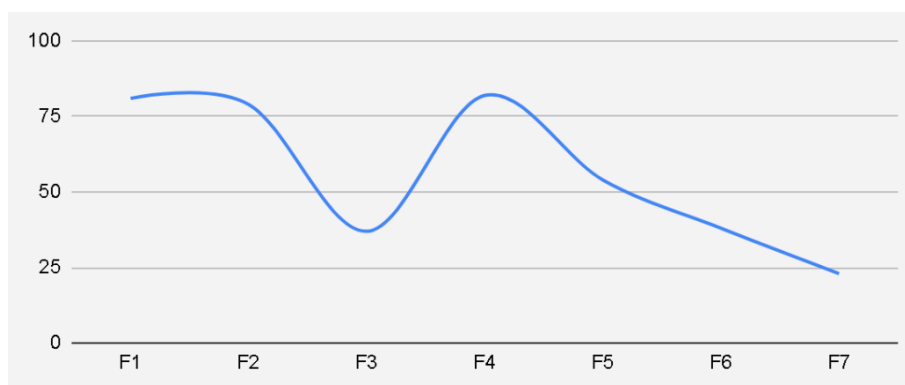
Time of accidents and demographics play a significant role in the profiling of accidents as they give a more insider investigation of the sociological and environmental aspect of the accident-causing factors (Oralhan & Göktolga, 2018) (Al-Karablieh & Kehagia, 2018). Demographic factors can include several factors such as the type of road, activities happening in the road, size or area of the driving space, pathways and walking areas along the roads, exposure to travel situations, construction activities happening across the area, etc., which are important to assess the viability of spatial judgement for drivers. Time of accidents can give a deeper look into the mindset of the drivers during various times of the day, and the factors in the social sphere and personal sphere which affect the driver's mentality such as hunger, sleep, light effects, etc.,

Along with vehicular conditions, the light effects and the weather conditions also affect accident propensity and the type of accident which can occur as well. Various times of day varied lighting effects. Road intersections, walk paths, road signage, etc., all have a varied interpretation mindset based on the lighting and the weather effects on a particular day. This also gives rise to variability in speed and driving behaviors in the daytime and nighttime, based on external factors such as traffic, heat or cold, vehicle capacity and capability, etc.,

In India in particular, it is said that the accidents tend to occur within a time frame of 3:00 PM to 6:00 PM, due to the fact that young adults, school children finish their university/college and schools along the same frame respectively, working adults also get off from work along the same time and businesses tend to start running with full force along the same frame we well. Hence the time is seen as a buzzing time. This also gives in more factors to account for a driver while driving, which can include erratic pedestrian behaviors, change of lighting leading to ineffective vision, etc.,

Based on the data that is there at hand, the average accident rate during various times of the day are as follows:

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(Fig.6: Graphical spread of the average accident rate during different time of the day)

To analyze the different timing and split of the day better, the day can be better split into different periods:

- i. Frame 1 (F1) - 12:00 AM to 8:59 AM
- ii. Frame 2 (F2) - 9:00 AM to 11:59 AM
- iii. Frame 3 (F3) - 12:00 PM to 1:59 PM
- iv. Frame 4 (F4) - 2:00 PM to 4:59 PM
- v. Frame 5 (F5) - 5:00 PM to 6:59 PM
- vi. Frame 6 (F6) - 7:00 PM to 8:59 PM
- vii. Frame 7 (F7) - 9:00 PM to 11:59 PM

F1 as the time suggests is the late night/early morning while F2 deals with the start of the morning routine for working individuals and school or college going students. F3 and F4 are the afternoon and end of the school or college timing for students. F5 and F6 are the final retirement time for the working individual and finally F7 is the late night and final frame of the day.

Taking the graphical representation as the trend, rate, and propensity of accidents during different frames, we can see that the maximum accidents is seen around F4 and there is a steep increase from F3 to F4 and a gradual decrease towards F5. Hence, taking the average timing, we can see that on the roads of Bengaluru the period between 1:30 PM to 6:00 PM is seen as the time of the day with the most accidents.

Diving deeper into F4, we can see that the time between 2:00 PM and 5:00 PM or 6:00 PM has the following easy observations:

- a. Increase in pedestrian activity from dormancy or least activity to higher activity
- b. Change or transition of weather from warmer to cooler temperature
- c. Transitioning of the lighting from straight and pinching (maximum brightness) to a more moderate and lighter tone of color (reduced to no brightness)

These factors can be a “distraction” or a change of pace of the driver, hence adding on the divided attention and an unexpected change in the overall pace of the city, leading to confusion and psychological or mental blockage.

Apart from the above point, it is also the period when the people are starting to relax from a day’s work and may even retire for the day. Hence drivers may also start getting into a relaxed state of mind, leading to subtle slacking of driving behaviors which can also lead to

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accidents. This can also be caused because of the shift's nature of the work of BMTC drivers, leading to physiological fatigue and mental tiredness after a shift or day's work. Hence this will also lead to accidents happening because of an urge to go to a comfortable environment such as office, or home.

The urge can also be a reason to give rise to various feelings and emotions such as:

- a. Restlessness
- b. Recklessness
- c. Anger
- d. Tiredness
- e. Sadness
- f. Lethargy or Laziness
- g. Lack of Interest

The above emotional points can be a major reason for the Time of Accident and Demographic including various psychological, physiological, or even socio- environmental factors causing the accident rates and numbers.

Adding on the above pointers, the timely working of streetlights, and the effectiveness of the reflective signs along the roads can also play a particularly significant role in the propensity to accidents and the effects that they can have in their avoidance as well.

Arriving at the Local Mediated Model for Accidents (in towns and cities)

Putting in all the above 4 factors as a model for accidental avoidance for BMTC or Bengaluru roads, based on the Conceptual Mediated and Proposed Conceptual Mediated Model:

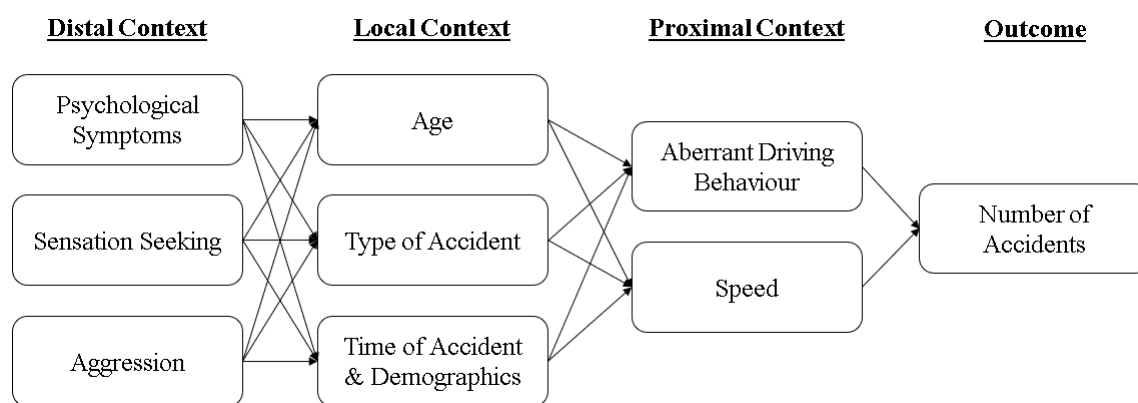


Fig.7: Local Mediated Accidents Model

The above model has 4 parts to it:

- a. Distal Context - Focuses on the internal factors of an accident to happen, which is more personality based and behavior inducing.
- b. Local Context - Includes the numerous factors of development of a person which gives a backing to the psychological factors of the distal context and can give rise to various sub factors such as cognition testing, spatial processing, etc.,
- c. Proximal Context - Focuses on the external factors of an accident and the environmental factors that affect the propensity of accidents to happen.
- d. Outcome - This is just simply measuring the number of accidents that will happen.

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Each of these factors, especially the local context, can and must be used for training and development and must be looked at to see how the sub factors under each can be developed much better.

Under the Local Context, the sub factors for training must be:

A. Age:

- h. Cognitive Factors
 - i. Learning and Development; Learning Capacity
 - ii. Memory Capacity
- i. Road Context and Road Activity Knowledge
- j. Spatial Judgement and Proximal Spatial Judgement
- k. Increasing attention span - or attention-oriented activity building

B. Type of Accident:

- l. Mental challenge-oriented development
- m. Stress Free mental state building activities - such as Yoga, retreats
- n. Using situations or real-life cases studies to raise accident awareness and discuss mode of action during events or actions.

C. Time of Accident and Demographics:

- o. Developing real world awareness
- p. General people development
- q. Trips and observational/educational trips
- r. Mini-educational seminars

Despite all the above core focus areas, the major areas that would also require no matter the accident type of propensity would be psychological aid such as counselling or health retreats which can help them in avoiding mental psychological blockage and avoid the induction of various mental illness or blockage making them unfit for working.

There must be a more People Management oriented approach towards employee or driver management and must be oriented towards development of the personnel through consistent people development activities that can focus on the above Local Context pointers and the use of better HR tactics to better motivate the people through Rewards and Recognition or any method that the situation can deem fit.

Apart from the pointers written above, the model can be used for prediction of accidents through sensitivity surveys, taken either from the perspective of the general public or through the eyes of the drivers and BMTC personnel. This can also help in understanding driver psyche much deeper and can even analyze the skills and attitude of drivers before starting of the job role and responsibilities.

The above discussed model can also include the factors that are not discussed in the above report/paper and can also play an inter-dependent role in the prevention of accidents and the use of the model in the training and development of drivers and/or to raise the awareness of pedestrians as well. This can also pave way towards making technological innovations for minimizing the accident risks from the view of drivers.

DISCUSSION

The above study has aimed at arriving at the mix of both sociological and psychological factors affecting accidents. With the data that was received, we can conclude that the psychological factorial analysis of age, accident type, time of accident, etc., All provide the opportunity to assess the accidents through a multitude of lenses. Each of the factors have come to conclusion that:

A. For the Age factor:

The analysis showed that almost 40% of the data proves that the profile majorly resides in understanding the age based psychological responses of the drivers. This, majorly Block B of the age group, give inferences such as:

- i. Cognitive factors that are derived from age are important to take into consideration whilst choosing the drivers and the routes on which the bus is to be driven in.
- ii. There is a lot of importance of experiential learning in the bus driving business, hence also involves the involvement of the age groups which have good hands-on experience in the work that they have been doing for a good while.
- iii. Hence, we can conclude that the right training mechanism must be focused on the age groups of 20 to 45 since the experience and the cognition, with the mental attitude towards work being better, can add to a reduced accidents count.

B. For the Type of Accident:

- i. Major accidents (9.6%) and Fatal Accidents (23%) can be concluded to induce a higher rate of emotional and mental instability than minor accidents, hence causing furthermore accidents. Hence it is vital that drivers with major or fatal accidents are mentally tested and understood to be mentally stable or active before getting into the field.

C. For the Accident Time and Demographic:

- i. There are numerous factors in accident time which can affect a driver and the pedestrian as well. These can affect the vision of a driver to the environmental sensations during various times of the day.
- ii. Higher light sensitivity can cause light blinding or glaring, and low intensity can cause absolute blinding. Hence either technical changes on the bus must be made or training must be given to drivers to be able to tackle the problems.
- iii. Along with the same, with the above factors also playing a significant role - especially the age factor - it is also important to balance out and satisfy the basic urges such as hunger, the urge to relive oneself, etc., which would also cause recklessness.

All of these are concluding factors based on the data at hand. The Local Mediated Accidents Model includes the above conclusions and can be used to assess and understand a driver based on the following factors and can test out the places of improvements.

The study in the future can also include on more hands-on working with the drivers through workshops and/or activities that can help raise awareness on the improvement of the cognitive capabilities, mental health, and can also see the change in the attitude, skills, and accident rate over a particular range of time. This can also help in understanding the feasibility of the model discussed above and practically practice with the profile created.

Points of Improvement

With the restriction of the type of data that is available, the current study aimed at giving a structural model for the understanding of accidents and the various psychological factors that can be added to that model. But with the above discussion there are also scope for improvement on the study:

1. Interviewing drivers and/or victims to get more case study for better evaluation.
2. Gaining in additional data types apart from the above explained types.
3. Collaborating with the data team of various organizations focusing on the work to reduce accidents and raise awareness.
4. Practical and hands-on visits to the place of accident and scoping out the various environmental factors affecting the rate of accidents.
5. Improving upon the present psychological evaluation and presenting better accident propensity models to be used in a local level.
6. Include gender-based statistics and analysis for both pedestrian and driver(s).
7. Producing suggestions, statistical methods, and implementable methods of safer tracking of accidents to gain additional point of views on accidents that are happening.

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Acknowledgement

The author(s) appreciates all those who participated in the study and helped to facilitate the research process.

Conflict of Interest

The author(s) declared no conflict of interest.

How to cite this article: Aadhithyan, TS & Sen, AV, S. (2023). Psychological Analysis Report of Accident & Traffic Data in Bengaluru. *International Journal of Indian Psychology*, 11(2), 1971-1986. DIP:18.01.199.20231102, DOI:10.25215/1102.199