

Anger, impulsivity, sensation seeking and driver attitudes as correlates for self-reported acts of risky driving behaviour among young drivers.

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205521990

2010

Submitted in partial fulfilment of the requirements for the degree of Master of Social Science (Health Promotion), in the Graduate Programme in the School of Psychology, University of KwaZulu-Natal, Durban, South Africa.

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Declaration

I declare that this dissertation is my own unaided work. All citations, references and borrowed ideas have been duly acknowledged. I confirm that an external editor was not used. This dissertation is being submitted for the degree of Master of Health Promotion in the Faculty of Humanities, Development and Social Science, University of KwaZulu-Natal, Durban, South Africa. None of the present work has been submitted previously for any degree or examination in any other University.



Shaneel Bachoo

24 November 2010

Acknowledgements

I would especially like to extend my gratitude to:

- Mr Anil Bhagwanjee – For his continued support & understanding throughout the process.
- Professor Arvin Bhana – For all his guidance, motivation & assistance.
- Dr Kay Govender – For assisting me with data analysis.
- My mother & family – For standing by me throughout the journey, always providing me with untiring love & support.
- Celosha Sukunandan – For assisting me with data entry as well as for her patience & understanding.

Abstract

The study used a cross-sectional survey design to investigate anger, impulsivity, sensation seeking and driver attitudes as correlates for self-reported acts of risky driving behaviour (RDB), among young drivers. A non-probability sample of 306 university students from two universities in the Durban region completed the self-administered questionnaire. A key focus area included an examination of age and gender differences in the above-mentioned constructs.

Fifty four percent of the sample were male (N = 165) and 46% female (N = 141). The mean age of males and females in the sample was 29 years and 25 years respectively. The majority of the sample (75%) indicated that they drive either on a daily basis or 3-6 days a week.

With regard to the relationship between the various personality constructs and self-reported acts of RDB, the results indicate that driver anger, sensation seeking, a sense of urgency and a lack of premeditation and perseverance were significantly related to self-reported acts of RDB. That is, drivers with higher driver anger, sensation seeking, urgency, and with a greater lack of premeditation and perseverance in daily activities were statistically more likely to report riskier driving acts.

With respect to gender differences, males reported significantly more acts of RDB, while females displayed a significantly lower amount of premeditation in their general daily activities. However no other significant gender differences were observed. The results suggested that driver attitudes were significantly related to self-reported acts of RDB on most indicators. That is, drivers with a negative attitude towards RDB-related behaviours reported significantly less engagement in RDB-related actions.

Finally, with respect to age differences, older drivers (25 years and older) reported significantly more negative attitudes towards rule violations/speeding and the careless driving of others. Also, older drivers reported a significantly lower sense of sensation seeking and urgency in life.

List of Key Acronyms Used:

- DAS -Driving Anger Scale
- DUID -Driving Under the Influence of Drugs
- DWD -Driving While Drunk
- RDB -Risky Driving Behaviour
- RTAs -Road Traffic Accidents
- SS -Sensation Seeking
- TPB -Theory of Planned Behaviour
- UKZN -University of KwaZulu-Natal
- WHO -World Health Organisation

Contents

Chapter 1:	12
Introduction	12
1.1. Road Traffic Accidents: A Global Health Issue	12
1.2. Road Traffic Accidents in Developing Countries.....	12
1.3. Young Drivers.....	13
Chapter 2:	16
Theoretical Framework	16
2.1 Impulsivity and Sensation Seeking.....	16
2.2 Anger.....	18
2.3 Attitudes.....	20
Chapter 3:	23
Literature Review	23
3.1 Personality Factors.....	23
<i>Anger, Aggression and Hostility</i>	23
<i>Sensation Seeking</i>	25
<i>Impulsivity</i>	27
3.2 Social Factors.....	28

3.3 Driver Attitudes	31
3.4 Substance Use	32
Chapter 4:	37
Methodology	37
4.1. Aims of the Study	37
4.2. Research Design.....	37
4.3. Population and Sampling Strategy.....	38
4.4. Measures	39
<i>4.4.1. Selection of Measures</i>	39
<i>4.4.2. Anger</i>	39
<i>4.4.3. Impulsivity/Sensation Seeking</i>	40
<i>4.4.4. Attitudes towards Risky Driving Behaviour</i>	42
<i>4.4.5. Risky Driving Behaviour</i>	43
4.5. Data Collection	44
4.6. Data Analysis	46
4.7. Ethical Considerations	47
Chapter 5:	49
Results	49
5.1. Sample Characteristics.....	49

5.2. Scale and Subscale Reliabilities.....	50
5.3. The Relationship between Driver Attitudes toward RDB and Self-Reported Acts of RDB	52
5.4. The Relationship between Anger, Impulsivity, Sensation Seeking and RDB.....	53
5.5. Gender Differences with Respect to the DAS, ARDB and SR-RDB subscales.....	54
5.6. Age differences in relation to the DAS, ARDB, SR-RDB and UPPS subscales – comparing two cohorts (under 25 years and 25 years and older).....	56
5.7. Predictors of self-reported acts of RDB.....	57
5.8. Summary of results in relation to the main objectives of the study.....	59
Chapter 6:	61
Discussion of Results	61
6.1. Introduction.....	61
6.2. The Relationship between Driver Attitudes toward RDB and Self-Reported Acts of RDB	61
6.3. Gender and Age differences in driver attitudes toward RDB and self-reported RDB.....	63
6.4. The Relationship between Anger, Impulsivity, Sensation Seeking and Self-Reported Acts of RDB.....	64
6.5. Summary of key findings in relation to the main objectives of the study.....	68
Chapter 7:	69
Conclusions, Recommendations & Limitations	69

7.1. Summary of the main findings.....	69
7.2. Intervention and policy recommendations.....	70
7.3. Limitations of the study	72
7.4. Recommendations for future research	74
Reference List	76
Appendix A:	88
Measures that were considered	88
Appendix B:	90
Questionnaire	90
Appendix C:	96
Letter of Permission	96
Appendix D:	97
Informed Consent Forms for Participants.....	97

List of Tables

Table 1:	Driver frequency by age and gender.....	p.50
Table 2:	Cronbach alpha reliability scores for scales.....	p.51
Table 3:	Correlations between the ARDB subscales and the SR-RDB...	p.52
Table 4:	Correlations between the DAS and UPPS subscales, and the SR-RDB	p.54
Table 5:	Gender differences on the DAS, ARDB and SR-RDB.....	p.55
Table 6:	Age differences in relation to the DAS, ARDB, SR-RDB and UPPS subscales.....	p.56
Table 7:	Multiple regression model for predicting self-reported acts of RDB.....	p.58

Chapter 1

Introduction

1.1. Road Traffic Accidents: A Global Health Issue

Road Traffic Accidents (RTAs) constitute a serious global health issue, which requires concentrated attention from governments, policy-makers, the transport industry, health promotion practitioners, researchers and all other relevant stakeholders globally. Worldwide, the number of people killed in road traffic accidents each year is estimated at almost 1.2 million, while the number injured could be as high as 50 million (WHO, 2004). In just over a decade since 1990, WHO estimates suggest that the annual number of deaths from RTAs world-wide rose by 10% (WHO, 2004). This increase is due mainly to the rise in RTAs in developing countries, particularly those in Latin America, the Caribbean, the Middle East, Africa and Asia (Ameratunga, Hajar & Norton, 2006). In 2002, RTAs ranked as the 11th leading cause of death in the world (WHO, 2004). It has been projected that by 2020, road traffic deaths will rise 60% worldwide and by 80% in Africa (Peltzer, 2008).

1.2. Road Traffic Accidents in Developing Countries

According to the World Report on Road Traffic Injury Prevention (WHO, 2004) the aggregate rates of road traffic fatality per 100 000 population were lowest in high-income countries in the European region (11 per 100 000), whereas the highest rates were reported in the low-income and middle-income countries in the eastern Mediterranean (26.4 per 100 000) and African regions (28.3 per 100 000). Over the past few decades, motor vehicles have become the primary mode of transport in developing countries. In 1998 these countries accounted for more

than 85% of all deaths due to road traffic accidents globally (Nantulya & Reich, 2002). In 2002 an estimated 200 000 people died on African roads (WHO, 2004), but this figure is probably somewhat higher due to under-reporting (Khayesi and Peden, 2005).

Evidence suggests that the problem of RTAs has been neglected in developing countries, which are the nations that are hardest hit by the epidemic. For instance, the World Summit on Sustainable Development held in Johannesburg, South Africa, did not include a single agenda item on road safety, notwithstanding the significant contribution of RTAs to the burden of disease in Africa (Khayesi & Peden, 2005).

Casualty rates for RTAs in South Africa are among the highest in the world, despite the efforts of state, civil society and research stakeholders to curb the problem (Van Schoor, Van Niekerk & Grobbelaar, 2001). During the early 90's South Africa's reported death rate of 11.7 per 100 million kilometers travelled was more than ten times that of the United States (Forjuoh, Zwi & Mock, 1998). Moreover, according to the South African national injury mortality surveillance system, there were 25 361 fatal injuries registered at 32 state mortuaries in 2001 (WHO, 2004). This represented approximately 35% of all non-natural mortality in South Africa in that year (WHO, 2004).

1.3. Young Drivers

Young drivers are significantly over-represented among those injured or killed in RTAs (Vassallo et al., 2007). Crash risks for teenage drivers are greater than those for any other comparable group (WHO, 2004). In the United States, 16-17 year olds are at significantly higher

risk than even 18-24 year olds (Preusser, Ferguson & Williams, 1998). According to the WHO (2004) young drivers (in developed countries) are at their greatest risk within the first 12 months of their licensure, and crash rates are slightly lower with each year of increasing age, but not until age 25-30 does the rate level off to that seen throughout most of adulthood (Shope, 2006). Research has indicated that being a teenager (or a young adult), speeding, driving at night (especially on weekends), driving while drunk (DWD) and travelling with one's peers are factors that place one at the highest risk of RTAs (WHO, 2004).

There is adequate evidence to conclude that the high injury rate of young drivers globally may at least in part be due to the tendency of this age group to engage in unsafe driving behaviours (Harré, 2000). There is also evidence to suggest that there are a host of intrapersonal (Lajunen & Parker, 2001; Jonah, 1997; Schwebel, Severson, Ball & Rizzo, 2006), and interpersonal (Preusser, Ferguson & Williams, 1998) factors that may form the basis for and even sustain risky driving behaviour (RDB) in young drivers.

From a review of the existing literature a few common trends emerge, which include personality factors, social factors, substance use factors and gender differences. Instrumental among these personality factors is evidence suggesting that anger (Deffenbacher et al., 1994; Deffenbacher et al., 2003), impulsivity (Dahlen, et al., 2005) and sensation seeking (Jonah, 1997; Burns & Wilde, 1995) are strongly implicated in risky driving behaviour among young drivers. This study therefore focused on the relationship between these three personality variables and RDB in the South African context, with a view to expanding the empirical evidence base and making recommendations to ameliorate the problem of RDB in this age cohort.

While the researcher is mindful of the complex and multivariate interaction of these personality factors, together with interpersonal, social and political factors, on RDB, resource constraints have been taken into account in delimiting the scope of this study.

Chapter two provides a theoretical framework from which the investigation has proceeded, while chapter three details a fairly comprehensive review of the relevant literature. Details about the methodology used in this investigation are outlined in chapter four. The results of the study are presented in chapter five and discussed, against the backdrop of the empirical and theoretical literature, in chapter six. Finally, the most salient conclusions emanating from the study, together with recommendations and limitations of the research, are presented in chapter seven.

Chapter 2

Theoretical Framework

2.1 Impulsivity and Sensation Seeking

Impulsivity is an important psychological construct, which has been implicated, in one form or another, in every major system of personality theory (Whiteside et al., 2001). Eysenck and Eysenck (1977) identified two factors relevant to the personality trait of impulsivity, one termed Impulsiveness (Imp), and the second termed Venturesomeness (Vent), both containing items related to risk-taking and sensation seeking (Eveden, 1999). Eysenck (cited in Eveden, 1999) differentiated these two factors in the following way:

“Our concept of Imp and Vent can best be described by analogy to a driver who steers his car around a blind bend on the wrong side of the road. A driver who scores high on Imp never considers the danger he might be exposing himself to and is genuinely surprised when an accident occurs. The driver who scores high on Vent, on the other hand, considers the position carefully and decides consciously to take the risk” (p. 181).

Buss and Plomin (1975) included impulsivity, emotionality, activity and sociability in their four factor model of temperament. They hypothesize that impulsivity is a multidimensional temperament where inhibitory control, or the ability to delay the performance of a behaviour, is considered to be a central aspect. Other components of impulsivity in their model involve the tendency to consider alternatives and consequences before making a decision, the ability to remain with a task despite competing temptations, and the tendency to become bored and seek novel stimuli (Whiteside et al., 2001). Buss and Plomin (1975) concluded that although

inhibitory control lies at the core of impulsivity, there are other facets, such as sensation seeking, which must be considered (Evenden, 1999).

Marvin Zuckerman, the author of the Sensation Seeking Scale (SSS; Zuckerman et al., 1964), remains one of the pioneers in the study of sensation seeking and impulsivity. According to Zuckerman (1994), sensation seeking (SS) “is a (personality) trait defined by the seeking of varied, novel, complex, and intense sensations and experiences and the willingness to take physical, social, legal and financial risks for the sake of such experiences” (p. 27). Zuckerman and Kuhlman (2000) wrote that high sensation seekers tend to appraise risk as lower than do low sensation seekers, even for activities that they have never tried, and they anticipate experiencing less anxiety than do low sensation seekers if they were in these situations. These expectations serve to increase the propensity for high sensation seekers to engage in risky activity given the opportunity to do so (Zuckerman & Kuhlman, 2000). The notion that SS has historically been associated with a range of risky behaviours is neatly captured by Zuckerman & Kuhlman (2000) in the following quotation:

“Sensation seeking has been associated with the participation in a number of risky activities including: potentially risky experiments, sports, vocations, criminal activities, sexual behaviour, smoking, heavy drinking, drug use and abuse, reckless driving and driving under the influence of alcohol, and gambling. Findings in most of these areas have been replicated many times, in different decades, and in different countries” (Zuckerman & Kuhlman, 2000, p. 1001).

There is also support for the view that there are hereditary (Zuckerman & Kuhlman, 2000) as well as biochemical (Zuckerman, 1996) variables which may have a bearing on the

overt display of SS behaviour. Some of the evidence of biochemical associations with SS behaviour has come through the study of Monoamine Oxidase (MAO), an enzyme involved in the catabolic degradation of the monoamine neurotransmitters (Zuckerman & Kuhlman, 2000). Inversely mirroring the relation of SS to age, MAO is lowest in adolescence and rises with age. It is higher in women than in men at all ages, just as SS is higher in men than women (Zuckerman & Kuhlman, 2000).

2.2 Anger

While most writers agree that the state of anger is defined by certain critical features, there is little agreement on what these features are. For instance, Sharkin (1988) defines anger as “an internal state involving varying degrees of interactions between physiological, affective, cognitive, motoric and verbal components” (p. 361). However, this definition fails to distinguish anger from other emotions or from other general psychological states, and other writers differ in terms of which of these features are to be included and how each feature should be precisely specified (Russell & Fehr, 1994). For instance, Deffenbacher et al. (1996) wrote that “too often the overlapping constructs of anger, hostility and aggression have been blurred and used interchangeably, or anger as an emotional, experiential construct has not been separated from the behaviours or modes through which anger is expressed” (p. 131).

In an attempt to elucidate our understanding of anger, Spielberger (1988) adapted state-trait personality theory to anger. The result was a categorization of anger into state anger and trait anger. State anger refers to a transitory emotional-physiological experience consisting of feelings and physiological activation (Deffenbacher et al., 1996), such as tension in the face and

the release of adrenal hormones. On the other hand trait anger, as the name suggests, refers to a more stable personality dimension of ones proneness for anger. Hence high trait anger individuals experience more frequent and more intense state anger (Spielberger, 1988). In a study that provided support for this theory, Deffenbacher et al. (1996, p.131) noted how state-trait anger theory leads to five general theoretical predictions:

1. Trait anger reflects a tendency to become more easily angered. That is, high-anger individuals should be more easily provoked into getting angry.
2. Trait anger reflects a tendency to respond with more intense anger when provoked.
3. Because of greater intensities and frequencies of anger reactivity, high trait anger individuals are predicted to cope less well with anger and to express themselves in less constructive ways. That is, trait anger reflects a tendency to express anger in less adaptive and less functional ways.
4. Due to greater frequencies and intensities of anger and because of less positive coping, high trait anger persons are more likely to experience negative anger-related consequences.
5. If trait anger reflects a unique personality disposition toward anger and not other emotional traits, then trait anger should relate to anger-related constructs more powerfully than to constructs that do not involve anger.

Using the Trait Anger Scale which was developed by Spielberger (1988), Deffenbacher et al. (1996) conducted a series of eight studies which provided support for all five of the above-mentioned hypotheses. The relationship between anger and aggression as a personality trait and driver anger specifically will be discussed in the review of literature that follows, suffice to say

here that empirical support for this association has been demonstrated (see Lajunen & Parker, 2001).

2.3 Attitudes

Attitudes have long been studied as predictors of human behaviour and have also featured in models that are used to predict or understand why we adopt (or fail to adopt) a particular line of action (Eagly & Chaiken, 1993). For instance, the popular Theory of Reasoned Action (Ajzen & Fishbein, 1980) maintains that the strongest predictor of human behaviour is *behavioural intention*, and that behavioural intention is in turn determined by ones *attitude* toward the behaviour, as well as by the perceived *social pressure* one feels to comply with behavioural norms. The theory was later expanded to include a *self-efficacy* component, and is now more commonly known as the Theory of Planned Behaviour (see Ajzen, 1991), and subsequent evidence has suggested that behavioural intentions based on attitudes better predict behaviour than intentions based on subjective norms (Sheeran, Norman & Orbell, 1999).

Ajzen and Fishbein (1977) have argued that attitudes and behaviours must be *compatible* to ensure a strong relation or a significant correlation. Eagly and Chaiken (1993) have noted that one way to think about this ‘compatibility’ is in terms of the generality versus specificity of the attitudes and behaviours that are related. Ajzen and Fishbein (1977) have suggested that all behaviours have the elements of *action*, *target*, *context* and *time*, and that these must be taken into account in the assessment of any attitude-behaviour correlation. To understand these elements and their connection with attitudes and behaviours, let us consider an example of a young man who harbours a positive attitude toward illegal drag racing (informal racing on public roads):

1. With respect to *action*, his attitude toward drag racing may be associated with the identification of a particular action (e.g. him participating in a drag race). Alternatively, his attitude may imply a range of actions associated with drag racing, such as modifying his car's engine, or even promoting drag racing events.
2. With respect to the *target*, his attitude toward attending drag races may mediate his participation in a drag race. Alternatively, his attitude may imply an interest in a range of drag race-related activities, such as viewing other drivers' engines and enjoying an interaction with them, or even enjoying the type of food that is typically sold at these events.

Attitudes towards behaviours do not necessarily imply contexts or times (Eagly & Chaiken, 1993). Bearing in mind the above example, consider the following:

1. With respect to *context*, the young man's attitude toward attending drag races may be related to a particular context, such as attending drag races on a particular racing strip with his best friend. Alternatively, it may imply a range of contexts not necessarily having to do with a particular location or his best friend.
2. With respect to *time*, his attitude may be linked to a particular time or occasion. So his attitude toward attending next month's drag race reflects a particular temporal event. Alternatively, it may refer to his attitude about attending at least one drag race in 2009 or it may be an attitude toward attending drag races in general.

Ajzen and Fishbein (1977) maintained that relations between attitudes and behaviours are maximally strong to the extent that their action, target, context and time elements are assessed at

the same level of generality or specificity (Eagly & Chaiken, 1993). This matching with respect to the four elements is known as the *principle of compatibility* (Ajzen, 1988). According to Eagly and Chaiken (1993) incompatibility often occurs in research because a broadly defined attitude (e.g., attitude toward Asia) is incorrectly correlated with a specific behaviour that is defined in terms of a specific action, target, context and time. This proposition has vital implications for the study of the relation between attitudes and behaviour, and has accordingly informed the study design and selection of measures.

Chapter 3

Literature Review

3.1 Personality Factors

For decades researchers have investigated the relationship between personality, and in particular various personality constructs, and RDB. The interest was perhaps sparked in the 40's when Tillman and Hobbs (1949, p.329) claimed that "a man drives as he lives". Since then, an array of authors has discussed the numerous aspects and subtypes of personality as indicators for risk-taking behaviour. Some of the more frequent personality factors that have emerged from studies focused on younger drivers include anger, aggression & hostility, sensation seeking, and impulsivity.

Anger, Aggression and Hostility

Psychologists involved in research on transportation have shown an increasing concern for the possible effect that the negative emotion of anger (and subsequent aggression) may have on driver behaviour (Underwood, Chapman, Wright & Crundall, 1999). Deffenbacher et al. (1994) postulated that anger may motivate drivers to commit various risky driving behaviours, such as tailgating (following too closely behind) and speeding, which may in turn increase accident proneness during the bout of this emotion. Deffenbacher et al. (2003) examined levels of aggression in samples of high anger and low anger drivers who were matched in terms of driving frequency and distance. Drivers were classified according to the Driving Anger Scale (DAS; Deffenbacher et al., 1994). Their results indicated that the high anger drivers reported more frequent and intense anger, and more aggression and risky behaviour in daily driving than

low anger drivers. In addition they found that high anger drivers experienced more frequent close calls and violations, and a greater use of aggressive and less constructive ways of expressing anger on the road.

Research on aggression in relation to driving has indicated that men are generally more aggressive drivers than women and that aggressive driving declines with age (Krahé & Fenske, 2002). Krahé and Fenske (2002) examined the concept of a macho personality as a predictor for aggressive driving behaviour. They found that younger motorists, those driving powerful cars, and those displaying a macho personality were significantly more likely to report driving aggressively. Moreover, macho men assigned greater importance to speed and sportiness of a car and less importance to safety aspects than non-macho men. This finding raises further concern, since nowadays high powered cars are more accessible and certainly more affordable, so driving a fast car is becoming more a matter of choice rather than financial resources (Krahé & Fenske, 2002).

In a study conducted in the UK, Lajunen and Parker (2001) investigated the relationship between general aggressiveness, driver anger and aggressive driving. The literature on aggressiveness suggests that it is a stable trait and that it persists over time and across situations. Hence the notion that people can have a complete personality shift as soon as they get behind the wheel is not supported by empirical work done on this personality trait (Lajunen and Parker, 2001). In an attempt to quantify anger, Lajunen and Parker (2001) used a revised version of the DAS. While they did find that the effects of verbal aggressiveness (by other drivers) on self-reported driver aggression was mediated by anger, the authors concluded that aggressive driver

behaviour is a complex phenomenon with a range of psychological causes. Hence although it is often the case, frustration does not always lead to anger and aggression, and aggressive behaviour does not always stem from anger or frustration. Firstly, frustrating situations may fail to produce frustration in people of calm temperament and secondly, while traveling with his friends a young male driver may, for instance, display aggressive driving behaviour in order to gain social acceptance even in the absence of anger or frustration (Lajunen & Parker, 2001).

In a subsequent study that also used the DAS, Dahlen et al. (2005) explored the potential contribution of sensation seeking (SS), impulsiveness and boredom proneness to driving anger in the prediction of aggressive and risky driving. Their findings did provide further support for the effectiveness of the DAS in predicting unsafe driving. However, it is suggested that SS, impulsiveness, and boredom proneness provided incremental improvements beyond the DAS in the prediction of aggressive driving. Hence, their results offered support for the use of multiple predictors in the understanding of aggressive driving and RDB.

Sensation Seeking

Sensation Seeking (SS) refers to a desire to defy monotony and to constantly search for new, and often unconventional stimulating activity. This type of behaviour has been observed to a larger degree in younger people and more specifically, males have traditionally and cross-culturally displayed greater SS behaviour than females (Zuckerman, Eysenck & Eysenck, 1978; Jonah, 1997; Harré, 2000). With respect to road use, indicators for SS behaviour include speeding, swerving through traffic, wanting to take a bend at high speed just for the thrill,

wanting to drive while under the influence of alcohol, racing with ones peers and other related behaviours.

In current studies and reports, SS is often defined in terms of scores on the Sensation Seeking Scale, first published by Zuckerman et al. (1964). The scale was later revised by Zuckerman and new items were added (see Jonah, 1997). Empirical evidence indicates that persons who scored high on this scale (i.e. display a greater propensity for SS) took more risks when they drove (Burns & Wilde, 1995). This correlation suggests that SS, as a component of one's personality, serves as a useful indicator for risky driving behaviour.

Schwebel, Severson, Ball and Rizzo (2006) examined the independent and combined roles of three personality traits (sensation seeking, conscientiousness, and anger/hostility), in predicting risky driving behaviour. In multivariate analyses, sensation seeking emerged as the best predictor of self-reported driving violations, while the interactive effect of anger/hostility by sensation seeking was also statistically significant in this regard. Similarly, in a study that investigated personality predictors of RTAs, Trimpop and Kirkcaldy (1997) found that drivers without violations preferred lower levels of arousal, were lower in thrill and adventure seeking, and they tended to avoid socially stimulating situations.

Those who subscribe to observational learning theories in their explanation of human behaviour (for instance Bandura, 1977) may be of the opinion that SS behaviour is learned from peers and significant others. However there is also evidence to suggest that SS behaviour has some kind of biological basis and there is even support for the view that it may be hereditary

(Eysenck, 1983; Zuckerman, 1994). Zuckerman (1994) believes that certain neurotransmitters like dopamine, serotonin and norepinephrine underlie the trait of SS. Dopamine, for instance, seems to motivate the exploration of the physical and social environment and provides positive arousal and reward associated with novel and intense stimulation (Jonah, 1997). As is often the case with such bio-chemical hypotheses, however, it is difficult to predict the direction of influence, in that it remains unclear whether the neurotransmitters are the cause or the outcome of the state of arousal implicated in RDB.

In his comprehensive review of the literature exploring the relationship between SS and RDB, Jonah (1997) identified three major direct associations between the following concepts: (1) Sensation seeking and drinking and driving (2) Sensation seeking and other risky driving behaviours, and (3) Sensation seeking and the (negative) consequences of risky driving. The “other risky driving behaviours” outlined by Jonah (1997) referred to behaviours such as non-use of seat belts and speeding, while the “consequences of risky driving” referred to incidents such as collisions and actual traffic violations. Hence direct and indirect associations have been observed in the empirical work that has been done on SS and its association with RDB.

Impulsivity

While impulsiveness is conceptually similar to SS, impulsiveness is concerned primarily with one's control over one's thoughts and behaviours (Dahlen, et al., 2005), rather than with stimulating outcomes. Impulsiveness has been associated with driving while drunk, reduced seatbelt use, impaired driver behaviour, reduced ability to perceive traffic signs and high accident rates (Dahlen, et al., 2005). In addition to anger and aggression, impulsiveness might be

related to the frequency and degree of aggressive reactions in a provocative situation (Lajunen & Parker, 2001). Cherpitel (1999) reported an association between impulsivity and injury in a general population sample. Her results indicated that impulsivity remained associated with injury even after adjustment by quantity and frequency of alcohol and drug use, as well as frequency of drunkenness. She concluded that “risk-taking dispositions may be more important predictors of injury than either drinking or drug use variables” (Cherpitel, 1999, p. 125). Impulsivity, anger/aggression and SS as personality traits may serve as such risk-taking dispositions.

3.2 Social Factors

Contrary to this body of literature that has posited a strong relationship between intrapersonal factors and RDB, Preusser et al. (1998) argues that RDB in young drivers does not appear to be a general characteristic of their driving. Rather, the propensity to take risks seems to be highly related to the driving context. Specifically, peer influences, especially in the study of youth risk behaviour, has come under intense scrutiny by researchers in RDB and health promotion in general. Otherwise safe drivers may often be observed displaying RDB in the presence of their peers (Jaccard, Blanton & Dodge, 2005; Preusser et al., 1998). In their study of the observed effect of teenage passengers on the RDB of teenage drivers, Simons-Morton, et al. (2005) reported that teenage drivers drove faster than the general traffic and that both male and female teenage drivers allowed shorter headways in the presence of a male teenage passenger.

Research has indicated that being a teenager (or a young adult), speeding, driving at night (especially on weekends), driving while drunk (DWD) and traveling with one’s peers are factors that place one at the highest risk of RTAs (WHO, 2004). It may be assumed that the measure of

risk would increase exponentially when all of the above-mentioned factors come together. Based on the identification of these factors, 75% of the US states, as well as the District of Columbia, had implemented a health promoting intervention through their graduated driver licensing systems (Rice, Peek-Asa & Kraus, 2003). This basically entailed limiting the drivers who fell into this category to conditions that are thought to be of relatively low risk. The main restrictions were on night-time driving and passenger transport. This intervention makes sense when one considers the fact that in the US, 16- and 17-year-olds are at significantly higher risk than even 18-24 year-olds (WHO, 2004; Preusser et al., 1998), with studies in developed countries indicating that youth were at particular risk of a crash in the period of 12 months following their licensure (WHO, 2004). A similar trend was also observed in the UK, where a sample of over 3000 accident cases involving young drivers (aged 17-25 years) that were reported over a two year period was analysed (Clarke et al., 2006). One of the findings of this study was that a significant number of accidents occurred at night, and the cause of the accidents seemed generally not to be a matter of visibility, but a consequence of the way these drivers used the roads at night. The authors reported that a significant proportion of crashes were associated with voluntary risk-taking behaviours of young drivers engaged in 'recreational' driving.

Although it has been noted that the presence of young passengers increases the risk of an accident for young drivers, the precise dynamics of how this works has not yet been established. It is possible that these passengers might distract the driver by behaviours such as talking or interfering with the radio. However, the answer must surely lie in how traveling with teen passengers has an effect on the driver's intrapersonal (psychological) dynamics and thus alters his behaviour. Hence another possible explanation is that a teenage driver may be inclined to

drive in a more risky manner because he perceives that the teen passengers would view such driving behaviour as desirable or expected (Simons-Morton, et al., 2005).

Given that research evidence emphatically indicates a higher risk for young drivers transporting young passengers, the question of how often a passenger speaks out against such behaviour, informing the driver of his sentiments in an effort to get the driver to drive more safely, must arise. So, how likely are passengers to speak out and what are the pertinent factors or barriers that govern this decision? In a survey conducted in Norway, Ulleberg (2004) attempted to answer this question. The results indicated that female passengers were most likely to report that they spoke out to an unsafe driver. Male passengers on the other hand, seemed to perceive more negative consequences in addressing unsafe driving, and they appeared to be less confident in their ability to influence an unsafe driver (self efficacy). They also seemed to be more likely to accept RDB from other drivers, and to perceive less risk in the risky driving situation than females.

Ulleberg (2004) observed that certain interventions aimed at empowering youngsters in speaking out against their peers' risky driving had failed and he postulated that a possible explanation for this was that the road safety campaigns had not helped the teenage passengers to voice their concerns, in a risky driving situation, but rather to choose other means of transportation. Hence interventions that enable and empower young passengers to be assertive towards their peers in such situations could prove to be effective. Ulleberg also believed that the personality make-up of the passenger was of critical importance. He outlined SS, mild social deviance and anxiety as traits that could prove significant. For instance, a sensation seeking

passenger may avoid speaking out since this type of thrill is deemed by him as desirable. And as mentioned above it is also possible and perhaps likely that some passengers avoid speaking out for fear of rejection from the social group or other milder (but strongly deterring) negative sanctions.

3.3 Driver Attitudes

A continuing problem in psychology research related to RDB has been the lack of studies investigating a continuity between safety attitudes and RDB, and the problems associated with predicting future behaviour from former reported attitudes (Iversen, 2004). The attitude-behaviour relationship has for a long time been a topic of considerable debate (see Howarth, 1988; Kraus, 1995). While a comprehensive account of this discussion is beyond the scope of this investigation, it would suffice to say that empirical evidence provides overwhelming support for the view that attitudes are strong predictors of behaviour. For instance, a meta-analysis of 88 attitude-behaviour studies revealed that attitudes significantly and substantially predict future behaviour (Kraus, 1995).

Several studies have used the Theory of Planned Behaviour (TPB; Ajzen, 1991) in an attempt to explain the attitude-behaviour relationship (for an example see Parker, Manstead, Stradling & Reason, 1992). For instance, using the TPB as a theoretical model, Parker, Lajunen and Stradling (1998) assessed respondents' beliefs and attitudes towards two aggressive driving scenarios. They found that beliefs and attitudes were predictive of self-reported aggressive driving behaviour, and the aggressive behaviour was particularly associated with positive (or less negative) beliefs and attitudes in relation to the initiation of an aggressive driving episode.

In another study informed by the TPB, Aberg (1993) investigated factors influencing drivers' decisions to drive after alcohol consumption. Aberg found that intentions to drink and drive were influenced by attitudes, evaluation of sanctions, social norms and drinking habits. However, the extent to which attitudes, rather than other TPB constructs such as subjective norms and behavioural intentions (see Ajzen, 1991), predicts driver behaviours is questionable. For example, in one study Parker et al. (1992) used the TPB to measure attitudes and intentions of drivers toward four driving violations: drinking and driving, speeding, close following and dangerous overtaking. The authors found that the relation between subjective norms and behavioural intentions was consistently stronger than that between attitudes towards behaviours and behavioural intentions. This suggests that while driver attitudes may be useful predictors of driver behaviour, one should not remain ignorant of other factors that influence the decisions drivers make.

3.4 Substance Use

Driving under the influence of drugs (DUID), and in particular driving while drunk (DWD) remains a global health problem despite world-wide efforts to address the issue. Results from driving stimulators, closed circuit and on-road driving studies illustrate that there is evidence of deficits in a range of skills after alcohol use. These include brake reaction time, speed control, collision frequency, steering responsiveness, indicator use and lane control (Kelly, et al., 2004).

Drinking to intoxication is not uncommon in South Africa (Parry, Myers & Thiede, 2003). While many South Africans either consume alcohol in moderation or do not drink at all, a large proportion of people consume alcohol at risky levels (Parry et al., 2003). Alcohol is a major risk factor for all types of fatal road traffic injury in South Africa. Tests that were conducted locally for blood alcohol concentration (BAC) on 2372 (or 34.6%) of the 6859 transport-related deaths indicated that 51.9% of these deaths had elevated BAC levels, and of these, 91% recorded BAC levels of 0.05 g/dl or higher (WHO, 2004).

Owing to the fact that accident rates in South Africa remain alarmingly high (Van Schoor et al., 2001; Forjuoh et al., 1998; WHO, 2004) despite the concerted efforts of campaigns such as “Arrive Alive” and more recently “Drive Dry”, researchers should perhaps develop and implement interventions targeting the psychological processes that underlie the decision to drive after having a few drinks. While there are regulations in place as to approximately how much an impending driver may drink, with most people being aware that a BAC level ≥ 0.05 g per 100ml of blood is illegal if one wishes to drive, the reality is that many drivers make a decision on whether or not to drive after drinking based on their perceived risk, and this perception may, for instance, even be informed by the type of beverage that they consumed (Greenfield & Rogers, 1999). For example, Greenfield and Rogers (1999) found that beer drinkers may tend to underestimate the intoxicating effect of this beverage when compared to other alcoholic beverages. The underlying point is that this subjective decision may have devastating consequences.

While research suggests that the general population views DUID in a negative light, the evidence suggests a lack of concern regarding DUID among the drug using population (Kelly, et al., 2004). Brown (1998) observed a similar trend among alcohol-consuming drivers in Australia, and his findings indicted that permissive attitudes towards DWD held by alcohol-consuming drivers may be mediated by the approval of such behaviour by ones peers. This suggests that peer group normative processes are strongly associated with DWD.

Due to its easy availability and the fact that it is used world-wide by a large number of young people, there is a growing concern over the potentially risk-inducing effects that cannabis (commonly known as dagga in South Africa) has on driver ability and hence road safety. According to the South African Community Epidemiology Network on Drug Use (SACENDU; 2008), cannabis (with the exception of alcohol) remains the most popularly used drug throughout most parts of South Africa and the majority of users are young adults. While significant research has been conducted on the effects of alcohol on young driver mortality, injury and accident rates, much more research is needed to assess the extent of cannabis-related RTAs in South Africa.

With the current state of youth alcohol abuse (Parry et al., 2003; Nygaard et al., 2003) and the increasing prevalence of DWD among young persons world-wide (WHO, 2004), a study by Dal Cin et al. (2008) assessing the role that the media plays in exposing adolescents at an increasingly young age to alcohol is certainly timely. Empirical evidence suggests that adolescents who begin to use alcohol at an early age (11-14 years) are at risk for later addiction and alcohol disorders (DeWit, et al., 2000). Research findings consistently demonstrate that

exposure to alcohol advertising is associated with current and later alcohol consumption, including positive attitudes towards this substance and a future intention to use it (Bhana, 2008).

According to Bhana (2008), one very interesting finding in the study by Dal Cin et al. (2008) was the extent to which alcohol depicted in movies with a PG13 rating was often indistinguishable from R rated movies. This clearly suggests that normative standards of alcohol use, at least in the West, are more widely tolerated. Bhana goes on to argue that while much more is known about youth exposure to alcohol advertising in developed countries, there are some interesting cross-national bases for comparison, especially since there is a global market for movies produced in the US. However, while there is a correlation between exposure to alcohol advertising at a young age and drinking-related problems in later adolescence, it may be specious to impute a cause- effect relationship. For instance, if the context for alcohol consumption is already well established then young people may respond more favorably to alcohol advertising. Hence what is cause and what is effect in this scenario is not easy to establish (Bhana, 2008).

In recent times, lifestyle as a factor in RDB among young drivers has also come under the spotlight (Møller, 2004; Bina, Federica & Graziano, 2006; Chliaoutakis, Darviri & Demakakos, 1999). Lifestyles that involve dominant traits of alcohol consumption or ‘drive without destination’ have been associated with accident risk (Chliaoutakis et al., 1999). Moreover, in a study by Bina et al. (2006), young men who displayed RDB were more likely to adopt lifestyles characterized by high involvement in antisocial behaviours, smoking, comfort eating and time spent in non-organized activities with friends.

With an increasing need to understand and address the issue of RDB and RTAs among young persons, a growing body of scientific literature, which offers holistic and theoretically informed insight, becomes indispensable if health promotion practitioners and policy makers are to make any significant inroads into reducing morbidity and mortality rates on our roads. To this end, the present study is concerned with the relationship between key personality variables (anger, impulsiveness and sensation seeking) and risky driving behavior among young drivers.

Chapter 4

Methodology

4.1. Aim and Objectives of the Study

The aim of this study was to investigate the relationship between driver attitudes and three personality traits (anger, sensation seeking and impulsivity) and self-reported risky driving behaviour. The specific objectives of the study were to:

1. Investigate the relationship between driver attitudes towards RDB and self-reported RDB.
2. Ascertain the relationship between anger, impulsivity, SS and RDB.
3. Analyse relevant gender and age trends with respect to the above-mentioned variables.

4.2. Research Design

A cross-sectional survey design was used, comprising specific objective measures for each of the variables under investigation. Objective quantitative measures allowed for statistical analysis of the relationships between variables which would not have been possible if qualitative data-collection methods were used, especially considering that personality constructs were measured. At a practical level, a survey design allows for relatively quick and efficient data collection, especially where group administration procedures are utilised (Durrheim, 1999), which is in keeping with the time and resource constraints pertaining to this short dissertation. Objective measures also have the advantage of enabling cross-sectional comparisons to be made, based on sample demographics. It should be noted, however, that cross-sectional designs suffer

the disadvantage of not capturing lived experience over time, but offer rather a snap-shot of reality, often between cohorts, at a given point in time (Sdorow & Rickabaugh, 2002).

4.3. Population and Sampling Strategy

The population for this study comprised male and female post-graduate university students from two public higher education institutions in Durban, KwaZulu-Natal, who are in possession of a driver's license. Participants were sourced from various faculties at the University of KwaZulu-Natal (UKZN; Howard College Campus) and the Durban University of Technology (DUT). An obvious advantage is the relative ease of access and minimal costs incurred in conducting fieldwork at a university. At UKZN, selected classes in the Faculty of Humanities, Development & Social Sciences, as well as the Faculty of Engineering were included in the study population. At DUT, post-graduate students attending Management Studies were included in the study population.

Post-graduate students were targeted because of the increased likelihood of them having driver's licences and sufficient driving experience to be able to respond to the selected measures. Both genders and a broad age spectrum were included because age and gender comprised independent variables in this study. Finally, institution and faculty/school/department were not controlled for because there was no intention to generate a probability sample that is generalisable in any significant respect, given the relatively limited scope of this study.

The sample therefore represented a convenience sample of 306 participants, being students in the respective classes who were willing to participate in the study. While sample size

was not large, adequate cell sizes were obtained for the purpose of inferential statistical analysis based on aggregated data.

4.4. Measures

4.4.1. Selection of Measures

In selecting the appropriate measures, the researcher searched for appropriate scales and compared them, so as to obtain the most suitable measure for each construct under investigation. He then tabulated the measures to facilitate a thorough comparison (see Appendix A) based on the following criteria:

- wide utilisation in studies measuring the construct under investigation, thus enabling comparisons to be made to other findings from the empirical literature;
- evidence of robust psychometric properties;
- response formats that generate data of at least ordinal strength, thereby enabling inferential statistical analysis
- measures that are suitable for group administration;
- a short administration time relative to competing alternatives.

Based on these criteria, four measures were selected, as presented and discussed below.

4.4.2. Anger

The propensity to become angry while driving was measured using the 14-item short form of the Driving Anger Scale (DAS) (Deffenbacher et al., 1994) (Appendix B: Part 2). Cluster analysis of the 33-item full version of the DAS resulted in six clusters: hostile gestures, illegal driving, police presence, slow driving, discourtesy and traffic obstructions (Dahlen et al.,

2005). The unidimensional 14-item version of the DAS was developed by selecting items from each cluster that were highly correlated with the cluster total and the total score of the long form (Deffenbacher et al., 1994). On the 14-item DAS, participants rate the extent to which a particular situation would make them angry on a 1-5 point Likert scale (ranging from 1= Not angered at all, through to 5= Very angered). Sample items from this measure include: (a) Someone hoots at you about your driving; (b) Someone is weaving in and out of traffic; (c) A police officer pulls you over.

The 14-item DAS has demonstrated strong internal consistency ($\alpha=0.80$) and is highly correlated with the long form ($r=0.95$) (Deffenbacher et al., 1994; Dahlen et al., 2005). Alpha reliabilities of the original scale range from 0.80 to 0.93 and 10-week test-retest reliability was 0.84 (Deffenbacher, 2000). In a study where the 14-item DAS was administered to general and clinical samples, driving anger correlated positively with anger in both the individual's most provocative situations and in commonly occurring driving events (Deffenbacher, White and Lynch, 2004), thereby indicating relatively good predictive validity.

4.4.3. Impulsivity/Sensation Seeking

The tendency to display impulsiveness and sensation seeking in ones general behaviour was measured using the 45 item UPPS Impulsive Behaviour scale (Whiteside & Lynam, 2001) (Appendix B: Part 5). In developing the UPPS, Whiteside and Lynam (2001) utilized a number of commonly used impulsivity measures and some related personality measures, including the Revised NEO Personality Inventory (*NEO-PI-R*; Costa & McCrae, 1992) and Zuckerman's (1994) Sensation Seeking Scale. Through exploratory factor analyses, four distinct facets

associated with impulsive-like behaviour were identified, resulting in the four sub-scales of the UPPS, viz.: urgency (12 items); (lack of) premeditation (11 items); (lack of) perseverance (10 items); and sensation seeking (12 items). The UPPS will be especially useful in this investigation, since it incorporates the two aspects of impulsivity (impulsiveness and sensation seeking) that have been found to be closely related (Whiteside & Lynam, 2001) and that are the subject of this investigation. All 45 items are answered on a 4 point Likert scale, where participants indicate how accurately the item describes themselves (ranging from 1 = Strongly Agree through to 4 = Strongly Disagree). Sample items from the UPPS include: (a) I usually think carefully before doing anything; (b) It is hard for me to resist acting on my feelings; (c) Sometimes I do things on impulse that I later regret.

Since its inception, a range of studies have affirmed the validity of the UPPS (Miller et al., 2003; Whiteside et al., 2005; Whiteside & Lynam, 2003), suggesting that it does measure what it claims to measure. Moreover, Whiteside and Lynam (2001) have presented information on the internal consistency, as well as the divergent and external validity of the UPPS. They found that the internal consistency coefficients were 0.91, 0.86, 0.90, and 0.82 for the subscales on Premeditation, Urgency, Sensation Seeking and Perseverance respectively. The convergent corrected item-total correlations across all subscales ranged from 0.38 to 0.79 with a mean of 0.58, whereas the average divergent item-total correlations ranged from 0.05 to 0.33 with a mean of 0.17. These results suggested good convergent and divergent relations among the four subscales.

Using the UPPS in a recent investigation that involved data collection at two time points (3-4 weeks apart), Anestis, Selby and Joiner (2007) observed, with respect to the UPPS

subscales, that: the coefficient alpha for the Urgency subscale was 0.91 for Time 1 and 0.89 for Time 2, the coefficient alpha for the Sensation Seeking subscale was 0.91 for Time 1 and 0.90 for Time 2, the coefficient alpha for the Premeditation subscale was 0.81 for Time 1 and 0.84 for Time 2, and the coefficient alpha for the Perseverance subscale was 0.87 for Time 1 and 0.84 for Time 2. This confirms that all four subscales of the UPPS have relatively high reliabilities and further that they are robust with regard to test-retest reliability.

4.4.4. Attitudes towards Risky Driving Behaviour

The measure on RDB (questionnaire on RDB assessing aspects of self-reported risky driving behaviours such as speeding), as well as the measure on attitudes towards RDB, were drawn from a study by Iversen (2004), in which he investigated whether attitudes towards traffic safety issues are predictors for future RDB.

The questions in this 16-item attitude scale (henceforth referred to as Attitude toward Risky Driving Behaviour; ARDB) were selected to cover violations of the traffic code and other important aspects of road safety (Appendix B: Part 3). The specific subscales on this measure are (a person's): Attitude towards rule violations and speeding (subscale 1: 11 items); Attitude toward the careless driving of others (subscale 2: 3 items); and Attitude towards drinking and driving (subscale 3: 2 items). Respondents judge on a five-point Likert scale how much they agree with a given statement, ranging from 1 = Strongly Agree through to 5 = Strongly Disagree (see fig. 1 below).

Figure 1: Sample Item on the ARDB (from subscale 1)

12. Traffic rules are often too complicated to be carried out in practice.

Strongly agree Agree Unsure Disagree Strongly disagree

Subscale 1, 2 and 3 showed alpha values of 0.821, 0.697 and 0.847 respectively, thus demonstrating adequate internal consistency (Iversen, 2004). With regard to inter-correlations between the three subscales, Iversen (2004) reported a high correlation between subscales 1 and 2 ($r = 0.28$; $p < .05$). The correlations between subscales 1 and 3 ($r = 0.21$; $p < .05$) and subscales 2 and 3 ($r = 0.20$; $p < .05$) were lower, indicating less similar factors (Iversen, 2004).

In summary, Iversen concluded that the three subscales are positively correlated, but they measure separate concepts and different latent variables. Consequently, he had decided to retain a model separating the 16 items into the three subscales, as opposed to collapsing the results into a single attitudinal score.

4.4.5. Risky Driving Behaviour

As mentioned in Section 4.4.4, in order to assess self-reported acts of RDB, a 24-item scale measuring seven factors which were designed by Iversen (2004) was used (Appendix B: Part 4). This 24-item measure (henceforth referred to as the scale on Self Reported acts of Risky Driving Behaviour; SR-RDB) contains specific questions on self-reported acts of risk-taking while driving. The SR-RDB contains the following seven subscales: Violation of traffic rules/speeding (6 items); Reckless driving/funriding (5 items); Not using seat belts (2 items); Cautious and watchful driving (4 items); Drinking and driving (3 items); Attentiveness towards children in traffic (2 items); and Driving below speed limits (2 items). Drivers complete the measure by indicating how often they carried out each of the specified activities on a 5 point Likert scale ranging from 1= Very Often through to 5 = Never (see sample item in Figure 2).

Figure 2: Sample item on the SR-RDB (from subscale 1)

12. Overtake the car in front even when it keeps appropriate speed

Very often Often Sometimes Rarely Never

As mentioned in Section 4.4.4, Iversen's (2004) aim was to investigate whether attitudes towards traffic safety issues are predictors for future risky behaviour in traffic. In designing, testing and proposing this measure, as well as the ARDB, he collected data at two collection points (N=1604) so as to determine the consistency of the scales. Factor analysis of the data collected at Time 1 and Time 2, indicated that the reliability coefficients were acceptable for most of the factors in both samples. With the exception of subscale 5 (Drinking and Driving), which showed a low value for both tests, the fit of the model was encouraging for all subscales across the two time periods (Iversen, 2004).

The highest correlation was found between subscales 1 (Violation of traffic rules/speeding) and 2 (Reckless driving/funriding) ($r = 0.43$), which indicates that these factors are most similar. The other subscales were moderately weakly correlated, thus indicating that risk-taking behaviour in traffic is multidimensional (Iversen, 2004).

4.5. Data Collection

Permission to conduct the study was granted by the Higher Degrees Committee of the Faculty of Humanities, Development and Social Sciences at UKZN and ethical approval for the study was secured from the Ethics Committee of UKZN. Formal permission was obtained from the Deputy Dean of the Faculty of Humanities, Development and Social Sciences at UKZN for

access to all the post graduate classes within the faculty for purposes of group administration of the four measures (see Appendix C). Data was gathered at multiple collection points during the early part of the third term (during August 2009). Multiple collection points were used since the researcher needed to liaise with the respective Heads of Schools and programme managers of each post graduate class to negotiate an appropriate time for the collection of data, with the aim of minimizing disruption of the academic programme. Most programme managers and lecturers were generally quite responsive and supportive in enabling the process of data-collection.

The researcher visited each lecture venue on the agreed date and time and kindly requested that the lecturer leave the venue before the commencement of the data collection. He gave a short introduction to the study, and informed students that only those persons who are in possession of a driver's license are requested to participate, should they wish to do so. Students who were not willing to participate, as well as those who did not have a driver's license, were given a separate task to perform (such as a reading related to the module in question, which the researcher obtained from the respective lecturer). The researcher then issued the questionnaire booklet and informed consent form (see Appendix D) to the willing participants who were asked to read and sign the latter document before commencing with the questionnaire. He elaborated on the ethical protocols adopted for this study, i.e. that participation was entirely voluntary, that participants were free to withdraw from the study at any time should they wish to do so; that their anonymity was assured in that results would be analysed by major demographic variables only with no reference to the identity of the person, school or faculty; and that only the researcher and his supervisor would have access to the data. To further assure anonymity, participants were given an envelope in which to insert and seal the completed questionnaire and

there was a large box placed at the front of the class in which they were asked to drop their envelopes. Care was taken to eliminate the effects of extraneous variables (Sdorow & Rickabaugh, 2002), such as noise from outside the room, or other such factors in the immediate environment. The questionnaire took ± 25 minutes to complete at most data collection points. Once all forms were placed in the box it was taken away from the venue by the researcher and stored in a safe external location.

Essentially the same procedure was followed at the Durban University of Technology, save for the fact that DUT recognised the approval of the study design and ethical protocols granted by the UKZN. This enabled a significant saving on data-collection time and resources, with individual schools and departments granting the researcher access to post-graduate classes at the DUT. Once at the classroom, exactly the same data-collection procedure was followed as described above. Data collection at DUT was thus completed in October 2009.

4.6. Data Analysis

Data was analysed using the Statistical Package for Social Scientists (SPSS) version 17. Data was pre-coded and a template was created for data input into SPSS. A file audit was conducted post-data entry so as to ensure accuracy by identifying and correcting entry errors. Descriptive statistics, such as frequencies and crosstabs, were used to present basic numerical results such as means and standard deviations, as well as to display any observed differences in gender and age. A factorial ANOVA was performed to test for differences in age and gender on selected variables (such as a participants score on the SR-RDB and ARDB).

A correlational analysis was used in order to test for significant correlations between participants' scores on the DAS, UPPS, ARDB and SR-RDB. One of the main inferential statistic analyses performed was a multiple linear regression to examine the effect of factors such as anger (DAS), impulsivity/SS (UPPS), and attitudes towards RDB (ARDB) on self-reported acts of RDB (SR-RDB).

4.7. Ethical Considerations

The proposed investigation only proceeded once the research proposal was approved by the Higher Degrees Committee of the Faculty of Humanities, Development and Social Sciences at UKZN and ethical approval for the study was secured from the Ethics Committee of the University of KwaZulu-Natal. Also, the researcher made it explicit that the completion of the questionnaire was not compulsory and that participants were at liberty to discontinue their participation at any stage of the study should they wish to do so. Neither the names of the student, nor the name of her/his department or school, was requested or entered onto the questionnaire. As mentioned in Section 4.5, a box was placed at the front of the class to assure further anonymity and the participants were assured that neither their lecturer nor anyone other than the researcher and his supervisor would have access to the data.

The data was analysed by key demographic variables such as gender and age, with no distinctions being made by department or school within the faculty. Thus, all precautions were taken to ensure the anonymity of all participants in any manuscript or publications that may emanate from this study. For the duration of the analysis and write-up of the study, the data was stored at a secure location, which only the researcher has access to. Upon completion of the

analysis, all hard copies of the data were handed to the School of Psychology at UKZN for safe storage. This data will be destroyed after a period of 5 years has elapsed.

Chapter 5

Results

5.1. Sample Characteristics

Data was collected from a total of 306 participants between the ages of 18 and 52 ($M = 27.2$; $SD = 8.64$). Fifty four percent of the sample were male ($N = 165$) and 46% female ($N = 141$). The mean age of males and females in the sample was 29 years and 25 years respectively. The majority of the sample (75%) indicated that they drive either on a daily basis or 3-6 days a week. The remainder of the sample was composed of persons who either drive between 1-2 days a week (14%) or rarely (11%). Table 1 shows the driving frequency in relation to the gender and age composition of the sample.

Table 1*Driving frequency by age and gender*

	Gender		Overall
	Male	Female	
Daily	105	80	185
3-6 Days per week	15	28	43
1-2 Days per week	24	19	43
Rarely	20	14	34
Average Age	29	25	27
	Cohorts		Overall
	under 25 years	25 years & older	
Daily	66	119	185
3-6 Days per week	33	10	43
1-2 Days per week	35	8	43
Rarely	26	8	34
Males	70	95	165
Females	91	50	141

Drivers have been categorised into younger (under 25 years; N = 160; 52.5%) and older (25 years and older; N = 145; 47.5%) cohorts in accordance with the literature pertaining to the general age classification of risky drivers (see Jonah, 1990).

5.2. Scale and Subscale Reliabilities

A scale is meant to consistently reflect the construct it is measuring. To this end a Cronbach's Alpha (α) score was calculated for each of the scales in the study. Table 2 shows the reliabilities of each of the DAS, UPPS, SR-RDB and ADRB scales and subscales.

Table 2*Cronbach alpha reliability scores for scales*

Scale	<i>n</i>	<i>M</i>	<i>SD</i>	<i>α</i>
DAS	14	42.90	10.22	.838
ARDB				
Attitudes toward rule violations and speeding	11	36.54	7.89	.789
Attitudes toward the careless driving of others	3	12.40	2.25	.581
Attitudes toward drinking and driving	2	8.05	2.07	.675
SR-RDB Aggregated total	22	71.11	9.81	.769
Violation of traffic rules/speeding	6	18.57	5.04	.831
Reckless driving	5	19.47	2.99	.598
Not using seat belts	2	7.93	2.14	.613
Cautious and watchful driving	4	15.83	2.59	.548
Drinking and driving	3	12.52	2.88	.759
Attentiveness to children in traffic	2	7.62	1.74	.617
Driving too much below the speed limit	2	6.82	1.78	.485
UPPS				
Lack of premeditation	11	20.12	4.56	.849
Urgency	12	27.20	5.85	.849
Sensation Seeking	12	32.11	6.13	.820
Lack of perseverance	10	19.23	3.71	.716

As can be seen in table 2, the lower alpha scores are generally associated with scales that have fewer items. Although it is generally agreed that a value between 0.7-0.8 (or higher) is

acceptable for cronbach's alpha, Field (2005) notes that this guideline needs to be used with caution, since it is highly dependent on the number of items in the scale.

Given the relatively low alpha score on the 2-item Driving too much below the speed limit subscale, as well as the researchers' dissatisfaction with the face validity of the two items, this subscale was dropped from all further analyses. Hence the SR-RDB aggregated scores used in the remainder of the chapter exclude this subscale.

5.3. The Relationship between Driver Attitudes toward RDB and Self-Reported Acts of RDB

A correlational analysis was done in order to determine the relationship between driver attitudes toward RDB and self-reported acts of RDB.

Table 3

Correlations between ARDB§ subscales and the SR-RDB†

	Attitude towards rule violations & speeding	Attitude towards the careless driving of others	Attitude towards drinking and driving
Violation of traffic rules/speeding	.582**	.243**	.268**
Reckless driving	.203**	.124*	.152**
Seatbelt usage	.123*	.078	.142*
Cautious and watchful driving	.178**	.227**	.035
Drinking and driving	.186**	.185**	.623**
Attentiveness to children in traffic	.252**	.098	.104

* $p < .05$ ** $p < .01$

†High score denotes safer self-reported driving behaviours

§High scores indicate a more negative attitude toward the respective construct

Table 3 shows significant correlations between driver attitudes toward RDB and self-reported acts of RDB. The most significant correlations involve the attitudes towards rule

violations and speeding subscale and the SR-RDB subscales. For example, this subscale correlated significantly with: self-reported acts of violation of traffic rules/speeding ($r = .582, p < .01$), reckless driving ($r = .203, p < .01$), drinking and driving ($r = .186, p < .01$), seatbelt usage ($r = .123, p < .05$) and cautious and watchful driving ($r = .178, p < .01$). These are all positive correlations, but it must be noted that the SR-RDB subscales measure both positive and negative constructs, with an overall high score on these subscales indicating safer self-reported driving behaviours.

5.4. The Relationship between Anger, Impulsivity, Sensation Seeking and RDB

A correlational analysis was also used in determining the relationship between the anger, impulsivity and SS scales and self-reported acts of RDB.

Table 4 shows the correlations between the selected personality indicators and the SR-RDB subscales

Table 4*Correlations between DAS and UPPS subscales, and the SR-RDB*

	Driver anger (DAS)	Lack of premeditation	Sense of urgency	Sensation seeking	Lack of perseverance
SR-RDB total†	-.152*	-.351**	-.328**	-.221**	-.227**
Violation of traffic rules/speeding	.172**	.186**	.254**	.218**	.078
Reckless driving	.077	.248**	.212**	.084	.185**
Seatbelt usage	-.046	-.033	-.119*	-.155**	-.064
Cautious and watchful driving	-.040	-.189**	-.211**	.004	-.224**
Drinking and driving	.074	.267**	.196**	.221**	.144*
Attentiveness to children in traffic	-.039	-.306**	-.204**	-.019	-.252**

* $p < .05$ ** $p < .01$

†High score denotes safer self-reported driving behaviours

As is indicated in table 4, safer self-reported driving behaviour was negatively correlated with driver anger ($r = -.152$; $p < .05$). Safer drivers reported higher levels of premeditation ($r = -.351$; $p < .01$) and perseverance ($r = -.227$; $p < .01$), and lower levels of sensation seeking ($r = -.221$; $p < .01$) and urgency ($r = -.328$; $p < .01$) in life.

5.5. Gender Differences with Respect to the DAS, ARDB and SR-RDB subscales

t-tests were used to assess the differences between male and female performance on the DAS, ARDB and SR-RDB subscales. While males and females did not differ significantly on the DAS or the ARDB subscales, some significant differences in their performance were observed on most of the SR-RDB subscales. Table 5 shows the differences between males and females on all subscales.

Table 5*Gender differences on the DAS, ARDB and SR-RDB subscales†*

Scale	Males <i>M</i>	Females <i>M</i>	(<i>df</i>)	<i>t</i>
DAS	43.14	42.62	271	.416
ARDB				
Attitudes toward rule violations and speeding ¹	36.30	36.82	288	-.558
Attitudes toward the careless driving of others ¹	12.46	12.32	297	.522
Attitudes toward drinking and driving ¹	7.92	8.21	296	-1.218
SR-RDB				
SR-RDB aggregated score	80.34	84.19	272	2.99**
Violation of traffic rules/speeding	17.70	19.59	293	-3.262**
Reckless driving	18.95	20.07	294	-3.255**
Seatbelt usage	7.33	8.64	301	-5.576**
Cautious and watchful driving	16.08	15.53	293	1.837
Drinking and driving	12.01	13.11	293	-3.336**
Attentiveness to children in traffic	7.87	7.32	300	2.729**
UPPS				
Lack of premeditation	19.39	20.98	284	-2.973**
Urgency	26.57	27.95	288	-2.013
Sensation Seeking	32.54	31.64	283	1.236
Lack of perseverance	19.19	19.28	280	-.211

** $p < .005$,† Bonferroni's correction factor was used in adjusting significance level for these tests to $p < .005$ ¹High scores here indicate a negative attitude towards these constructs

Using Bonferroni's correction factor the significance level for the t-test scores was lowered to .005. The table indicates that males reported significantly more risky driving behaviours than females ($t(272) = -2.99, p < .005$). On the UPPS, we observed that females

displayed a significantly greater lack of premeditation in their daily activities ($t(284) = -2.97, p < .005$).

5.6. Age differences in relation to the DAS, ARDB, SR-RDB and UPPS subscales – comparing two cohorts (under 25 years and 25 years and older)

As reflected in table 6, t-tests were used to assess differences between younger (under 25 years) and older (25 years and older) persons with respect to all measures.

Table 6

Age differences in relation to the DAS, ARDB, SR-RDB and UPPS subscales – comparing two cohorts (under 25 years and 25 years and older)

Scale	Under 25 years <i>M</i>	25 years & older <i>M</i>	(<i>df</i>)	<i>t</i>
DAS	42.54	43.33	271	-.638
ARDB				
Attitudes toward rule violations and speeding [†]	33.99	39.47	288	-6.281**
Attitudes toward the careless driving of others [†]	11.96	12.87	287	-3.568**
Attitudes toward drinking and driving [†]	8.15	7.95	296	.818
SR-RDB aggregated score	81.02	83.42	272	-1.844
UPPS				
Lack of premeditation	20.50	19.69	284	1.491
Urgency	28.39	25.87	288	3.750**
Sensation Seeking	33.52	30.57	283	4.177**
Lack of perseverance	19.58	18.83	280	1.701

** $p < 0.005$,

† Bonferroni's correction factor was used in adjusting significance level for these tests to $p < .005$

[†]High scores here indicate a negative attitude towards these constructs

Older persons displayed a significantly greater negative attitude towards rule violations/speeding ($t(288) = -6.28, p < .005$), and the careless driving of others ($t(287) = -3.57, p < .005$) than their younger counterparts. Also, older persons displayed a significantly lower sense of urgency ($t(288) = 3.75, p < .005$) and sensation seeking ($t(283) = 4.18, p < .005$) in their daily actions. No significant cohort difference was observed on the aggregated SR-RDB score.

5.7. Correlates of self-reported acts of RDB

A multiple regression analysis involving age, gender, driving frequency, the DAS and the subscales on the ARDB and UPPS, was run in order to determine the extent to which these independent variables (in the form of a model) impact on the dependent variable (self-reported acts of RDB). Table 7 shows the results of the regression analysis.

Table 7*Multiple regression model for predicting self-reported acts of RDB*

	Standardised beta coefficients	t value	Sig.	Adjusted R square	R square	Model significance (p)
Model 1				.437	.467	.000
Predictor variables:						
Age	.042	.68	.498			
Gender	.213	3.71	.000**			
Driving frequency	.138	2.38	.018*			
DAS total	-.083	-1.43	.154			
Att. Rule violations/speeding	.305	4.89	.000**			
Att. Careless driving of others	.139	2.29	.023*			
Att. Drinking & driving (lack of)	.212	3.76	.000**			
Premeditation (sense of) Urgency	-.256	-3.23	.001**			
Sensation seeking (lack of)	-.155	-2.35	.020*			
Perseverance	-.010	-.17	.863			
	.096	1.31	.191			

* $p < .05$ ** $p < .01$

The R2 value tells us how much of the variability in the outcome variable is accounted for by the correlating variables. For this model the R2 value is .467, indicating that the model accounts for 46.7% of the variance in the DV.

The strongest correlates in the model are gender ($t(196) = 3.71; p < .001$), attitudes towards rule violations/speeding ($t(196) = 4.89; p < .001$), attitudes towards drinking and driving ($t(196) = 3.76; p < .001$) and a lack of premeditation ($t(196) = -3.23; p < .001$). The

other significant correlates were driving frequency ($t(196) = 2.38; p < .005$), attitude towards the careless driving of others ($t(196) = 2.29; p < .005$), and a sense of urgency ($t(196) = -2.35; p < .005$).

5.8. Summary of results in relation to the main objectives of the study

In the previous chapter we noted that the specific objectives of the study were to:

- Investigate the relationship between driver attitudes towards RDB and self-reported RDB.
- Ascertain the relationship between anger, impulsivity, SS and RDB.
- Analyse relevant gender and age trends with respect to the above-mentioned variables.

The results suggested that driver attitudes were significantly related to self-reported acts of RDB on most indicators. That is, drivers with a negative attitude towards RDB-related behaviours reported significantly less engagement in RDB-related actions (see table 3).

With regard to the relationship between the various personality constructs and self-reported acts of RDB, the results indicate that driver anger, sensation seeking, a sense of urgency and a lack of premeditation and perseverance were significantly related to self-reported acts of RDB. That is, drivers with higher driver anger, sensation seeking, urgency, and with a greater lack of premeditation and perseverance in daily activities were statistically more likely to report more risky driving acts (see table 4).

With respect to gender differences, males reported significantly more acts of RDB, while females displayed a significantly lower amount of premeditation in their general daily activities. However no other significant gender differences were observed (see table 5).

Finally, with respect to age differences, older drivers (25 years and older) reported significantly more negative attitudes towards rule violations/speeding and the careless driving of others. Also, older drivers reported a significantly lower sense of sensation seeking and urgency in life (see table 6).

Overall, the most significant predictors of RDB returned by the regression model were: gender, attitudes towards rule violations/speeding, attitudes towards drinking and driving, and a lack of premeditation. The other significant predictors were: driving frequency, attitude towards the careless driving of others, and a sense of urgency in life (see table 7).

Chapter 6

Discussion of Results

6.1. Introduction

In this chapter we discuss the findings of chapter 5 in relation to both the theoretical framework (chapter 2) and the empirical literature that was reviewed in chapter 3.

6.2. The Relationship between Driver Attitudes toward RDB and Self-Reported Acts of RDB

Ajzen and Fishbein (1977) have argued that attitudes and behaviours must be *compatible* to ensure a strong relation or a significant correlation. Eagly and Chaiken (1993) have echoed this view, noting that one way to think about this ‘compatibility’ is in terms of the generality versus specificity of the attitudes and behaviours that are related. The findings of this study serve to further validate this notion. For instance, persons displaying a more negative attitude toward drinking and driving reported significantly less driving-while-drunk episodes ($r = .623, p < .01$) (as opposed to other more general risky traffic behaviours).

However, while the attitudes towards risky driving in this study correlated significantly with the respective self-reported behaviours, the measures used do not take into account Ajzen and Fishbein’s (1977) elements of *action, target, context* and *time*. For example, while an individual who displayed a more negative attitude toward rule violations and speeding also reported less violations of traffic rules and speeding, there may be *times* and *contexts* in which she may engage in such behaviour. If this is true then the frequency of such times and contexts

would be critical with respect to the validation of the relationship between ARDB and SR-RDB. Nevertheless, the data from the present study, as well as two previous studies (Iversen, 2004; Iversen & Rundmo, 2004), provide encouraging results for the validity of both these measures.

While attitudes towards rule violations and speeding and towards the careless driving of others correlated the strongest with most of the self-reported risky driving behaviours (a finding that is consistent with that of Iversen (2004)), all three of the ARDB subscales correlated significantly with most of the SR-RDB subscales (see table 3). This suggests that it is difficult to separate risky attitudes and behaviours, as they appear to cluster together. In other words, persons with negative attitudes towards these constructs are more likely to engage in generally safer driving practices.

As was found in Iversen's (2004) study, attitudes towards rule violations and speeding was the strongest predictor of self-reported RDB in general ($r = .48, p < .01$), suggesting that this specific attitude needs attention when developing interventions aimed at reducing RDB. This notion is given support by the World Report on Road Traffic Injury Prevention (WHO, 2004). They note that the speed of motor vehicles is at the core of the road injury problem, influencing both crash risk and crash consequence. Studies on speeding in Sweden have indicated the following: the probability of an accident involving injury is proportional to the square of the speed, the probability of a serious accident is proportional to the cube of the speed, and the probability of a fatal accident is related to the fourth power of the speed (Nilsson, 1982; Andersson & Nilsson, 1997). In 2001 the South African Ministry of Transport reported that excessive speed or speed too fast for the circumstances plays a role in approximately 30% of all

crashes and about 50% in the case of commercial freight and public passenger vehicles (Ministry of Transport, 2001). These facts clearly highlight the dangers of exceeding speed limits, and the need for interventions that seek to reduce the incidence of speeding.

6.3. Gender and Age differences in driver attitudes toward RDB and self-reported RDB

Surprisingly, no significant differences were observed between males and females on all three attitudinal subscales. This finding is contrary to previous research in this area which suggests that women (and older persons) express a more positive attitude toward compliance with traffic laws (Yagil, 1999).

On the other hand males scored significantly higher than females (i.e. reported more risky behaviour) on all but one of the seven SR-RDB subscales. That is, males reported significantly more violations of traffic rules and speeding ($t(293) = -3.262, p < .005$), reckless driving ($t(294) = -3.255, p < .005$), and drinking and driving ($t(293) = -3.336, p < .005$), less seatbelt usage ($t(301) = -5.576, p < .005$) and less attentiveness toward children in traffic ($t(300) = 2.729, p < .005$). These findings are in accordance with much of the previous research examining gender differences in RDB, especially among young drivers (Laapotti, Keskinen & Rajalin, 2003; Harre, Field & Kirkwood, 1996).

In their report the WHO (2004) indicated that over 50% of all mortality due to RTAs globally occur among persons between the ages of 15 and 44 years – an age range that makes up 94.4% of the current sample – and that this was especially the case in low and middle income countries. As noted in chapter 5, we further broke this age group down into two cohorts (under

25 years and 25 years & older) in accordance with the literature pertaining to the general age classification of risky drivers (see Jonah, 1990). A factorial ANOVA revealed that although both gender ($F(1, 270) = 14.87, p < .001$) and age ($F(1, 270) = 9.03, p < .005$) significantly predicted self-reported acts of RDB, with males and younger drivers reporting riskier driver behaviour, there was no significant interaction between the two variables. In other words, contrary to the general empirical trend (Yagil, 1998; Laapotti & Keskinen, 1998; Harré et al., 1996), young male drivers in this study did not report significantly more risky driving behaviours than other age/gender cohorts. Two possible reasons for this relate to perhaps the main limitations of this investigation. Firstly, our measure of RDB was via self reports. Observed behaviour would have made for more accurate findings, but it is especially difficult and impractical to obtain precise behavioural data for a study of this nature. The second possible reason has to do with the relatively small sample size compared to other studies, which reduced the statistical power of the analysis.

6.4. The Relationship between Anger, Impulsivity, Sensation Seeking and Self-Reported Acts of RDB

The results suggested that all the personality constructs in question correlated significantly, and in the expected directions with the SR-RDB aggregated score. That is, persons with safer self-reported driving behaviours scored significantly lower on the sensation seeking (SS) ($r = -.221; p < .01$) and sense of urgency ($r = -.328; p < .01$) subscales. They also demonstrated significantly less driver anger ($r = -.152; p < .05$). Conversely these persons evidenced significantly greater levels of premeditation ($r = -.351; p < .01$) and perseverance ($r = -.227; p < .01$) than individuals who reported more risky driving behaviours. These findings are

very much in accordance with much of previous research that examined the relationship between these selected personality constructs and RDB (Deffenbacher et al., 2003; Schwebel et al., 2006; Dahlen, et al., 2005).

Driver Anger

The data suggested that there was no significant difference on the DAS scores between younger and older drivers– a finding that is contrary to previous research, which suggests that younger drivers tend to experience more anger while driving (Lajunen & Parker, 2001). Also worth noting is the finding that as with previous research (Deffenbacher et al., 2003) males and females did not differ significantly on their self-reports of driver anger.

While driver anger logically seems a vital predictor in the study of RDB, it must be noted that emotional states cannot be more than a mediating factor in RDB. Deffenbacher et al. (1994) claim that anger experienced while driving has the tendency to predispose individuals to risky driving practices such as tailgating and speeding. When comparing high and low anger drivers, Deffenbacher et al. (2003) found that high anger drivers reported more aggression, riskier driving practices, and greater use of hostile and less adaptive ways of expressing their anger while driving.

As noted in chapter 3, research on aggression in relation to driving has indicated that men are generally more aggressive drivers than women and that aggressive driving declines with age (Krahé & Fenske, 2002). Hence if anger is the main source of driver aggression, it would appear that anger results in aggressive driving more frequently for men than for women, since gender

disparities in driver anger are not as apparent and empirically conclusive as they are for driver aggression. However, as discussed in chapter 3, anger does not always lead to aggression and aggressive behaviour is not always preceded by feelings of anger (Lajunen & Parker, 2001). Driver anger is therefore only a partial contributing factor for the higher levels of driver aggression found in young males.

What other factors might account for the reportedly higher levels of driver aggression among young males? Ozkan and Lajunen (2005) investigated sex (i.e. male or female) and gender role (i.e. masculine or feminine) differences in predicting aggressive driving among young drivers. Their study demonstrated that masculinity is related to risky and aggressive driving, and thus that the masculine gender role might be one of the key factors behind high traffic accident mortality among young drivers. Ozkan and Lajunen (2005, p. 557) concluded that, "It seems that a 'highly masculine' personality makes young drivers more likely to get involved in risky driving." This effectively means that masculinity might be as important an independent variable, and indeed more important, than gender. Hence it is possible that the focus on gender differences in RDB in this study masked the impact of masculinity as a key explanatory variable in risky driving behaviour.

Sensation seeking and impulsivity

As discussed in the review of literature, while impulsivity is conceptually similar to SS, impulsiveness is concerned primarily with one's control over one's thoughts and behaviours (Dahlen, et al., 2005), rather than with stimulating outcomes. To this end the lack of premeditation and sense of urgency subscales from the UPPS serve as useful indicators of

impulsivity. The data in this study indicated that safer drivers reported significantly higher levels of premeditation ($r = -.351$; $p < .01$) and significantly lower levels of urgency ($r = -.328$; $p < .01$) in their day-to-day activities, indicating that impulsivity is positively related to risky driving practices. This finding is corroborated by those of Dahlen et al. (2005). Further, in her study on substance use and risk-taking dispositions, Cherpitel (1999) found that both impulsivity and SS had independent main effects. She concluded that they may be more important predictors of risk for injury than alcohol and drug use.

Impulsiveness may even play a mediating role in provoking aggressive behaviour in a provocative situation (Lajunen & Parker, 2001). Lajunen and Parker (2001) noted that since impulsive persons tend to act on the spur of the moment, often without considering all aspects of the situation at hand, it can be argued that impulsive persons are more likely to interpret other drivers' behaviour as provocation and to respond according to that interpretation.

Drivers scoring high on SS also reported more RDB-related activity. One of the aims of the study was to examine age- and gender-related differences within key variables (SS being one of them). While younger drivers reported significantly higher SS tendencies than their older peers ($t(283) = 4.18$, $p < .005$), there were no gender effects for SS, suggesting that SS was age, but not gender specific in the sample. The higher SS score among the younger cohort is in accordance with the general literature trend (Harré, 2000; Jonah, 1997), however the non-significant difference between males and females on their SS scores is not in keeping with previous reports (Farrow & Brissing, 1990; Zuckerman, Eysenck & Eysenck, 1978; Dahlen et al., 2005), suggesting that the younger females in this sample were almost as keen on thrill-seeking behaviour as the younger males.

6.5. Summary of key findings in relation to the main objectives of the study

The results indicated that driver attitudes were significantly related to self-reported acts of RDB on most indicators, suggesting that drivers with a negative attitude towards RDB-related behaviours reported significantly less engagement in RDB-related actions.

Regarding the relationship between the various personality constructs and self-reported acts of RDB, the results show that driver anger, sensation seeking, a sense of urgency and a lack of premeditation and perseverance were significantly related to self-reported acts of RDB. That is, drivers with higher driver anger, sensation seeking, urgency, and with a greater lack of premeditation and perseverance in daily activities were statistically more likely to report higher levels of RDB.

With respect to gender differences, males reported significantly more acts of RDB, while females displayed a significantly lower amount of premeditation in their general daily activities. However no other significant gender differences were observed.

Finally, with respect to age differences, older drivers (25 years and older) reported significantly more negative attitudes towards rule violations/speeding and the careless driving of others. Also, older drivers reported a significantly lower sense of sensation seeking and urgency in life.

Chapter 7

Conclusions, Recommendations & Limitations

This chapter offers a summary of the main findings of the study and provides recommendations for intervention, policy, and further research and discusses the limitations of the investigation.

7.1. Summary of the main findings

The study demonstrated that driver attitudes towards RDB were strong predictors of self-reported acts of RDB, suggesting that generally negative attitudes towards behaviours such as speeding and drinking and driving strongly predict self-reported driver behaviours, i.e. people with a more negative attitude toward risky driving behaviours were less likely to report engaging in such behaviours. This correlation was not specific, in that a negative attitude toward one type of RDB predicted lower self-reports of that behaviour as well as other risky driving behaviours in general, a finding that lends support to the attitude-behaviour hypothesis, which has gained much momentum over the years (Iversen, 2004). While there were no significant gender differences on the attitudinal subscales, males reported significantly more self-reported acts of RDB on 6 out of the 7 SR-RDB subscales, while females displayed a significantly lower amount of premeditation in their general daily activities.

The results suggested that all the personality constructs in question (anger, impulsivity and sensation seeking) correlated significantly, and in the expected directions, with the SR-RDB

aggregated score. That is, persons with safer self-reported driving behaviours scored significantly lower on the SS and sense of urgency subscales of the UPPS. They also reported significantly less driver anger. Conversely these persons reported significantly greater levels of premeditation and perseverance. Surprisingly, males and females did not differ significantly on self-reported driver anger. While younger drivers reported significantly higher SS tendencies, there were no gender effects for SS, suggesting that SS was age but not gender specific in the sample.

Persons who were 25 years and older reported a significantly greater negative attitude toward rule violations and speeding, and the careless driving of other people. However the two age cohorts (under 25 & 25 and older) did not differ significantly in their attitude toward drinking and driving. Also of note was the finding that the younger cohort demonstrated a significantly higher level of urgency, and a significantly greater thirst for SS in their daily activities, than their older peers.

7.2. Intervention and policy recommendations

The empirical support for the attitude-behaviour hypothesis evidenced in this study vindicates the development of interventions that focus on this dynamic. This finding was corroborated by Iversen (2004), who found that attitudes measured in her first survey were predictive of behaviours measured in the second survey. Since attitudes towards rule violations and speeding was the strongest predictor of RDB in this sample, it is recommended that mass media campaigns continue to focus on altering this attitude, especially among young people, who had a significantly more positive attitude toward speeding and rule violations in this sample.

However health promotion practitioners should not be ignorant of other attitude-behaviour dynamics that may be at play. For instance, television advertisements that aim to create positive attitudes towards sober driving may fall short of bringing about behaviour change if peer influences are ignored (Brown, 1998). Hence, along with a focus on the dangers of drunk driving, such efforts may benefit from content that aims to positively alter people's attitudes towards harmful peer influences and the pressure to conform.

Since it has been demonstrated in this investigation, as well as in other studies, that RDB among young drivers is positively associated with constructs such as impulsivity, SS and anger (Jonah, 1997; Dahlen et al., 2005; Lajunen & Parker, 2001), a less conventional method to road safety is also proposed here. Interventions targeting young drivers (with high school and tertiary educational settings being particularly relevant), which focus on reducing thrill-seeking (i.e. sensation seeking), impulsive tendencies and anger in young people could be implemented. The evidence from this study, as well as other such studies (see Lajunen and Parker, 2001) suggests that the idea that people may have a complete personality shift when they get behind the steering wheel is not supported by empirical work. Hence the notion that a "man drives as he lives" (Tillman & Hobbs 1949, p.329) appears to hold quite true. It is therefore proposed that interventions which aim to produce positive and constructive changes in young peoples' personality, by assisting them in controlling anger, impulsiveness and thrill-seeking tendencies, must be seen as feasible and even necessary, especially when such changes, if effected, are also likely to reduce other health-compromising behaviours, particularly substance use and risky sexual behaviour (Donohew et al., 2000; Kalichman, Heckman & Kelly, 1996). For instance, in

examining television campaigns aimed at decreasing substance use through reducing SS, Palmgreen et al. (2001) found that the campaigns reversed upward developmental trends in 30-day marijuana use among high-sensation seekers, while Zimmerman et al. (2007) observed a similar trend in a television campaign aimed at increasing safer sexual behaviours through reducing SS. The benefits of such interventions may therefore be observed at various levels, if effectively implemented.

From a policy point of view, a review of the life skills high school curricula and similar curricula at tertiary educational level is strongly indicated, so as to encompass a more holistic approach to risk behaviour than currently pertains. The aim must be to challenge young people's constructions of thrill-seeking behaviour in general (e.g. risky sexual behaviour, risky driving behaviour, substance use behaviour), and enable them with the requisite knowledge and skills to avoid making impulsive decisions and displaying impulsivity in their daily thoughts and actions. It goes without saying that if such programmes are implemented they must be effectively monitored and evaluated in order to ensure ongoing programme effectiveness and improvement (Reddy, Kok, Van Den Borne, Yach, 1995).

7.3. Limitations of the study

One of the more obvious limitations of the study has to do with the fact that the measure of RDB was based on self-reports, given the inherent difficulty in gathering objective measures of observed RDB. An approach that may have been more useful is that used by Iversen (2004), who gathered data on participants' attitudes at one point in time and later gathered data on their self-reports, in an effort to obtain more accurate data. While this was not possible in this study due to resource constraints, it could be a viable next step in research into RDB.

Another limitation has to do with the fact that this study was confined to university students and not a representative sample from the general population, a limitation that most convenience samples tend to suffer.

Furthermore, this study derives from theoretical constructions of the relationship between attitudes and behaviour (Ajzen & Fishbein, 1977; Eagly & Chaiken, 1993). As noted in Chapter two, Ajzen and Fishbein (1977) have argued that attitudes and behaviours must be compatible to ensure a strong relation or a significant correlation. Eagly and Chaiken (1993) have noted that one way to think about this ‘compatibility’ is in terms of the generality versus specificity of the attitudes and behaviours that are related. Ajzen and Fishbein (1977) have suggested that all behaviours have the elements of action, target, context and time, and that these must be taken into account in the assessment of any attitude-behaviour relationship. In this regard the measures used in this study were not designed to assess the relationship between attitudinal and behavioural constructs at this level of specificity. To cite an example, the statement from the ARDB scale “It is acceptable to drive through an amber robot” is not specific about the context. Hence an individual who answered “Disagree” to this question may have answered otherwise had something about the context been articulated (e.g. “In an emergency...”). For this reason the findings of this study with regard to attitude-behaviour relationships need to be further explored through larger scale research with more detailed and indeed more complex measures.

Finally, it may be argued that the sample was too small, and statistical power too low, to make compelling policy and interventionist recommendations, and that a much larger, more

representative investigation is necessary to support or refute the findings herein. Nevertheless, this study does provide useful guidance for future research that will further examine attitudes and personality constructs in relation to RDB.

7.4. Recommendations for future research

The first recommendation for future research has to do with the idea of gender roles and aggressive driving. While there have been many studies (such as this one) investigating gender differences in RDB among young drivers, few have looked at differences in gender roles as a predictor. As noted in chapter 6, a study by Ozkan and Lajunen (2005), which investigated sex (i.e. male or female) and gender role (i.e. masculine or feminine) differences in predicting aggressive driving among young drivers demonstrated that masculinity is related to risky and aggressive driving, and thus that the masculine gender role might be one of the key factors behind high traffic accident mortality among young drivers. The findings of Ozkan and Lajunen's investigation may serve to point out a key limitation in research on RDB among young drivers. Further research must be conducted in order to gain a more comprehensive understanding of the role of masculinity/femininity in RDB among young drivers.

The second recommendation deals with driver attitudes. This study, along with that of Iversen (2004) indicated that attitudes towards rule violations and speeding was the strongest (attitudinal) predictor of RDB in the entire sample. However in light of Ajzen and Fishbein (1977) notions of the importance action, target, context and time in attitude-behaviour studies, an investigation that is more sensitive to these notions would be useful in assisting us to understand the precise dynamics of the attitude-behaviour dynamic of road users. However this requires a

thorough understanding and application of theories on attitudes and will most likely result in the construction of new measures, which should be target of further methodological research in this arena that will undoubtedly advance our empirical knowledge base for policy interventions and action.

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Appendix A

Measures that were considered

Construct	Measures	No of Items	Scoring type	Subscales	Reliability/Validity
Anger	Driving Anger Scale	14	5pt Likert-type		$\alpha = 0.80$ Quite popular
Aggression	Driving Anger Expression Inventory	34			$\alpha = 0.84$ Evidence for good reliability & Validity
	Aggressive Driving Scale	24	5pt likert type		$\alpha = 0.83$ Not very popular
Impulsiveness/ Sensation Seeking	Impulsivity Rating Scale	7	5pt likert-type	Irritability; Patience-Impatience; Time needed for decision; Aggressivity; Control of response; Capacity for delay	Not very widely used but has been used and validated.
	UPPS	45	5pt Likert-type	Sensation Seeking; (lack of) Premeditation; (lack of) Perseverance; Urgency	Very Good. The author's approach was thorough. Also the scale is very widely used, and there is tremendous support for reliability & validity. I like this measure.
	Brief Sensation seeking Scale	8	5pt likert-type	Experience seeking; Boredom susceptibility; Thrill & adventure seeking; Disinhibition (2 items each)	$\alpha = 0.74$ Could be used if we find good motivation, but I fear that it might be criticized for being too short.

Risk-taking attitude	Attitudes towards Risky Driving Behaviour (ARDB)	16	5pt likert-type	Attitudes towards violations & speeding; Attitudes towards the careless driving of others; Attitudes towards drinking & driving	Measure developed by author (Iversen, 2004). He demonstrated good internal reliability and decent coefficient alpha scores. This measure would be much recommended for our purposes.
	Young Driver Attitude Scale	15		Safe driving; Speeding; Riding with an unsafe driver; Concern for others	$\alpha = 0.92$ The full version of this scale is very long. I have a 15 item adaptation that was used and seems good.
Attitude to speeding	Speeding Attitude Scale	14	7pt likert-type		$\alpha = 0.89$ Not widely used
Dangerous driving	Self-Reported measure for Risky Driving Behaviour (SR-RDB)	24	5pt Likert type	Violation of traffic rules/speeding; reckless driving/funriding; Not using seat belts; Cautious & watchful driving; Drinking & driving; Attentiveness towards children in traffic; Driving below speed limits	Measure was designed by author (Iversen, 2004). It demonstrated good reliability and the fit of the models was encouraging. It would be recommended for its relevance here.

Appendix B

Questionnaire

Part 1

Instruction: Please tell us a little about yourself by answering a few questions below.

Please indicate your:

1. Age years

2. Gender Male Female

3. For approximately how long have you been driving?

years months

4. How frequently do you drive?

Daily 3-6 days a week 1-2 days a week Rarely

5. Have you ever driven before acquiring your learner's license?

Yes No



Part 2

Instruction: Imagine that each situation described below was actually happening to you and rate the amount of anger it would provoke in you. Indicate your answer with an X in the appropriate box.

	Not angered at all	Mildly angered	Moderately angered	Angered	Very Angered
1. Someone is weaving in and out of traffic in front of you.	1	2	3	4	5
2. A slow vehicle on a single lane road will not pull left and let you pass by.	1	2	3	4	5
3. Someone reverses in front of your vehicle without looking.	1	2	3	4	5
4. Someone fails to stop at a red robot or stop sign.	1	2	3	4	5
5. You pass a radar speed trap.	1	2	3	4	5
6. Someone speeds up when you try to pass him/her.	1	2	3	4	5
7. Someone is slow in parking and is holding you up in dense traffic.	1	2	3	4	5
8. You are stuck in a traffic jam.	1	2	3	4	5
9. Someone makes an obscene gesture towards you about your driving.	1	2	3	4	5
10. Someone hoots at you about your driving.	1	2	3	4	5
11. A cyclist is riding in the middle of the lane and is slowing you down in heavy traffic.	1	2	3	4	5
12. A police officer pulls you over.	1	2	3	4	5
13. A truck in front of you kicks up sand or gravel onto your car.	1	2	3	4	5
14. You are driving behind a large truck and you cannot see around it.	1	2	3	4	5

Part 3

Instruction: Please indicate to what extent you agree or disagree with the following statements. Indicate your answer with an X in the appropriate box.

	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
1. Some traffic rules must be ignored to ensure smooth traffic flow.	1	2	3	4	5
2. It makes sense to exceed speed limits to get ahead of really slow drivers.	1	2	3	4	5
3. It's ok to travel with someone who speeds if that's the only way to get to your destination.	1	2	3	4	5
4. Traffic rules must be respected regardless of road and weather conditions.	1	2	3	4	5
5. I would never drive after drinking alcohol.	1	2	3	4	5
6. Speed limits are exceeded because they are too restrictive.	1	2	3	4	5
7. It is acceptable to drive through an amber robot.	1	2	3	4	5
8. It's ok to travel with someone who speeds if other passengers are also ok with it.	1	2	3	4	5
9. Taking chances and breaking a few rules does not necessarily make one a bad driver.	1	2	3	4	5
10. It is acceptable to take chances when no other people are involved.	1	2	3	4	5
11. I don't want to risk my life and health by riding with an irresponsible driver.	1	2	3	4	5
12. Traffic rules are often too complicated to be carried out in practice.	1	2	3	4	5
13. If you are a good driver it is acceptable to drive a little faster.	1	2	3	4	5
14. I would never travel with a driver who I knew has been drinking alcohol.	1	2	3	4	5
15. When road conditions are good and nobody is around, driving at 140 km/h on a freeway is ok.	1	2	3	4	5
16. Punishments for speeding should be more severe than they currently are.	1	2	3	4	5

Part 4 Instruction: Please indicate with an X how often you find yourself doing the following acts while driving.

	Very Often	Often	At times	Rarely	Never
1. Break 60 km/h speed limits by more than 10 km/h.	1	2	3	4	5
2. Drive too close to the car in front to be able to stop if it should brake.	1	2	3	4	5
3. Drive short distances in a car without wearing a seat belt.	1	2	3	4	5
4. Reduce your speed to allow another vehicle to pass.	1	2	3	4	5
5. Drive after you have drunk more than one glass of beer or wine.	1	2	3	4	5
6. Reduce speed to below 50 km/h when signs show that you are in areas where children play.	1	2	3	4	5
7. Break 120 km/h speed limits by more than 10 km/h.	1	2	3	4	5
8. Get distracted because of things happening around you while driving.	1	2	3	4	5
9. Drive long distances in a car without wearing a seat belt.	1	2	3	4	5
10. Reduce speed when you see a sign indicating danger.	1	2	3	4	5
11. Drive the morning after drinking even though you are uncertain that the alcohol is out of your body.	1	2	3	4	5
12. Overtake the car in front even when it maintains an appropriate speed.	1	2	3	4	5
13. Create dangerous situations because you are not attentive enough.	1	2	3	4	5
14. Reduce speed when conditions are bad even though the speed limit might be higher.	1	2	3	4	5
15. Break traffic rules to ensure more continuous driving.	1	2	3	4	5
16. Drive without sufficient safety margins.	1	2	3	4	5
17. Reduce speed to far below the speed limit when the roads are slippery.	1	2	3	4	5
18. Ride with a person you know has been drinking too much alcohol.	1	2	3	4	5
19. Drive at 40 km/h or less in a residential area.	1	2	3	4	5
20. Ignore traffic rules to proceed faster.	1	2	3	4	5
21. Keep on driving even when you are tired and actually need a break.	1	2	3	4	5
22. Reduce speed in areas where children play even when no children can be seen.	1	2	3	4	5
23. Drive faster to catch up on an appointment.	1	2	3	4	5
24. Drive at 80km/h or less on the freeway.	1	2	3	4	5

Part 5

Instruction: Below are a number of statements that describe ways in which people act and think. For each statement, please indicate with an X how much you agree or disagree with the statement. Note that this section continues on the next page.

	Strongly Agree	Agree	Disagree	Strongly Disagree
1. I have a reserved and cautious attitude toward life.	1	2	3	4
2. I have trouble controlling my impulses.	1	2	3	4
3. I generally seek new and exciting experiences and sensations.	1	2	3	4
4. I generally like to see things through to the end.	1	2	3	4
5. My thinking is usually careful and purposeful.	1	2	3	4
6. I have trouble resisting my cravings (for food, cigarettes, etc.).	1	2	3	4
7. I'll try anything once.	1	2	3	4
8. I tend to give up easily.	1	2	3	4
9. I am <i>not</i> one of those people who blurt out things without thinking.	1	2	3	4
10. I often get involved in things I later wish I could get out of.	1	2	3	4
11. I like sports and games in which you have to choose your next move very quickly.	1	2	3	4
12. Unfinished tasks really bother me.	1	2	3	4
13. I like to stop and think things over before I do them.	1	2	3	4
14. When I feel bad, I will often do things I later regret in order to make myself feel better at the time.	1	2	3	4
15. I would enjoy water skiing.	1	2	3	4
16. Once I get going on something I hate to stop.	1	2	3	4
17. I don't like to start a project until I know exactly how to proceed.	1	2	3	4
18. Sometimes when I feel bad, I can't seem to stop what I am doing even though it is making me feel worse.	1	2	3	4
19. I quite enjoy taking risks.	1	2	3	4
20. I concentrate easily.	1	2	3	4
21. I would enjoy parachute jumping.	1	2	3	4
22. I finish what I start.	1	2	3	4
23. I tend to value and follow a rational, "sensible" approach to things.	1	2	3	4

Please Turn Over

	Strongly Agree	Agree	Disagree	Strongly Disagree
24. When I am upset I often act without thinking.	1	2	3	4
25. I welcome new and exciting experiences and sensations, even if they are a little frightening and unconventional.	1	2	3	4
26. I am able to pace myself so as to get things done on time.	1	2	3	4
27. I usually make up my mind through careful reasoning.	1	2	3	4
28. When I feel rejected, I will often say things that I later regret.	1	2	3	4
29. I would like to learn to fly an airplane.	1	2	3	4
30. I am a person who always gets the job done.	1	2	3	4
31. I am a cautious person.	1	2	3	4
32. It is hard for me to resist acting on my feelings.	1	2	3	4
33. I sometimes like doing things that are a bit frightening.	1	2	3	4
34. I almost always finish projects that I start.	1	2	3	4
35. Before I get into a new situation I like to find out what to expect from it.	1	2	3	4
36. I often make matters worse because I act without thinking when I am upset.	1	2	3	4
37. I would enjoy the sensation of skiing very fast down a high mountain slope.	1	2	3	4
38. Sometimes there are so many little things to be done that I just ignore them all.	1	2	3	4
39. I usually think carefully before doing anything.	1	2	3	4
40. Before making up my mind, I consider all the advantages and disadvantages.	1	2	3	4
41. In the heat of an argument, I will often say things that I later regret.	1	2	3	4
42. I would like to go scuba diving.	1	2	3	4
43. I always keep my feelings under control.	1	2	3	4
44. I would enjoy fast driving.	1	2	3	4
45. Sometimes I do impulsive things that I later regret.	1	2	3	4

Appendix C

Letter of Permission

*Prof - Please say yes to Skaneel provided
(a) Ethical clearance is obtained
(b) Each HOS agrees for this school.
Copy to RT-T and HOS/DHOS
Truly
D*



The Dean, Faculty of Humanities, Development & Social Sciences
University of Kwazulu Natal
Howard College Campus
29 July 2009

Dear Prof. McCrudden

RE: Request for permission to conduct fieldwork for dissertation research with post-graduate classes in the Faculty of Humanities, Development & Social Sciences

I would like to introduce myself. My name is Shaneel Bachoo and I am a Masters student in Health Promotion in the School of Psychology at Howard College. The title of my dissertation is: "Anger, Impulsivity, Sensation-Seeking and Driver Attitudes as Correlates of Self-Reported Risky Driving Behaviour among Young Drivers". The population for my study includes all post-graduate students housed at all sites within the faculty.

I hereby request your consent to approach all Heads of School in the Faculty with a view to negotiating a single period with each of their post-graduate classes (Honours, Masters and PhD) for the purpose of conducting fieldwork. The study is quantitative and the self-administered questionnaire should take between 20-30 minutes to complete, thereby ensuring minimal disruption of the academic programme. Please be assured that my research proposal and ethics protocols have been approved by the School of Psychology's Higher Degrees Committee in June 2009. Should you give me permission to proceed with logistical arrangements, please be assured that I will only conduct the study once my research proposal and ethics protocols have been approved by the Faculty's Higher Degrees Committee.

Your principal consent means that I may go ahead and liaise with Heads of School and their program managers to determine whether they are agreeable and in that instance, to negotiate appropriate times and dates for data collection. I thank you for your time and trust that you will give due consideration to my request. Please contact me or my supervisor, should you require any further details regarding this matter, and I look forward to hearing from you.

Yours sincerely

Shaneel Bachoo (205521990)

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Founding Campuses:

Edgewood

Howard College

Medical School

Pietermaritzburg

Westville

Appendix D

Informed Consent Forms for Participants

Dear Participant

Research Project: Anger, Impulsivity, Sensation Seeking and Driver Attitudes as Correlates of Self-Reported Risky Driving Behaviour among Young Drivers

I, **Shaneel Bachoo** from the School of Psychology at the University of KwaZulu-Natal, am conducting this study in partial fulfilment of my degree, Master of Social Science (Health Promotion) under the supervision of Mr A Bhagwanjee

- This study is aimed at increasing our understanding of the role that attitudinal and personal factors may play in influencing driver behaviour.
- If you agree to participate, you will be asked to complete (and hence provide your views in) a questionnaire that broadly deals with:
 - Angry driving
 - Impulsive behaviours
 - Attitudes towards risky driving behaviour
 - Self-reported acts while driving
- Your participation is completely anonymous and your responses are confidential. This means that you and your school cannot and will not be identified individually.
- Only my supervisor and I will have access to the questionnaires and data, meaning that your lecturers will have nothing to do with analysis and reporting of this research
- The research report will make no reference to individuals or Schools within the Faculty and will be made available to all participants.
- If you decide not to participate, you can withdraw at any stage of the process.
- You may address any issues or concerns you have about the study to me or my supervisor, both of whose details are provided below.
- Signing your name at the bottom means that you agree to participate in this study.

I, _____, agree to participate in the study as described above. I understand that my participation is entirely voluntary and that I can withdraw at any time. If I have any questions I can call Shaneel Bachoo on 031 242 5542 or 0829943212, or Anil Bhagwanjee on 031-260 7973 or 083 777 4973

Participant Signature

Date

