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Road safety and the use of mobile devices in South Africa

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DECLARATION

I, Albert Mahlomotja, declare that this research article is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the Graduate School of Business Administration, University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

SIGNATURE

Signed at: Randburg, Blairgowrie

On the 23rd day of March 2019

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- Save the best for last I would like to thank my God my creator through him everything is possible.
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ABSTRACT

The research paper investigates the use of mobile driving (MD) on South African roads. The advent of technological advancement has become a prevalent force within society as it has shaped the behaviour and psychology of motorists' on our road. The MD is a popular gadget amongst all motorists. Unfortunately, it has created a very unconducive environment for safe driving as motorist are distracted leading to impaired response time of reflexes and poor attention of the road. Despite law enforcement prohibiting the use of the MD while driving motorist still continue behaviour.

The research paper has already illicit findings to address the discourse and solving a social problem. Working professionals in the age category 25-34 and 35-49 years old are frequent users of MD while driving likely due to work pressures and limited time constraints. The removal of the MD is not the solution but rather to integrate the MD with the car. Boredom is the root cause for mobile use while driving. Though having company in the car mitigate the use of the MD. People who MD with greater purpose (professionals, business people) are also more likely to be alone in the car which exacerbates the behaviour.

The Road Traffic Management Corporation (RTMC), South African Police Services (SAPS), Discovery and the National Traffic Police are the custodians in South Africa that are the beneficiaries of the research.

LIST OF ABBREVIATIONS

DaCoTA European Commission Directorate General for Mobility and Transport ITF International Transport Forums

NHTSA National Highway Traffic Safety Administration

SAPS South African Police Services

JMPD Johannesburg Metro Police Department

NDS Naturalistic Driving Study

WHO World Health Organisation

RTMC Road Traffic Management Corporation

GDP Gross Domestic Products

TPB Theory of Planned Behaviour

GPS Global Positioning System

DIDC Discovery Insure Driving Challenge

RTC Road Traffic Crashes

RTI Road Traffic Incident

MD Mobile Driving

MDD MD while driving

1. Introduction

Ignorance is at the heart of impulsive behaviour. The failure of an individual to accept that their conduct is wrongful and instead the individual insist on proceeding with it. According to subject matter experts, impulsiveness is a multidimensional concept that has been defined variously as an inability to wait, a tendency to act without forethought, insensitivity to consequences, and an inability to inhibit inappropriate behaviours (Ainslie, 1975). Driving a motor vehicle is a normal daily routine which a grown adult can conduct having achieved majority status in the eyes of the law. At the same time operating a mobile driving (MD) is easy and practical for anybody regardless of age group. Mobile driving shall be used as an abbreviation very often as MD. The paradox comes in when the motorist tries to multi task the two separate functions of driving and mobile use at the same time. The simultaneous function is compelled by the advent popularity of, but not limited to texting, browsing, viewing videos, social media and playing games on a MD. The behaviour can leads to the detrimental impact of an accident, near miss and delayed response on the road as a consequence (Chrisholm, 2012).

This discovery strengthens IPSOS findings that South Africa has the highest proportion of participants 41% guilty of texting, emailing and active on social media while driving. Resulting in a lethal concoction of motor accidents in the country (Toren, 2015). MD have asserted its dominance on our daily lifestyles. Entrenched within the human psyche, there is a need for constant connectivity to one's devices (Penning, 2013). The International Association for the Wireless Telecommunications Industry has reported that Globally the number of text messages has increased more than 23 times between 2005 & 2009 to 1.6 trillion messages annually (CITA, 2010). Inevitably this led to a significant increase in the number of texting while driving occurrences especially among young drivers (Nemme, 2010) (Owens, 2011).

MD are a catalyst of a growing means of communication, because of its discreetness to uphold conversation with no words spoken and noise uttered. A motorist with a handheld can text without looking at the keypads on the phone over time. This misconstrues them into believing that they can drive while texting, browsing, playing games and view videos, which puts them in danger of potential accidents presented by cognitive, visual and physical distraction attained from ignorance and "I know better" mind-set. Cognitive resources are necessary to read the messages and to think

of responses. Visual attention is required to read the message with sight of the keypads on the phone while driving when responding, entails the phone must be physically held with the hand while manually entering keystrokes while driving (Saquer, 2012). Our research shall assist us to gain a better understanding of the South African motorist psyche decision making process. The alarming rate of high accidents which are caused by MD users as a root cause is a growing concern on the behaviour. Hands-free devices and voice recognition technology have both failed to curtain the behaviour (Venter, 2016).

The technological age of MD has raised a growing consciousness of image on social media and maintaining a personal footprint in being responsive to conversation on a digital platform. A MD allows the motorist accessibility to respond to conversations at the touch of a keypad. The problem present in our current domain is that MD users have become so addictive (Nemme, 2010). To the detriment of their safety and that of the fellow motorist. We can reckon with pure logic that being active on social media can wait until the end of your journey but the psychological (peer pressure) and social pressures (culture), misleads motorists to engage and maintain a conversation during the entire, if not intervals of the, journey. In 2015 a total of 12944 fatalities in 10613 fatal Road Traffic Crashes (RTCs) were recorded by the RTMC. Under-reporting of RTCs is a global issue which leads to 5% adjustment accounted for under-reporting (European Road Safety Observatory, 2009).

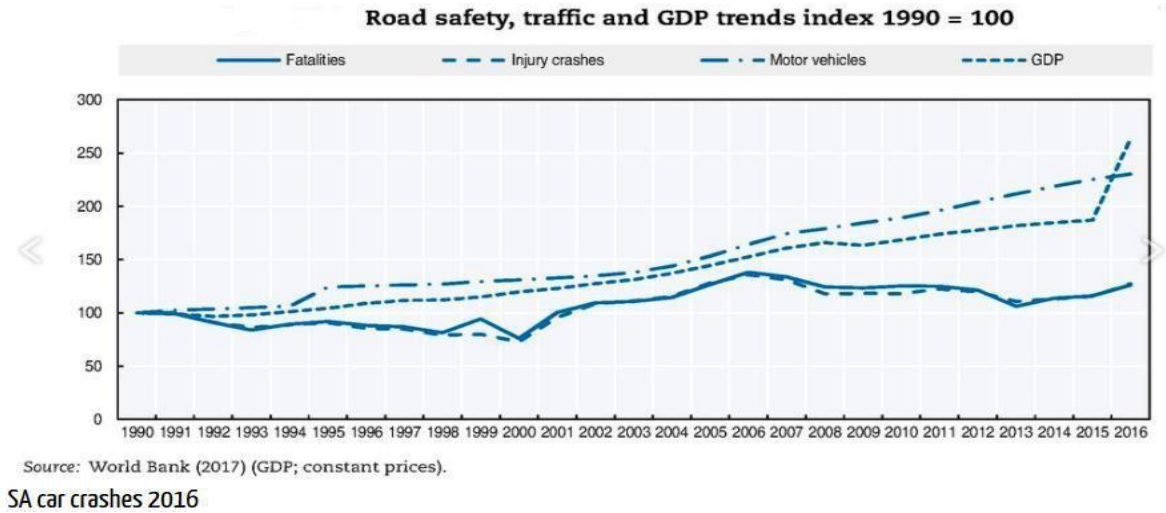


Figure1: SA Car Crashes 2016 (World Bank, 2017)

The total cost of RTCs on South Africa's road network for 2015 amounted to an estimated R142.95 billion which equates to 3.4% of GDP (Labuschagne, 2016).

Number of RTCs and RTIs for 2015, adjusted for underreporting					
	Fatal	Major	Minor	Damage only	Total
Number of RTCs	11 144	40 117	132 609	648 560	832 431
	Death	Serious	Slight	No injury	Total
Number of persons	13 591	62 520	202 509	1 429 794	1 708 414

Tabl e 1: No. of RTC and RTIs for 2015 (World Bank, 2017)

According to the Traffic Offices Survey Report (2016), has handheld devices whilst driving as 13371 incidents collectively for the year 2016 while averaging a monthly incident rate of 669. Though it may appear minute at 0.2% contribution against 6333177 total offences relative to 1% contribution in 2015, its impact when practising the behaviour is disastrous. The behaviour of being active on social media while driving is compared relative to drunken driving in that the motorist's reflections are impaired.

Offences Item Groups	Number	Activities	Group Offences TOS 2016	% of Total Offences TOS 2016	% of Total Offences TOS 2015
3 Moving Offences	1	Inconsiderate Driving	101,359	1,6%	0,2%
	2	Overtaking in Face/Barrier line	3,423	0,1%	0,8%
	3	Road Sign/Marking -Traffic Signal Violation	54,970	0,9%	**5,7%**
	4	Stopping on freeway	8,755	0,1%	0,3%
	5	Speed-Manual (Hand Held Camera)	199,801	3,2%	**10,8%**
	6	Speed- Camera (Fixed Camera)	68,934	1,1%	**24,0%**
	7	Seat belt (driver)	67,458	1,1%	**4,1%**
	8	Seat belt (Passenger)	61,676	1,0%	**14,4%**
	9	Seat belt (Rear)	303,283	**4,8%**	0,3%
	10	Unlicensed Vehicles	329,667	**5,2%**	3,4%
	11	Fail to display Licence Disc	160,355	2,5%	1,9%
	12	Fail to display Operator Card	9,979	0,2%	0,5%
	13	Overloading (goods)	2,038,724	**32,2%**	1,1%
	14	Overloading (passengers)	1,115,462	**17,6%**	1,1%
	15	Held Cell phone in Hand Whilst driving	13,371	0,2%	1,0%
	16	Other Moving Offences	238,103	3,8%	2,8%
		Sub-Total	**4,775,320**	**75,4%**	**72,2%**

Table2: Moving Offences breakdown on Traffic Offences Survey 2015 (Labuschagne, 2016).

A national dialogue needs to take place to address texting while driving, as the fatality rate is growing on our roads. The purpose of the report is to raise a growing consciousness of road safety, adherence to legislation and preventative measures for being active on social media while driving.

Cost Category	Total Cost per RTC (R million)					
	Fatal	Major	Minor	Damage only	Total	%
Human Casualty Cost	58 332	24 794	14 546	1 358	99 030	69.3
Vehicle Repair Cost	218	809	2 902	17 395	21 326	14.9
Incident Cost	2 018	5 113	2 740	12 723	22 595	15.8
Total Cost	**60 569**	**30 716**	**20 189**	**31 477**	**142 951**	**100.0**
Per cent	42.4	21.5	14.1	22.0	100.0	

Table3: Total RTC costs by cost category and cost element (Labuschagne, 2016).

In 2011 the World Health Organisation (WHO) and the National Highway Traffic Safety Administration (NHTSA) indicated that worldwide the proportion of drivers making use of mobile phones while driving has increased from 1% to 11% in the last five to ten years (Burton, 2011). Driver inattention according to the NHTSA (2014) is the leading factor in most crashes and near-crashes in South Africa.

The International Transport Forums (ITF) 2018 road Safety Annual Report indicate South Africa experiences 32 accidents per 100,000 people per year and 25% of those crashes are caused by the use of mobile phones while driving. This means for a population of 57,485,287 as reported on Sunday 19th August 2018 by the United Nations, only 18,395 are real-time accidents that have occurred, and 4,599 are accidents related to the use of MD. Other countries also report similar statistics as indicated in Table4

Country	Contributory factor in injury and fatal crashes
Australia	14 per cent of crashes where drivers were hospitalised but not killed in the crash were attributed to distraction (Beanland et al. 2013).
New Zealand	10 per cent of fatal crashes and 9 per cent of injury crashes caused by distraction (WHO and NHTSA, 2011).
Netherlands	8.3 per cent crashes resulting in fatalities were due to mobile phone usage (SWOV factsheet, 2012).
Spain	37 per cent of all crashes were caused by distracted driving (WHO and NHTSA, 2011).
Canada	10.7 per cent of fatal crashes caused by distracted driving (WHO and NHTSA, 2011).
Great Britain	2 per cent of crashes are attributed to driver distraction (Burton, 2011).
Columbia	9 per cent of all crashes attributed to distraction and 21 percent of crashes involving pedestrian fatalities (WHO and NHTSA, 2011).

Table 4: Distraction Crashes in countries other than RSA (Venter, 2016)

1.1 Research Problem

The use of MD while driving has raised a new impulsive behaviour in which motorists lack consciousness of potential hazards. The research paper determines whether impulsiveness does form part of everyday driving in South Africa. The research problem is to investigate a definitive solution for being active on MD while driving in South Africa as follows:

1) How does the use of mobile phones impact and impair driving and road safety?
2) What are the factors that lead to the use of mobile phones while driving?

Notwithstanding the technological advancement in hands free and voice recognition, many accidents continue to be recorded that are a direct root cause of MD while driving (Pope, 2000). This all points to a bigger problem that awareness and technological advancement alone cannot tackle the behaviour. This begs the question what else can be done to address the known behavioural problem targeting motorists who are inclined towards impulsive behaviour.

2. Literature Review

2.1 Impulsive Behaviour

Impulsive behaviour in layman terms can be defined as a set of actions triggered by an urge in which individuals are unaware they could potentially cause detrimental harm to themselves or to other people in the process. The 3 constructs that measure impulsive behaviour using the Barratt Impulsiveness Scale are: (Bari, 2016)

- the inability to concentrate or focus attention on the task at hand, making quick cognitive decisions in line with lack of perseverance dimension
- the tendency to act without thinking and in a way similar to Whiteside and Lynam's (2001) urgency dimension
- non-planning impulsiveness which entails the lack of future planning

The Barratt Impulsiveness Scale (BIS-11) is a questionnaire designed to assess the personality/behavioural construct of impulsiveness (Patton, 1995). It is the most widely cited instrument for the assessment of impulsiveness and has been used to advance our understanding of this construct and its relationship to other clinical phenomena for 50 years (Stanford, 2009). The current version of the Barratt Impulsiveness Scale (BIS-11) is composed of 30 items describing common impulsive or non-impulsive (for reverse scored items) behaviours and preferences (Patton, 1995).

The method of identifying impulsive decision making was derived in the field of economics, adopting the concepts of choosing between smaller, immediate and larger, but with a delayed monetary option. One's tendency to choose smaller, immediate monetary reward, also termed delay discounting (Ainslie, 1975), is based on the premise that the value of an outcome diminishes as a result of its delayed receipt (Mazur, 1987) and has been thought to underlie some forms of impulsive decision-making (Madden, 2010).

2.2 Habit formation & behaviour change

The theory of habit formation & behaviour change (Messinis, 2002) is a habit of specific behaviour that is prompted by a particular cue or trigger, and results in a positive outcome. Motorists are active on social media while driving as they achieve self-fulfilment in the process. This outcome of self-fulfilment encourages repetition of the behaviour over a period of time, and as a result it becomes routine and subconsciously acceptable behaviour to the human psyche. Motorists may be unaware that the habit exists, which means that it's difficult to change from the onset. Changing the behavioural habit of mobile users on social media whether texting, browsing and watching videos, may require the removal of the cue to act on the behaviour, which in this instance is the MD. The cue should be removed to avoid triggering the habitual behaviour of the motorist, or it must be replaced by a new behaviour, such as a hands-free device or voice recognition technology. Providing a loyalty rewards program to encourage correct behaviour, encourages change, such as placing your MD in the boot of the car, or using a hands free and voice recognition device can go a long way to change behaviour. Discovery has done a good job by encompassing an application which monitors and provides a score at the end of the trip, based on which the insured motorist gets rewards through a reduction in premium spinoffs and discounts through Vitality points (Matseba, 2018).

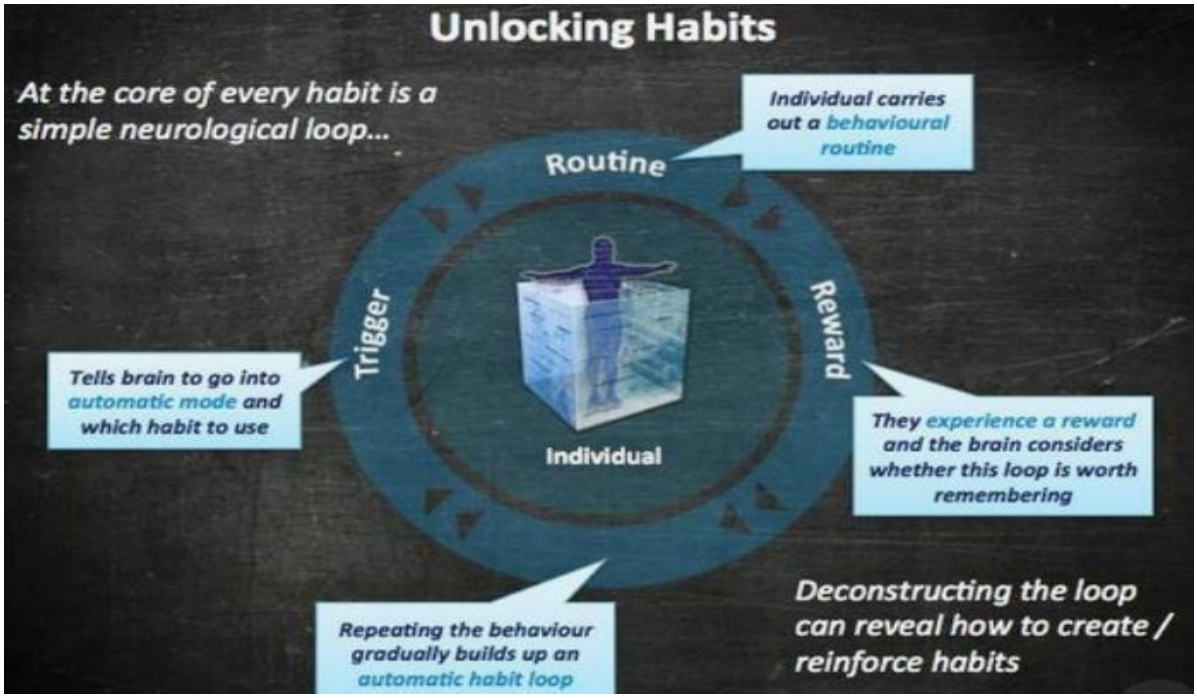


Figure2: Theory of Habit Formation & Behaviour change (Pinterest, 2017)

2.3 Consumer Behaviour

Many researchers have attempted to identify factors encouraging impulsive behaviour (Karbasivar, 2011). Motorists are focused on instant gratification of their strong need, not thinking of the real problem which is to be resolved in a higher-quality manner (Solomon, 2002). Numerous forms of impulsive purchases are namely rationally unplanned, emotionally impulsive and objectively impulsive. Special attention devoted to factors influencing impulse purchases and consumer behaviour (Žnidersic, 2014).

External impulsive behaviour factors are under full control of motor vehicle manufacturers, and they will try to use them to incite the impulse buying mechanism, such as tuning the radio, adjusting the mirror and switching on the aircon (Ling, 2015). Impulsive buying behavior can be considered as a way of increasing profit (Dalley, 2011). Modifications made to the vehicle with the intention of upgrading safety features on the motor vehicle have yielded an adverse effect.

Internal impulsive purchase factors are related solely to the motorist and can influence them to a minor extent. Examples include talking to passengers, grooming, as well as eating and drinking. Any engagement in the secondary tasks listed above influences driving performance negatively, because the driver divides his attention between the driving task and the secondary activities (Stutts, 2003; Horberry, 2006).

International research related to distracted driving behaviour revolve around talking on a telephone (either hand-held or hands-free) while driving (Caird, 2005; Peisner, 2011); texting (Breen, 2009; Leung, 2012), passenger distractions (Stutts, 2003; Drews, 2008), grooming, eating and drinking while driving (Stutts, 2003). All of these activities contribute to degradation in driving performance, despite skill of driving and years of experience.

2.4 Role of Inattention and Distraction Drivers

Society has been engulfed in an emerging impulsive communicational lifestyle choice that endangers the lives of motorists on South African roads. Being active on your MD while driving is a ticking time bomb waiting to explode. The statistics in

Table 1-4 indicate a growing trend of handheld usage while driving, contributing to road fatality as a global phenomenon. Arrive Alive campaigns lack relevance and a vibrant undertone to draw the attention of the motorists, as their focus is on addressing fatigue of the driver and roadworthiness of the vehicle (Gqirana, 2015). It has been argued that through impulsive behaviour, the motorist may overlook the law in the interest of MD usage. Institutional structures such as SAPS, Traffic Police and JMPD have failed to mitigate this particular behaviour despite the consequences.

The role that inattention and distraction drivers play in crashes or near-crashes has received much attention from researches, motor insurance, government, vehicle manufacturers, advertisement agency, law enforcement and mobile manufactures as well (NHTSA, 2014). This has resulted in wireless communication, infotainment (broadcast material which is intended both to entertain and to inform) and driver assistance systems becoming a standard feature in modern manufactured motor vehicles (Venter, 2016). Indications suggest that with these technologies, the incidence of distraction-related crashes have escalated and left the driver worse off (Young, 2007). Behaviours that contribute to driver inattention and distraction also include eating and drinking while driving, interaction with passengers (Just, 2008), passenger influences (Strayer, 2007, Young, 2007) and listening to music (Ünäl, 2012). Inattentiveness while driving is difficult to determine, due to the fact that fatigue, drowsiness and highway hypnosis are also considered as inattentive driving and difficult to observe (Young, 2007, Stelling, 2012).

Inattention is associated with a lack of situational awareness where the driver is not aware of potential risks in the traffic environment, and is thus unable to appropriately respond to these risks (Young, 2007; Stelling, 2012). Driver distraction can be referred to as a specific type of driver inattention that occurs when a triggering event induces an attention shift away from the primary task of driving (NHTSA, 2014; Horberry, 2006). Anything that diverts the driver's attention away from the primary task of safely navigating the vehicle is driver distraction and multi-tasking while driving (Salvuci, 2002). A concern highlighted in the literature is that despite the large body of research that has emerged on inattentive and distracted driving in the last decade, there are still no universal definitions agreed upon (Regan, 2011). Furthermore, the modification made to motor vehicles to deter mobile usage through social media while driving has

left the motorists worse with no significant changes citing the current strategies as ineffective to resolve the behavioural problem (Lee, 2013).

Research suggests that those who are active on their MD while driving are 23 times more likely to have an accident than those who do not (Box, 2009). Furthermore, the probability of a crash while driving is twice as likely when drinking and driving (Penning, 2013). South African motorists are not immune to the behaviour despite law enforcements. The attitude of the driver requires change. The problem is not identifying the offenders who disobey the law and operate under duress. Rather it is to change the perception, behaviour and level of decision making as they are of paramount importance to resolve and to find a definitive solution.

2.5 The Law on Handheld Usage While Driving

The South African National Road Traffic Act No. 93 of 1993 under Regulation 308A prohibits use of device a communication while driving on a public road, which is not limited to the following:

- The use of a cell phone at a traffic light
- Taking pictures, browsing the internet and interacting on any social media platform
- The rule applies to officials as well, where in the past they used to be exempted.

The only exemptions to the rule apply when the device is in use only if neither hand or body part is holding the phone. This can only be achieved through a hands free set and voice recognition technology. Guilty offenders of the rule will be liable for a R500 spot fine, which can escalate to R750 in accordance to current municipal policy. Under no circumstance can an officer confiscate your phone or detain you, even if you are driving without a driver license at the time as have been reported by John Best, a Mayco member for Safety & Security (Nzimande, 2016).

Mobile usage while driving is equal to driving blind for 5 seconds with each text (Penning, 2013). In the duration of the 5 seconds, cognitive resources are used to read the message: visual attention requires the message to be read, and the physical aspect entails the motorist to hold the phone with either hand (Saquer, 2012). As a result, the motorist is compromised and operating the vehicle with impaired response time.

In South Africa, with rising costs of living and economic turmoil, South African motorists is anxious and tense for the future. Maslow's Hierarchy of Needs (1943, 1954) states that people are motivated to achieve certain needs and that some needs take precedence over others. There are five stages, which all need to be fulfilled to achieve self-fulfilment. According to Maslow's (1987) definition, safety needs includes security from crime, fear, protection of family and property. Maslow (1987) wrote that in American society, most adults are satisfied with their safety needs. The statutory laws and government ensure for the safe running of the society to avoid chaos and disorder in the country. In relation to texting while driving, the proliferation of safer vehicles with airbags and motion sensors, improved public safety laws, presence of law enforcement (Traffic police, Johannesburg Metro Police Department and South African Police Service) and safety belt use, all satisfy that second tier of safety needs satisfaction.

In a recent interpretation of Maslow's theory, Gorman (2010) reasons that a person cannot pursue higher order needs without having the lower level needs such as food, shelter or safety fulfilled as a prerequisite. Under this assumption texting, while driving is either due to poor risk cognizance on the part of the driver, or because the driver feels safe and is both motivated and able to pursue higher need satisfaction. Maslow's hierarchy of needs in his theory emphasized the critical importance of culture in personal fulfilment. Safety needs are satisfied largely due to law enforcements. Belongingness needs involve affiliation with a group, and esteem needs require achievement or recognition. Without societal norms as a guide, people have a lack of direction in how to satisfy their needs. Culture provides the framework for personal definition, motivation and achievement, which is socially recognized (Gorman, 2010).

Exploring cultural attitudes, values, and norms in light of distracted driving illuminates what is valued by motorists and their level of needs satisfaction regarding safety, belongingness, esteem, and ultimately leads to an improved understanding of the

social culture. Maslow's Law shall expand the need for texting while driving, where hierarchy levels 3 to 5 focus on the needs, which are social (the need to belong covering family, friendships & intimacy) and esteem (self-worth, accomplishment, confidence and self-actualization) These are driving factors, which compel the use of texting while driving. Mobile usage while driving fulfils all five stages of Maslow's Law to reach self-actualization.

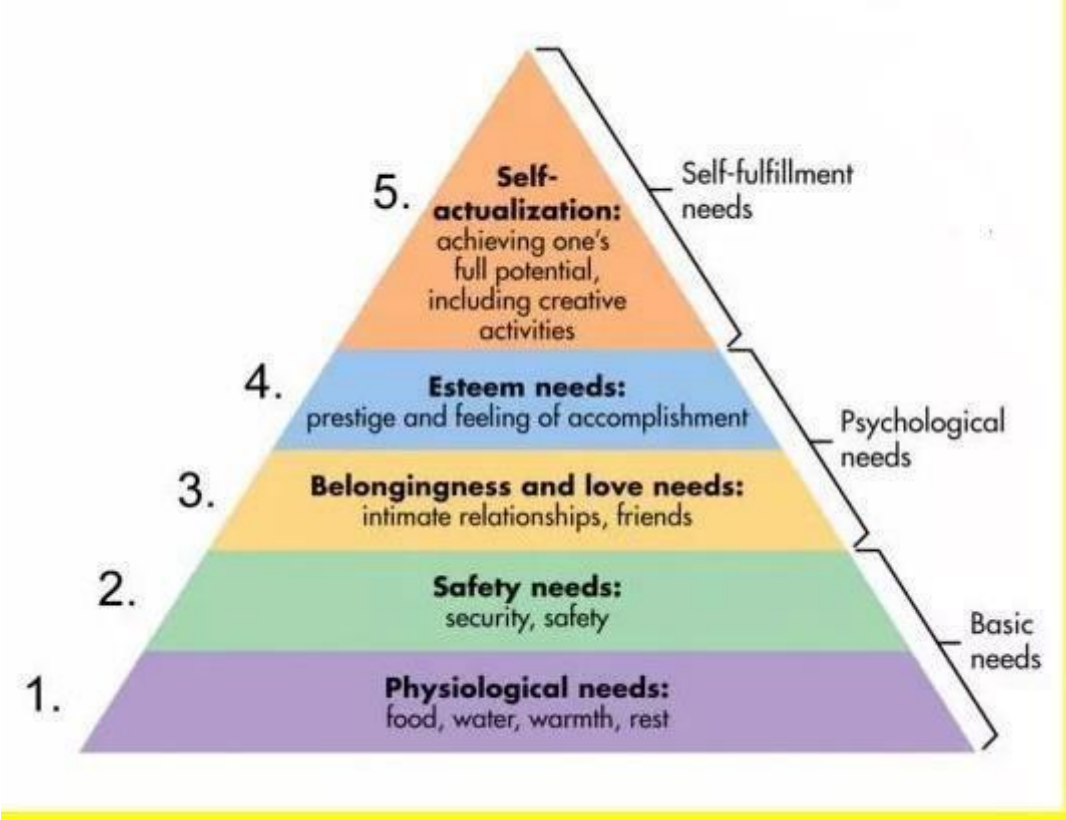


Figure3: Maslow's Hierarchy of Needs (Maslow, 1943)

Mobile usage while driving can be associated with the necessity to be loved as a human being, being cared for by another person, the need to belong, which is internalised in all of us as human beings as a social identity to the world. The interaction boosts your self-esteem, as a reflection of views are being taken into consideration, knowing your views are being heard in a safe platform for your personal privacy, and the curiosity to read the respond texted, creates a continuous dialogue, even during driving, as the physiological standpoint as social consciousness is more important than concentrating on driving. It involves elements of psychology, safety, love, belonging, appreciation, self-esteem and social identity, which make up the five levels of needs on Maslow's Hierarchy (Jerome, 2013). These elements are satisfied, therefore indicating Maslow's Hierarchy of Needs offer a positive perspective on

mobile usage while driving, even though it is categorically wrong in principle of statue laws on our roads.

2.7 Behaviour of Mobile Usage While Driving

Statistics indicated in figure 4 show how the behaviour impacts on the economy in terms of GDP and taxpayers money, but is still being practiced as a daily lifestyle, due to social pressure, consciousness of digital image and curiosity to always be updated, resulting in a high hit ratio of the cell phone in the motorist's hand while driving.

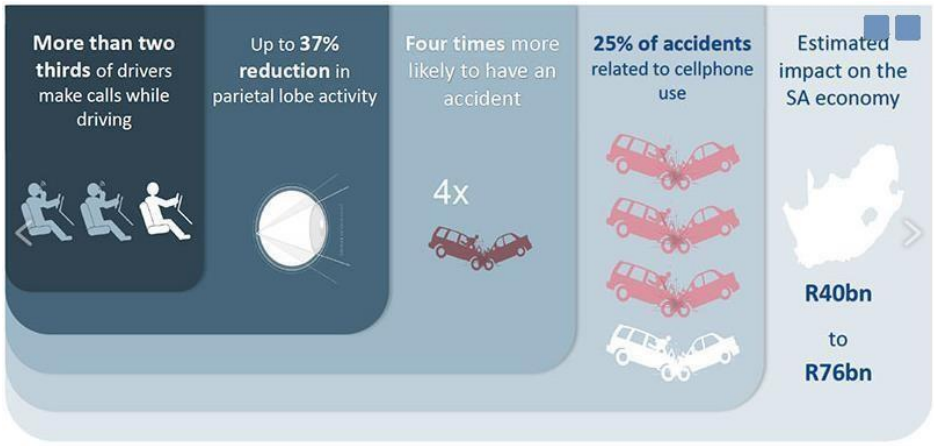


Figure4: Chain effect of texting while driving to economy (Businesstech, 2016)

Subjective norm is to keep up to date of your social media time feed, to remain active and relevant with the change in times. The social class we associate with, predetermine how often does a motorist logon. To them the update is more important than complying with Traffic Law. Perceived behavioural control forms a chain effect, as the software application provider can link on multiple apps all to one single profile. Facebook can link to Instagram, Whatsapp and LinkedIn, ensuring the behaviour and search cookie profile is monitored to predetermine what product to market on their profile, while browsing any off the integrated applications. However, it's snooping and infringing on motorist privacy, but it assists the application provider to remain relevant and updated on what is trending in each respective territory.

Loyalty programmes can be seen as the carrot and stick to drive the change in the motorist's behaviour, to stop or mitigate mobile usage while driving. The theory of habit formation and change in behaviour encourages appropriately rewarding motorists. An application is already designed by Discovery to monitor the movement of the MD in

the car while in motion, and the motorist scores Vitality points for good behaviour and receives a reduction in motor premium (Matseba, 2017). The theory discovered that having the MD encourages use of it while driving hence, a hard line stance taken is that all phones must be placed in the boot of the car and a hands free device is mandatory for all motorist behind the wheel. Ideally in our study we wanted drivers to answer based on their actual driving experience which contributed to and reflected the definition of their attitudes. In our research we wanted drivers to answer based on their actual driving experience which contributed to and reflected the definition of their attitudes (Fitch, 2013).

2.8 Types of driver distraction

Sources of distraction can reside inside or outside the vehicle (DaCoTA, 2012). It can be technology- or traffic-related, self-initiated or imposed upon by the situation or circumstances (DaCoTA, 2012). Activities that affect a driver's ability to focus on the road vary from visual distractions inside and outside the vehicle, to cognitive and physical distractions within the vehicle (Victor, 2014). Pulling drivers' visual attention away from the road and the driving task, dilutes the drivers' ability to maintain a safe driving position and to react to potential hazards within the road environment. Cognitive resources are necessary to read the messages and to think of responses. Visual attention is required to read the message with sight of the keypads on the phone while driving, when responding, and physically entails the phone must be held with the hand while manually entering keystrokes while driving (Saquer, 2012)

2.9 Influential factors that impair driver performance

Research highlights that young and novice drivers tend to engage more in distracting driving activities than experienced drivers, which result in novice and young drivers being more at risk of being involved in a distracted driving related crash (Stavrinos., 2011). Experienced drivers are less likely to be involved in distracted driving crashes, but when they do engage in secondary activities it impairs their reaction times (Victor, 2000; Singh, 2010). Research has established that female drivers are more distracted while talking on a cell phone, and make more driver errors when driving distracted, compared to male drivers, who experience more distraction when there are

passengers in the vehicle (Singh, 2010; Irwin, 2011). Outside distractions include roadside advertisements (Young, 2007; Chattington, 2009), and moving billboards (Roberts, 2013). Furthermore, external distractions include a driver dazzled due to the sun, vehicles' headlights, checking for traffic and other road users, trying to find a location, scenery and looking at people or animals next to the road (Baird, 2011).

Although most studies agree that distraction causes a higher risk of a crash, there seems to be little agreement about the exact size of the effect (Stelling, 2012). Nevertheless, distraction affects essential aspects of road users' performance (Stelling, 2012). Talking on a telephone while driving has been proved to significantly reduce reaction time (Breen, 2009), speed control (Burn, 2002; Mayhew, 2013), as well as maintaining lane position (Mayhew, 2013). Similarly, engaging in a conversation with a passenger leads to slower reaction times, increases in following distance and difficulty in keeping the vehicle on the road (DaCota review, 2012). Distracted drivers fail to see visual information and cues when they take their eyes or their minds off the road (Stelling, 2012). Furthermore, distracted drivers tend to look straight ahead for longer time periods, do not consider their immediate (peripheral) environment often enough, looks at the dashboard and in the mirrors less frequently, and the drivers' reaction times increase along with displays of late and abrupt braking (Vlakveld, 2006).

2.10 Evidence of distracted driving in South Africa

South Africa is no exception to technology developments and according to AC Nielsen in Southern Africa (2011); more South Africans have access to mobile phones than to drinking water. Despite reports indicating that 25% of crashes in South Africa are related to the use of mobile phones, little formal research related to the prevalence of distracted driving has been published (My Broadband 2015). In 2015 a total of 12944 fatalities in 10613 fatal Road Traffic Crashes (RTCs) were recorded by the RTMC. This behaviour had an impact on our economy to the amount of R142.95 billion expenditures, which equates to 3.4% of GDP (Labuschagne, 2016). This point further reinforces the significance of the research paper to contribute towards a societal problem in South Africa. Indications from the private sector are that distracted driving is probably a major problem in South Africa.

In response, Discovery Insurance in collaboration with Cambridge Motion Technology, has created an application that uses telematics to measure driver behaviour on the cell phone in an awareness campaign referred to as the Driver Challenge (CMT, 2018). The accelerometer and GPS on the phone senses the movement of the cell phone inside the motor vehicle to provide a driver score at the end of the trip about their driver behaviour. The challenge incentives clients for good behaviour while driving, either in the form of reduced premiums or petrol discounts. Discovery Insure indicated that through its Discovery Insure Driving Challenge (DIDC) programme, the data collected shows that on average a single instance of mobile phone usage in South Africa represents approximately 52 seconds of distracted driving (My Broadband, 2015). The Company indicated that when driving at 60 km/h, this few seconds are equivalent to driving blind and makes crashes four times more likely to occur.

In addition, the research found that the worst 20% of offending South African drivers use their phones for an average of three minutes per trip (My Broadband, 2015). The application shall in the coming years become the gold standard of vehicle insurance, similar to fitting a tracker system. The application shall become compulsory, as it can determine whether the cell phone was in use prior to an accident during the investigation and in turn, motorists shall take their behaviour serious when means have been identified to expose them for texting while driving.

2.11 Research Purpose

MD have immense public utility, improving communication in social and commercial interactions. Nonetheless, their role in driver distraction and consequently in road traffic crashes means that some measures are required. The purpose of the report is to address MD where legislative measures, law enforcement, regulation of industry and changing social perception fail. It is important for government to be proactive now to preventable traffic injuries and deaths on roads in South Africa.

2.12 Research Question

In light of this, the study addresses the following research questions:

1) How does the use of mobile phones impact and impair driving and road safety?
2) What are the factors that lead to the use of mobile phones while driving?

Our research question ask if there is an association between mobile usage and impaired driving among South African motorists. From the literature review, it is clear that a number of factors related to MD impact the driver's ability to concentrate. Based on this, the following research propositions are proposed:

Factors of mobile phone use while driving:

PA1: Demographics influence the use of MD whilst driving. PA2:

Mobile phone use influences the use of MD whilst driving.

PA3: Security devices, like handheld kits, influence the use of MD whilst driving. PA4:

The particular mobile phone application influences the use of MD whilst driving.

PA5: Emotional states associated with mobile phone use influence the use of MD whilst driving.

PA6: Culture influences the use of MD whilst driving.

PA7: The perceived cost of mobile phone use influences the use of MD whilst driving.

Mobile phone use and safety:

PB1: Mobile phone use influences driver concentration.

PB2: Security devices, like handheld kits, influence driver concentration.

PB3: The particular mobile phone application influences driver concentration.

2.13 Conclusion

We are studying the effects of being active on social media while driving, as there is very little existing research in South Africa about distractive driving. More than 4 500 people died in 2016 on South African roads caused by speeding, alcohol and distracted driving, where the use of MD while driving is top of the list in terms of driver distraction. Approximately 41% of South Africans are guilty of mobile usage whilst driving according to Market and Opinion Firm Ipsos (NHTSA, 2014). In the process we are addressing a social problem where motorists are inherently unconscious of the dangers they are bringing to themselves and others. Lastly, the behaviour has a cost implication on our GDP in terms of billions of rand which varies in amounts according to reports and motor insurance industry attention. According to Precious Nduli, head of technical marketing at Discovery Insure, states South Africa has one of the highest road accident rates in the world, with around 25% of accidents related to cellphoneuse while driving. The implications of the behaviour on our economy is R307 billion a year which equates to 8% to 10% of the South African GDP (My Broadband, 2015).

3. Research Methodology

3.1 Research Paradigm

Research paradigms are human constructions, which deal with first principles or ultimates indicating where the researcher is coming from so as to construct meaning embedded in data (Lincoln, 2000). Paradigms are thus important because they provide beliefs and dictates, which, for scholars in a particular discipline, influence what should be studied, how it should be studied, and how the results of the study should be interpreted (Kivunja, 2017).

Qualitative research is primarily exploratory in nature and used to gain an understanding of underlying reasons which provides insight into the problem, while quantitative research is used to quantify the problem by way of generating numerical data that can be transformed into usable statistics for formulating fact in research (DeFranzo, 2011).

The research paper follows a quantitative research paradigm, in order to test the propositions made regarding MD and road safety

3.2 Research Design

The research design is based on descriptive statistics which will help to answer the research propositions. Descriptive statistics deals with the presentation of numerical facts or data, with the methodology of analysing the data (Anderson, 2010). The advantages are its low cost relative to other methods, no interviewer bias and the respondent has sufficient time to reply. The disadvantage of descriptive statistics are respondents can provide spontaneous answers, no control over the speed of feedback and the wrong person can complete the questionnaire (Bernard, 2012).

Furthermore, I used inferential statistics to extrapolate the sample of data taken from a population to describe and make inferences about the population (Foley, 2018). Inferential statistics are valuable when examination of each member of an entire population is not convenient or possible (Babyak, 2004).

3.3 Population and Sample

The population for the research is the South African motorist. Population is the broader group of people to whom you intend to generalize the results of your study (Hungler, 1999). Whereas the sample will always be a subset of your population (Haber, 1998).

Data collection for the purpose of our research has used the snowball sampling, where research participants recruited other participants for the study. Statistics research defines snowball sampling as a non-probability sampling technique where existing study subjects recruit future subjects from among their acquaintances and helps access hidden population groups difficult to access (Sharma, 2017). Thus the sample group appears to grow like a rolling snowball, as the sample builds up enough data to be useful for research (Johnson, 2014). The snowball sampling came for colleague referrals, friends, family, WITS Alumna Office and GIBS postgraduate. The snowball sampling advantages allows for studies to take place where otherwise it might be impossible to conduct, because of a lack of participants and snowball sampling may help you discover characteristics about a population that you weren't aware existed (Noy, 2007). The disadvantages are that it is usually impossible to determine the sampling error or make inferences about populations based on the obtained sample, as it does not select units for inclusion in the sample based on random selection (Sharma, 2017).

For descriptive statistics the general rule is a sample size of no less than 30 would allow us an adequate observation to utilize the benefits of the Central limit Theorem (Louangrath, 2014). At this point it would demonstrate the bell shape curve, if the data is normally distributed. Whereas for inferential statistics, the rule of thumb for determining sample size is a sample size larger than 100 and broken into subsamples with a minimum sample size of 30 for each category (Roscoe, 1975).

Based on the number of respondents we achieved 202 sample size, based on reasons mentioned above for both descriptive statistics and inferential analysis. A collective of academics agree sample sizes of 200 to 300 respondents provide an acceptable margin of error and fall below the point of diminishing returns (Lyons, 2015). The sample size, though small at over 200 respondents for the research paper, shall give

an opportunity for larger scale future research, either initiated by the insurance industry, government, traffic departments and vehicle manufacturers, to build on.

3.4 Research Instrument

The research instrument constitutes closed-ended survey questions, with questions mainly measured on 5 points (e.g. likert scale). The online questionnaire was developed against the literature review, application of the theoretical framework, and the theory of habit formation and change of behaviour. There are 2 sections to the online questionnaire, broken down into demographic information, and MD and road safety distraction.

The questionnaire is designed to probe and elicit deeper information pertaining to the factors seen to influence mobile phone use and road safety, namely mobile phone usage, perceptions of risk, perceived cost of mobile phone use while driving, culture pertaining to mobile phone use and driving, and emotions. Ethical approval has been obtained from the Ethics Committee of the University of the Witwatersrand (Appendix A) as protocol number WBS/BA0500740X/253.

3.5 Data Collection

Our research data came from online questionnaires completed by motorists to provide data for our research paper. Advantages of online questionnaires include (Sincero, 2012)

- ease of data gathering deploys rapid completion of the respondents
- minimal costs facilitates fast data collection from the target population
- automation in data input provides hassle-free handling of data which mitigates the possibility of data errors
- increase in response rates due as the highest level of convenience is provided to the respondents
- flexibility of design easily conducted through the internet.

While the disadvantages of the online questionnaire (Sincero, 2012)

- absences of interviewer especially with open ended questions

- inability to reach disadvantaged population as not all respondents do not have access to internet
- survey fraud for respondents who answer for the sake of getting it done

All prospective respondents are provided a disclaimer that the questionnaire is strictly for research purposes and under no event will their identity be revealed. All interviewees are encouraged to be honest and transparent at all times to all our questions without any judgement. The questionnaires itself comprises of 30 questions and which was quick and easy to fill in. On average it took less than 20 minutes on the online questionnaire to complete. The use of an electronic format increases accessibility for prospective respondents.

3.6 Data Analysis Method

Data analysis is the process of bringing order, structure and meaning to the mass data collected (Marshall,1999). Its aim is to develop new thoughts and views when analysing the problem. We used inferential statistics in the research to determine if there is a relationship between two independent variables. There were 3 common test used namely T-test, ANOVA and Pearson correlation. This data analysis method can illustrate differences and similarities across data sets, where key features are highlighted in large data set for rich interpretation (Braun, 2006).

BASIS FOR COMPARISON	DESCRIPTIVE STATISTICS	INFERENTIAL STATISTICS
Meaning	Descriptive Statistics is that branch of statistics which is concerned with describing the population under study.	Inferential Statistics is a type of statistics, that focuses on drawing conclusions about the population, on the basis of sample analysis and observation.
What it does?	Organize, analyze and present data in a meaningful way.	Compares, test and predicts data.
Form of final Result	Charts, Graphs and Tables	Probability
Usage	To describe a situation.	To explain the chances of occurrence of an event.
Function	It explains the data, which is already known, to summarize sample.	It attempts to reach the conclusion to learn about the population, that extends beyond the data available.

Table5: Key features of Descriptive and Inferential Analysis (Stangor, 2011)

For example, to measure the diameter of each nail that is manufactured in a mill is impractical. You can measure the diameters of a representative random sample of nails. You can use the information from the sample to make generalizations about the diameters of all of the nails.

	HYPOTHESIS	TEST TO DETERMINE RELATIONSHIP & P VALUE		
		ANOVA	CORRELATION	T-TEST
1	Demographics and the use of mobile devices whilst driving	X		
2	Mobile phone use and the use of mobile devices whilst driving			X
3	Security devices and the use of mobile devices whilst driving			X
4	Mobile phone application and the use of mobile devices whilst driving	X		
5	Emotional states associated with mobile phone use and the use of mobile devices whilst driving	X		
6	Culture and the use of mobile devices whilst driving	X		
7	The perceived cost of mobile phone use and the use of mobile devices whilst driving	X		
8	Mobile phone use and driver concentration		X	
9	Security devices and driver concentration		X	
10	The particular mobile phone application and driver concentration	X		

Table 6: Test to determine relationship and p value

To ensure the reliability and validity of the data, the online questionnaire will be checked to see if all questions have been answered, for accurate extraction of codes. Codes were evaluated for relevance to the research question, and the time duration to complete the questionnaire completion will be monitored to disregard tick exercise respondents completing the questionnaire too early (Henning, 2004).

3.7 Assumptions

An assumption is an unexamined belief: what we think without realizing we think it (Foster, 1996). It is reasonable to assume that the respondents are willing participants in the research if their identity is withheld for confidentiality reasons. Furthermore, the respondents will be truthful in answering the questionnaires. Descriptive and correlation analysis were identified as the best way to analyze the sampled data. The sampling method may impair generalization of the results (Phillips, 2000).

Snowball sampling provides a means of accessing vulnerable and more impenetrable social groupings (Vogt, 1999). However, the nature of similarity within social networks may mean that 'isolates' are ignored (Griffiths, 1993).

3.8 Limitations

The limitations of the study are those characteristics of design or methodology that impacted or influenced the interpretation of the research findings (Price, 2004). The biggest limitation to the quantitative research is data, research bias, focusing on the wrong issue and lack of proper context.

3.9 Reliability and Validity

Reliability constitutes is a way of assessing the quality of the measurement procedure used to collect data in a dissertation (Salthouse, 2002). In order for the results from a study to be considered valid, the measurement procedure must first be reliable (Ratcliff, 1993). The research question examines the motorist's decision making process and behavioural influence, which are unique to a motorist's human psyche. The expectation is that there is consistency, but the objective is to identify behavioural patterns to decision making. We shall obtain reliability from the study from the respondents' transparency, sample size and willingness to participate in our online survey.

Validity refers to whether the study or measuring test is measuring what is claims to measure (Phelan, 2005). The research shall use criterion-related validity to predict future or current performance in terms of how The study results correlate with other criteria of interest (Burn, 2017). Internal validity is helped by the fact that the section of the questionnaire on demographic information is adopted from previous studies. The sample size of the study is reasonable. As a general rule, sample sizes of 200 to 300 respondents provide an acceptable margin of error and fall below the point of diminishing returns (Lyons, 2015). Validity of the study was well reinforced through making the objectives of the study clear, removing any ambiguity, and ensuring the online questionnaire matches the defined objectives. (Cozby, 2001).

4. Results

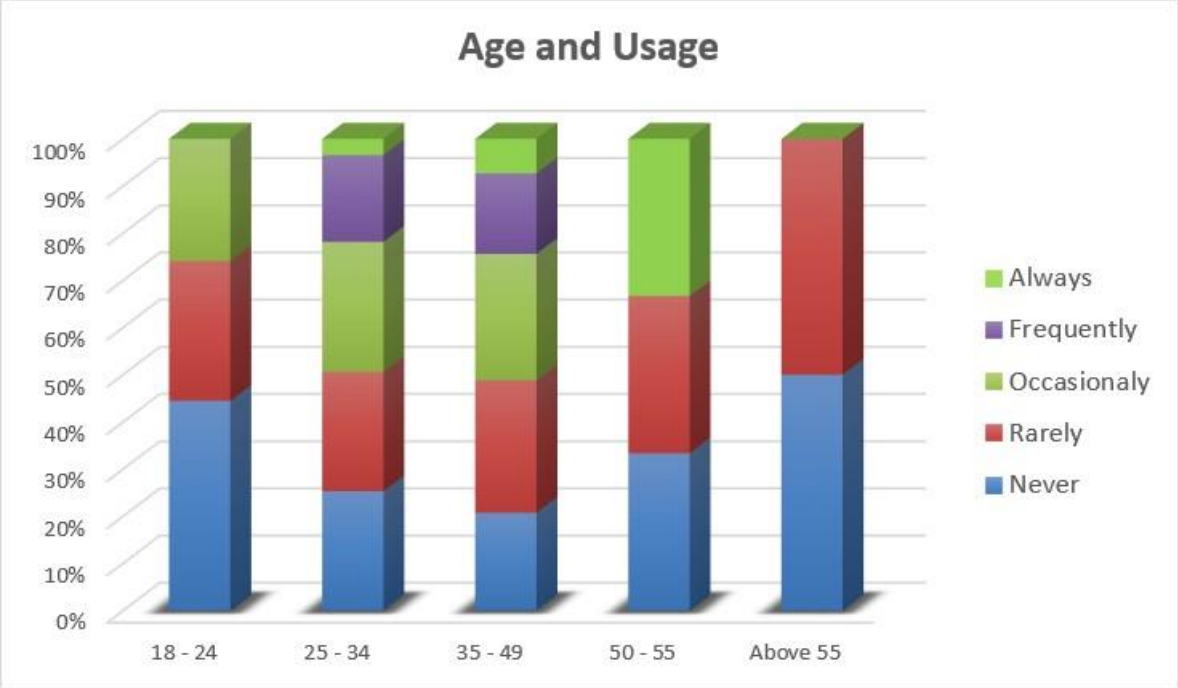
4.1 Demographics and the use of MD whilst driving

PROPOSITION 1: The age of respondent relates to the frequency of usage of MD whilst driving

Frequency of Usage of MDs while driving / Age							
		Age					Total
		18 – 24	25 - 34	35 - 49	50 - 55	Above 55	
Frequency of Usage of MDs while driving	Never	6,0%	10,9%	8,5%	0,5%	0,5%	26,4%
	Rarely	4,0%	10,9%	11,4%	0,5%	0,5%	27,4%
	Occasionally	3,5%	11,9%	10,9%	0,0%	0,0%	26,4%
	Frequently	0,0%	8,0%	7,0%	0,0%	0,0%	14,9%
	Always	0,0%	1,5%	3,0%	0,5%	0,0%	5,0%
Total		27	87	82	3	2	201
		13,4%	43,3%	40,8%	1,5%	1,0%	100,0%

Table 7: Frequency of usage across age groups.

Table 7 above shows that 26.4% of respondents never use their MD while driving. Out of these 26.4%, 6% were between 18 – 24 years old, 10.9% between 25 – 34, 8.5% between 35 – 49 years old and only 1% all respondent above 50 years old. Among the younger group of respondents (18 – 24) no respondent reported frequently and always using their MD while driving. The majority of respondents in this age bracket reported that they never use their MD while driving (6%). Interestingly, most of the respondents who reported always and frequently using their phones whilst driving is found between 25 and 49 years old.



Histogram 1: Frequency of usage of MD while driving across age groups

The age category does have an influence on the frequency of mobile use while driving. The utopian idea that it's the millennials who use their MD does not hold true as the data suggests 13.4% for 18-24 year olds. The working professional are the most dominant and can be defined in 25-34 and 35-49 year olds. The reality which drives usage is the employee drive to maintain shareholder value by being productive with every given opportunity.

A one-way ANOVA (analysis of variance) was conducted to examine whether the age relates to the frequency of usage of MD while driving. The choice of One-way ANOVA was informed by the fact that frequency of use is considered as a continuous variable (interval scale from 1 to 5) and age group as an ordinal variable (independent variable). The results of the ANOVA test are provided in Table 2 below:

ANOVA					
Frequency of Usage of MDs while driving					
	Sum of Squares	df	Mean Square	F value	p-value
Between Groups	15.433	4	3.858	2.906	.023
Within Groups	260.268	196	1.328		
Total	275.701	200			

Table 8. One-way ANOVA test (Age/ usage)

According to Table 8, age significantly relates to the frequency of usage as indicated by the p-value below 0.05.

4.2 Mobile phone use and the use of MD whilst driving

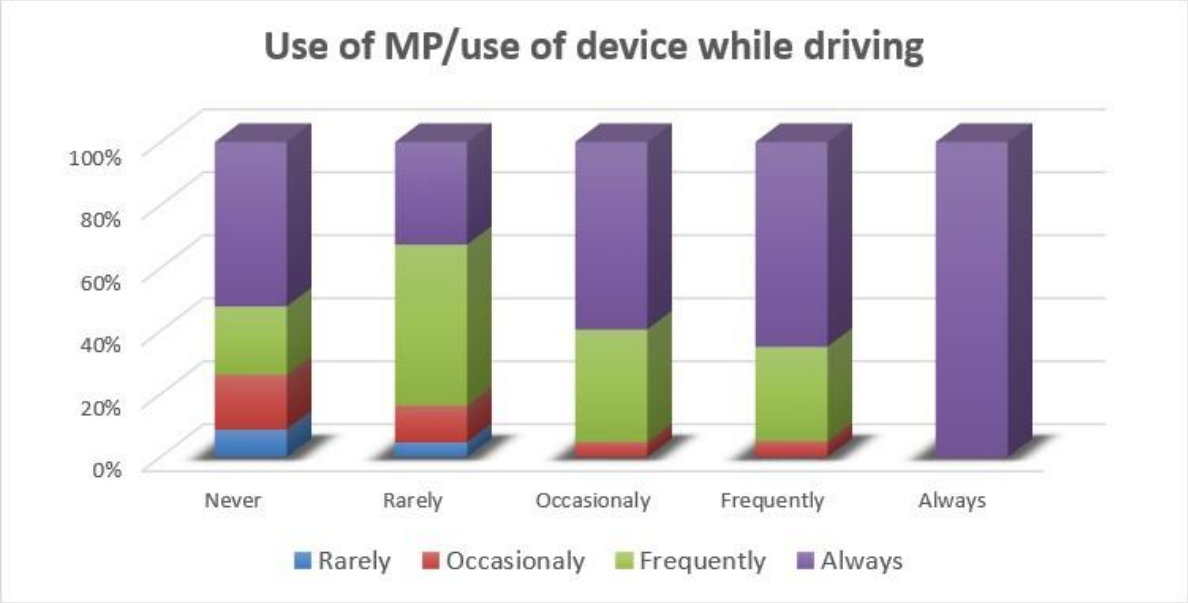
PROPOSITION 2: Mobile phone use influences the use of MD while driving

		10.How regularly do you use MD while driving?				
		Never	Rarely	Occasionally	Frequently	Always
How frequently do you use mobile phone	Rarely	4,0%	1,0%	0,0%	0,0%	0,0%
	Occasionally	8,0%	2,5%	1,0%	0,5%	0,0%
	Frequently	10,1%	11,1%	7,5%	3,0%	0,0%
	Always	24,1%	7,0%	12,6%	6,5%	1,0%
Total	Frequency	92	43	42	20	2
	Percentage	46,2%	21,6%	21,1%	10,1%	1,0%

Table 9: The frequent use of MD while driving

Table 9 presents the results of the descriptive statistics for the frequent use of MD use while driving. The results show that a total of 46.2% (n=92) never use their mobile phones, followed by a total of 21.6% (n=43) and 21.1% (n=42) respectively rarely and occasionally use their mobile phones. The lowest groups indicated that they always

use their mobile phones with a total of 1% (n=2) followed by 10.1% (n=20) that indicate that they frequently use their mobile phones.



Histogram 2: Use of Mobile Phone against use of device while driving

The use of MD is growing to be a life threating issue among motorist. The data suggest that motorist never to rarely do not use MD whiles driving. The solution to curb the behaviour of use of MD might be cause as there is a indirectly proportionate relationship.

A Pearson moment correlation was conducted to test whether there is a relationship between the usage of mobile phone and the regular use of MD whilst driving. The results are presented in the table below:

Correlation and descriptive statistics				
Correlation coefficient	p-value		Mean	Std. Deviation
0,205	0,004	How regularly do you use MD while driving?	1,98	1,082
		How frequently do you use mobile phone	4,29	0,870

Table 10: Pearson correlation between How regularly do you use MD while driving? And How frequently do you use mobile phone?

Table 10 above indicates that there is a positive and statistically significant correlation between the usage of MD whilst driving and the frequency of usage of mobile phone ($r=0.205$; p-value<0.001). Although the relationship is weak ($r<0.3$), the more one uses a mobile phone more likely one is to use the MD whilst driving. There is 99% of this occurring.

We also investigated the relationship between hand-free kit and the usage of MD whilst driving. Given that hand-free kit was measured through a dichotomous measurement (yes/no) the independent t-test was deemed appropriate to examine this relationship. The table below summarizes the t-test.

Do you have a hand-free kit installed in your car?		Mean	Std. Deviation	p-value	t-value
10.How regularly do you use MD while driving?	Yes	1,87	1,066	0,119	-1,565
	No	2,11	1,098		
	No	2,11	1,098		

Table 11: T-test between hand-free kit and the usage of MD whilst driving

The table 11 above suggests that there is no significant relationship between the possession of a hand-free kit and the usage of MD while driving (p-value >0.05; t-value= -1,565). The mean of the frequency of usage however suggests that the respondents who don't have a hand-free kit installed (M=2.11) tend to use more frequently their MD whilst driving compared to those who have a hand-free kit installed (M=1.87)s.

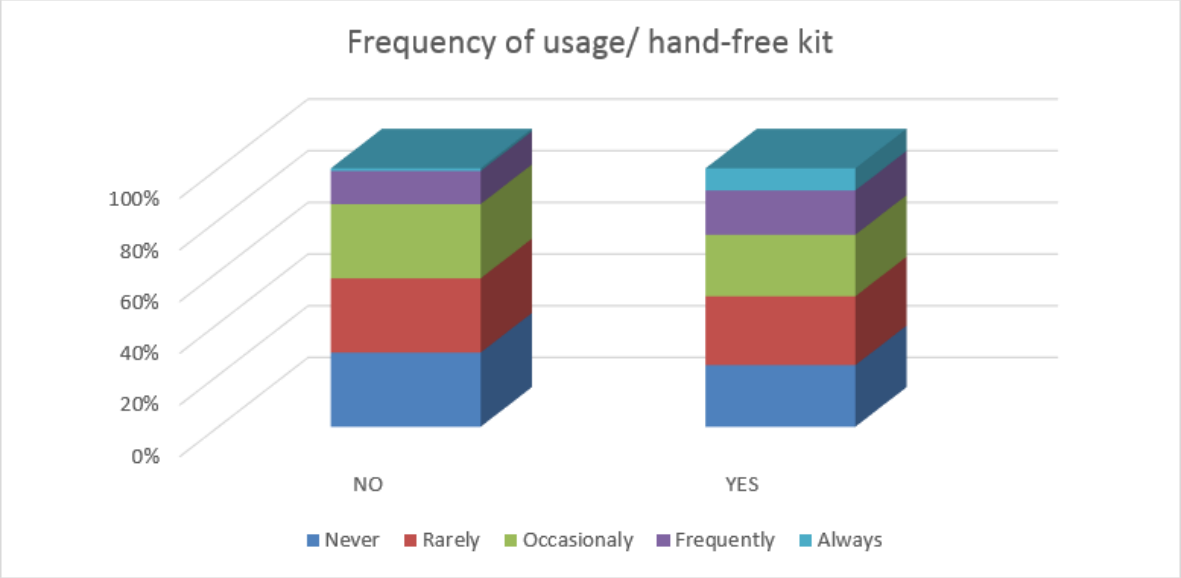
4.3 Security devices and the use of MD whilst driving

PROPOSITION 3: Security devices influence the use of MD while driving

		Frequency of Usage of MDs while driving					Total
		Never	Rarely	Occasionally	Frequently	Always	
Do you have a hand-free kit installed in your car?	NO	13,6%	13,6%	13,6%	6,0%	0,5%	47,2%
	YES	12,6%	14,1%	12,6%	9,0%	4,5%	52,8%
Total	Frequency	52	55	52	30	10	199
	Percentage	26,1%	27,6%	26,1%	15,1%	5,0%	100,0%

Table 12: Frequency of Usage of MD while driving with hands-free kit

In Table 12 indicates 26.1% (n=52) of the respondents indicated that they never use their MD apart/detached from the hands-free kit installed with a total of 27.6% (n=55) indicated that the rarely use their MD apart from the hands-free kit installed, followed by 26.1% (n=52) indicated that they occasionally use their mobile phones apart/detached from the hands-free kit installed. Only a total of 15.1% (n=30) said they frequently use their mobile phones apart/detached from the hands-free kit installed and 5% (n=10) of respondents indicate they always use their MD while driving.



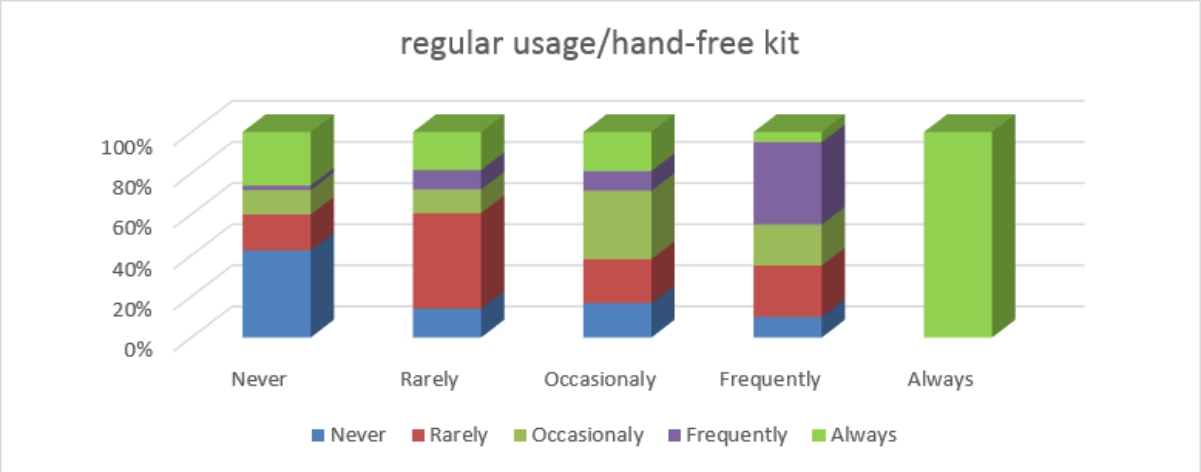
Histogram 3: Frequency of usage/ hand-free kit

The old saying of you can take a donkey to the river but you cannot force he donkey to drink the water holds true. Hands free kit being available in the car does not necessary suggest that the kit is being used by the motorist. The presence of a hands free kit appears to be a window dressing exercise. There is a lack in the need to use the hands free and rather a suggestion to inclusively involve the benefits of use in the training material of obtaining a driver and learners license.

		10.How regularly do you use MD while driving?					Total
		Never	Rarely	Occasionally	Frequently	Always	
Do you use your MD apart/detached from the hands-free kit installed?	Never	19,6%	3,0%	3,5%	1,0%	0,0%	27,1%
	Rarely	8,0%	10,1%	4,5%	2,5%	0,0%	25,1%
	Occasionally	5,5%	2,5%	7,0%	2,0%	0,0%	17,1%
	Frequently	1,0%	2,0%	2,0%	4,0%	0,0%	9,0%
	Always	12,1%	4,0%	4,0%	0,5%	1,0%	21,6%
Total	Frequency	92	43	42	20	2	199
	Percentage	46,2%	21,6%	21,1%	10,1%	1,0%	100,0%

Table 13: Frequency of MD use while driving detached from hands free kit

Table 13 indicates less than half of the respondents 46.2% (n=92) indicate that they never use their MD apart/detached from the hands-free kit installed followed with by 21.6% (n=43) and 21.1% (n=42) respectively as rarely and occasionally use their MD while driving. The lowest groups are frequently as 10.1% (n=20) followed by always as 1% (n=2) which indicate frequent use of MD while driving apart/detached from the hands-free kit installed.



Histogram 4: Regular usage/hand-free kit

The redundancy of the hands free kit defeats the purpose of having the technological advancement. The usage would suggest that the motorists is adopting its benefit to help keep the motorist aware and safe on the road. The fact that the detached hands free kit is not used at times implies that locating it in the car creates a lack of concentration from the motorist.

A t-test was conducted to investigate the relationship between the usage of hand-free kit and the usage of MD when driving. The table below presents the t-test:

Group Statistics					
Do you have a hand-free kit installed in your car?		Mean	Std. Deviation	p-value	t-value
Frequency of Usage of MDs while driving	Yes	2,60	1,260	0,058	1,92
	No	2,29	1,054		

Table 14: T-test between usage of hand-free kit and usage of MD when driving

No relationship was found between the possession of hand-free kit and the frequency of usage ($p>0.05$). A Pearson correlation was conducted to test the relationship between how regularly respondents' usage their MD and usage of MD apart/detached from the hands-free kit installed.

	Mean	Std. Deviation	p-value	r coefficient
10.How regularly do you use MD while driving?	1,98	1,082	0,017	0,169
Do you use your MD apart/detached from the hands-free kit installed?	2,72	1,491		

Table 15: Pearson between usage of hand-free kit and usage of MD when driving

There is a positive but weak relationship between the two variables.

4.4 Mobile phone application and the use of MD whilst driving

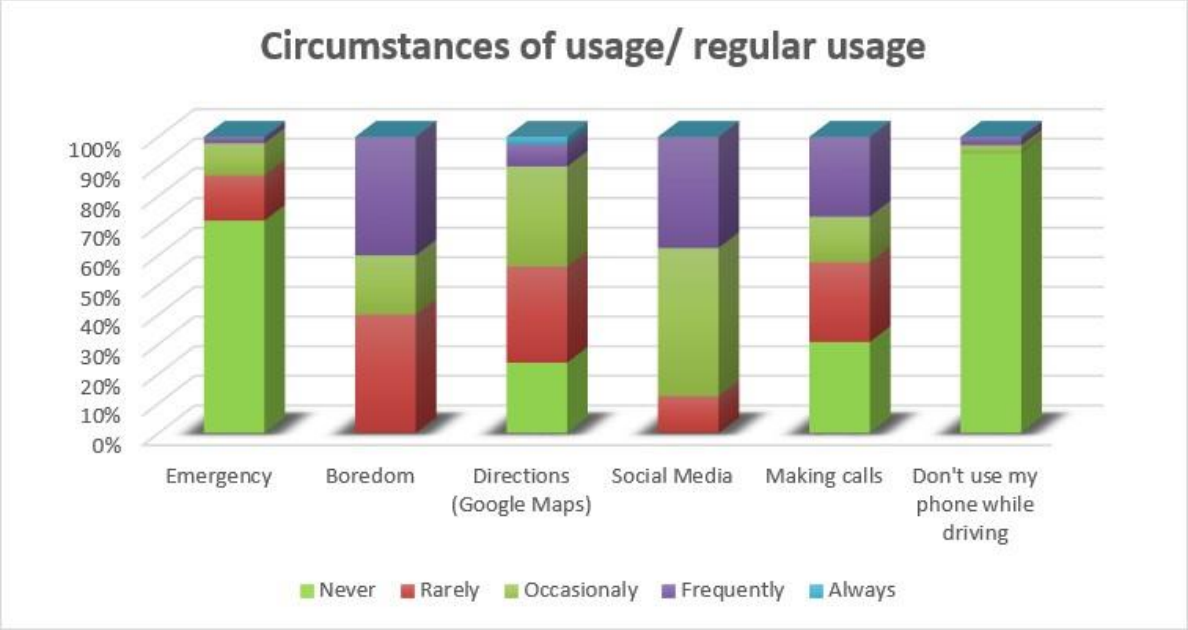
PROPOSITION 4: The particular mobile phone application influences the use of MD while driving

		10.How regularly do you use MD while driving?					Total
		Never	Rarely	Occasionally	Frequently	Always	
Under what circumstances do you use your MD while driving?	Emergency	16,5%	3,5%	2,5%	0,5%	0,0%	23,0%
	Boredom	0,0%	1,0%	0,5%	1,0%	0,0%	2,5%
	Directions (Google Maps)	9,5%	13,0%	13,5%	3,0%	1,0%	40,0%
	Social Media	0,0%	0,5%	2,0%	1,5%	0,0%	4,0%
	Making calls	4,0%	3,5%	2,0%	3,5%	0,0%	13,0%
	Don't use my phone while driving	16,5%	0,0%	0,5%	0,5%	0,0%	17,5%
Total	Frequency	93	43	42	20	2	200
	Percentage	46,5%	21,5%	21,0%	10,0%	1,0%	100,0%

Table 16: Under what circumstances do you use your MD while driving

The question “Under what circumstances do you use your MD while driving?”, most of these respondents indicated that they use their MD while driving in the circumstance of looking for directions with a total of 40%, followed by those who said they use it for emergencies with a total of 23%, while those that said

they don’t use their mobile phone while driving was a total of 17.5%. The lowest group of these participants indicated that they use their mobile phones while driving because of boredom were a total of 2.5% meanwhile those that use it for social media were a total of 4%.



Histogram 5: Circumstances of usage/ regular usage

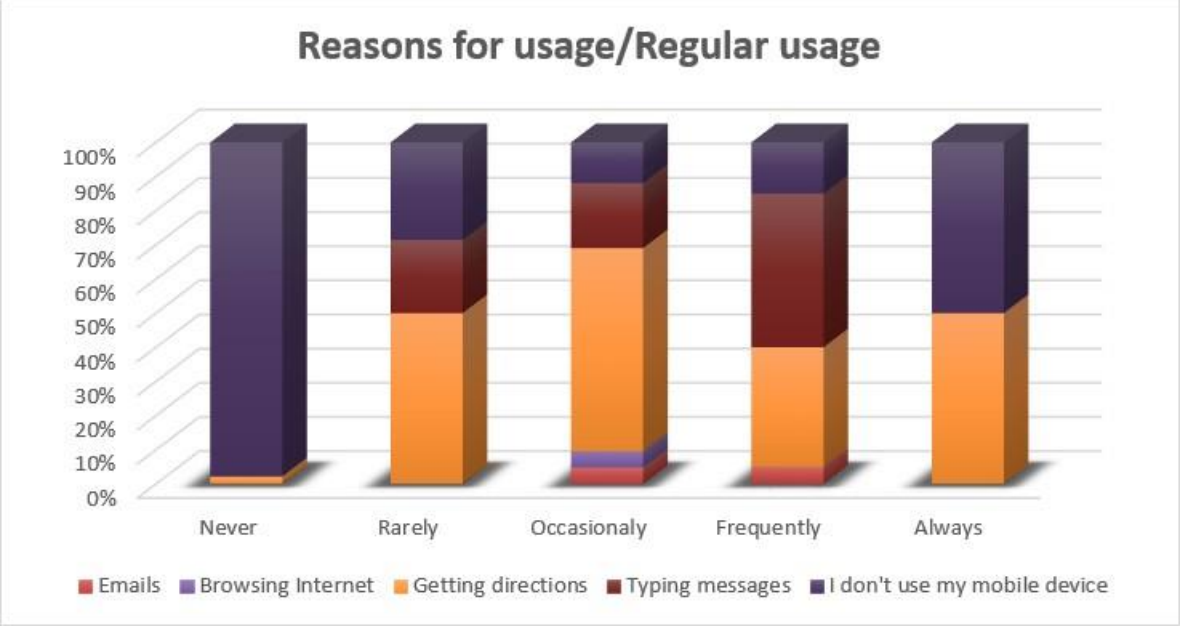
There is a directly proportionate relationship between the use of the MD and circumstances for use in the form of directions. To incorporate the MD to a driver need to help facilitate direction in reaching the end destination ultimately encourages usage. Usage in a positive light allows the motorist to pay attention to the due diligence of mounting the mobile phone to encourage safe use with no distraction.

A one-way ANOVA was used to measure the relationship between these two variables. The results of the ANOVA test are provided in Table 17 below:

10.How regularly do you use MD while driving?				
	Mean	Std. Deviation	p-value	F value
Emergency	1,43	0,779	0,001	16,703
Boredom	3,00	1,000		
Directions (Google Maps)	2,33	1,003		
Social Media	3,25	0,707		
Making calls	2,38	1,203		
Don't use my phone while driving	1,14	0,601		
Total	1,98	1,082		

Table 17: One-way ANOVA test (Circumstances to use your MD while driving)

The table above indicates that there is an association between the usage and the circumstances ($p<0.01$).



Histogram 6: Reasons for usage/Regular usage

The future of typing messages is voice recognition texting application. Encouraging a safety precaution to each use of the MD eliminates distraction. The data implies getting directions and typing messages.

The relationship between these two variables was tested through a one-way ANOVA given that the variable “reasons” has more than two categories.

10.How regularly do you use MD while driving?					
	N	Mean	Std. Deviation	p-value	F-value
Emails	3	3,33	0,577		
Browsing Internet	2	3,00	0,000		
Getting directions	56	2,71	0,803		
Typing message	26	3,00	0,849	0,001	47,088
I don't use my MD	112	1,31	0,760		
Total	199	1,97	1,084		

Table 18: One-way ANOVA test (The relationship between these two variables)

The table above shows that the usage of MD varies across the reasons for using MD while driving. Thus, there is a relationship between the two variables (p-value<0.01).

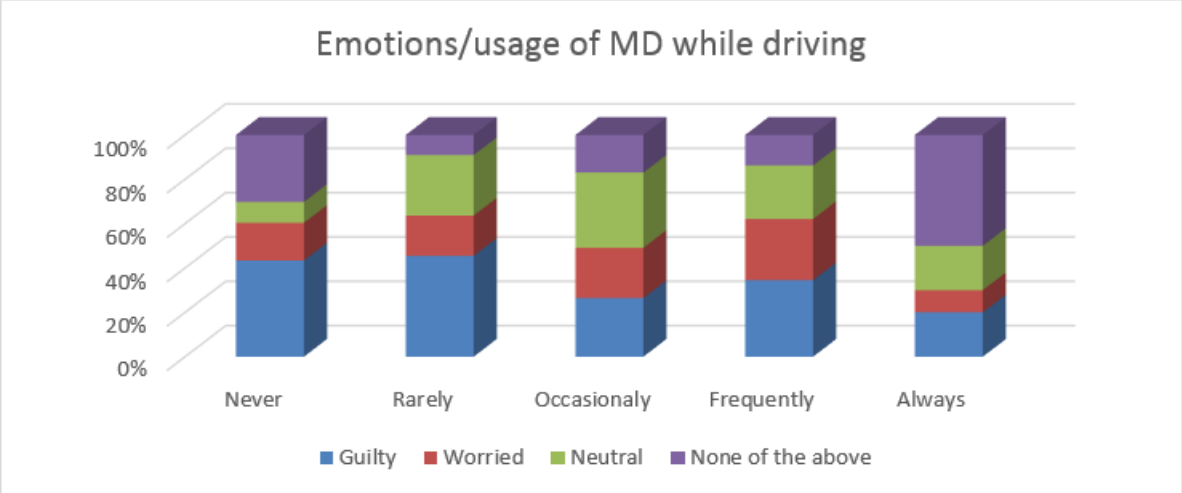
4.5 Emotional states associated with mobile phone use and the use of MD whilst driving

PROPOSITION 5: Emotional states associated with mobile phone use influence the use of MD while driving.

		Frequency of Usage of MDs while driving					Total
		Never	Rarely	Occasionally	Frequently	Always	
14.What emotions do you feel when using your MD while driving?	Guilty	11,5%	12,5%	7,0%	5,0%	1,0%	37,0%
	Worried	4,5%	5,0%	6,0%	4,0%	0,5%	20,0%
	Neutral	2,5%	7,5%	9,0%	3,5%	1,0%	23,5%
	None of the above	8,0%	2,5%	4,5%	2,0%	2,5%	19,5%
Total	Frequency	53	55	53	29	10	200
	Percentage	26,5%	27,5%	26,5%	14,5%	5,0%	100,0%

Table 19: Emotions felt when using MD while driving

The respondents were asked what emotions they feel when using their MD while driving and 99% (n=200) respondents took part to this question. Those that said they feel emotions of guilt were a total of 37%, neutral emotions were a total of 23.5% and worried were a total of 20%. The smallest out of the group was 19.5% as none of the above feelings were applicable.



Histogram 7: Emotions/usage of MD while driving

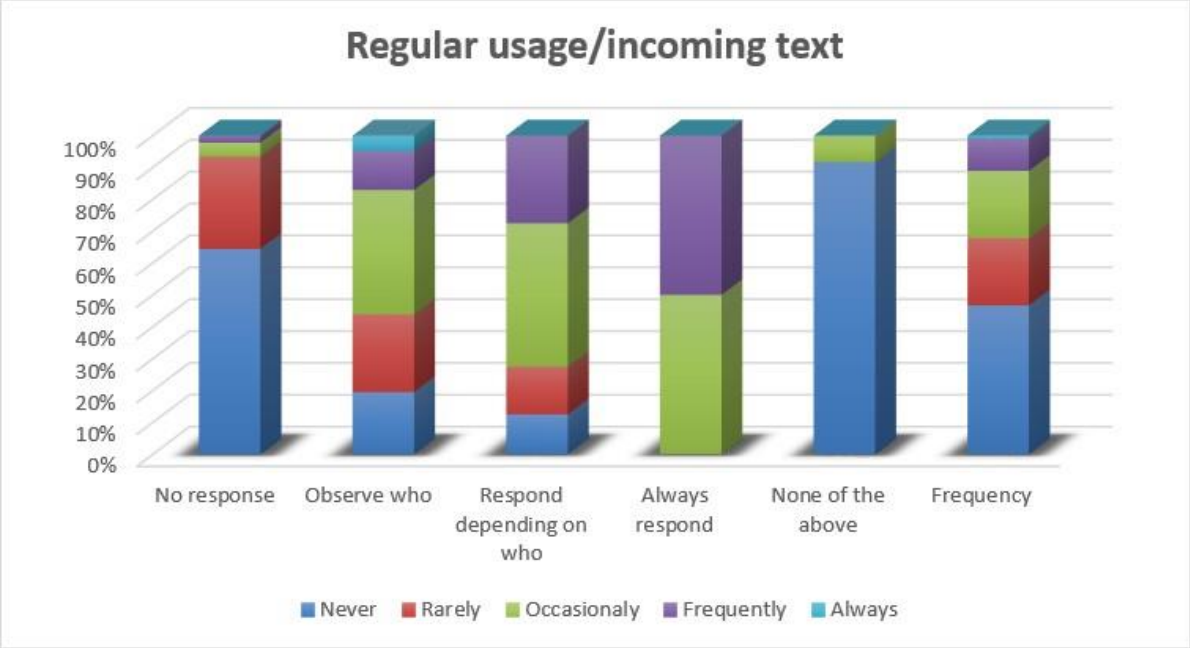
The emotional attachment of guilt to the behaviour of mobile use while driving suggest the driver consciousness that they know its wrong but still proceed to complete the action. The need to address wrongful behaviour emanates the guilty and worried feeling. Understanding the root causes that force the driver to proceed with their actions

The relationship between these two variables was further investigated through a one-way ANOVA. The analysis is provided in the table 20 below:

10.How regularly do you use MD while driving?				
	Mean	Std. Deviation	p-value	F-value
Guilty	1,74	0,980	0,001	10,326
Worried	2,26	1,186		
Neutral	2,53	0,929		
None of the above	1,46	0,996		
Total	1,97	1,084		

Table 20: One-way ANOVA test (The relationship between these two variables)

The table above indicates that there is an association between the emotions and usage of MD.



Histogram 8: Regular usage/incoming text

The impulse response to incoming text or phone calls is a distraction. The driver need to know who texted is a function of curiosity of the individual. It is highly advisable to lock the MD in the boot of a car to rule out the possibility of distraction. Short term motor insurers have taken an interest in this field as loop hole for repudiating a claim.

The association between these two variables was investigated through a one-way ANOVA. The results are presented in the table 21 below:

10.How regularly do you use MD while driving?				
	Mean	Std. Deviation	p-value	F-value
No response	1,44	0,689	0,001	35,236
Observe who	2,59	1,095		
Respond depending on who	2,88	0,966		
Always respond	3,50	0,577		
None of the above	1,17	0,565		
Total	1,97	1,084		

Table 21: One-way ANOVA test (The relationship between these two variables)

The p-value <0.01 suggests that there is an association between these two variables.

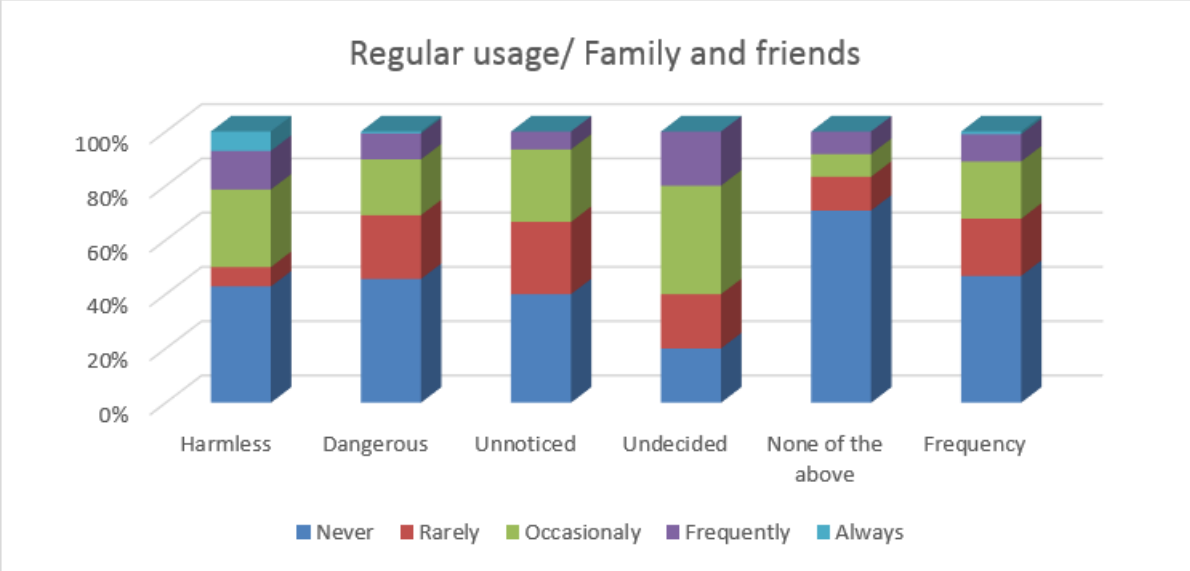
4.6 Culture and the use of MD whilst driving

PROPOSITION 6: Culture and the use of MD whilst driving

		10.How regularly do you use MD while driving?					Total
		Never	Rarely	Occasionally	Frequently	Always	
16.How do your friends and family see mobile use while driving?	Harmless	3,0%	0,5%	2,0%	1,0%	0,5%	7,0%
	Dangerous	31,2%	16,1%	14,1%	6,5%	0,5%	68,3%
	Unnoticed	3,0%	2,0%	2,0%	0,5%	0,0%	7,5%
	Undecided	1,0%	1,0%	2,0%	1,0%	0,0%	5,0%
	None of the above	8,5%	1,5%	1,0%	1,0%	0,0%	12,1%
Total	Frequency	93	42	42	20	2	199
	Percentage	46,7%	21,1%	21,1%	10,1%	1,0%	100,0%

Table 22: Family and friend sentiment on the use of MD while driving

The results from the above shows that majority of the respondent's family members and friends see using MD while driving to be dangerous with a total of 68.3%, and 12.1 said none of the above. Meanwhile a total of 7.5% said they are unnoticed, 7% said they are harmless and 5% said they are undecided.



Histogram 9: Regular usage/ Family and friends

Perceived danger is what can be associated with regular use of the MD. Despite knowledge of the dangers there is still an inherent use of MD. Regulation of the behaviour is still not enough of an effort. More still needs to be done.

The linkage between these two variables was further examined. A one-way ANOVA was conducted. The results are presented in the table 23 below:

	Mean	Std. Deviation	p-value	F-value
Harmless	2,36	1,393	0,062	2,287
Dangerous	1,96	1,057		
Unnoticed	2,00	1,000		
Undecided	2,60	1,075		
None of the above	1,54	0,977		
Total	1,97	1,084		

Table 23: One-way ANOVA test (The relationship between these two variables)

The results show that there no relationship between what family and friend think about using MD while driving and the actual usage of MD whilst driving (p-value>0.05).

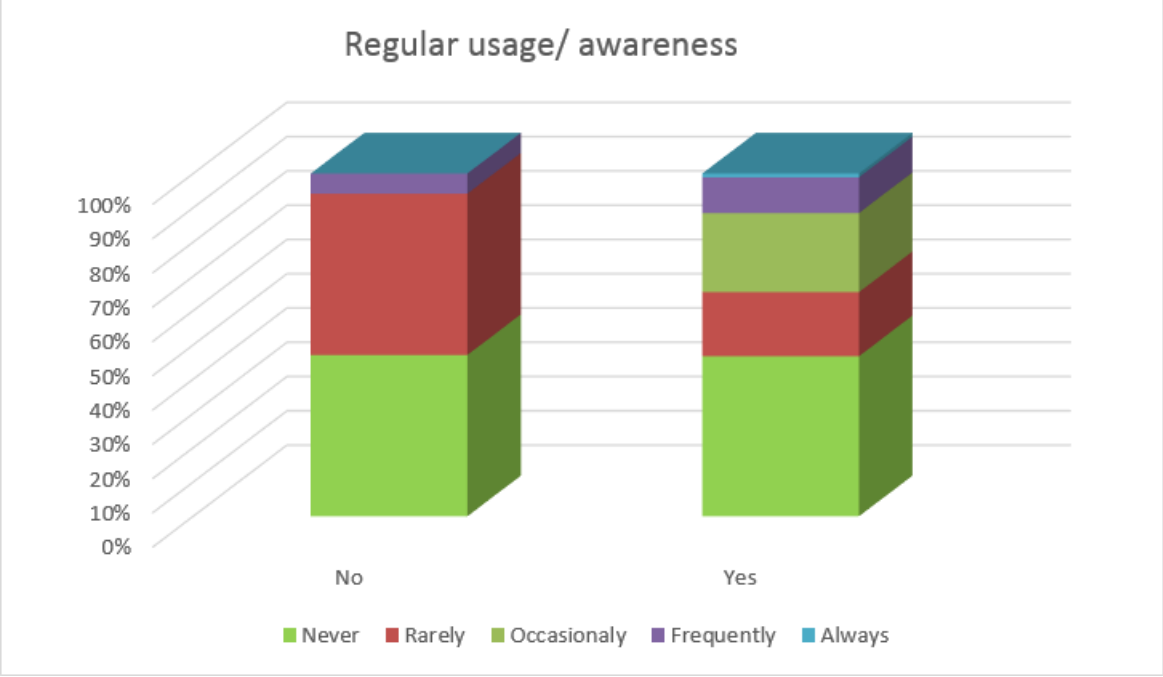
4.7 The perceived cost of mobile phone use and the use of MD whilst driving

PROPOSITION 7: The perceived cost of mobile phone use influences the use of MD whilst driving.

		10.How regularly do you use MD while driving?					Total
		Never	Rarely	Occasionally	Frequently	Always	
21. Are you aware mobile use while driving is unlawful?	No	4,0%	4,0%	0,0%	0,5%	0,0%	8,5%
	Yes	42,7%	17,1%	21,1%	9,5%	1,0%	91,5%
Total	Frequency	93	42	42	20	2	199
	Percentage	46,7%	21,1%	21,1%	10,1%	1,0%	100,0%

Table 24: Awareness of mobile use while driving is unlawful

Majority of the respondent indicated yes that they are aware mobile use while driving is unlawful with a total of 91.5% and 8.5% who said no they were not aware mobile use while driving was unlawful.



Histogram 10: Regular usage/ awareness

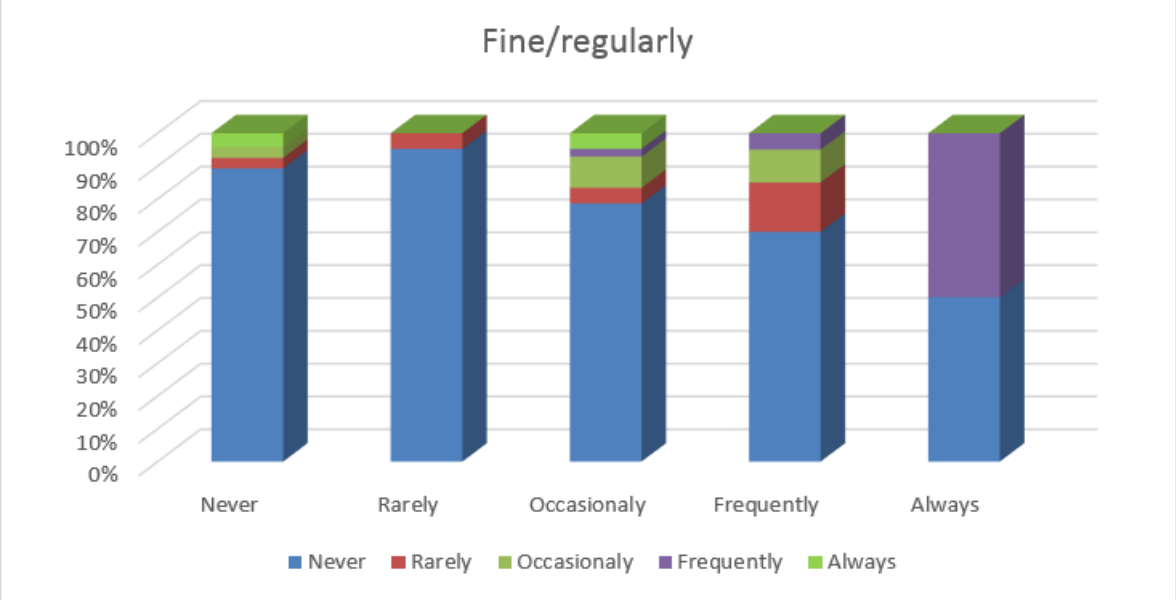
The lack of ethical driving behaviour is a concerning. Mobile usage while diving is known by motorist as unlawful but the behaviour is still there. In addressing this a more proactive rather than reactive approach is required.

The association between these two variables was tested through an independent sample t-test because the independent variable is dichotomous. The table 25 below summarises the results.

21. Are you aware mobile use while driving is unlawful?		Mean	Std. Deviation	p-value	t-value
10.How regularly do you use MD while driving?	Yes	2,01	1,105	0,098	0,358
	No	1,65	0,786		

Table 25: T-test between frequency of mobile use while driving and awareness of unlawful behaviour

The test is statistically not significant (p-value>0.05). Therefore, there is no relationship between the awareness of the unlawfulness of driving and using MD and the frequency of usage of MD.



Histogram 11: Fine/regularly

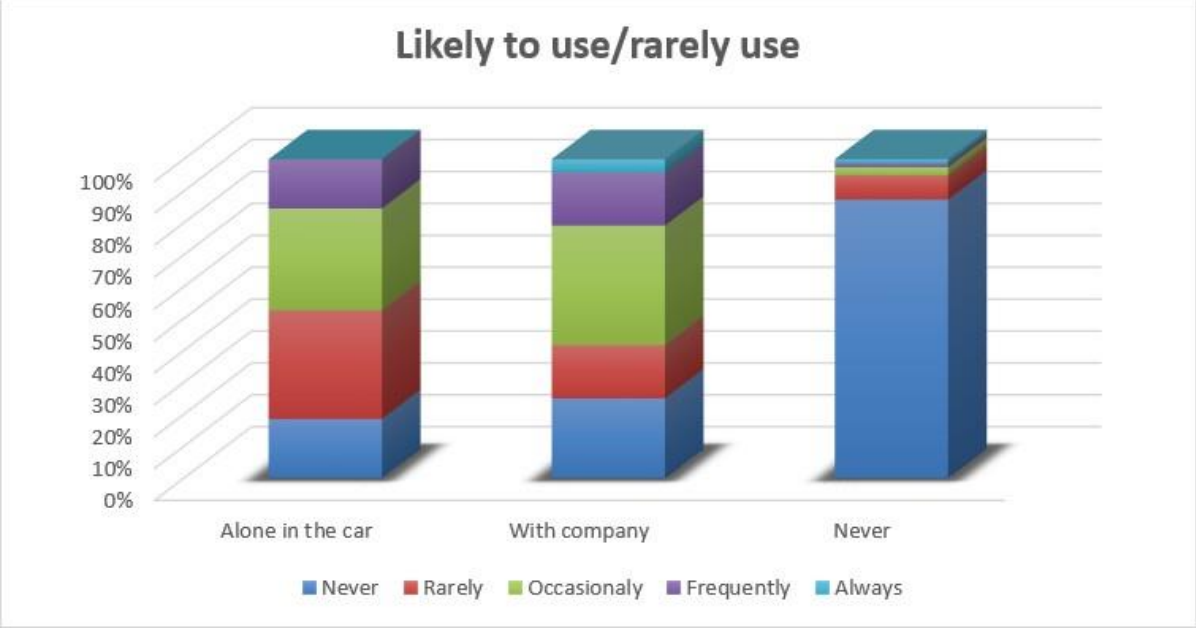
Consequence in the form of a fine is still not sufficient to stop the regular use of MD. Based on the respondents' feedback that they have never received a fine but in the online questionnaire they have given admission to the unlawful behaviour. Address it requires a definitive approach where the commuter concept of Gautrain works well as it speaks to the working professional who will try to read, type and respond to email and make calls in his time spent travel to his destination.

The relationship between the fines received and the usage of MD was assessed through a one-way ANOVA. The table 26 below summarises the analysis.

10.How regularly do you use MD while driving?				
	Mean	Std. Deviation	p-value	F-value
Never	1,89	1,026	0,002	4,539
Rarely	2,50	1,269		
Occasionally	2,56	1,236		
Frequently	4,00	1,000		
Always	1,67	1,033		
Total	1,97	1,084		

Table 26: One-way ANOVA test (The relationship between the fines received and the usage of MD)

Table 15 shows that there is an association between the frequency of receiving fines and the usage of MD ($p<0.01$).



Histogram 12: Likely to use/rarely use

There is a high probability that a driver will use their MD while driving if his alone in the car. For honest reason of seeking directions is the next step where MD has useful application to assist driver in arriving at their end destination. Despite emergency,

boredom, making call and social media provide compelling reasons to use the MD. Its more than 2/3 of the respondents are distracted or impaired while driving creating a risk or danger on the road.

The relationship between these two variables was tested and presented in the table 16 below.

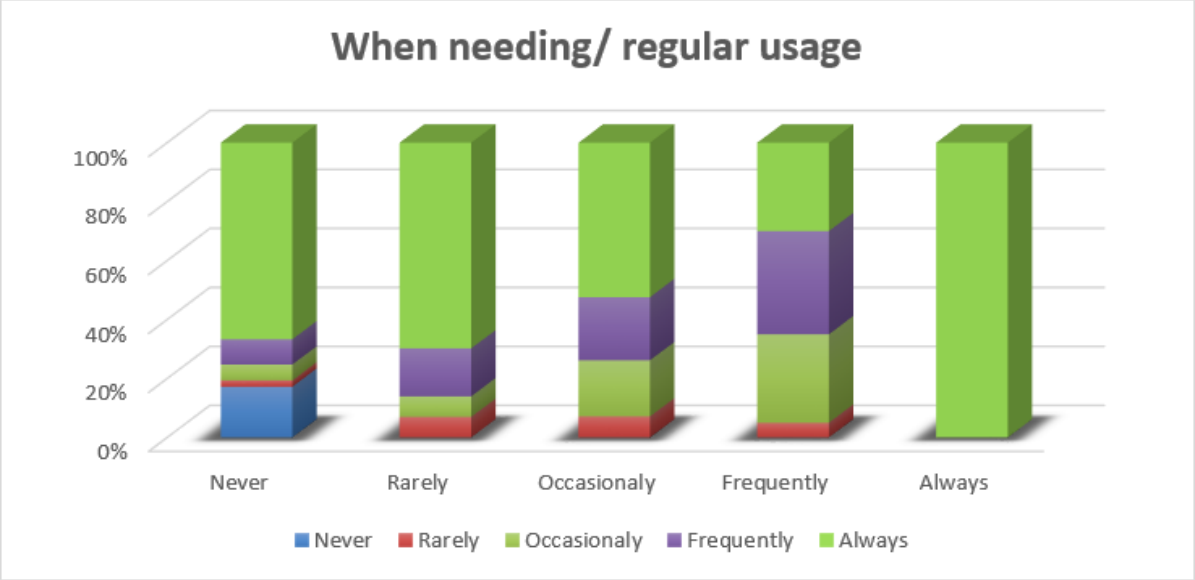
10.How regularly do you use MD while driving?				
	Mean	Std. Deviation	p-value	F-value
Alone in the car	2,44	0,968		
With company	2,58	1,176		
Never	1,22	0,673		
Total	1,98	1,082	0,001	47,498

Table 27: One-way ANOVA test (The relationship between these two variables)

The p-value <0.01 suggests that there is a significant association between these two variables.

		10.How regularly do you use MD while driving?					Total
		Never	Rarely	Occasionally	Frequently	Always	
12.When needing to use your mobile phone, do you first ensure that it is safe to do so?	Never	8,0%	0,0%	0,0%	0,0%	0,0%	8,0%
	Rarely	1,0%	1,5%	1,5%	0,5%	0,0%	4,5%
	Occasionally	2,5%	1,5%	4,0%	3,0%	0,0%	11,0%
	Frequently	4,0%	3,5%	4,5%	3,5%	0,0%	15,5%
	Always	31,0%	15,0%	11,0%	3,0%	1,0%	61,0%
Total	Frequency	93	43	42	20	2	200
	Percentage	46,5%	21,5%	21,0%	10,0%	1,0%	100,0%

Table 28: Safety action to consider when using mobile phones



Histogram 13: When needing/ regular usage

It is encouraging to observe the consciousness of safety when using the MD while driving. Despite predominant consensus that they ensure safety at all times. It is rather misleading to say the least as previous questions 2/3 of motorist are willing to consider following up on the MD while driving which creates a risk or danger inevitably.

A Pearson moment correlation was used to examine the relationship between the two variables.

	Mean	Std. Deviation	p-value	r coefficient
10.How regularly do you use MD while driving?	1,98	1,082	0,763	0,021
12.When needing to use your mobile phone, do you first ensure that it is safe to do so?	4,18	1,261		

Table 29: Pearson correlation

The table indicates that there is no relationship between the two variables (p>0.05).

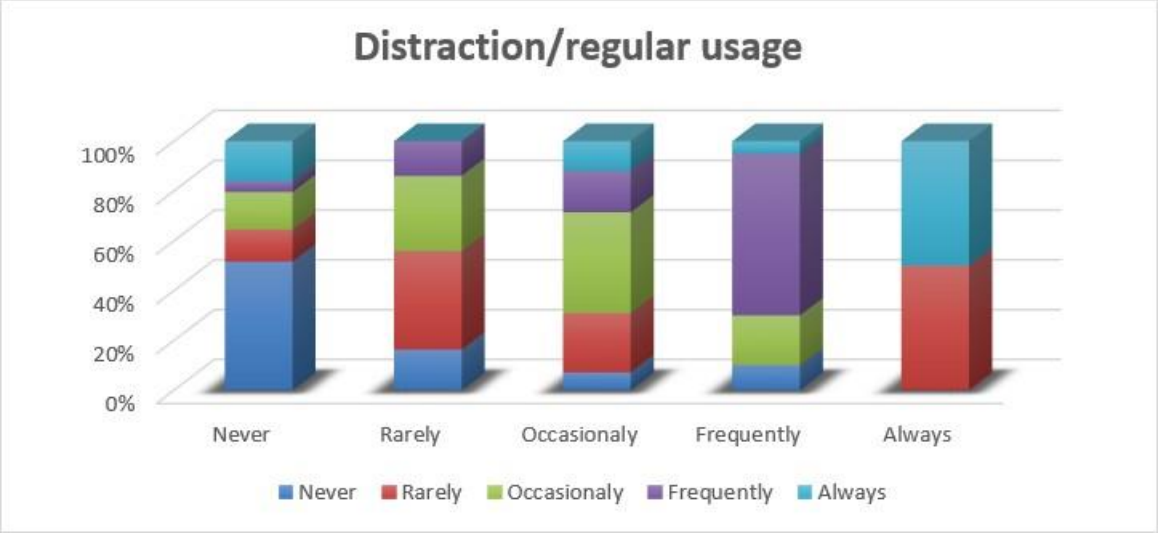
4.8 Mobile phone use and driver concentration

PROPOSITION 8: Mobile phone use and driver concentration

		10.How regularly do you use MD while driving?					Total
		Never	Rarely	Occasionally	Frequently	Always	
Does your mobile phone distract your driving?	Never	24,0%	3,5%	1,5%	1,0%	0,0%	30,0%
	Rarely	6,0%	8,5%	5,0%	0,0%	0,5%	20,0%
	Occasionally	7,0%	6,5%	8,5%	2,0%	0,0%	24,0%
	Frequently	2,0%	3,0%	3,5%	6,5%	0,0%	15,0%
	Always	7,5%	0,0%	2,5%	0,5%	0,5%	11,0%
Total		93	43	42	20	2	200
		46,5%	21,5%	21,0%	10,0%	1,0%	100,0%

Table 30: Mobile phone distraction while driving and concentration

Table 30 shows the results of the normality about the MD usage. Most of the respondents indicated that their mobile phones never distract their driving with a total of 30% followed by those who indicated that their mobile occasionally with a total of 24%, while 20% indicated that their mobile phones rarely distract their driving, with only a total of 11% (n=22) who said they always get distracted by their mobile phones while driving.



Histogram 14: Distraction/regular usage

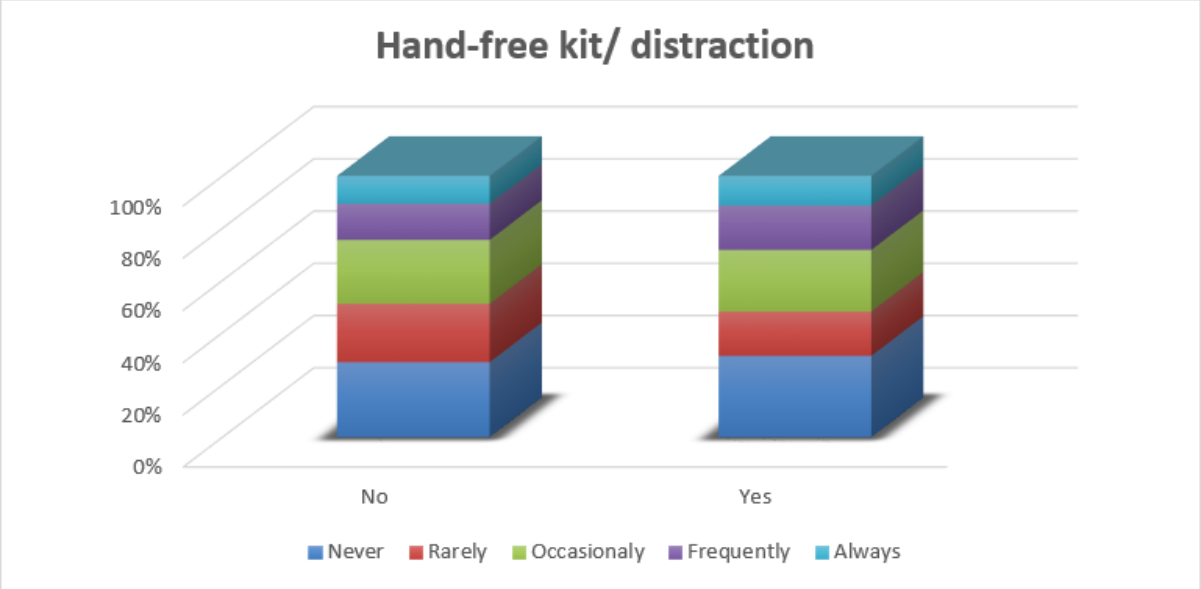
According to the data received half of the respondents claim that using their MD does not affect the driving at all. Ignorance is the root cause. As was cited in the literature review Mobile usage while driving is equal to driving blind for 5 seconds with each text (Penning, 2013). In the duration of the 5 seconds, cognitive resources are used to read the message: visual attention requires the message to be read, and the physical aspect entails the motorist to hold the phone with either hand (Saquer, 2012). As a result, the motorist is compromised and operating the vehicle with impaired response time.

A Pearson correlation was conducted to test the relationship between these two variables.

	Mean	Std. Deviation	p-value	r coefficient
10.How regularly do you use MD while driving?	1,98	1,082	0.001	0,337
Does your mobile phone distract your driving?	2,57	1,349		

Table 31: Pearson correlation

The table 31 above shows that there is a positive and statistically significant relationship between the distraction and the usage of MD while driving ($p<0.01$; $r=0.337$).



Histogram 15: Hand-free kit/ distraction

It's is very difficult to deduce the use of a hands free kit and the impact it has on the distraction of the motorist. Further investigation needs to be made to divulge into the root cause and effect.

A t-test was used to test the association between the two variables.

Do you have a hand-free kit installed in your car?		N	Mean	p-value	t-value
Does your mobile phone distract your driving?	Yes	106	2,60	0,792	0,264
	No	94	2,55		

Table 32: T-test between mobile phone distract and hands free kit

The t-test suggests that there is no relationship between the two variables ($p<0.05$).

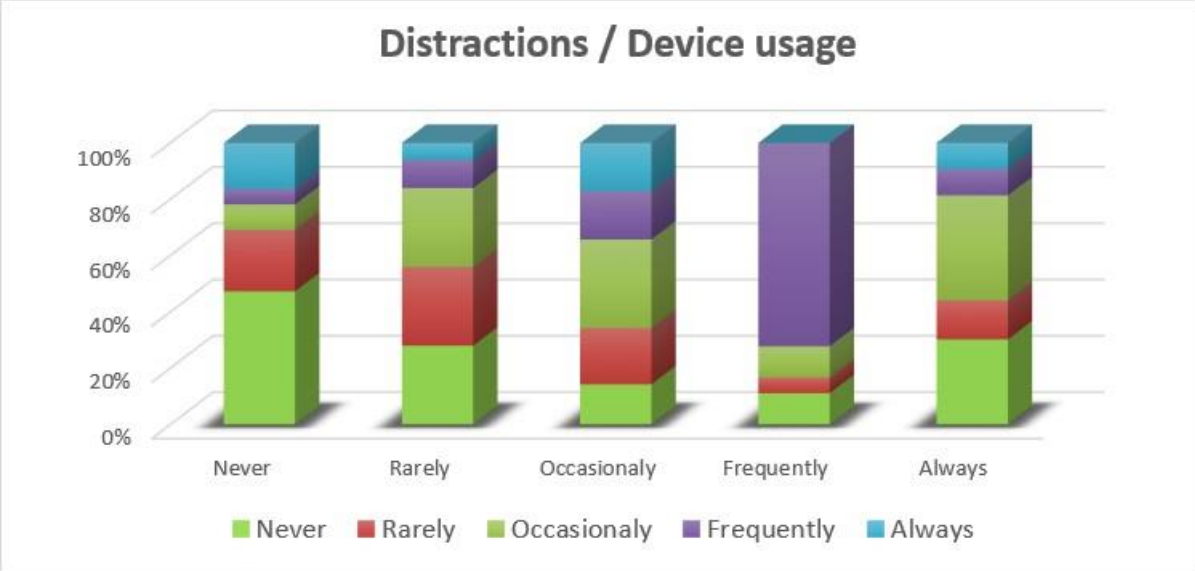
4.9 Security devices and driver concentration

PROPOSITION 9: Security devices and driver concentration

		Do you use your MD apart/detached from the hands-free kit installed?				
		Never	Rarely	Occasionally	Frequently	Always
Does your mobile phone distract your driving?	Never	12,9%	7,0%	2,5%	1,0%	6,5%
	Rarely	6,0%	7,0%	3,5%	0,5%	3,0%
	Occasionally	2,5%	7,0%	5,5%	1,0%	8,0%
	Frequently	1,5%	2,5%	3,0%	6,5%	2,0%
	Always	4,5%	1,5%	3,0%	0,0%	2,0%
Total	Frequency	55	50	35	18	43
	Percentage	27,4%	24,9%	17,4%	9,0%	21,4%

Table 33: Mobile phone distraction and security

Table 33 shows the results of the normality about the MD usage. Most of the respondents indicated that their mobile phones never distract their driving with a total of 27.4% (n=55) followed by those who indicated that their mobile occasionally with a total of 17.4% (n=35), while 24.9% (n=50) indicated that their mobile phones rarely distract their driving, with only a total of 21.4% (n=43) who said they always get distracted by their mobile phones while driving.



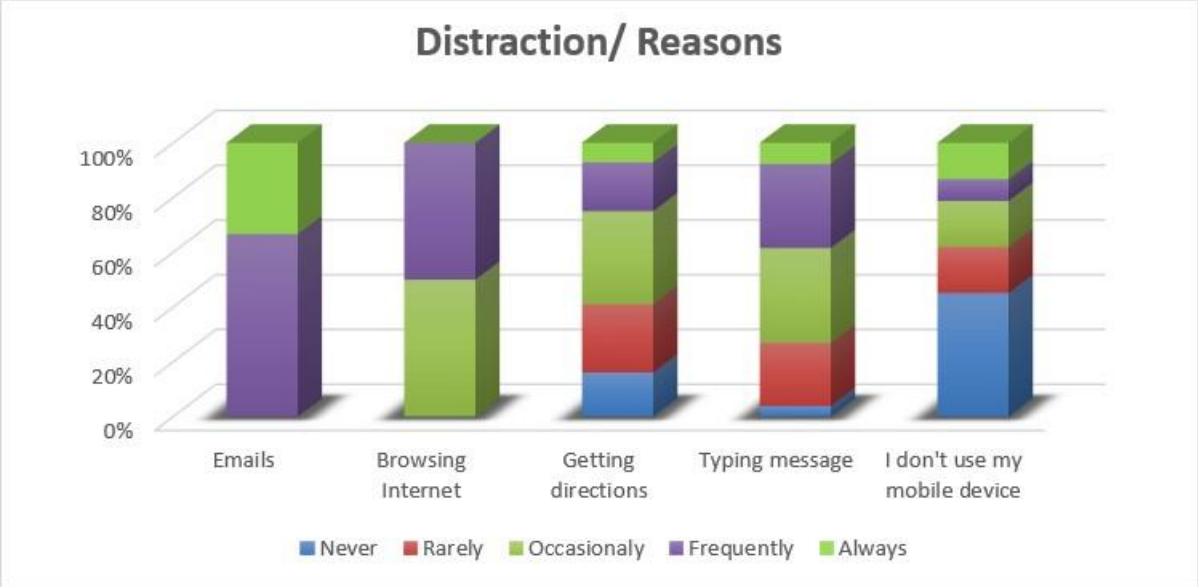
Histogram 16: Distractions / Device usage

A Pearson correlation was conducted to test the linkage between these two variables.

	Mean	Std. Deviation	p-value	r coefficient
Does your mobile phone distract your driving?	2,57	1,349	0,031	0,153
Do you use your MD apart/detached from the hands-free kit installed?	2,72	1,491		

Table 34: Pearson correlation

The correlation analysis above indicates that there is a positive and statistically significant relationship between the two variables ($p<0.05$ and $r=0.153$).



Histogram 17: Distraction/ Reasons

As was cited in the Literature Review suggest that with these technologies, the incidence of distraction-related crashes have escalated and left the driver worse off (Young, 2007). The motorist now has plenty of things to do besides driving nowadays as compared in the 1980s. As much as technology is meant to benefit us it's a gift and a curse at the same time which varies from motorists.

A one-way ANOVA was used to investigate the association between these two variables.

	N	Mean	Std. Deviation	p-value	F-Value
Emails	3	4,33	0,577		
Browsing Internet	2	3,50	0,707		
Getting directions	56	2,75	1,148		
Typing message	26	3,15	1,008		
I don't use my MD	113	2,27	1,441		
Total	200	2,57	1,351	0,001	4,648

Table 35: One-way ANOVA test (The relationship between these two variables)

The table above shows that there is an association between the two variables ($p<0.01$).

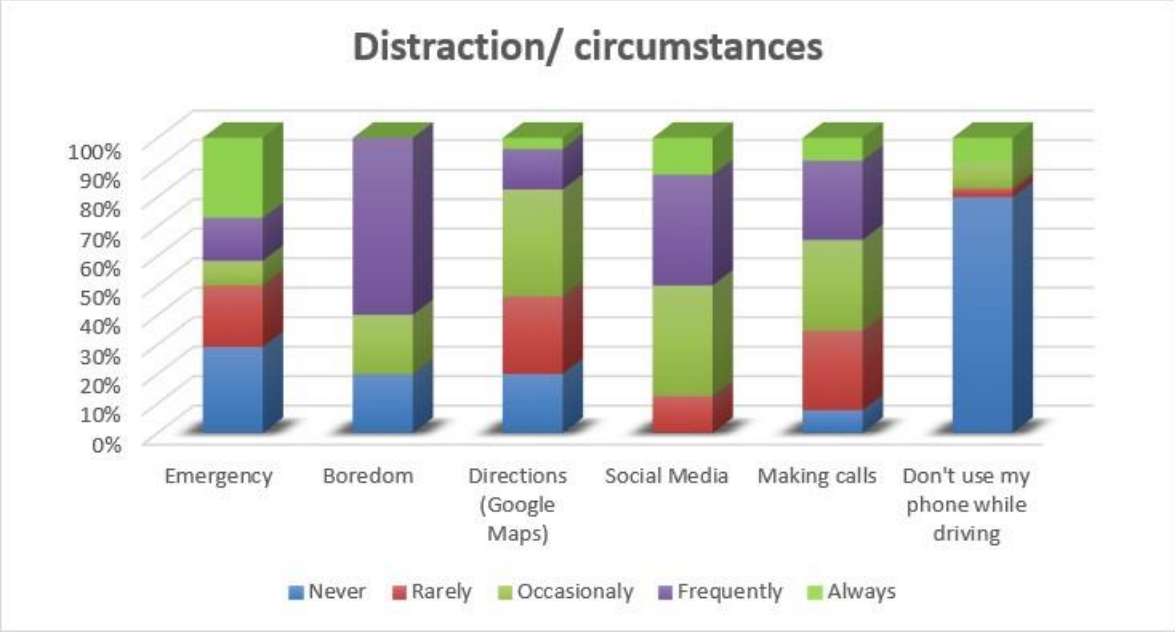
4.10 The particular mobile phone application and driver concentration

PROPOSITION 10: The particular mobile phone application and driver concentration

		Under what circumstances do you use your MD while driving?						Total
		Emergency	Boredom	Directions (Google Maps)	Social Media	Making calls	Don't use my phone while driving	
Does your mobile phone distract your driving?	Never	6,9%	0,5%	7,9%	0,0%	1,0%	13,9%	30,2%
	Rarely	5,0%	0,0%	10,4%	0,5%	3,5%	0,5%	19,8%
	Occasionally	2,0%	0,5%	14,4%	1,5%	4,0%	1,5%	23,8%
	Frequently	3,5%	1,5%	5,4%	1,5%	3,5%	0,0%	15,3%
	Always	6,4%	0,0%	1,5%	0,5%	1,0%	1,5%	10,9%
Total	Frequency	48	5	80	8	26	35	202
	Percentage	23,8%	2,5%	39,6%	4,0%	12,9%	17,3%	100,0%

Table 36: Mobile phone distraction and phone application

Table shows the results of the normality about the MD usage. Most of the respondents indicated that their mobile phones never distract their driving with a total of 30.2% followed by those who indicated that their mobile occasionally with a total of 23.8%, while 19.8% indicated that their mobile phones rarely distract their driving, with only a total of 10,9% who said they always get distracted by their mobile phones while driving.



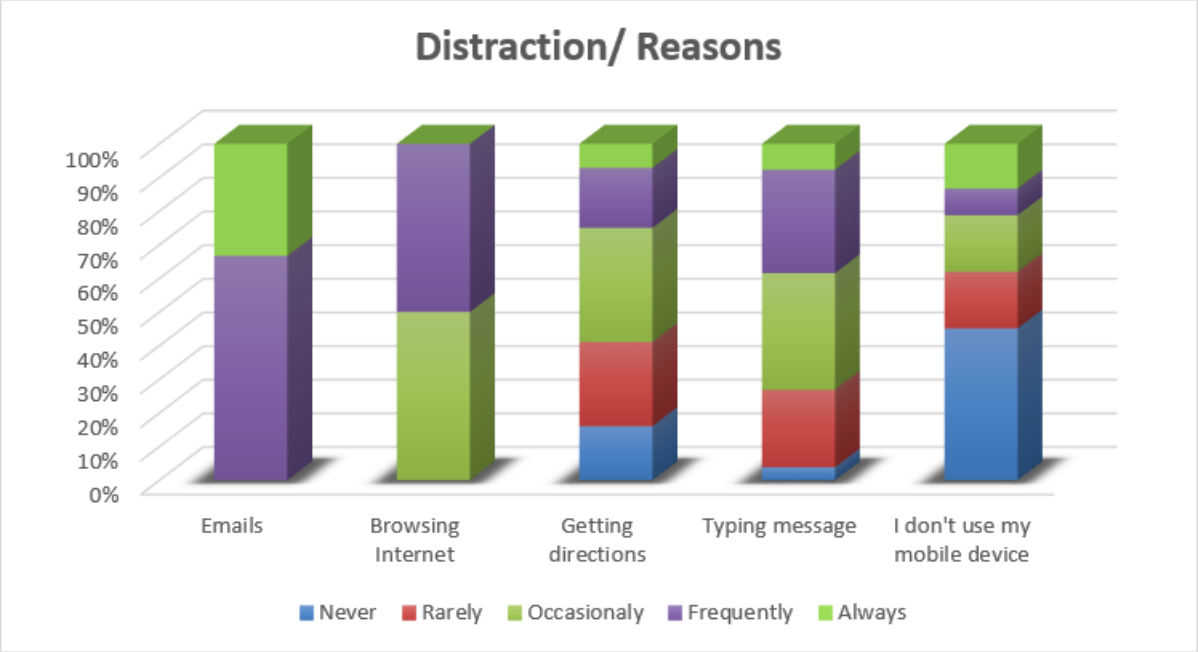
Histogram 18: Distraction/ circumstances

The linkage between these two concept was further investigated. A one-way ANOVA was used for the analysis.

	N	Mean	Std. Deviation	p-value	F-value
Emergency	48	2,90	1,627	0,001	7,057
Boredom	5	3,20	1,304		
Directions (Google Maps)	80	2,55	1,078		
Social Media	8	3,50	0,926		
Making calls	26	3,00	1,095		
Don't use my phone while driving	35	1,54	1,221		
Total	202	2,57	1,349		

Table 37: One-way ANOVA test (The relationship between these two variables)

Given that p-value is below 0.01, there is an association between these two variables.



Histogram 19: Distraction/ Reasons

Please see Histogram 17 for the explanation

The relationship between these variables was assessed through a one-way ANOVA.

The results are provided in the table 26 below:

	Mean	Std. Deviation	p-value	F-value
Emails	4,33	0,577	0,001	4,648
Browsing Internet	3,50	0,707		
Getting directions	2,75	1,148		
Typing message	3,15	1,008		
I don't use my MD	2,27	1,441		
Total	2,57	1,351		

Table 38: One-way ANOVA test (The relationship between these two variables)

The table shows that there is an association between these two variables ($p<0.01$).

5. Discussion of results

	HYPOTHESIS	ANOVA		CORRELATION		T-TEST		RELATIONSHIP	REASON
		F value	P value	Correlation coefficient	P value	P value	T value		
1	Demographics and the use of mobile devices whilst driving	2.906	0.023					Yes. P value below 0.05	Age relates to frequency of usage
2	Mobile phone use and the use of mobile devices whilst driving			0.205	0.004	0.119	-1.565	No. P value above 0.05	Relationship weak r<0.3 and no significant relationship
3	Security devices and the use of mobile devices whilst driving			0.169	0.017	0.058	1.92	No. P value above 0.05	Positive but weak relationship weak r<0.3
4	Mobile phone application and the use of mobile devices whilst driving	16.703	0.001					Yes. P value below 0.01	There is a relationship between two variables
5	Emotional states associated with mobile phone use and the use of mobile devices whilst driving	10.326	0.001					Yes. P value below 0.01	There is a relationship between two variables
6	Culture and the use of mobile devices whilst driving	2.287	0.062					No. P vlaue above 0.05	No relationship between two variables
7	The perceived cost of mobile phone use and the use of mobile devices whilst driving	4.539	0.002			0.098	0.358	Yes. P value below 0.05	Frequency of receiving fines relates to usage of mobile device
8	Mobile phone use and driver concentration			0.337	0.001	0.792	0.264	Yes. P value below 0.05	Positive and significant relationship
9	Security devices and driver concentration	4.648	0.001	0.153	0.031			Yes. P value below 0.05	Positive and significant relationship
10	The particular mobile phone application and driver concentration	7.057	0.001					Yes. P value below 0.01	There is a relationship between two variables

Table 39 Summary of 10 Hypothesis

5.1 Hypothesis Discussion

Hypothesis 1 Demographics and the use of MD whilst driving did reveals that there is a relationship between age and frequency of usage. It can be deduced that working professionals in the age category 25-34 and 35-49 years old are frequent users of MD while driving likely due to work pressures and limited time constraints. The theory of habit formation & behaviour change sets in hypothesis 1 amongst the working professionals. Where the outcome of MD use while driving encourages repetition of the behaviour over a period of time, and as a result it becomes routine and subconsciously acceptable behaviour to the human psyche. Students make use of mobiles while driving far less than expected. Similarly, the more elderly are also less prone to MD.

Hypothesis 2 Mobile phone use and the use of MD while driving shows us that the relationship which in turn alludes there is no significant relationship. Half the respondents may use MD but more than half claim they either occasionally, rarely and never use their MD while driving. The results are debateable as despite the questionnaire being anonymous respondents gave a politically correct answer which is misleading to the reality of what actually happens. The solution seems to be to attempt to better integrate mobiles into cars and driving, than to attempt to remove mobiles from cars, or reduce mobile use while driving or having to drive.

Hypothesis 3 Security devices and the use of MD while driving has cited that there is a positive but weak relationship. Hands free kits are seldom used by motorists the data confirms an analogy which is a general norm in society. A security device, like a hand-free kit, does not necessarily prevent MD. Those prone to MD seem to be more prone to have a hand-free kit. It may point out the difference in need: using mobiles device while driving more hazardous, and without really planning for it, or being proactive about it, versus much conscious about MD and the need to use a mobile while driving, and taking steps to attempt to facilitate the need, and reduce the risk and side-effects.

Hypothesis 4 Mobile phone application and the use of MD while driving indicates that there is a relationship between two variables. The relationship confirms the notion of a growing consciousness of image on social media which has given borne to impulsive behaviour. This discovery from the data solidifies the IPSOS finding that South Africa has the highest proportion of participants at 41% guilty of texting, emailing and active

on social media while driving. The frequency with which mobiles are used whilst driving, and apart from a hand-free kit, suggests that the kits are ineffective and inefficient. Emergencies are not that a prominent reason for using a mobile while driving. At the same time, using mobiles for entertainment while driving, is a prominent reason. In wishing to better manage MD, it may be beneficial to distinguish between pressing use (directions, calls), versus non-pressing use (calls, social media). Certain forms of use may be easily distinguishable as non-desirable, whilst others may not. Technology can focus more on simply blocking undesirable use, like social media, whilst better facilitating more understandable use, like directions, and making important calls.

Hypothesis 5 Emotional states associated with mobile phone use and the use of MD whilst driving specifies there is a relationship between two variables. Guilt is experienced more by those not prone to MD, than those prone to MD. It may suggest that guilt is a significant deterrent of MD, especially if the person cannot truly justify it. Some that use mobiles while driving, experience guilt to, suggesting a possible case of no escape and inevitability. Some are worried, suggesting the fear of repercussion. A significant number experience hardly any emotion, suggesting they either feel justified, or do not consider MD to be a serious matter.

Hypothesis 6 Culture and the use of MD while driving reveals there is no relationship between the two variables. Shaping culture may be a way of working in on MD, and perhaps more can be done in this regard, and current efforts should be re-evaluated. Culture like affects the propensity of MD. Yet, culture is not that outspoken against MD. In general, culture is accommodating and undecided on MD. Awareness does not necessarily have a significant impact on MD. Those who do not MD, do not necessarily do so because of awareness. Those who MD, are also rather aware of the implications, etc. It suggests awareness alone is a poor response to MD.

Hypothesis 7 The perceived cost of mobile phone use and the MD whilst driving shows us that there is a relationship. The frequency of receiving fines relates to the usage of MD. The issuing of a traffic fine is an immaterial expense to the motorist. The notion that I am only sorry when I get caught applies to motorist in the use of their MD whilst driving. Though there is a relationship that traffic fines are issued to repeat offenders. It still does not curb the behaviour which requires a definitive solution. People that MD also frequently receive fines, suggesting fines are not really effective in dealing with

MD, also that people may be more pressed to MD, such that it is not simply impulsive or arbitrary behaviour. For examples may be using mobiles for work while driving. Company in the car impacts MD. It may impact MD due to/ driven by entertainment or boredom. It may be less likely to impact more purposeful use of mobiles while driving, like making important or business calls, or getting directions. People who MD with greater purpose (professionals, business people) are also more likely to be alone in the car.

Hypothesis 8 Mobile use and driver concentration has cited that there is a positive but significant. The time study of mobile usage while driving is equal to driving blind for 5 seconds with each text (Penning, 2013). The data result corroborates the time study. People who MD, admit to being distracted by it. Interestingly, some no longer feel they are distracted by it. It may point to more established behaviour, that may not be easy to rectify. Of course, some are more easily distracted than others.

Hypothesis 9 Security devices and driver concentration indicates that there is a positive but significant relationship. The result alludes a bigger problem that awareness and technological advancement alone cannot tackle the behaviour. Hand-free kits do not necessarily impact concentration/ distraction while driving. This suggests the technology is ineffective and inefficient, and should be improved upon. Interestingly, getting directions are less demanding on concentration, than emails, browsing the internet, or texting/ typing messages. The impact on concentration promises to be an accurate way to tackle and curb the consequences of MD too. Unless or until more effective technology can be found, the drastic measure of disabling applications demanding on concentration may be an effective way of improving road safety. Texting (typing) and getting directions are dominant reasons for using mobiles while driving. These are things that current security devices, like hand-free kits, poorly address. Technology can better target these needs, to reduce MD. A drastic measure may be to disable texting and directions on the phone, while driving. A more user friendly measure may be to look to improve these functions, to make them less dangerous while driving.

Hypothesis 10 The particular mobile phone application and driver concentration specifies there is a relationship between two variables. Again, mobile related factors/ reasons that impact concentration while driving, can be divided between purposeful

(directions, emergencies, calls) and non-purposeful actions (boredom, social media, calls). Boredom is a significant reason for MD.

6 Final Conclusion

The loss of human life on South African roads requires a definitive solution that stretches beyond road safety initiatives, awareness, passing legislation and distractive driving. Researchers have invested heavily in information that does not translate into action unfortunately. No one is trying to reinvent the wheel with innovation. The lack of investment has resulted in the Road Accident Fund (RAF) being technically insolvent based on the numerous claims having a quantifiable impact on our nations GDP.

Current technology such as hands-free kit to counter MD is generally failing and can/ should be improved. MD demonstrates both cultural and behaviour phenomena. Culture generally accommodates MD and behaviour demonstrates it is ingrained. It will thus also take more than awareness and fines to correct. And both these are equally ineffective to deal with MD.

There are more drastic measures available to deal with MD like disabling certain mobile functions/ applications while driving. Part of the solution to MD and solving MD is to distinguish between pressed used and non-pressed use. Cases where the driver has to use his phone vs cases where the driver feels like using his phone. Applications vary in their impact on concentration.

The behaviour of MD use while driving requires renewed efforts to examine it deeper to obtain relevant root cause. Reasons vary across differenct age categories depending on what the relevant need is for the MD at the point in time. It clear working professionals are the predominant users. It would be an exciting understudy to focus the research more leveraged towards the working professionals and get to the details. Public and private sector have a role to play as they are beneficiaries of a healthy and safe driving working class. More so the short term insurers (Discovery) and road management agencies (RTMC).

7 Recommendations for future research

Future research can further look at the following:

1. Segmentation of MD: investigating in greater depth why certain clusters MD. For example, it was proposed that the MD habits of age groups 25-34 and 35-49 can be explained by work demands (being professionals) and 'business'.
2. The dichotomy and distinction between necessity MD and leisure MD: It is suggested that a distinct divide exists in terms of MD as necessity MD – people who are forced to MD, because of circumstances or requirements – and MD as leisure MD – people who are enticed to MD.
3. MD as ingrained behaviour: specifically examining whether and the extent to which MD is ingrained behaviour, particularly among certain clusters known to MD significantly.
4. Technology and MD: investigating both the efficiency of existing technology to deal with MD, and how technology can improve countering MD. It implies a better integration of mobiles with cars.
5. Boredom, MD and driving/ road safety: as a significant factor of MD too, boredom is a very interesting phenomenon in the context of MD and driving/ road safety.
6. Students and MD: examining specifically why students MD far less than expected.
7. Emotions, behaviour and culture around MD: A certain culture around MD is evident. This can be researched further.
8. Extreme measures to MD: the reasoning, perceptions and acceptance of more extreme measures to MD, as perceived by drivers, also promises to offer an unique perspective on MD.
9. The best approach to MD: The impact and efficiency of awareness and penalties (fines) as methods to deal with MD, and alternative strategies.
10. There is a strong need to invest in Road Safety research in South Africa. Consultation session held with the RTMC was there is a lack publication in road safety as a topic resulting in RTMC outsourcing the function to CSIR.

11. There are enormous cost saving benefits for short insurer in examining behaviour and psychology of motorist in South African. The reward and recognition program offer by Discovery is becoming popular where Vitality points and reduced premium entices the driver to drive diligently. The TPB removes triggers that exacerbate the action such as MD
12. Mandatory research from private business on all employees driving pool cars to monitor and assess the driver behaviour of their own staff. As a private business drive the collection of data can help lawmakers, psychologists and motorists store data relevant to the driver psyche decision making process.
13. It has been cited in the research that technological advancement cannot alone remedy the behaviour. There is a strong need for aggressive behaviour education as recommended by Sawnson (2013).

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