

KISS OF DEATH: DISTRACTED DRIVING RELATED BEHAVIORS AMONG DRIVERS IN BOTSWANA

Mpho M. Pheko¹, Kagiso N. Tlhabano², Nicole Monteiro³, Shyngle K. Balogun⁴

Department of Psychology, University of Botswana,
BOTSWANA.

¹mphopheko@live.com

ABSTRACT

The current study was an exploratory study to investigate the different types and prevalence of different distracted driving related behaviours (DDRBs) amongst the Botswana drivers. Data were collected via roadside observation using a log and pen and pencil. The observations took place in Gaborone, the capital city of Botswana and seven researchers were involved in observations. In all observations, at least two researchers observed all drivers to identify those who were engaged in a secondary activity while driving. A total of 462 drivers engaging in DDRBs were recorded and the results revealed that amongst Botswana drivers, the most common distraction were: talking on the cell phone, looking around, talking to other occupants in the car, drinking or eating, texting on the phone, looking at oneself on the mirror/putting make-up/wearing glasses, fiddling with car controls, reading newspapers or maps, smoking cigarettes, and singing or dancing – in that order. Given the seemingly limited traffic related research in Botswana, the results of this study will help in raising awareness about the dangers of DDRBs and to also inform policies and actions related to the DDRBs. We also hope to promote similar research activities in Botswana.

Keywords: Driving, Distractions, Botswana, Traffic, Cell phone

INTRODUCTION

The World Health Organization (WHO, 2004; 2011) estimated that worldwide 1.2 million people are killed and 50 million people are injured in traffic accidents each year. The organization also informed that if there are no innovative commitments to prevention, these figures will increase by about 65% over the next 20 years. Others have also revealed that the majority of the people who die every year as a result of road accidents are from developing economies (The World Bank, 2002) such as Botswana. This suggests that the global burden of road traffic deaths and injuries are disproportionately concentrated in countries with other pressing economic and societal challenges, and with people who may least afford health care (Sharma, 2008). As far as developing countries are concerned, these fatalities have been attributed to lack of awareness of the road safety problem in the public, political and professional arenas which manifests in the form of poor institutional capacity, insufficient funding of road safety issues, and ill trained and/or unmotivated law enforcers (Zietlow, 2006).

The Embassy of the United States in Gaborone, Botswana (2013) warns that in Botswana, there are a high number of traffic accidents and attributes these to either the structural issue (e.g., stretches of two-lane highways without shoulders, poor street lightings and even presence of domestic and wild animals on the roads); and/or the behavioral issues (e.g., driving habits, excessive speed, drunk drivers). The fact that road transport is the primary means of transport in the country (Archer, Chanda, Darkoh, & Mpotokwane, 2005), suggestions that road accidents represent the second largest contributor to the death toll after

HIV/AIDS in Botswana (Mphela, 2011; WHO & Government of Botswana, 2009), the WHO's traffic related death and injury projections, highlight the country's need to address road traffic behavior and related consequences as a priority and a public health concern. The limited research available in Botswana regarding road safety suggest that a large proportion of road traffic accidents are as a result of human errors caused by road-users' behaviour which mainly include the decision to disobey rules of the road (Mphela, 2011). The current study focused specifically on a category of road users' behaviors that will hereafter be referred to as Distracted Driving Related Behaviors (DDRBs).

Distracted Driving Related Behaviors

Despite the obvious importance of paying full attention to driving, people regularly engage in a wide variety of multitasking activities (Strayer, Drews, & Crouch, 2006). Given the potential dangers of DDRBs, some have compared DDRBs to drunk driving and driving without seat belts (Grzeskowiak, 2011). Accordingly, DDRBs should be regarded as a serious public threat (Wilson & Stimpson, 2010) and an important risk factor for road traffic injuries (WHO, 2011) as they increase the chance of motor vehicle crashes. DDRBs have been described as any secondary behaviour that the motor vehicle operator may engage in mentally or physically and which draws the attention of a driver away from the main task of driving (Ranney, 1994; WHO, 2011). In 2003, a study using U.S. crash data revealed that driver inattention (which also includes DDRBs), was related to between 20 to 50 percent of all police-reported crashes. The U.S. **National Highway Traffic Safety Administration (NHTSA)** (2010), also indicated that in 2008, approximately 1 in 6 fatal vehicle collisions resulted from DDRBs. Accidents resulting from DDRBs do not only endanger the driver, they also endanger passengers, other drivers, and pedestrians (Bone & Mowen, 2006; Johnson, 2012). They may also destroy other infrastructures such as stop signs, traffic lights, and nearby buildings.

The DDRBs problem might be exacerbated by the fact that cars nowadays are increasingly embedded with new technologies and devices such as blue tooth, navigation systems, telephones, televisions, cruise controls and other portable devices. Despite their convenience and advantages, these devices may further increase driving related distractions (Horrey, Lesch, & Melton, 2010). The above statistics and discussions highlight the importance of establishing the types and prevalence of driving related distractions and the types of drivers who are more likely to be distracted (Sullman, 2012). Johnson, Voas, Lacey, McKnight, and Lange (2004) analyzed photographs of drivers in New Jersey turnpike and revealed that the most common distractions included using a mobile phone, smoking, eating/drinking, and interacting with a passenger. Most of these examples were also cited by the U.S. National Highway Traffic Safety Administration (NHTSA, 2010) which cited distracted driving to include: using a cell phone, talking to other passengers in the car, eating, drinking, smoking, adjusting radio, fiddling with controls in the car, and reaching for object in car while driving.

To the knowledge of the authors, the types and prevalence of the above listed DDRBs has not been established in Botswana. McEvoy & Stevenson (2008) also observed that while research DDRBs on driving performance is advanced, the research measuring exposure to driver distractions is still in its infancy. Sullman (2012) also observed that there is little peer reviewed research investigating the driver distraction using roadside observations. Where available, others have also observed that most of the attention from both the policymakers and the media has been focused on talking and texting on cell phones while driving (Wilson & Stimpson, 2010).

AIMS OF THE CURRENT STUDY

To address the above perceived and identified gaps in research, the current study was an exploratory study to investigate the different types of DDRBs and the common DDRBs found in Botswana. Therefore in the current study, an effort was made to investigate the prevalence of all type of DDRBs, including cell phone use, by a naturalistic observational approach. Given the seemingly limited traffic related research in Botswana, we also aim to: raise awareness about the dangers of DDRBs, promote similar research activities, and inform policies and actions related to the DDRBs.

METHOD

Procedures

Similar to Sullman (2012), data in the current study were collected via roadside observation using a log and pen and pencil. The observations took place in Gaborone, the capital city of Botswana and seven researchers were involved in observations. At any time, at least two researchers observed all drivers to identify those who were engaged in secondary activities while driving. While both observers were observing the DDRBs, one observer was the designated logger. This was important because the gender of the driver, the type of distraction, type of car, condition of car (i.e., new, old, new/old, very old), and perceived age (categorized as an age range, i.e. 20s 30's 40s, and 50s) of the driver, and time of day were also captured. Therefore, the second observer called out the DDRB and all other important features of the cars and the drivers. Each of the observational sessions lasted for 1 hour and a total of 8 hours of observations were accumulated. The observations were made between 7:00 am and 8:30am (morning peak); 2:00pm and 3:00 pm (off-peak); and 4:30pm and 6:30pm (afternoon peak).

Data Analysis

Data analysis involved using the Statistical Package for the Social Sciences (SPSS) programme (IBM SPSS Statistics 20). DDRBs were purposefully not identified or defined prior to the observation in order to not limit the observers. Therefore, after data collection, the first task before imputing the data entailed reviewing all the distractions and coding them for imputation. The distractions which were infrequently observed were also moved into the "other" category (e.g. scratching oneself, opening the door, watching TV, and throwing an object out of the window). After coding, data were inputted into SPSS and a series of data analyses techniques were used to provide insight into the data. As explained under aims and objectives, this was an exploratory study investigating the different and common DDRBs found in Botswana. Gender differences and age differences in relation to the prevalence of the DDRB were also investigated. We also examined the potential influence of time of the day on the prevalence of the DDRBs.

RESULTS

A total of 462 drivers engaging in DDRBs were recorded during the study. Table 1 and Figure 1 present a summary of the observed DDRBS.

The results presented in Table 1 and Figure 1 revealed that amongst Batswana drivers, the most common distraction were: talking on the cell phone (31.2%), looking around (16.9%), talking to other occupants in the car (15.4%), drinking or eating (9.8%), texting on the phone (8.2%), looking at oneself on the mirror/putting make-up/wearing glasses (5.8%), fiddling with car controls (4.9%), reading newspapers or maps (2.2%), smoking cigarettes(2.9%), and singing or dancing (2.0%).

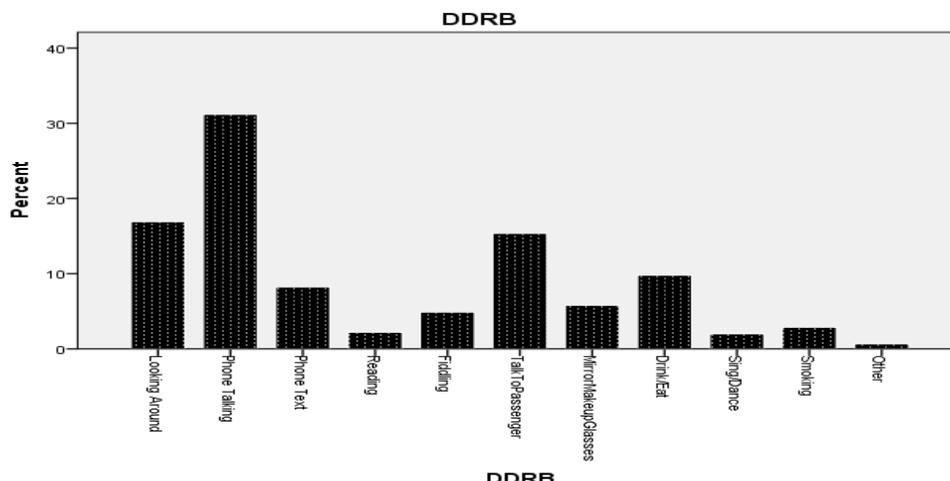


Figure 1. Prevalence of Each DDRB.

Table 1. Observed Distracted Driving Related Behaviors and the Gender Differences

<i>Distracted Driving Related Behaviors</i>												
	<i>Looking Around</i>	<i>Phone Talking</i>	<i>Phone Texting</i>	<i>Reading</i>	<i>Fiddling</i>	<i>Talking to Passengers</i>	<i>Mirror Makeup Glasses</i>	<i>Drinking or Eating</i>	<i>Singing or Dancing</i>	<i>Smoking</i>	<i>Other</i>	<i>Totals</i>
Totals												
Count	76	140	37	10	22	69	26	44	9	13	3	449
% within Gender	16.9%	31.2%	8.2%	2.2%	4.9%	15.4%	5.8%	9.8%	2.0%	2.9%	0.7%	100%
% within DDRB	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
% of Total	16.9%	31.2%	8.2%	2.2%	4.9%	15.4%	5.8%	9.8%	2.0%	2.9%	0.7%	100%
Male												
Count	62	105	27	8	14	47	14	28	8	13	3	329
% within Gender	18.8%	31.9%	8.2%	2.4%	4.3%	14.3%	4.3%	8.5%	2.4%	4.0%	0.9%	100%
% within DDRB	81.6%	75.0%	73.0%	80.0%	63.6%	68.1%	53.8%	63.6%	88.9%	100%	100%	73.3%
% of Total	13.8%	23.4%	6.0%	1.8%	3.1%	10.5%	3.1%	6.2%	1.8%	2.9%	0.7%	73.3%
Female												
Count	14	35	10	2	8	22	12	16	1	0	0	120
% within Gender	11.7%	29.2%	8.3%	1.7%	6.7%	18.3%	10.0%	13.3%	0.8%	0.0%	0.0%	100%
% within DDRB	18.4%	25.0%	27.0%	20.0%	36.4%	31.9%	46.2%	36.4%	11.1%	0.0%	0.0%	26.7%
% of Total	3.1%	7.8%	2.2%	0.4%	1.8%	4.9%	2.7%	3.6%	0.2%	0.0%	0.0%	26.7%

Looking at gender differences, the results revealed that men were more likely to engage in the DDRBs compared to women, as 73% of the distracted behaviours were carried out by men. Even looking at specific behaviours, the findings revealed in all of the DDRBs a larger percentage of men engaged in the DDRBs compared to women, some to a larger degree than

others (e.g. talking on the cell phone males = 75%, females = 25%; Looking around males = 81.6%, females = 18.4%; and talking to passengers males = 68.1%, females = 31.9%).

Time of the day analysis of the data revealed that, in fact, time of the day made a difference in terms of the prevalence of some of the DDRBs. Figure 2 shows that majority of the DDRBs were observed during the morning peak between 07:00 -08:30 (49.1%), followed by the afternoon peak between 16:30 -18-30 (26.1%) and off peak from 14:00-15:00 (24.1%). The findings further revealed that the majority of drivers (42.1%) spoke on the cell phones and text on the phones (35.1%) between the hours of 16:30 pm and 18:30 pm and the hours of 07:00 am and 8:30 am where (40.0%) spoke on the cell phones and text on the phones (43.2%). The majority of people who were eating or drinking (54.5%) did so between the hour of 14:00 and 15:00. The findings further revealed that people who were looking around (72.4%) did so in the morning between the hours of 7:00-08:30. Examples of looking around included (looking down, looking back, looking at other occupants in the car, and looking outside the car).

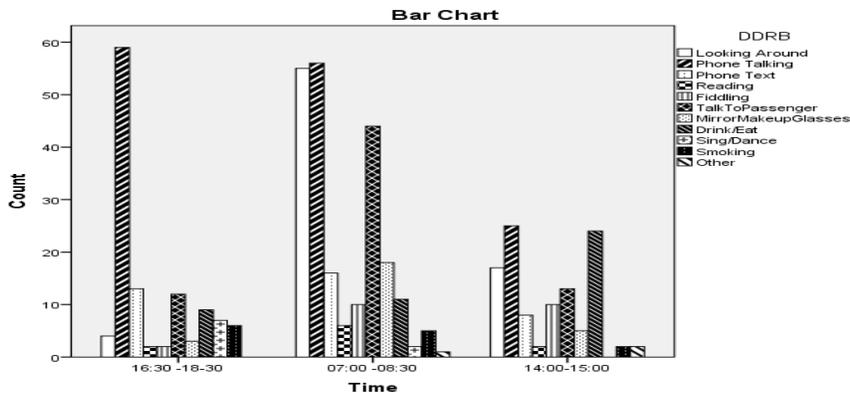


Figure 2. Time of the day and Prevalence of DDRB

Age analysis also revealed that the majority of the DDRB were observed between people aged between thirty and forty nine years old. Specifically, 45% of the DDRBs were observed among people between the ages of 30-39 while another 41% of the DDRB were observed amongst aged between 40 and 49 years old. Figure 3 and Table 2 presents the age related findings.

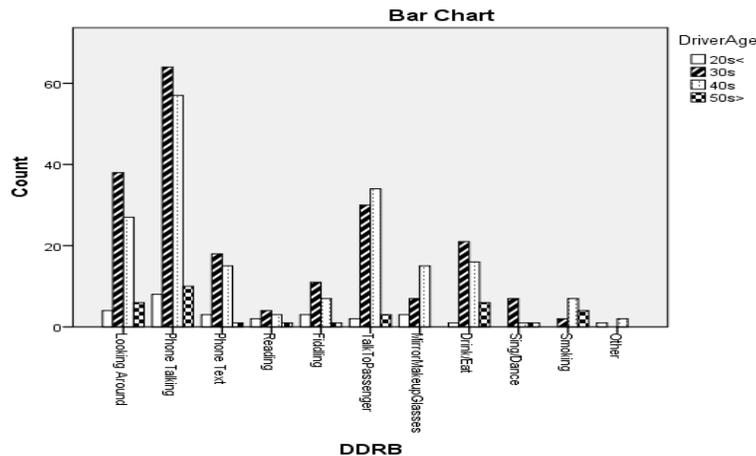


Figure 3. Driver Age and Prevalence of DDRBs

Table 2. Age Differences in Distracted Driving Related Behaviours

<i>Distracted Driving Related Behaviors</i>												
	<i>Looking Around</i>	<i>Phone Talking</i>	<i>Phone Texting</i>	<i>Reading</i>	<i>Fiddling</i>	<i>Talking to Passengers</i>	<i>Mirror Makeup Glasses</i>	<i>Drinking or Eating</i>	<i>Singing or Dancing</i>	<i>Smoking</i>	<i>Other</i>	<i>Totals</i>
Age 20 and Below												
Count	4	8	3	2	3	2	3	1	0	0	1	27
% within Driver Age	14.8%	29.6%	11.1%	7.4%	11.1%	7.4%	11.1%	3.7%	0.0%	0.0%	3.7%	100%
% within DDRB	5.3%	5.8%	8.1%	20.0%	13.6%	2.9%	12.0%	2.3%	0.0%	0.0%	33.3%	6.1%
% of Total	0.9%	1.8%	0.7%	0.4%	0.7%	0.4%	0.7%	0.2%	0.0%	0.0%	0.2%	6.1%
Age 30-39												
Count	38	64	18	4	11	30	7	21	7	2	0	202
% within Driver Age	18.8%	31.7%	8.9%	2.0%	5.4%	14.9%	3.5%	10.4%	3.5%	1.0%	0.0%	100%
% within DDRB	50.7%	46.0%	48.6%	40.0%	50.0%	43.5%	28.0%	47.7%	77.8%	15.4%	0.0%	45.3%
% of Total	8.5%	14.3%	4.0%	0.9%	2.5%	6.7%	1.6%	4.7%	1.6%	0.4%	0.0%	45.3%
Age 40-49												
Count	27	57	15	3	7	34	15	16	1	7	2	184
% within Driver Age	14.7%	31.0%	8.2%	1.6%	3.8%	18.5%	8.2%	8.7%	0.5%	3.8%	1.1%	100%
% within DDRB	36.0%	41.0%	40.5%	30.0%	31.8%	49.3%	60.0%	36.4%	11.1%	53.8%	66.7%	41.3%
% of Total	6.1%	12.8%	3.4%	0.7%	1.6%	7.6%	3.4%	3.6%	0.2%	1.6%	0.4%	41.3%
Age 50 and Above												
Count	6	10	1	1	1	3	0	6	1	4	0	33
% within Driver Age	18.2%	30.3%	3.0%	3.0%	3.0%	3.0%	0.0%	18.2%	3.0%	12.1%	0.0%	100%
% within DDRB	8.0%	7.2%	2.7%	10.0%	4.5%	4.3%	0.0%	13.6%	11.1%	30.8%	0.0%	7.4%
% of Total	1.3%	2.2%	0.2%	0.2%	0.2%	0.7%	0.0%	1.3%	0.2%	0.9%	0.0%	7.4%

DISCUSSION

The current study supported the assertions that drivers do engage in multitasking activities while driving (Strayer et al., 2006). The findings further provided insights into these suggestions by providing information about the type of driver (i.e., in terms of age, gender) who is more likely to be distracted, and the most common DDRBs that Botswana drivers are more likely to engage in. Similar to Stutts, Feaganes, Rodgman, Hamlett, Meadows, Reinfurt (2003), in the current study it was observed that amongst the DDRBs, most were not new or technological. In Stutts et al.'s (2003) study, the non-technological DDRBs included talking to passengers, eating, drinking, lighting a cigarette, applying makeup, and listening to the radio. In this study the non-technological DDRBs included looking around, talking to other occupants in the car, drinking or eating, looking at oneself on the mirror/putting make-up/wearing glasses, reading newspapers or maps, smoking cigarettes, and singing or dancing. In their study, Stutts et al., (2003) indicated that these distractions are responsible for an estimated 25% of all automobile accidents. The dangers in DDRB are believed to stem from

the fact that when drivers are distracted they may transfer their attention from information in the driving scene to the secondary activity (Strayer et al., 2003; WHO, 2011).

Our findings revealed that the most common DDRB was talking on the cell phone, which has been identified as the most problematic DDRB. Cell phone use as a DDRB seems to be prevalent even internationally, as the NHTSA (2010) indicated that in the U.S. 995 fatalities and 24,000 injuries were believed to be caused by cell phone related distractions. There are good reasons to believe that some of these new DDRBs, such as cell phone use, may be substantially more distracting than the old DDRBs since when using a cellphone attention may be directed away from the external environment and toward an internal, cognitive context associated with the phone conversation (Strayer et al., 2006; WHO, 2011). The cognitions required in cell phone conversations may also explain findings that drivers are more likely to miss critical traffic signals, be slower in reacting to the signals, and be involved in rear-end collisions when they are conversing on cell phones (Strayer et al., 2003) and that using a cellphone while driving quadruples the chances of being in a traffic accident (Redelmeier & Tibshirani, 1997).

Younger drivers (e.g., college students) have also been associated with DDRBs including talking on the cell phone and texting while driving (e.g., Cramer, Mayer, & Ryan, 2007). For instance Tison, Chaudhary, and Cosgrove (2011), revealed that in their study, younger drivers between the ages of 18 to 20 years old were more likely to make a phone call and to text while driving, and attributed this to boredom. Tison et al. (2011) also revealed that younger drivers were likely to report that talking on a phone while driving makes no difference on their driving performance. In the current study, only 20 (6.1%) of younger drivers were observed engaging in DDRB. Of this number, 11 of the drivers were either talking on the phone ($N = 8$) or texting ($N = 3$). This number is small compared to other studies. However, it does not necessarily mean that young Botswana drivers may not engaged in DDRBs. One explanation may be that because of economic reasons, compared to the developed nations, most young drivers of this age in Botswana cannot afford cars, and therefore they are less likely to be observed driving.

While the picture regarding DDRBs looks bad, the good news is that similar to other administrations, the Botswana government has already put in place laws meant to deter drivers from using cell phones while driving. However from the results of this study, it is clear that people are still using the cell phones anyway. Others have established relationships between perceived attachment to the cell phone and the use of cell phone and social media while driving (Weller, Shackelford, Dieckmann & Slovic, 2012). Weller et al. (2012) also suggested that because cell phones increasingly have greater functionalities, attachment to one's phone may also increase, subsequently increasing the prevalence of DDRB. While Botswana may not be as advanced technologically as the developed countries, it was interesting that cell phone use was prevalent amongst those who engaged in DDRBs. This demonstrates that arguments by Weller et al., (2012) might also apply in contexts like Botswana.

Limitations of the Study

While this study has shed light on the different types of DDRBs in Botswana, several limitations must be acknowledged. First, the findings of the current study are solely descriptive, limiting anyone to establish relationships between the different variables in the study. Furthermore, the study's design did not allow for investigation of DDRB's prevalence. It is also imperative to highlight that because the current study was observational, the age of the drivers could only be inferred. While our investigation did reveal that the use of

cellphones while driving is prevalent amongst Botswana drivers; researchers such as Rakauskas, Gugerty, and Ward (2004) advice that similar studies may benefit more from designs that allow determination of how much distractions devices such as cell phones and navigation systems bring to driving. Consequently, because of the design of the study and nature of data collected, this study should only be considered as an exploratory analysis which will serve the purpose of generating future research activities in countries like Botswana which are reported to be experiencing the global burden of road traffic deaths and injuries (Mphela, 2011; Sharma, 2008).

Impact on the Industry and Practice

The WHO (2004) suggests that of all the human related systems, road traffic systems are the most complex and the most dangerous. This may explain the findings that while the Botswana government has banned any form of cell phone use by drivers, a large number of drivers were observed freely using cell phones while driving. The WHO (2004) also calls for impartial research and development on road safety and calls this an essential effective road safety programme making the current study important for stakeholders such as the policy makers, insurance companies, cell phone manufacturers, the Botswana police, and the Botswana Motor Vehicle Accident Fund

Such investigations are vital especially since drivers continue to engage in DDRBs despite the enacted laws and the impending danger of the behaviors. On the surface, one may see this as a call for increased law enforcement and education of drivers about the dangers of using cell phones while driving. Yet being citizens and residents of Botswana, we know that such education and increased law enforcement seem not to be effective. For example, Mphela's (2011) study warned that existence of policies, increasing traffic fines, and even enforcing the new traffic laws in Botswana has achieved little in the reduction of car accident related fatalities. What is not clear in Mphela's (2011) study is whether enforcement of the laws and enactment of policies have lead to a reduction in the prevalence of DDRBs and other illegal behaviors. The WHO (2011) also informs that there is limited information and research regarding the effectiveness of interventions to address the DDRBs. Accordingly and similar to the WHO (2011), we recommend that the government of Botswana support its legislation by instituting strong enforcement plans and public awareness campaigns that put specific emphasis on the risk of the DDRBs.

Given the suggestions that the mobile phone has become a gateway to people's personal and professional lives, and that this may lead to increased attachment to one's cell phone; future studies may also investigate how such attachments may affect people's risk judgments (Weller et al., 2012). The demands and pace of the new millennia may play a role by robbing people of extra time, in turn increasing the prevalence of DDRBs like eating and drinking in the car on the way to work. These developments, therefore, call for continued empirical investigation of factors that can predict DDRBs as well as moderators and mediators of the relationships between such factors and DDRBs.

We also suggest that governments, cell phone manufactures and automobile providers should come up with preventative new-car options and even make them standard in every car just like seatbelts and airbags. Until such a time, similar to Wilson and Stimpson (2010), we recommend that to discourage drivers from using handheld devices while driving, legislation should be paired with effective enforcement. Others such as Johnson (2012) have suggests that one way of preventing technology DDRBs is to get into the habit of putting the electronic detractors away (e.g., putting the cell phone off or silenced, or in the boot of the car, putting in the right CD, setting the GPS or the preferred radio station) before driving.

Lam (2002) also recommended that to teach younger children who will be future drivers about the dangers of DDRBs, parents who are driving with young children in need of urgent care could stop somewhere safe before attending to the children. Similar to Lam (2002), we are of the view that this could be achieved if effective public education programmes on the dangers of engaging in DDRBs are affected. Therefore, we also recommend safety education, that aim to increase awareness of the effect of distraction on the risk of car collision and injury. These may include media campaigns and pamphlets that the police distribute during roadblocks.

CONCLUSIONS

Drivers, passengers, pedestrians (Bone & Mowen, 2006; Johnson, 2012; Lam, 2002), the infrastructure, stakeholders at all levels (e.g., the government, insurance companies, the police, motor accident funds, and hospitals) on the whole are affected by dangers associated with DDRBs, making the results obtained in this study important for road safety and public health. As such, we conclude by suggesting that stakeholders at all levels need to work as a collective to come up with informed interventions, create greater levels of awareness and commitment, and make informed decisions regarding prevention of DDRBs.

ACKNOWLEDGEMENTS

The authors would like to thank other Traffic Psychology and Accident Prevention Research Team who helped in collecting data for the current study: Seipone Mphele, Mosebetsi M. Selemogwe, Rapelang Chilisa, and Monde Kote. Preliminary results of this research were also presented at the Symposium on Traffic Psychology and Accident Prevention at the University of Botswana.

REFERENCES

- Archer, E. K., Chanda, R., Darkoh, M. B. K. & Mpotokwane, M. A. (11 - 13 July 2005) Road improvement and safety: A case study from the western region of Botswana. Paper presented to the 24th *Annual Southern African Transport Conference, South Africa*; 1920017127
- Bone, S. A. & Mowen, J. C. (2006). Identifying the traits of aggressive and distracted drivers: A hierarchical trait model approach. *Journal of Consumer Behavior*, 5(5), 454-464. doi:10.1002/cb.193
- Braitman, K. A. & McCartt, A. T. (2010). National reported patterns of driver cell phone use in the United States. *Traffic Injury Prevention*, 11, 543-548. doi:10.1080/15389588.2010.504247
- Cramer, S., Mayer, J. & Ryan, S. (2007). College students use cell phones while driving more frequently than found in government study. *Journal of American College Health*, 56(2), 181-184.
- Embassy of the United states Gaborone, Botswana. (2013). Gaborone Retrieved March 5, 2013, from <http://botswana.usembassy.gov/road-safety.html>
- Grzeskowiak, J. (2011). Governments target distracted driving. *American City & County*, 126(9), 16.
- Horrey, W. J., Lesch, M. & Melton, D. F. (2010). Distracted Driving: Examining the effects of in-vehicle tasks. *Professional Safety*, 55(1), 34-39.

- Johnson, T. (2012). Distracted driving: Stay focused when on the road. *Nation's Health*, 42(1), 28.
- Johnson, M. B., Voas, R. B., Lacey, J. H., McKnight, A. S. & Lange, J. E. (2004). Living dangerously: Driver distraction at high speed. *Traffic Injury Prevention*, 5, 1–7.
- Lam, L. T. (2002). Distractions and the risk of car crash injury The effect of drivers' age. *Journal of Safety Research*, 33(3), 411-419.
- McEvoy, S. P., Stevenson, M. R. & Woodward, M. (2007). The prevalence of, and factors associated with, serious crashes involving a distracting activity. *Accident Analysis and Prevention*. 39, 475–482.
- Mphela, T. (2011). The impact of traffic law enforcement on Road accident fatalities in Botswana, *Journal of Transport and Supply Chain Management*, 264-277.
- National Highway Traffic Safety Administration. (2010). Traffic safety facts research note: an examination of driver distraction as recorded in NHTSA databases. US Department of Transportation. <http://www-nrd.nhtsa.dot.gov/Pubs/811216.pdf>
- Odero, W. Garner, P. & Zwi, A. (1997). Road traffic injuries in developing countries: a comprehensive review of epidemiological studies. *Tropical Medicine and International Health*, 2(5), 445–460.
- Rakauskas, M. E., Gugerty, L. J. & Ward, N. J. (2004). Effects of naturalistic cell phone conversations on driving performance. *Journal of Safety Research*, 35(4), 453-464. doi:10.1016/j.jsr.2004.06.003
- Ranney, T. A. (1994). Models of driving behavior: A review of their evolution. *Accident Analysis & Prevention*, 26, 733–750.
- Redelmeier, D. A. & Tibshirani, R. J. (1997). Association between cellular-telephone calls and motor vehicle collisions. *New England Journal of Medicine*, 336(February 13), 453-458.
- Sharma, B. R. (2008). Road traffic injuries: A major global public health crisis. *Public Health (Elsevier)*, 122(12), 1399-1406. doi:10.1016/j.puhe.2008.06.009
- Strayer D. L., Drews, F. A. & Crouch, D. J. (2006). A comparison of the cell phone driver and the drunk driver. *Human Factors*, 48(2), 381–391.
- Strayer D. L., Drews, F. A. & Johnston W. A. (2003). Cell phone-induced failures of visual attention during simulated driving. *Journal of Experimental Psychology: Applied*, 9 (1): 23–32. doi:10.1037/1076-898X.9.1.23. PMID 12710835
- Sullman, M. M. (2012). An observational study of driver distraction in England. *Transportation Research: Part F*, 15(3), 272-278. doi:10.1016/j.trf.2012.01.001
- Stutts J., Feaganes J., Rodgman E., Hamlett C., Meadows, & Reinfurt, D. (2003). *Distractions in everyday driving*. AAA Foundation for Traffic Safety: Washington, DC.
- Tison, J., Chaudhary, N. & Cosgrove, L. (2011). *National phone survey on distracted driving attitudes and behaviors*. (Report No. DOT HS 811 555). Washington, DC: National Highway Traffic Safety Administration.
- Weller, J. A., Shackelford, C., Dieckmann, N. & Slovic, P. (2012). Possession attachment predicts cell phone use while driving. *Health Psychology*, doi:10.1037/a0029265

- Wilson, F. A. & Stimpson, J. P. (2010). Trends IN FATALITIES FROM DISTRACTED DRIVING IN THE United States, 1999 to 2008. *American Journal of Public Health*, 100(11), 2213-2219. doi:10.2105/AJPH.2009.187179
- World Bank. (2002). *Road safety*. Retrieved March 5, 2013, from: <http://www.worldbank.org/transport/roads/safety.htm>
- World Health Organization. (2004). World report on road traffic injury prevention: summary. Retrieved on February 12, 2013, from www.who.int/violence_injury_prevention/publications/road_traffic/world_report/summary_en_rev.pdf
- World Health Organization. (2011). *Mobile phone use: a growing problem of driver distraction*. Geneva, Switzerland, World Health Organization, Retrieved on March 07, 2013, from www.who.int/violence_injury_prevention/publications/road_traffic/en/index.html
- World Health Organisation & Government of Botswana, (2009). *WHO Country Cooperation Strategy: Botswana 2003-2007*