# PERSONALITY AND BEHAVIORAL FACTORS RELATED TO DRINK-DRIVING AMONG YOUNG MALES

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**David McKillop**

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# ABSTRACT

The study aimed to replicate the findings of research which highlighted a number of personality and behavioural variables that effect an individuals drink-driving frequency, and intoxication level while driving. These variables are aggression, sensation seeking, self-rated driving style and skill, driving related anger, and alcohol consumption. The studies sample ($N$ = 129) was made up entirely of 20 - 24 year old males. This group has been shown to drink-drive more frequently than any other age group in New Zealand, and males drink-drive significantly more than females. Results showed that physical aggression, verbal aggression, alcohol consumption and risky driving style were correlated with drink-driving intoxication level. However, once a regression analysis was employed it was discovered that only alcohol consumption level had significant predictive validity in relation to drink-driving intoxication level. The more a participant drank the more likely they were to drive when drunk. Overall, the results tend to question how much impact the personality variables studied really have on the frequency of drink-driving. Assumptions in relation to the findings, and implications future research on factors effecting drink-driving, are also discussed.

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# INTRODUCTION

Traffic accidents are the most common form of death for persons aged 16 - 24 in Canada (Jonah, 1986), the U.S.A. (Donovan, 1993), New Zealand (Bailey, 1991) and Australia (Deery and Love 1996). The statistics for New Zealand are particularly noteworthy. In fact, up until 1988 New Zealand's vehicle related death rate for the age group 16 - 24 was the highest of the 27 countries that regularly keep these statistics (Bailey, 1991). Even more disturbing is the large number of alcohol related, or drink-driving, fatalities incorporated in these statistics. Two - thirds of all drivers aged 20 - 24 killed in 1988 had been drinking alcohol beforehand (Bailey, 1991). These facts constitute a major drink-driving problem in New Zealand, especially for young drivers. This is despite the fact that millions of dollars have been spent on counter measures trying to stop people, young males in particular, from driving after consuming enough alcohol to impair their control of a motor vehicle. These counter measures have included massive advertising campaigns, random breath testing and harsher penalties. The extremely graphic television advertising campaigns are an example of this. Research from the New Zealand Land and Transport Safety Authority (LTSA) shows that in 1997 there were 147 fatalities (27% of all road fatalities) caused by drunk-drivers. Although this represents a marked improvement from previous years, for example the highest ever recording in 1987 there were 329 deaths (41% of road fatalities), drink-driving remains a major problem. Males make up 82% of offenders, and although they make up a very small percentage (8.3%) of all drivers 15 - 24 year olds cause one-third of all drink driving accidents (Chamberlain 1995). Drink-driving has an estimated social cost of 600 million dollars to New Zealand, constituting one-quarter of total social cost associated with injuries (LTSA, 1997). Social cost is made up of hospital costs, lost income from having time off work, lost income from spouses having time off work, cost of running emergency vehicles and so on.

A study by Hudson and Voolman (1988) that analysed all the positive evidential blood and breath tests in Palmerston North (pop. 61 000) over a 16 - month period found the

percentage of offenders in the 20 - 24 age group to be more than twice as high as any other group. The next highest was the 25 - 29 year old age group. The female to male ratio in this study was 1 : 19 which is consistent with many other studies worldwide (Hudson and Voolman, 1988).

Therefore, drink-driving is very common among young males, and with this in mind research on the topic should be aimed at young males. The present study specifically aims to gain a sample of males aged 20 - 24, as this is the group for which this behaviour is most common. In general, the aim of research such as this is to reduce the terrible rate of drink-driving in New Zealand, in some way. If this is the case, then the results of any research on the topic must be applicable to the section of society with the biggest drink-driving problem.

The remainder of this introduction reviews contemporary literature that has discovered strong relationships between drink-driving and a number of personality variables. Early studies in this area (e.g. Donovan, Martlatt and Salzberg 1983) focussed almost specifically on the relationship between aggression and drink-driving, and found significant correlations between these variables that warranted further consideration. These early studies generally used alcoholic populations to do this which jeopardised external validity. Later studies remedied this by using more representative samples, and also began to look at the effect of other variables, such as sensation seeking, on drink-driving behaviour (e.g. Donovan 1993). Sensation seeking was also shown to significantly effect drink-driving in many studies. Other variables that have been shown to effect drink-driving include self-esteem, self-rated driving skill and depression. This introduction will continue to reinforce the existence of a relationship between personality variables and drink-driving, and offer reasons why it needs to be studied. Initial sections discuss the state of research in relation to the effects of aggression, sensation seeking and driving related anger on drink-driving and looks at the development of research in this area. The review continues with a look at self -

rated driving style and skill and the problems inherent with measuring personal alcohol intake. Finally the introduction contains a discussion of the specific research question and various research goals suggested by the review and examined in the research.

Alcohol also tends to be involved in the most serious accidents (Gray 1988; cited in Bailey 1991). Drinking drivers tend to have high speed crashes and consequently more severe injuries (Gray 1988; cited in Bailey 1991). Research also shows that people who have significant levels of alcohol in their bodies when they receive injuries do not recover as quickly or as well as those with similar injuries but who haven't been drinking (Gray 1988; cited in Bailey 1991)

The drink-driving counter measures implemented in New Zealand are both numerous and varied. These include mandatory blood sampling of suspected drink drivers, blitzing, major television campaigns, harsher penalties and random stopping. Bailey (1988) has found that although these measures have, at various times, had some effect on the rate of drink-driving, overall the rate remains high. It appears unlikely that any particular countermeasure tried up until this stage will stop drink-driving all together. Furthermore, these counter measures are proving to remain ineffective with those aged 20 - 24 (Bailey 1988; Wells-Parker, Bangert-Drowns, McMillen and Williams 1995; Mann, Smart and Anglin 1995). Data collected by Bailey (1991) in New Zealand over a number of years, show decreases in drink-driving fatalities for this age group remain insignificant. Not only this, but decreases in incidences of drink-driving and attitudes to travelling with a drink-driver are also non-significant (Bailey, 1991).

Therefore, although it is widely understood that drink-driving is illegal and extremely dangerous countermeasures have failed to have a significant effect on decreasing the number of young 'drunk-drivers' in New Zealand. Bailey (1988) states that, apart from 20-24 year old males, all other age groups have shown significant decreases in the number of drink-driving incidences. This is also true for females. It appears that

the countermeasures introduced have had some level of success with older people and women. However, younger people are refusing to learn from their mistakes, from their friends mistakes and from the raft of evidence that points to the fact that drink-driving is extremely dangerous. This being the case it appears pertinent to further analyse why there are a large number of young males who continue to drink drive, and what factors influence them to do this.

Research into factors that affect drink-driving was virtually non-existent until the late 1970s when the severity of this problem became apparent. It is likely the increase in car usage throughout the 1970s and the influx of cheap, mass produced cars from Japan led researchers to notice a subsequent increase in vehicle related deaths. Thus, a number of "classic" studies were published in the early to mid 1980s that outlined the major factors to be considered when assessing influences on drink-driving. These studies basically "set the scene" for subsequent research in this area and consequently these early studies are frequently cited in a lot of the more up to date research on the topic.

A study by Donovan et al. (1983) incorporated a major review of personality factors, drinking behaviour and driving styles in relation to drink-driving and led to the formulation of a number of theories. The first major point offered in this article is the fact that not all people who admit drink-driving do it frequently, and that those who do drink-drive infrequently are not categorically dangerous. They put forward the theory that the focus on alcohol *per se* as the primary causal factor in many drink -driving accidents obscures the contribution of many personality and driving style factors. Clay (1972; cited in Donovan et al. 1983) analysed a number of participants with the same blood alcohol level, and rated both their driving ability and relative dangerousness on the road. They argue that there are a number of people who can drive perfectly safely after drinking a small amount of alcohol, and that if they do this very infrequently the chances of having an accident are relatively slim. They also point to the fact that there

are also a large group of people for whom alcohol promotes certain personality characteristics, such as aggression and sensation seeking, that makes it very dangerous for them to drive. It appears that these characteristics also make them drink-drive much more frequently than the average person. This point is demonstrated further by the large rate of re-offending (or recidivism) in New Zealand by drink-drivers. A study by Bailey and Winkel (1981) found that of 639 disqualified drink-drive offenders, 30% had a previous drink-driving conviction, and of the 171 convicted as teenagers 27% were re-convicted before they were 20. It should be also kept in mind that these were only the ones caught by the police, it may also be the case that there were a large number of re-offenders who weren't caught (Bailey and Winkel 1981, cited in Bailey 1991).

This Donovan et al. article (1983) drew together the results from a number small studies, analysed them, and then formulated theories on what personality traits had the most influential effects on drink-driving decision making. These theories, relating to sensation seeking, aggression and driving related anger, will be discussed further on in this review. It must be stated that these early studies in this article suffer from one major limitation and that is that the large percentage were performed on alcoholic populations and, thus, the results may be somewhat different than those for a non-alcoholic sample. The personality trait that Donovan et al. (1983) found to have the most effect on drink-driving was aggression. Studies cited in Donovan et al. (1983) by Selzer (1969), Zelhart (1972), Selzer and Barton (1977), Clay (1972), and Shaffer (1974) all point to a major correlation between frequency of drink-driving, or number of drink-driving offences, and aggression. Donovan et al. (1983) also make mention of the possibility of driving related anger and it's likely relationship with drink driving.

The other major personality characteristic that Donovan et al. (1983) highlight is that of sensation, or thrill, seeking. Although there was not as much evidence for the discriminative power of this variable as for aggression, there was reasonable evidence

that high sensation seekers were more likely to drink-drive. A study by Schuman, Pelz, Ehrlich and Selzer (1967; cited in Donovan et al. 1983) administered a personality questionnaire to number of participants in an attempt to decipher personality characteristics that effected drink-driving. Through multiple regression they concluded that sensation seeking, among other personality traits, was significantly predictive of drink-driving. Thus the Donovan et al. article (1983) reviewed the research on this topic up to that date and used it to postulate a number of theories. Importantly they theorised that aggressive people and sensation seekers were much more inclined to drink-drive frequently. Theories as to why this may be the case will be addressed in depth later in this introduction.

These early studies suffered through the lack of published statistics surrounding the nature of vehicle accidents. There was also a lack of related studies on vehicle accidents, or drink-driving. A large increase in the collection and publication of statistics in this area in the mid to late eighties highlighted the drink-driving problem and led to a resurgence of research about drink-driving. Consequently there is a noticeable gap in the research between the mid-eighties and early-nineties. This resumption of interest in this topic lead to the publication of another group of what may be called "classic" studies in the early nineties. These studies benefited from having a clearer picture of the extent of the problem, and the quantitative studies appear to avoid alcoholic samples and use samples that were more representative of the population. For example all the studies cited in the Donovan et al. (1983) article used alcoholic samples from detoxification units. Another frequently cited article by Jonah (1986) offers a concise overview of a number of qualitative studies on risky driving behaviour by adolescents. This study raises a number of plausible and interesting theories, some of which are outlined in this review. For example Jonah cites research (Pierce 1975; Galin 1981) to reinforce his argument that lack of driving experience and expertise, combined with the sensation seeking behaviour of

adolescents, form a deadly combination that results in a large number of accidents for young drivers.

The studies by Donovan (1993), Deffenbacher, Oetting and Lynch (1994), and Arnett, Offer and Fine (1997) benefit from major changes in the way traffic statistics are reported. More detailed analysis of traffic accidents has given researchers the ability to isolate certain groups of people and situations where accidents are more prevalent. Bailey (1991) reports that the number of studies by the LTSA in to traffic accidents has increased dramatically over the last 15-20 years. Similarly the recording of numbers, proportions and ages of drink-driving offenders by the police force has improved dramatically. Therefore, New Zealand researchers in the current era have a much more detailed and concise body of statistics from the LTSA, and the Police, with which to make their basic assumptions, than those researching 20 years ago. For example, analysis of statistics show that the majority of those being caught drink-driving are 20-24 year old males. This offers researchers a sample on which to focus and theorise about why this group offend so often.

In the Donovan (1993) study a sample of 1,196 young adults drink-driving behaviour was correlated with a number of behavioural and personality variables. Among these were aggression and risk-taking. The items in the risk-taking measure was very similar to those found in sensation seeking questionnaires and, thus, are of interest. Donovan found significant relationships between a number of the variables he examined. Firstly, he discovered that risk taking and aggression were significantly correlated in his young adult sample. Secondly, he found statistical significance at the .001 level for the relationships between risk taking and drink-driving, and aggressiveness and drink-driving. Analysis of this data leads to the conclusion that young adults who drove after drinking more frequently reported taking more risks in life, and were somewhat more aggressive. This study used a large sample that was more representative of the general population than an alcoholic sample. This provides the Donovan (1993) study with

more external validity than the earlier studies in this area, as the results could be applied to sections of society who did not suffer from alcoholism. The sample were all aged between 18 and 25 which is of particular interest in relation to the present research.

The Arnett et al. (1997) study, carried out in the U.S.A., adds considerable weight to the developing theory that sensation seeking and aggression have a substantial effect on the amount young adults drink-drive. They had fifty-nine University students keep a log of their driving behaviour over a ten day period and analysed these logs for a number of risky driving behaviours, including drink-driving. About one-quarter of the sample admitted drink-driving in this period. Arnett et al. then concentrated on measuring sensation seeking and aggression in these fifty-nine participants and correlated risky driving with these two personality characteristics. Arnett et al. found significance at the $p = .001$ level for the relationship between frequent drink-driving and both aggression and sensation seeking. The findings of this study were consistent with previously mentioned studies in that the high rate of drink-driving by young adults is associated with a tendency to "seek sensation" and to be generally more aggressive (Donovan et al., 1983; Donovan, 1993; Jonah, 1986). Arnett et al. (1997) also found levels of both aggression and sensation seeking to be significantly higher in 18 - 24 year olds compared to older samples, and higher in males than females. The use of log keeping as a data collection technique in the Arnett et al. (1997) study opens the study up to some criticism in relation to possible confounds. Firstly, if there were a few days missing from a log incorporating only ten days this means around 20 - 30% of the data was missing, there is no mention of how this was handled. Secondly, there is no mention of controls for social desirability and how this could be achieved when analysing data in a log form. Finally, it is likely that only the more conscientious of students would fill in the log to a level that meant numbers of risky driving practices could be effectively extracted. Therefore, maybe the more risky drivers failed to fill

out their log satisfactorily and appeared to be less risky drivers. This point also relates to the social desirability issue.

Interestingly Arnett et al. (1997) make it clear that they are focusing on trait rather than state personality measures and this requires some further explanation as the present study follows this trend. The state-trait distinction is a valid and important one to make as it creates a division between displaying isolated incidences of aggression or sensation seeking (state) and those who show a general and ongoing disposition towards aggressive or sensation seeking behaviour (trait). In studying incidences of drink-driving Arnett et al (1997) analysed an ongoing pattern of behaviour and therefore wanted to assess if those who were more prone to drink-drive had an aggressive or sensation seeking type personality. This points to the study of an over all trait rather than isolated incidences.

This state-trait distinction has been made in many areas of research including the study of loneliness (Hector-Taylor and Adams, 1996), anger (Deffenbacher, Oetting, Thwaites, Lynch, Baker, Stark, Thacker and Eistwerth-Cox, 1996) and anxiety (Spielberger, 1972). Deffenbacher et al. (1996) offer a concise and effective description of the difference between state and trait. State characteristics, they explain, refer to a "transitory emotional-physiological condition consisting of subjective feelings and physiological activation" (Deffenbacher et al. 1996 pp. 131). They explain that, in most cases, the state reaction is a response to an immediate situation, varies in intensity along a continuum and fluctuates over short periods. The trait condition on the other hand refers to a stable personality inclination of proneness to a certain reaction (eg. aggression), and the tendency to experience frequent state reactions. For example trait aggression refers to a unique personality disposition towards aggression and not necessarily other personality traits. Bushman (1995) states that recent research has shown that aggressive tendencies over time and situations are currently being shown to be more stable than was originally thought to be the case. The present study aims to

study an overall disposition towards aggressiveness and sensation seeking and its relation to frequency of drink-driving and, thus, has chosen trait measure of these personality variables.

Too often the overlapping constructs of aggression, anger and hostility have been misused or used interchangeably when they are not, in fact, the same thing. Pertinent to this issue is to make the distinction between aggression, anger and hostility. Firstly, anger can be viewed as the emotional state that precedes an aggressive act. Anger is purely a feeling that doesn't denote an action and this anger can be brought about a number of situations and events. Anger is an experiential, emotional construct which can be differentiated from the behaviours or ways in which anger is expressed. Aggression, therefore, can be seen as the acting out of angry feelings. A person must be angry to be aggressive but not all angry people are aggressive (Deffenbacher et al., 1996). Aggression involves physically acting out angry feelings by threatening other people, carrying out threats of physical violence, or having the extreme desire to do so. Hostility, it is assumed, is closer to anger than aggression in that it is a feeling and not necessarily an action. Although hostility can be used in a military sense in most psychological research this is not the case and, thus, hostility can be defined as the purely person directed derision of anger. Where anger can be bought on when a person stubs their toe or cuts themselves with a knife, hostility is directed at another human being. Buss and Perry (1992) treat hostility as a variable defined by resentment, suspicion and antagonism towards other people. Hostility doesn't necessarily precede aggression, for example you can feel hostile towards a work colleague who you feel is trying to undermine you. You don't necessarily feel aggressive, or even overly angry, but you feel hostile towards this person and treat them with suspicion and contempt in further meetings. Although these constructs are closely related they are, none in the less, subtlety different from each other. The present study will assess trait aggression as a separate and distinct variable from either hostility or anger.

The third personality variable to be measured in the present study is driving-related anger. The idea of driving-related anger was proposed in the D. M. Donovan et al. (1983) study but it took Deffenbacher, Oetting and Lynch (1994) to develop a scale to measure this variable.

They conceptualise driving anger as a personality trait related to trait anger but a more "situation- or context-bound anger than trait anger" (Deffenbacher et al., 1994; pp 84). Driving anger is the extent to which anger is experienced in driving related situations. They theorise that driving-related anger could have a relationship with a number of risky driving practices in particular drink-driving. This theory is yet to be fully tested, but a theory of a driving related anger affecting drink-driving was originally postulated and tested by Donovan et al. (1983). They found that those who displayed greater anger when confronted with frustrating situations whilst driving, were more likely to be involved in alcohol related accidents. As previously mentioned the constructs of aggression and anger are distinct and different from each other, however, there is no denying that they are closely linked. As research has continually shown a relationship between aggression and drink-driving (Donovan et al. 1983; Donovan 1993; Arnett et al. 1997;) it is quite possible that anger (or driving-related anger) and drink-driving could also be related. Research by Deffenbacher, Oetting, Thwaites, Lynch, Baker, Stark and Eiswerth-Cox (1996) discovered that those with higher trait anger levels drank significantly more alcohol than those with lower levels of anger. They also found men had higher anger levels and drank more than women. Later in this introduction research that finds a significant relationship between high alcohol consumption and increased frequency of drink-driving will be introduced. Evidence for the possible relationship between driving-related anger and drink-driving can thus be found. That is, if angry people drink more, and people who drink more drink-drive more often, then it is possible that those with the specific type of anger proposed will drink-drive more often also. Deffenbacher et al. (1994) strongly advise the use of their Driving Anger Scale to research the correlation between driving anger and drink-

driving. Deffenbacher et al. (1994) found the Driving Anger Scale had a reliability alpha of $r = .80$, this is satisfactory for psychological research (Nunnally 1960; cited in Jennings 1994). With this in mind, and heeding Deffenbacher et al.'s suggestion for research in the area of drink-driving and driving anger, this measure will be used in the current research.

It is important at this stage to examine possible theories as to why aggression, sensation seeking and driving related anger are likely to have an effect on the frequency of drink-driving.

From a psychodynamic viewpoint it is plausible that trait aggressive people need an outlet for their aggression, and this could be manifested in many ways including contact sports, watching violent television and playing violent video games. It can also be manifested through driving a vehicle in an aggressive, reckless manner, such as drink-driving (Arnett et al.1996). Bailey (1991) reports that frequent drink-drivers have higher incidences of domestic violence than the "average" population. Domestic violence is essentially an aggressive act, and this adds further weight to the argument that aggressive people have an increased tendency drink-drive. When driving a car you are hypothetically in control of the vehicle, if aggressive people need to control situations driving may satisfy this desire. A study by Bushman and Cooper (1990, cited in Myers 1993) discovered that alcohol diminishes normal restraints on aggression, and reduces ones ability to consider the results of their actions. If a person is feeling particularly aggressive after drinking alcohol, as can be the case (Smart 1995), this may increase their desire to drive. Schuman et al. (1967, cited in Donovan et al. 1983) conducted an extensive series of interviews with 18-24 year old males and found that a measure that incorporated driving-related anger, aggression, driving to 'blow off steam' after an argument and impulsive, daredevil driving was significantly correlated with drink-driving. It seems that this notion of driving to release tension is linked with aggression and could explain why a relationship between aggression and

drink-driving exists. It could be that after consuming alcohol the personal controls of aggressive people are released and the act of blatantly breaking the law by drink-driving is an outlet for aggression. The opposite of the fundamental attribution error (Myers 1993) is often applied to people who have been drinking alcohol. That is, their behaviour is blamed on the fact that they have been drinking rather than an internal disposition, or desire, to carry out a certain behaviour. People often absolve themselves of total responsibility for an action when they are drunk, and it is quite plausible that aggressive people get drunk "on purpose" to ease some of this responsibility for their actions. As previously mentioned, those who drink in larger quantities drink-drive more frequently (Pelz, McDole and Schuman 1975; Holubowycz and McLean 1995). Aggressive people have also been shown to drink in larger quantities (Steer and Fine 1978; Deffenbacher et al 1996). Thus, if we follow the argument through that aggressive people drink more, and people who drink in larger quantities drink-drive more often, the idea that there is a possible relationship between aggression and drink-driving becomes plausible. Many researchers (Donovan et al. 1983; Vingilis, Studuto, Macartney-Filgate, Liban and McClellan 1994; Arnett et al. 1997) emphasise the fact that in many situations it isn't the car or the alcohol consumption that is the "weapon' but the personality of the driver. A large number of studies have shown aggressive people drink-drive more frequently and this appears to be the major problem (Arnett et al. 1997, Donovan 1993).

Theories as to why a relationship between sensation seeking and drink-driving may exist appear more clear-cut than those in relation to aggression. Sensation seeking can be defined as "the need for varied, novel and complex sensations and experiences to maintain an optimal level of arousal" (Ball, Farnill and Wangeman 1984). The construct of sensation seeking also encompasses the idea of experience through a non-conforming lifestyle (Zuckerman, Eysenck and Eysenck 1978) and this idea is often associated with adolescents breaking away from parents control, and being influenced by peer relationships. Cars can be used to provide a number of intense experiences

including racing other cars, driving at high speeds and breaking the law in the face of authority. Engaging in experiences in cars gives young people an interest outside that of their parents and also opens them up to the undeniable influences of their peers. As alcohol diminishes ones inhibitions, the desire to access intense experiences through recklessly driving a car may become stronger, and harder to repress. It can also be argued that drinking alcohol constitutes a form of sensation-seeking behaviour in is own right, especially drinking to excess. For those adolescents who have what may be called a sensation seeking personality trait, the relationship between drinking alcohol and then driving recklessly as an experience is very strong (Arnett et al. 1997). Jonah (1986) reports that it may not necessarily be the fact that alcohol retracts from the drivers skill so much as that it diminishes their ability to perceive risk and make intelligent decisions. Young people have significantly less driving experience compared to older adults and this is likely to greatly increase the problem. Both Jonah (1986) and Deery and Love (1996) have conducted studies whereby young drivers are shown a series of 'risky' situations that can be encountered when driving and asked to rate how 'risky' each situation is. One of the 'risky' situations was to drink a certain amount of alcohol before driving. The young samples found the situations significantly less 'risky' than older samples in both studies. This inability to perceive risk, coupled with the desire to experience sensation in a car, may result in a significant relationship between sensation seeking and drink-driving. The fact that young people may spend a lot more time socialising away from home means they may be more likely to be drunk, in a car, in a state of excitement and in a 'sensation seeking' frame of mind. Driving fast while drunk is likely to provide excitement to the adolescent who craves it.

Another factor tying aggression, sensation seeking and drink-driving together is the theory that much higher levels of both aggression and sensation seeking have been found in young adults, when compared to more mature adults and younger children (Zuckerman, Eysenck and Eysenck, 1978; Ball, Farnill and Wangeman, 1984; Hyde, 1984; Harris, 1996; Arnett et al. 1997). Males were also shown in these studies to

have significantly higher levels of sensation seeking and aggression than females. Harris (1996) conducted a very large study on ethnicity, gender and age in relation to aggression, and discovered that men were far more likely to be not only the aggressors, but also the targets of aggression, except in the case of domestic violence. Harris used the Buss-Perry Aggression Questionnaire (1992) and found statistical significance in both gender and age differences. Harris (1996) also found a significant negative correlation between age and acts of aggression both as the aggressor and as a target. People get less aggressive as they get older for various reasons, but it is probably due to a combination of biological and environmental changes. An environmental change can be due to the fact that older people have families, and career jobs, to consider when decision making. This often means more a logical, structured analysis of problems is a more suitable solving mechanism than aggressive acts. Biologically we change as we get older also. After age twenty-five the male hormone testosterone decreases, as does aggression, hinting that testosterone affects aggression (Myers 1993). Indeed, Myers (1993) found that significant numbers of both male and female criminals had higher testosterone levels than average. Changes in neurotransmitter levels over time and alterations in brain activity may also effect aggression levels. Harris' (1996) results are very similar to those found in the Hyde (1984) meta-analysis. Hyde analysed 143 studies on the topic up until 1984 and found males to be significantly more aggressive than females on a 'wide variety' of aggression measures, but particularly on physical and verbal aggression inventories. Hyde also found that young participants were significantly more aggressive than older participants.

Zuckerman et al. (1978) conducted a study in to the age and gender differences in relation to sensation seeking. They found that gender differences for sensation seeking were significant in total score on the Sensation Seeking Scale and also on four out of the five separate sub-scales. Males were significantly higher sensation seekers. They also found significance in the decline of sensation seeking with age. Zuckerman et al. put this decline with age down not only to the "mellowing effect of experience" (pp

148) but also to physiological changes such as slowing of cortical activity and the decreasing of gonadal hormone output. These results were very similar to those found by Ball et al. (1984) who studied an Australian sample and found significant negative correlations for sensation seeking and both age and gender.

Therefore it appears that both sensation seeking and aggression are far more prominent personality traits of young males than any other age group or gender. Similarly, it seems that drink driving is very much a young males activity (Donovan et al. 1983; Bailey 1991). Sensation seeking and aggression have also both been shown to have an association with drink-driving. The link here cannot be overlooked and adds further weight to the theory that aggression and sensation seeking are associated with the frequency of drink-driving. It may also help to explain why young males drink-drive so often.

Although aggression and sensation seeking have frequently been shown to have an effect on drink-driving they are not universally accepted as doing so. A major study by Vingilis, Stoduto, Macartney -Filgate, Liban and McLellan (1994) compared two groups of car accident victims, one which had alcohol in their blood and one which didn't, on demographics, personality characteristics and driving related attitudes. In the personality variables she assessed aggression and sensation seeking and found no differences between the two groups. In fact, the only difference between the alcohol positive and alcohol negative groups was overall alcohol consumption rates, the alcohol positive group generally drank more. However, this study had a relatively small sample size ($n = 96$) when compared to many other studies in this area and the average age of the participants, which was 36 years old, was also high also in comparison to other studies on this topic. The sample was slightly different than the one used in the present study in that the dependent variable was whether a participant had alcohol in their blood when they crashed, rather than how often they confessed to

drink-driving. With this in mind, however, this study does shed some doubt on the universality on the drink-driving and aggression / sensation seeking relationship.

Jonah (1986) looks at the sensation seeking side of the argument and drops this term in favour of risk taking. He states that drink driving is part of a whole raft of risky behaviours undertaken by young adults, and it is the preoccupation with risk taking rather than sensation seeking that brings about the relationship with drink-driving. While the difference between risk taking and sensation seeking may at times seem quite minimal there remains a significant difference between the two. Risk taking doesn't imply that the person gains any inherent emotional gratification from the experience and merely states that the individual has taken a risk. The reasons for performing the risky behaviour could be due to peer pressure, a need to be at a certain place at a certain time or any number of reasons (Jonah, 1986). Sensation seeking on the other hand implies that the individual is doing something, say drink-driving, for the emotional pleasure it brings. In light of this the present study focuses on the emotional response, or sensation seeking as opposed to risk taking. The vital difference here is the emotional gratification gained from the experience (Zuckerman et al. 1996). If a person acts out a risky behaviour purely for emotional gratification and the heightened sense of excitement it brings this is sensation seeking. Thus, risk is the behaviour - sensation is the emotion (Arnett 1994).

Therefore, studies have regularly shown that there is a significant association between both sensation seeking and aggression and the frequency of an individuals drinking and driving. Similarly, a specific type of anger, driving-related anger, has been theorised to effect an individuals to decision whether or not to drink-drive. It has also been shown that 80 - 90% of drink-driving is performed by males, and by far the largest offenders are aged between 20 and 24. Finally young males have been shown to have the highest sensation seeking and aggression levels of any age group, and of either gender. The research goal to be analysed in the present study is that young males whose sensation

seeking and aggression levels are higher than average will drink-drive more frequently. It is also hypothesised that there will be significant correlations between high sensation seeking and aggression levels.

As previously reported New Zealand has a particularly salient record when it comes to drink-driving fatalities and incidences (Bailey 1991). It seems that any research in to preventing this problem using a New Zealand population is vital if the rate of drink-driving is to be lowered. Because many of New Zealand's young adults live in the country, or in small towns out of the main socialising centres, they are more likely to have cars and more likely to live definite driving distance from many drinking establishments. This is likely to effect New Zealand's drink-driving problem for this age group, and research in to the factors effecting their decision making in relation to drink-driving could be invaluable in attempting to curb this problem.

Another variable that has been found to have significant effects on drink-driving frequency is the amount of alcohol consumed, and how regularly an individual drinks alcohol. It has been found, not surprisingly, that frequency of drinking and amount consumed is higher in drink-drivers than those who do not drink-drive (Wilson 1992). Problem drinking has been a well recognised factor in drink-driving (Donovan 1993; Vingilis et al. 1994). Vingilis et al. (1994) found that a significantly higher number of drivers found over the legal blood alcohol concentration (BAC) limit had a self-perceived drinking problem than those found under the BAC limit. It is hypothesised that as the level and frequency of an individuals drinking increases the frequency of drink-driving of the individual will increase, as will the level of intoxication while driving.

Peoples drinking patterns and behaviour are notoriously difficult to measure (Guidelines for Drug and Alcohol Assessment, 1996). This is due to many factors.. Firstly, peoples drinking patterns change frequently due to things such as stress,

holiday times, whose around them or even an event such as the rugby world cup. This being the case it is very hard to tie many people down to a certain "drinking behaviour type". Secondly pub measures and "home pour measure" are often quite different. A single nip pour at a pub is 15mL of spirits where as a "small" home pour could be up to 25mL (Bailey 1991). Similarly, many house wines at establishments are around 10% alc/vol, however, a good bottle of wine bought from a bottle store may be up to 13% alc/vol. And finally, peoples memory of how much they have drunk over a period is often poor. When drinking is done in a relaxed environment people are often not concentrating on the quantities they are drinking. If a person gets drunk to the extent of memory loss they may not remember what they drank or how much and sometimes remembering what you drank and how much two or three months ago can be impossible (Guidelines for Drug and Alcohol Assessment, 1996).

The problems inherent in measuring peoples drinking behaviour can be illustrated by the large numbers of devices used to perform this task. The quality of these measures range from very ineffective measures with little validity or reliability, to extremely complex measures that are perhaps effective for research that requires a very in depth level of measuring drinking behaviour. Such a high level of complexity is not required in the present study.

The Alcohol Use Disorders Identification Test (AUDIT) (Guidelines for Drug and Alcohol Assessment 1996) measure is an example of a measure that lacks even basic face validity. The wording and measurement of the drinking behaviour variable in the AUDIT is well below what would be expected from a measure of this variable. No analysis of psychometric properties of this measure was available. For example, question one asks "How often do you have a drink containing alcohol" and the first possible response is "Never or Less", you can't get less than never. The second question asks how many drinks do you have on a typical day drinking and the first possible answer is "Never", never is not a number or a numerical measure. Thus the

AUDIT lacks face validity and because psychometric information is non-existent analysis of content validity and reliability is impossible.

Therefore, with these problems in mind the measure developed by Paulin, Simpson and Waal-Manning (1985) appears to be very effective. This measure firstly assess the respondents actual drinks (eg can of beer, bottle of beer, glass of wine) and then converts them into grams of alcohol consumed. This gives a measure of alcohol consumption and enables the grouping of drinkers (eg heavy, light, moderate). This measure also only asks respondents to give amounts in an average week, which is much easier to work out than over the last month and gives more reliable results than asking about the week preceding, as this week may have been extraordinary for some reason. This measure has been used on New Zealand populations in the past without major problems. This measure also offers the user a technique with which to group respondents in to categories of alcohol consumption, a device not found in many other measures. The categories are non-drinkers, occasional social drinkers, light drinkers (2-99 g alcohol/week), moderate drinkers (100-299 g alcohol/week) and heavy drinkers (300 g or more alcohol/week). This measure has a degree of complexity ideal for the present study and appears to be a practical measure that counters some of the problems associated with other measures. With the ranges of grams of alcohol in the categories mentioned above, this measure is flexible to allow some memory deficiencies and variance in size of beverages consumed. It also only asks for an average weeks consumption. This makes it easier to give an accurate estimate of alcohol consumption as it ignores extraordinary weeks, and people generally have an idea of average alcohol intake. It is also easier to work out actual drinks consumed rather than the 'standard drinks' measure, as used by measures such as the AUDIT. It is hypothesised that those who fall in to the heavy drinkers category will have higher levels of both sensation seeking and aggression, and will also drink drive more frequently.

An article by Pelz, McDole and Schuman (1975) is an often cited study that assess the relationship between drinking and drink-driving behaviour. The authors surveyed a sample of 1670 young men in the state of Michigan, U.S.A. in relation to their drinking behaviour, their drink-driving behaviour and their accident involvement. Pelz et al. (1975) firstly make the point that studies on alcohol and driving shouldn't focus specifically on those who are of the legal drinking age. They conclude that "from Helsinki to Winnipeg to Wichita some experimentation with alcoholic beverages is widespread among teenagers" (pp 958) and that this group of adolescents, who are under the legal drinking age, are likely to effect the drink-driving problem also. This study makes some very pertinent conclusions that suggests this association between young males and drink-driving is by no means a new phenomenon and that progress on this problem is extremely slow. They firstly make the conclusion that as the young men get older they drink more, and they consequently drink-drive more frequently. In this study 58% of 20 year olds had driven after drinking in the last month. Secondly, they found that the more severe the crash they more frequently alcohol was involved. Thirdly, they found that the majority of crashes for 18 - 19 year olds did not involve alcohol, where as for those aged 22 - 24 the majority of crashes did involve alcohol.

This study is one of the first major pieces of research in this area and it's results have stood the test of time. These results have been replicated many times and there appears to be a definite link between an increase in alcohol consumption and an increase drink-driving.

Holubowycz and McLean (1995) analysed the drinking behaviours and patterns of injured male car drivers and motorcycle riders in South Australia. They located participants who had a blood alcohol level (BAC) of 80 mg/dl or over, (the legal limit in Australia), and interviewed the participants either in the hospital, or after they had been discharged. The interviews consisted of identifying how many standard drinks they consumed, how often in the last month, and what their attitudes towards drinking

and driving were. They then compared the respective 'drinking patterns' with the different levels of blood alcohol (ie 80 - 100; 100 - 120) and attempted to identify trends. They also compared self-reported drinking patterns with self-reported drink driving behaviour. Participants who drank more often and/or in greater quantities were found to have significantly higher BAC levels when they crashed, and they identified beer as their preferred drink more than those who drank less frequently. In relation to drink-driving, the percentage who expected their driving would be impaired after eight or more drinks decreased significantly as BAC category increased. Critically, the percentage of those who reported that they drove at least once a week within two hours of drinking increased dramatically as BAC increased, as did the proportion who reported driving at least once a week with a BAC level they believed to be over 80mg/dl. The percentage advocating a loosening in drink-driving laws also increased as respective BAC level increased. Holubowycz and McLean (1995) discovered that those participants who had higher BAC levels at the time of the accident, consumed significantly more alcohol in their day to day existence, than those with lower BAC levels. They also found that as BAC level increased so did participants relaxed attitude to drink-driving behaviour and laws.

Although this study includes some interesting findings these are somewhat constricted by the research's limitations. These limitations also raise questions surrounding the validity of the study. This was a retrospective study that questioned subjects very soon after a traumatic incident. There would be doubt over the ability of the respondents to remember how much they drank before an accident or whether they would answer truthfully in light of possible legal action. There also seems to be certain ethical issues in asking personal questions in a hospital environment where the subject is being treated for injuries sustained in the accident which the researcher is studying. This gives the respondent an opportunity to understate the amount of alcohol the consumed before the crash to present themselves in a better light and thus the validity of the finding is jeopardised.

The fact that 52% of those found over the legal BAC limit in Australia (80 mg/dl) had been drinking in pubs or bars before hand, prompted Holubowycz and McLean (1995) to suggest greater responsibility for lowering the level of drink-driving must rest on publicans and bar owners. This appears to invade the basic right of people to make their own decisions in relation to the own behaviour. The publican provides a service which can be either used or not used by the public, the decision rests with those who want to drink. While the publican is encouraged to stop serving overly intoxicated patrons, make taxi phones available and display anti drink-driving posters, it is not up to them to physically make sure a patron doesn't drink-drive. This decision is entirely up to the patron deciding how to get home. We must be careful not to consistently and publicly implicate drinking establishment owners in drink-driving accidents.

A study by Midanik, Tam, Greenfield and Caetano (1996) in the U.S.A. compared self-reported drinking patterns and behaviour with the ICD-10 measure of alcohol dependence, and drink-driving behaviour in a sample of over 22 000 males and females. The ICD-10 measure is a 23-item questionnaire designed to cover the six criteria of alcohol dependence (compulsion to drink, impairment of control over drinking etc), that were instigated by the World Health Organisation. Their results showed a significant relationship between increased alcohol consumption and increased drink-driving incidences. Particularly strong was the relationship between the number of days in a year on which five or more drinks were consumed, and drink-driving frequency. This graph of this relationship rose most steeply for those who are non-dependent on alcohol and drink in moderate amounts. This leads to the conclusion that people think it is acceptable to drive after a five or more drinks when they don't drink this amount 'that often'. Midanik et al. (1996) also found increased levels of both drinking and drink-driving for younger participants and for males. Interestingly their results showed that of those who drink five or more drinks in one sitting, once a week, 50% have driven after drinking. Again this is a seemingly well executed study that

provides further weight to the argument that increased alcohol consumption leads to increased drink-driving incidences, and indicates that further analysis of this relationship appears worthwhile.

Studies by Deery and Love (1996) and Grube and Voas (1996) have shown that self-rated driving style and skill has a significant on drink-driving behaviour. The measurement of this variable requires participants to answer a questionnaire that assesses how they personally rate their own driving skill and driving style.

Deery and Love (1996) studied the effect of a moderate dose of alcohol on the perceptions of traffic hazards for a young sample. They begin by making a clear distinction between driving skill and driving style. Driving skill is expected to improve with practice and training and is concerned with 'performance limitations on aspects of the driving task' (eg using the steering wheel to track the road). Driving style is concerned with the decision making aspects of driving, or the manners and habits the individual driver has developed over time. For example driving speed, travelling distances and drinking and driving. Deery and Love aimed to test the participants response to what constituted dangerous driving skill and styles in a video. . Participants were given this test firstly after consuming no alcohol at all, and then after being given a moderate amount of alcohol (0.05% BAC). Significant results were found in relationship between amount of alcohol consumed and how hazardous the subject felt a particular situation was. That is; the more alcohol, the less hazardous a situation was perceived to be. For example subjects took longer to perceive a hazard (driving skill) and responded in a more abrupt manner (driving style) when under the influence of alcohol. Analysis of this data helped lead to the development of the Driving Expectancy Questionnaire.

The Driving Expectancy Questionnaire, developed by Deery and Love (1996) after the initial study mentioned above, offers an apparently valid and reliable way to measure

driving style and skill. The authors established validity through a series of factor analyses, and then through analysis on a population ($n$ = 191; 101 men) that included multiple regression and discriminant functions. In Deery and Love's study the overall Cronbachs Alpha for the DEQ was 0.86, and the alpha's for the two subscales were 0.85 and 0.84 for driving skill and driving style respectively. Again they make the distinction between driving style and driving skill, however, in this study they use a sober sample and study their expectancies on various facets of driving, including driving drunk. Answers were given on a Likert scale. Factor analysis of the DEQ uncovered two distinct factors, one relating to driving style and one to driving skill. Trials on two different samples revealed evidence that the two factor model had a significant relationship with drink-driving practices. That is, frequent drink-drivers felt they were more skilful drivers and reported a riskier driving style than non-drink drivers. Deery and Love performed a multiple regression in order to assess the contribution of the DEQ to statistical prediction of drink-driving. After controlling for age on the first step of the regression they added scores on the DEQ on the second step. They found statistical significance in the DEQ's ability to predict both drink-driving frequency and level of impairment when driving. In summary, what these results indicate is that those who score highly on the DEQ subscales of driving style and driving skill are more inclined to drink-drive frequently, and at higher levels of intoxication than the average offender. In another section of this study Deery and Love (1996) found that those who reported drink-driving frequently showed a significantly higher monthly alcohol intake, and number of drinks reported on each drinking occasion. In fact, they found alcohol consumption to be the single most powerful predictor of drink driving behaviour. The reported psychometric information on the DEQ and its significant ability to predict drink-driving make it a suitable measure with which to measure driving expectancy in the present study.

Grube and Voas (1996) also studied driving expectancies in relation to drinking and driving. They used a sample size of 1015 and assessed drinking and driving in relation to expectancies of gaining physical injury when drink-driving. They asked the participants if they would drink-drive after 1, 3, 5, or more drinks and what expectancies they had of being able to control the vehicle and avoid physical injury. They also measured the respondents beliefs about how well they could control a vehicle if confronted with a 'risky' situation that may cause an accident. They found that those who felt they could handle risky situations easily felt it was acceptable to drive after drinking, and did this more frequently than other respondents. They also found that those who felt their driving skill would prevent them from physical injury were more frequent drink-drivers than other subjects.

The area of research surrounding self-rated driving style and skill and drink-driving is still in its relative fledgling stages. However, the research by Deery and Love (1996) and Grube and Voas (1996) indicates that peoples expectancies of their personal driving skill and driving style has significant effects on their decisions whether or not to drink and drive. It is an area that warrants further research, as the results thus far have indicated a relationship with drink-driving, and further analysis on a New Zealand population may bring to light further factors affecting this relationship. Hypothetically, if a person shows very risky driving style, this inherent 'riskiness' could include drink-driving frequently. Similarly, if a participant rates their own driving skill highly, they may expect that alcohol consumption will have very little effect on their ability to drive skilfully. The fact that driving style and skill has been shown to have effects on drink-driving, yet has been relatively unstudied up to this stage, means its inclusion in the present study may offer more confirmation of its role in drink-driving frequency.

Therefore, there is a large number of research articles assessing each of three different factors relating to drink-driving. These variables, analysed in this introduction, are personality variables, drinking behaviour variables and driving expectancy variables. It

would be beneficial to understand how these variables effect a New Zealand population. The benefit in knowing more about the factors effecting the decision whether or not to drink-drive, may be a reduction in the number of young males in New Zealand who drink-drive frequently. Analysis of variables effecting this can help with the implementation of further counter measures that will reduce the amount of drink-driving. It could help with the "angle" that advertisements take. For example, maybe by getting peers to try and prevent their friends drink-driving is a more effective way to prevent drink-driving by young males. The fact that drink-driving remains such a huge problem in New Zealand, yet not a lot of research on the topic is executed in New Zealand, means that studies on the topic may provide valuable information needed to help reduce drink-driving. It is possible that counter measures developed overseas do not necessarily work with the New Zealand psyche. Research in our own country may highlight this. Besides the ongoing study by John Bailey there appears to be little interest in the topic. The desire to assess which variables have the major effect(s) on drink-driving, and in which combinations, make it very desirable to follow through a research project on all three of the above mentioned variables. The amount of carnage on New Zealand roads caused by young males drinking and driving, means it is time to further research the reasons for their decision to get behind the wheel after drinking. This introduction has provided a number of variables that appear to effect this decision, and now the study of these on a New Zealand population must be performed. Research by a number of people on this topic may help to prompt increased interest in the factors surrounding its prevalence, and may also offer some insights in to how to countermeasure drink-driving. Thus, it appears that research combining personality, behaviour and expectancy variables, in a New Zealand sample, is required at this stage.

**Therefore the current research aims to test these research goals:**

**1)** Do individuals who drink-drive frequently, differ from those who never or infrequently drink-drive, on measures of aggression, sensation seeking and driving-related anger. Does intoxication level of the drunk-driver, relate to different levels of these personality variables. Do the findings replicate those of Donovan et al. (1983), Jonah (1986), Arnett at al. (1997) and Donovan (1993).

**2)** Does the present study find that increased alcohol consumption significantly relates to increased drink-driving frequency, as found by Pelz et al. (1975) and Vingilis et al. (1994).

**3)** Do subjects who never or seldom drink-drive differ from frequent drink-drivers on their self-rated driving skill and style as found by Deery and Love (1996).

# METHOD

## *Respondents*

The sample for this research consisted of 129 males aged 20 - 24 ($M$ = 22.8 yrs). As previously mentioned research by Bailey (1991) indicates that males make up around 82% of the offenders in this age group and, thus, females weren't sought as participants in the study. The total number of questionnaires circulated was 266, thus giving a total response rate of 47%.

## *Measures*

The major research tool in this study was a 18 page questionnaire combining the measures of the following variables in this order; drinking behaviour, aggression, sensation seeking, driving expectancies, driving related anger, drink-driving behaviour and demographic data, all the measures utilised a self report method. The drinking behaviour, drink-driving behaviour and demographic data sections required the respondents to record numbers or tick one of a number of possible answers, all the other measures were in Likert scale form. Full item wordings are given in appendix two.

## *Aggression*

Aggression was measured using Buss and Perry's (1992) revised version of the Buss-Durkee Hostility Scale which was originally formulated in 1957. This scale was used to measure aggression in research by both Donovan (1993) and Vingilis et al. (1994). The revision of the original measure was performed by Buss and Perry (1992) in order to update some of the language used and improve factor reliability scores. The resultant factor analysis identified four factors which the authors named:- Physical Aggressiveness, Verbal Aggressiveness, Anger, and Hostility. With the desire to avoid the definition problems described in the introduction in relation to aggression, anger and hostility the present study uses only the Physical Aggression and Verbal

Aggression subscales. Buss and Perry (1992) stress that it is acceptable to use the whole measure, or as many of the subscales as one desires, in their instructions on using the measure (Buss and Perry 1992). Physical Aggressiveness is a 9-item scale reflecting the tendency to employ physical measures when angered and has a reported reliability alpha of 0.85 (Buss and Perry 1992). Statements such as "If someone hits me I hit back" and "Once in a while I can't control the urge to strike another person" are answered on a five level Likert scale ranging from 'not very characteristic of me' to 'very characteristic of me'. Verbal aggression is a 5-item scale reflecting enjoyment of arguments and tendency to insult others when provoked. A sample statement is "I can't help getting in to arguments with people who disagree with me'. This subscale has a reliability alpha of 0.72 (Buss and Perry 1992) and uses the same Likert scale as Physical Aggression. Reliability alpha's for the subscales were 0.85 and 0.72 for physical aggression and verbal aggression respectively.

### ***Sensation Seeking***

Arnett (1994) reported that the majority of research conducted in the area of sensation seeking (Vingilis et al. 1994; Ball et al. 1984; Zuckerman et al. 1978) has used the Sensation Seeking Scale (SSS), Form V, to measure this construct. However, Arnett has identified a number of limitations in the conception and form of this scale that, he concludes, limit the conclusions that can be drawn from it. Briefly Arnett (1994) attacks the SSS on four points. Firstly, he finds fault with the 'forced choice' format leaving the respondents the possibility of feeling both (or neither) of the answers may apply to them. Second, several of the items contain mentions of strenuous physical activity which brings to light problems with age differences. Although older people are generally not as strong or physical as an adolescent sample, this doesn't necessarily mean that they have less of a sensation seeking type personality (Arnett 1994). Third, words such as hippie, jet set and queer are somewhat dated, especially when measuring the behaviour of younger people such as in the present study. Fourth, he states that the SSS contains numerous questions on drug use, alcohol use and sexual

behaviour - which is precisely the type of behaviour often studied when using this measure. This presents a possible confound when using this measure. It suggests that a reported relation between sensation seeking and these types of behaviour, may be little more than a relation between questions about these types of behaviour on the Sensation Seeking Scale, and other similar questions about these types of behaviour in the research questionnaire (Arnett 1994).

Thus, Arnett (1994) developed the Arnett Inventory of Sensation Seeking (AISS), and in taking heed of the sound arguments against using the Sensation Seeking Scale the present study will utilise the Arnett Inventory of Sensation Seeking. Information relating to the reliability of the AISS is included below. This scale involves twenty statements to which respondents indicate, by circling the letter (A, B, C, or D),how well the statement describes them. For example; 'I would have enjoyed being one of the first explorers as an unknown land' or 'I like movies with lots of explosions and car chases'. Respondents possible answers are:- (A) Describes me well,
(B) Describes me somewhat, (C) Does not describe me very well, or (D) Does not describe me at all. Answers are given a numerical value ranging from four for answer (A), to one for answer (D). Scores are added to give total sensation seeking score. The AISS score incorporates two 10-item subscales named novelty and intensity. The sensation seeking level of the participant can be measured using the total score or one of the two subscales. Reliability alpha's were reported by Arnett (1994) as 0.70 for the total scale, and 0.64 and 0.50 for the intensity and novelty subscales respectively. Convergent validity with the SSS was reported as 0.41.

## ***Driving Related Anger***

Deffenbacher et al. (1994), as mentioned in the introduction, developed a scale to measure this specific type of anger related to driving a car and the actions of other road users. Probably more colloquially known as "road rage", Deffenbacher et al (1994) theorise that this specific type of anger may effect the safety of both the drivers and other road users, and that it may promote risk taking and aggressive driving behaviour. They also state that it may be useful to have a measure of driving-related anger if at some stage programs are introduced to try and reduce driving anger. The resultant driving anger scale is a 33-item scale with six subscales. However, the authors have also developed a 14-item short version of the scale that doesn't involve subscales. A statement such as 'Some one speeds up when you try to pass them' is answered on a five point Likert scale ranging from (1) Not angry at all, to (5) Extremely angry. The scores are added to gain the total 'score' of driving related anger. The present study uses the short version of the Driving Anger Scale which has a reliability alpha of 0.80. The correlation between the long and short versions is 0.95. Factor analysis of the items in the driving anger scale located six subscales. Items were selected from each subscale that were highly correlated with both that subscale, and the total score on the long form of the measure. This resulted in the 14-item short version of the scale.

## ***Driving Style and Skill***

In order to test the hypothesis that frequent drink-drivers rate themselves as being more skilful car drivers, and more risky, than those who drink drive less frequency, the present study utilises a newly developed measure of self-rated driving skill and style. The measure used for this construct is the Driving Expectancy Questionnaire (DEQ) questionnaire developed by Deery and Love (1996). As previously mentioned this questionnaire assesses both driving style and driving skill with two 9-item subscales. Deery and Love (1995) tested this measure in a study examining "young drivers across

the spectrum of drink-driving practices, from non drink-drivers to convicted drink-drivers, and to examine their expectancies about driving and their drink-driving practices" (pp 194). They found the DEQ to have significant predictive ability in relation to drunk-driving, and results demonstrated that frequent drink-drivers rated themselves as more skilful at driving, and more risky in their driving. (Deery and Love 1995 pp 193).

Respondents are asked to answer on a different five point Likert scale for each of the two subscales of the DEQ. For the driving skill subscale respondents answer a statement such as 'My ability to steer a car', with one of the following responses:- (1) Extremely Poor, (2) Poor, (3) Average, (4) Good, or (5) Extremely Good. Similarly, driving style subscale statements such as 'I take risks' are answered on a Likert scale with the following responses:- (1) Not at all, (2) Occasionally, (3) Some of the Time, (4) Often, or (5) All of the time. The respondents scores are then added and divided by nine (the total number of statements in each of the two subscales) to give self-rated driving style and skill. The overall Cronbachs Alpha for the DEQ was 0.86. The alpha's for the two subscales were 0.85 and 0.84 for driving skill and driving style respectively. The factors were moderately correlated (0.33) indicating reasonably independent factors. A multiple regression indicated the measure had significant predictive validity and when factor scores were compared across four drink-driving scores significant criterion-related validity was found. Thus, the psychometric information indicates a measure with high reliability. The results from the study by Deery and Love (1996), and the publication of validity and reliability levels, reinforce the use of this measure as an effective way to analyse the driving style and skill variable. Thus, this measure will be used in the present study.

### ***Drinking Behaviour***

The Paulin et al. (1985) measure of drinking behaviour was used to measure this variable. This measure has been chosen over a number of other alternatives because it

remedies some of the problems inherent in many others. Firstly measures such as the AUDIT often use ambiguous and dated language, such as; 'How many drinks did you consume last week'. The term drinks is not defined, it could be a standard drink or a measure such as a can or stubbie. There are also validity and reliability problems with other measures. As mentioned the AUDIT measure asks if how often you drink alcohol, and the first possible response is 'never or less'. You can't get less than never, and this jeopardises even basic face validity. In particular, the Paulin et al. measure provides a way to convert 'laymans' measures of drinks (cans, handles, jugs, glasses) in to a valid and reliable measure. For example a 750ml bottle of beer equates to 22g of alcohol and one glass of wine has 8g of alcohol.

Respondents were asked to record their alcohol consumption on an 'average' week. For example how many cans, jugs, glasses of wine, single nip spirits etc. The amount they have drunk is then converted into overall grams of alcohol. Respondents are then categorised in to four levels:-

* Occasional social drinkers (0 - 1 g alcohol/week) - ***Group One***
* Light drinkers (2 - 99 g alcohol/week) - ***Group Two***
* Medium drinkers (100 - 299 g alcohol/week) - ***Group Three***
* Heavy drinkers (300 g alcohol/week) - ***Group Four***

Grouping the respondents in to these categories will make it possible to study the correlation between how much a respondent drinks and how often they drink and drive, and also looking at personality characteristics and drinking patterns.

## ***Drink-Driving Behaviour***

The drink driving measure was adapted from that used by Pond (1996) in which respondents were categorised in to levels of intoxication when driving. This measure is similar to that used by Donovan (1993). Donovan used this type of measure as it

offered a way to measure both frequency of drink-driving, and the participants intoxication level whilst driving. Measuring this involved respondents answering, firstly, if they had ever driven a car or motorcycle after consuming alcohol. If they answered no they moved on to the next question. If the answered yes, they recorded the number of times they had driven in the following situations in the last six-months:-

**A)** After drinking a small amount of alcohol, but not enough to feel the effects of the alcohol.

**B)** After drinking enough alcohol to feel slightly drunk.

**C)** After drinking enough alcohol to feel definitely drunk.

If respondents had never driven in one or more of the three categories they were asked to record a '0' in the appropriate column. Participants were then asked whether they had ever been DIC'd (the New Zealand term for being legally charged with drink-driving) and how many times this had happened.

Participants were then rated in relation to the total number of times they had driven after drinking alcohol. Participants were also categorised in to five intoxication levels as follows:-

**1)** Never driven after drinking.

**2)** Had driven after drinking but not in the last six months.

**3)** Had driven after drinking in the last six months but only as far as the first available response (after a small amount of alcohol, but not enough to feel the effects of the alcohol).

**4)** Had driven after drinking in the last six months but only up to the second available response (after drinking enough alcohol to feel slightly drunk). In this level they could also have recorded an amount in the first available response (after a small amount of alcohol, but not enough to feel the effects of the alcohol).

**5)** Had driven after drinking alcohol and right up to the last available response (after drinking enough alcohol to feel definitely drunk). Respondents in this drink-driving intoxication level could have numbers recorded in all three drink-driving intoxication level responses. Therefore, drink-drivers were able to be analysed in two ways; total frequency of drink-driving and severity of intoxication when drink-driving.

## ***Demographic Data***

Participants were classified as either Students, Blue Collar workers, White Collar workers or Beneficiaries. The percentages of classifications were as follows; Students 77.5%; Blue collar 10.9%; White Collar 10.1%; and Beneficiaries 0.8%. Participants were also asked to record their date of birth to decipher their age, and their sex, to make sure only males were included in the study. The respondents were also asked to identify to which ethnic group they felt they belonged by choosing either:- New Zealander of European descent, New Zealander of Maori descent, New Zealander of Asian descent , New Zealander of Pacific Island descent, or other for those who did not identify with any of these. Percentages of these ethnic groups were; New Zealander of European descent 86%; New Zealander of Maori descent 10.9%; New Zealander of Asian descent 0%; New Zealander of Pacific Island descent 0.8%; and other 2.3%. Participants were also asked what their highest educational qualification was, again, by ticking an appropriate box ranging from less than three years at secondary school, to postgraduate degree/diploma. Finally they were asked to record any other qualifications they held and in which occupation they were currently employed. Full item wordings can be found in appendix two.

## ***Procedure***

The first page of the questionnaire included a brief explanation of the research which informed respondents that the research analysed personality and behaviour factors in relation to drink-driving, and that was part of a Masters degree in psychology. Also

included was an introduction to the researcher with contact details and an explanation of the participants rights in the study. This illustrated their right to anonymity and confidentiality, the right to pull out of the study or not participate at all and the right to contact the researcher at any time, and assured them that these rights would be upheld. The second page of the questionnaire contained seven instructions on how to fill out the questions and simple reminders such as 'please complete all the pages of the questionnaire trying not to miss any'. These pages can be found in appendix two.

The back page of the questionnaire was a form on which the participant could indicate whether or not they wished to receive a brief document containing the results of the research, and an address for the return.

The sample was generated by distributing the research questionnaires in a number of environments and providing a freepost return envelope to ensure ease of return for participants. In order to comply with the informed consent facet of ethical research an explanation of the nature of the research, what it aims to assess and possible conclusions was also presented to possible participants. The participants were gained by a number of methods, in all of these cases the research questionnaire was presented with the freepost addressed envelope and thus, there was no pressure to fill out the questionnaire 'then and there'. Respondents were recruited through a number of "snowballing", and several acquaintanceship, networks of the researcher as follows;

* Walking door to door around a number of streets in Palmerston North asking if anyone who lived there fitted the research criteria (20 - 24 year old males) and giving them the questionnaire and explanation.

* Walking around the Massey University Palmerston North campus approach those who appeared to fit the criteria and asking them if they would fill out a questionnaire.

* Handing the questionnaires out to possible participants at various social occasions including 21st birthdays and social gatherings of other types.

* Sending bundles of 10 - 20 of the questionnaires coupled with a detailed explanation of the study to friends in Whangarei, Wellington, Christchurch and Hamilton and asking them to pass the questionnaires around to friends and flatmates who fit the participant criteria.

* Giving the Questionnaires to members of the Queen Elizabeth College Old Boys Senior B rugby team.

* Approaching workmates at Centrepoint Theatre and workers in the student services department at Work and Income New Zealand both in Palmerston North.

# RESULTS

### *Analysis of sample*

All of the 129 participants in the present study were male, ranging in age from 20 -24 years old, ($M$ = 22.8, $SD$ = 1.183). Ethnic groupings were European New Zealanders (86%, n = 111), Maori (10.9%, n = 14) and other ethnicities (3.1%, n = 4). The majority were university students (77.5%, n = 100), however, blue collar workers (10.9%, n = 14) and white collar workers (10.1%, n = 13) were also represented, there was one beneficiary included in the study. A large number had an undergraduate degree (72.9%, n = 94), with 3.1% (n = 4) having a postgraduate degree or diploma. The percentages of those whose highest qualification was at secondary school level were 4.7% (n = 6) for three or four years at secondary school, and 19.4% (n = 25) for five years at secondary school. It is likely that this educational attainment data is somewhat misleading, as the question pertaining to this in the questionnaire suffered some ambuguity. It appears that many respondents may have indicated that they have an undergraduate degree, when in fact they are in the process of completing their degree.

Data that analyses the relationship between demographic data and the independent variables can be found in appendix one. Significant relationships between the demographic data and the independent variables was virtually non-existant. Maori participants were discovered to drink significantly more than European participants. For the formal education and current occupation variables participants were classified in to two groups. For the education variable participants were classified in to those who had a maximum of a secondary school education, or those who had a university education. No significant differences between these two groups was found on any of the independent variables. For the current occupation variable participants were classified as either full-time employed, or as students. Again, there were no significant differences between these groups on any of the independent variables.

In relation to the dependent variable of drink-driving behavior, 91.5% (n = 118) of the sample had driven after drinking alcohol at some stage in their life, with 84.5% (n = 109) having done it in the last six months. This means that out of a sample of n =129 only nine had never driven after drinking. Eleven participants (8.5%) admitted drink-driving in their life but not in the last six-months. Only 6.2% (n = 8) of the sample had ever been arrested and charged for drink-driving. The drink-driving variable is measured as total number of times the respondent has drunk-driven in the last six months, and as five intoxication levels. The five intoxication levels were; never drunk-driven, drunk-driven but not in the last six months, only drunk-driven to a level where the alcohol effects could not be felt, drunk-driven to a level where the effects of alcohol were felt, and drunk-driven when they were definitely drunk. Table 1 presents the descriptive information for levels of intoxication when drink-driving. Over half the sample (55.0%) had driven a vehicle while feeling slightly drunk in the last six months. For the age group in the sample this level of intoxication would put them definitely over the legal blood alcohol level. Almost a third (27.1%) had also driven while feeling definitely drunk. The percentages in the table add to more than 100% because, hypothetically, a respondent could have driven at all three intoxication levels in the past six months. Similarly, it is quite possible for a participant to have driven after a small amount of alcohol and after feeling definately drunk in the last six months. Thus, the percentage indicates how many respondents admitted driving at that particular level of intoxication in the last six months. The mean number of times relates only to those who admitted drinking at that particular intoxication level more than zero times.

**Table 1**

***Percentages and Means for Different Levels of Intoxication While Driving***

| LEVEL OF INTOXICATION WHILE DRIVING | *% OF SAMPLE DRIVEN AT THIS LEVEL* | *MEAN (SD)* | *RANGE (# of times)* |
|---|---|---|---|
| **1** - After drinking a small amount of alcohol but not enough to feel the effects. | 82.2% (N = 33) | 8.0 (11.28) | 0 - 80 |
| **2** - After drinking enough to feel slightly drunk. | 55.0% (N = 41) | 4.1 (4.62) | 0 - 24 |
| **3** - After drinking enough to feel definitely drunk. | 27.1% (N = 35) | 2.9 (2.54) | 0 - 24 |

Table 2 presents the means and standard deviations for the independent variables. The Physical Aggression score is very similar to that reported in the study by Buss and Perry (1992) which had a $M = 24.3$ ($SD = 7.7$), for a sample of 612 males aged between 18 and 20 years old. However, their sample reported higher Verbal Aggression ($M = 15.2$; $SD = 3.9$). The alcohol consumption mean just fits in to the rate for medium drinkers, as specified by Paulin et al. (1985), however the high standard deviation suggests this variable contains some extreme values either side of the mean.

**Table 2**

***Means and Standard Deviations for the Independent Variables***

| VARIABLES | ($n$ = 129) *Mean* | *SD* |
|---|---|---|
| Driving Anger | 40.55 | 8.52 |
| Sensation Seeking | 24.60 | 4.13 |
| Verbal Aggression | 11.81 | 3.62 |
| Physical Aggression | 24.01 | 6.08 |
| Driving Skill | 4.04 | 0.44 |
| Driving Style | 3.03 | 0.44 |
| Alcohol Consumption (grams alc) | 291.22 | 203.81 |

Table 3 presents the intercorrelations of the independent variables. On the diagonal in bold are the Cronbachs alphas for the measure in the present study. The correlations between the independent variables range from $r = .01$ to $r = .42$. Inspection of the correlation coefficients presented in table 2 shows that there are a few high correlations, particularly for physical aggression, DEQ driving style and alcohol consumption. The significant positive correlations between physical aggression and both verbal aggression and driving anger appears logical considering the similar emotions involved in these constructs. Contrary to research reported by Donovan et al. (1983) sensation seeking was not significantly correlated with any other variables. The highly significant DEQ driving style correlations with physical aggression, verbal aggression, driving anger and alcohol consumption ($p < .001$) are consistent with correlations reported in the literature (Deery and Love 1996). Similarly, the physical aggression and alcohol consumption correlation has been reported previously (Deffenbacher et al. 1994).

**Table 3**

***Independent Variable Intercorrelation Matrix***

| VARIABLES | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| **1**. Driving Anger | **.86** | | | | | |
| **2**. Verbal Aggression | .14 | **.71** | | | | |
| **3**. Physical Aggression | .25* | .53** | **.80** | | | |
| **4**. Sensation Seeking | -.06 | .01 | .06 | **.58** | | |
| **5**. DEQ Driving Skill | .10 | .01 | .13 | .16 | **.80** | |
| **6**. DEQ Driving Style | .33** | .33** | .33** | .10 | .09 | **.84** |
| **7.** Alcohol Consumption | .11 | .18 | .42** | .02 | .03 | .28** |

Note - Cronbachs alphas are shown on the diagonals in bold.

*p < .01, **p < .001 (one-tailed tests).

Factor and reliability analysis of the measures revealed significant problems with the Arnett Inventory of Sensation Seeking measure. Internal consistency for the intensity and novelty subscales were only .49 and .40 respectively, well below the standard of .60 set down by Nunnally (1960, cited in Jennings 1994) as an acceptable level psychological research. Factor analysis located a total of eleven items in the Arnett Inventory of Sensation Seeking that appeared to be lowering the consistency of the measure. This resulted in the decision to use a 9-item measure of sensation seeking without the proposed subscales. As shown above the Arnett Inventory of Sensation Seeking measure utilised in the present study had an alpha of .58. It is acknowledged that this is still relatively low, however, it is very close to Nunally's proposed level and is as high as could be achieved in the present study. Similarly, the Buss and Perry

(1992) measure of verbal aggression originally had an alpha of .61. Factor analysis resulted in the decision to remove one of the five items improved the Cronbach's alpha to .71. All of the other measures have satisfactory alpha levels.

There are two ways to utilise the information gathered in relation to drink-driving behavior, total drink-driving frequency or in the levels described previously. Table 4 presents the correlations between both drink-driving intoxication level and total drink-driving frequency with the seven independent variables. Total drink-driving frequency was calcualted by adding the total number of times the respondent admitted drink-driving, regardless of intoxication level. As total drink-driving frequency has little correlation with the variables the analysis of results in the present study will use the drink-driving intoxication level variable. The drink-driving intoxication level variable (range 1- 5) was calculated by assessing the highest level of intoxication at which the respondent had admitted to driving. Thus, if a respondent admitted to having driven after drinking enough to feel definitely drunk they scored a five. Thus, this construct remained a continuous variable. However, if they had only ever driven after drinking a small amount of alcohol but not enough to feel the effects they were in level three, and so on. There were significant correlations between drink-driving intoxication level and physical aggression, driving style and alcohol consumption ($p < .001$). Significance was also found for the verbal aggression ($p < .01$) variable.

**Table 4**

***Intercorrelation Between Drink-Driving and Independent Variables***

| INDEPENDENT VARIABLES | **Drink-Driving Intoxication Level** | **Total Drink-Driving Freq.** |
|---|---|---|
| **1.** Driving Anger | .00 | .12 |
| **2.** Verbal Aggression | .21* | .12 |
| **3.** Physical Aggression | .36** | .16 |
| **4.** Sensation Seeking | .03 | .18 |
| **5.** DEQ Driving Skill | .03 | -.11 |
| **6.** DEQ Driving Style | .28** | .16 |
| **7.** Alcohol Consumption | .42** | .17 |

*p < .01, **p < .001 (one-tailed tests).

# TESTING OF RESEARCH GOALS

***Research Goal One***

Research goal one, that the four personality variables are associated with the amount of drink-driving, was tested using ANOVA analysis. Table 5 contains the results of the ANOVA's testing the significance of the difference between verbal aggression, physical aggression, sensation seeking and driving anger variables and the respondents drink-driving intoxication level. Significant differences were found between physical aggression and drink-driving intoxication level. A post-hoc ranges test (Scheffe, 1956) found level five was significantly different from levels one, two and three at the $p < .05$ level. Therefore, those who drove after drinking enough to feel definitely drunk were found to be significantly more physically aggressive than those who had

never drunk-driven, those who hadn't drunk-driven in the last six months, and those who had drunk driven after a small amount of alcohol but not enough to feel the effects.

**Table 5**

***Results of ANOVA Between Drink-Driving Intoxication Level and Personality Variables***

| VARIABLES | Drink-Driving Intoxication Level 1 (n=11) | 2 (n=9) | 3 (n=33) | 4 (n=41) | 5 (n=35) | F - Stat |
|---|---|---|---|---|---|---|
| | MEAN (SD) | | | | | |
| Driving Anger | 41.00 (9.65) | 38.39 (5.28) | 40.73 (8.99) | 40.78 (8.51) | 40.38 (8.77) | .104 |
| Physical Aggression | 21.45 (4.34) | 20.22 (6.67) | 22.00 (4.06) | 24.20 (5.81) | 27.46 (6.76) | 5.85*** |
| Verbal Aggression | 10.64 (3.56) | 10.11 (4.26) | 11.64 (3.06) | 11.76 (3.56) | 12.57 (3.34) | 1.18 |
| Sensation Seeking | 26.27 (3.70) | 22.89 (3.82) | 23.82 (4.37) | 24.61 (4.42) | 25.23 (3.63) | 1.35 |

*p < .05, **p < .01, ***p < .001.

1 - Never driven after drinking alcohol.

2 - Driven after drinking but not in the last six months.

3 - After drinking a small amount of alcohol but not enough to feel the effects.

4 - After drinking enough to feel slightly drunk.

5 - After drinking enough to feel definitely drunk

***Research Goal Two***

The association between drink-driving intoxication level and both driving style and driving skill was also tested using ANOVA. Driving style score was shown to be significantly different between drink-driving levels. A post-hoc ranges test (Scheffe, 1956) showed participants in level five were significantly more risky drivers than those in levels one and four. That is those who admitted driving after they were definately drunk were significantly more risky drivers than those who had never drunk-driven and those who had driven after drinking enough to feel slightly drunk. Table 6 summarises the data.

**Table 6**

***Results of ANOVA Between Drink-Driving Intoxication Level and Driving Style and Skill***

| VARIABLES | Drink-Driving Intoxication Level | | | | | F - Stat |
|---|---|---|---|---|---|---|
| | 1 (n=11) | 2 (n=9) | 3 (n=33) | 4 (n=41) | 5 (n=35) | |
| | MEAN (SD) | | | | | |
| Driving Skill | 4.06 (0.30) | 3.74 (0.30) | 4.07 (0.51) | 4.07 (0.42) | 4.03 (0.46) | 1.13 |
| Driving Style | 2.77 (0.34) | 2.83 (0.37) | 3.05 (0.45) | 2.92 (0.38) | 3.26 (0.46) | 5.07*** |

*p < .05, **p < .01, ***p < .001.

1 - Never driven after drinking alcohol.

2 - Driven after drinking but not in the last six months.

3 - After drinking a small amount of alcohol but not enough to feel the effects.

4 - After drinking enough to feel slightly drunk.

5 - After drinking enough to feel definitely drunk

***Research Goal Three***

For the comparison between alcohol consumption and drink-driving intoxication level, total alcohol consumption (grams) was used. An ANOVA was used to test mean differences for the sample between alcohol consumption and drink-driving intoxication level. The results are presented in Table 7. The difference was significant and a post-hoc ranges test (Scheffe 1956) showed that drink-driving intoxication level five drank significantly more at the $p < .05$ level than levels one, two and three. That is, those who had driven after feeling definitely drunk, consumed significantly more alcohol than; those who had never drunk driven, those who had not drunk driven in the past six months, and those who had driven after drink alcohol but not enough to feel the effects.

**Table 7**

***Results of ANOVA Between Drink-Driving Intoxication Level and Alcohol Consumption***

| VARIABLES | Drink-Driving Intoxication Level | | | | | F - Stat |
|---|---|---|---|---|---|---|
| | 1 (n=11) | 2 (n=9) | 3 (n=33) | 4 (n=41) | 5 (n=35) | |
| | MEAN (SD) | | | | | |
| Alcohol Consumption | 116.4 (35.1) | 108.8 (36.3) | 144.4 (25.1) | 196.6 (30.7) | 212.8 (36.5) | 7.31*** |

*p < .05, **p < .01, ***p < .001.

1 - Never driven after drinking alcohol.

2 - Driven after drinking but not in the last six months.

3 - After drinking a small amount of alcohol but not enough to feel the effects.

4 - After drinking enough to feel slightly drunk.

5 - After drinking enough to feel definitely drunk

## *PREDICTORS OF DRINK-DRIVING BEHAVIOR*

In order to identify the most significant predictors of drink-driving behavior, two heirachical regression analyses were conducted. For the first of these regression analyses total drink-driving frequency was used as the dependent variable, and for the second, drink-driving intoxication level was the dependent variable. The other aim of the regression analysis was to test if the personality variables had significant associations with drink-driving, over and above those associations due to alcohol consumption. Both methods for measuring alcohol consumption were used in separate regression analyses. As previously explained, these methods are total alcohol consumption, in grams, and the different consumption levels as described by Paulin et al (1985).

Prior to conducting the regression analysis an inspection of the data was carried out to check for skewness, normality and outliers. Analysis of *Z* scores indicated three univariate outliers for the total alcohol consumption variable, four for the total drink-driving frequency variable and one for the verbal aggression variable. These outliers were greater than three standard deviations from the mean and were omitted from further analysis. The total alcohol consumption and total drink-driving frequency variables were also significantly positively skewed at $p < .05$. A log10 transformation was performed on the total drink-driving frequency variable and this reduced the skewness. On the total alcohol consumption variable the logarithm transformation was found to be ineffective. Thus, a square root transformation was applied, and the skewness was reduced with this technique. These two transformed variables were utilised in the hierarchical regression analysis.

### First Regression Analysis

The first regression analysis used total drink-driving frequency as the dependent variable. The independent variables were entered in two steps, with total alcohol consumption entered at step one and verbal aggression, physical aggression sensation

seeking, driving anger, driving skill and driving style entered at step two. The results for the regression, showing beta values for each step, are given in Table 8.

**Table 8**

***Summary of Heirachical Regression Analysis For Variables Predicting Drink-driving intoxication level***

| Variable | Step One *Beta* | Step Two *Beta* |
|---|---|---|
| Alcohol Group | 0.42*** | 0.31*** |
| Verbal Aggression | | 0..00 |
| Physical Aggression | | 0..21* |
| Sensation Seeking | | -0.02 |
| Driving Anger | | -0.14 |
| Driving Skill | | -0.00 |
| Driving Style | | 0.18* |
| ***R Square*** | 0.18 | 0.26 |
| ***Adjusted R Square*** | 0.17*** | 0.21*** |
| ***R Square Change*** | | 0.08 |

*p < .05, **p < .01, ***p < .001

An examination of step one of this regression analysis showed alcohol consumption group was a significant predictor of drink-driving intoxication level, F (1, 126) = 27.14 p <.001. However, the addition of the personality variables entered at step two failed to produce a significant increase in the prediction of drink-driving intoxication level. Thus, when alcohol group is taken in to consideration the effect of personality

variables is non-significant in prediction drink-driving behavior. Despite the significance of physical aggression and driving style, the results of this regression analysis fail to support the research goals that were generated for this study.

With all seven variables entered in to the equation it is possible to determine the predictive power of the regression model. Overall, the nine variables produced an adjusted R square figure of 0.21, indicating that these variables account for twenty one percent of the variance in drink-driving intoxication level. This was significant. However, the non-significance of the personality variables, entered at step two, in predicting drink-driving means that alcohol consumption was the largest predictor of drink-driving behavior. An additional regression analysis using drink-driving intoxication level and total aclohol consumtion, produced similar results.

Another regression analysis was conducted to assess if the personality variables significantly predicted drink-driving behavior when the total drink-driving frequency and total alcohol consumption variables were assessed. The total drink-driving frequency variable was calculated by totaling the number of times the respondent admitted drink-driving, regardless of intoxication level. Total alcohol consumption was gained by calculating the total number of grams of alcohol they drank. The relationships between total drink-driving frequency and total alcohol consumption, and the other independent constructs had consistently been different to the relationships when drink-driving was measured in the levels mentioned previously. With this in mind, these variables were used because it was felt that their slightly different construction may alter the significance for the predictive ability of the personality variables. Table 9 presents the data for this regression analysis.

**Table 9**

***Summary of Heirachical Regression Analysis For Variables Predicting Total Drink-Driving Frequency.***

| Variable | Step One *Beta* | Step Two *Beta* |
|---|---|---|
| Total Alcohol Consumption | 0.38** | 0.19 |
| Verbal Aggression | | 0.04 |
| Physical Aggression | | 0.06 |
| Sensation Seeking | | 0.13 |
| Driving Anger | | 0.03 |
| Driving Skill | | -0.06 |
| Driving Style | | 0.09 |
| ***R Square*** | 0.14 | 0.19 |
| ***Adjusted R Square*** | 0.13** | 0.14 |
| ***R Square Change*** | | 0.04 |

*p < .05, **p < .01, ***p < .001

As can be seen from Table 8, total alcohol consumption entered on stage one was significantly predictive of drink-driving frequency in the total equation. This equation accounted for thirteen percent of the total variance which was significant, $F(1, 105) = 5.87$, $p < .05$. The addition of the personality variables at step two resulted in an R square increase of four percent in the total variance, which was non-significant. Thus, it appears that the personality variables in the present study do not have significant

predictive ability over and above the predictive ability of alcohol level. An additional regression analysis using total drink-driving frequency and alcohol consumption in levels, produced similar findings.

In the first regression analysis the independent variables were found to have non-significant effects on drink-driving behavior over and above that of Paulin et al.'s alcohol levels. Thus, total alcohol consumption was used in the second regression analysis to test if this changed the nature of the relationship. However, similar effects were discovered.

# DISCUSSION

Drink-driving continues to quite possibly be the major traffic problem in New Zealand, particularly for young males. A number of studies have highlighted personality variables that seem to have an association with the frequency of drink-driving by young males. These personality characteristics include sensation seeking personality (Donovan et al. 1983), aggression (Donovan 1993) and self-rated driving style and skill (Deery and Love, 1996). These variables have been frequently reported to be significant predictors of drink-driving behavior. These studies generally focussed primarily on the personality characteristic they were studying and failed to recognise the significance of alcohol consumption and its effect on drink-driving.

The present study attempted to replicate the findings of a number of previous research articles, which located variables that appeared to significantly predict drink-driving behavior. The present study had three main research goals: (1) to test whether aggression, sensation seeking and driving-related anger levels differ in individuals who drink-drive frequently as compared to those who seldom or never drink drive. The aim was to replicate the research findings of Donovan et al. (1983), Jonah (1986), Donovan (1993) and Arnett at al. (1997); (2) to analyse whether subjects who never or seldom drink-drive differ from frequent drink-drivers on their self-rated driving skill and style as discovered by Deery and Love (1996); and (3) to attempt to replicate the findings by Pelz et al. (1975) and Vingilis et al. (1994) that indicate increased alcohol consumption significantly relates to higher frequency of drink-driving.

The results of the present study found a number of significant correlations and mean differences between the independent variables and drink-driving behavior. The hypothesis that driving anger, sensation seeking and aggression would have significant relationships with drink-driving frequency and intoxication level was partially supported. Significant correlations were discovered between drink-driving level, and

both verbal and physical aggression. Significance was also found in the ANOVA for physical aggression and drink-driving level. However, in contrast to previous research driving anger and sensation seeking failed to have any significant relationships of any kind with drink-driving. When these personality variables were entered in a regression analysis after alcohol consumption had been controlled for, they were found to be non-significant predictors of drink-driving behavior.

Sensation seeking has consistently been found to have a strong relationship with drink-driving in research, particularly in studies by Donovan et al. (1983) and Jonah (1986). The failure of the present study to find any significance in this relationship could be a function of a number of possible explanations. These could include the obvious sample bias, inadequate measuring of drink-driving or alcohol consumption, or be due to the fact that the relationship is method dependent. The Arnett Inventory of Sensation Seeking was found to have low reliability in the present study ($r$ = .58). This may have effected the results when compared to those reported by Arnett (1994). Arnett reported a reliability alpha of ($r$ = .70) and reasons for the present studies failure to reach this level of reliability could be the result of major differences between the two studies. Arnett used a sample of 16 - 18 year old participants of both genders, this is very different from the sample used in the present study. Arnett's measure was formulated and tested on participants in a suburb of Atlanta, Georgia, U.S.A. and, thus, may be 'culturally bound' to this sector of society. The factors considered above, and consequent modifications to the measure, may have effected the results in relation to sensation seeking. If a researcher was attempting to replicate the present study it may be advisable to use the SSS (Zuckerman 1978) to test this variable. It would also be possible to assess a slightly different variable such as risk taking, as suggested by Jonah (1986), or novelty seeking, and their association with drink-driving.

Deffenbacher et al. (1994) hadn't actually studied the Driving Anger Scale in relation to drink- driving previously, but theorised that driving-related anger was likely to have

a relationship with drink-driving behavior. However, the results of the present study fail to back this theory up in any way. Driving-related anger was found to have significant correlations with physical aggression and risky driving style and further research in to these relationships may be warranted. However, the results of the present study indicate that in relation to drink-driving, driving anger appears to have very little influence. Once alcohol consumption had been controlled for in a regression analysis, driving anger was a non-significant predictor of drink-driving behavior.

In relation to the second research goal; driving style was shown to have a significant correlation with drink-driving behavior. Similarly, an ANOVA discovered a significant mean difference between driving style and drink-driving level. Driving style was also found to have significant correlations with driving anger, verbal aggression, physical aggression and total alcohol consumption. However, the driving skill subscale of this measure had non-significant relationships with all the other independent variables, as well as drink-driving. An ANOVA showed a non-significant mean difference between driving skill and drink-driving level. Therefore, it appears that riskier drivers drink-drive at higher intoxication levels, but not necessarily more frequently, and those who rate their driving skill highly do not drink-drive more often, or at higher intoxication levels. Contrary to previous research (Deery and Love 1996) driving style and skill were also discovered to be non-significant predictors of drink-driving, once alcohol consumption had been controlled for.

Finally, total alcohol consumption was found to have significant correlations with physical aggression and driving style. It was also found that alcohol consumption had a highly significant relationship with drink-driving level. Most interestingly, alcohol consumption was the only significant predictor of drink-driving frequency, and drink-driving intoxication level. As mentioned above some of the other independent variables have significant correlations and mean differences with drink-driving.

However, when alcohol consumption was controlled, none were significant predictors of drink-driving behavior.

The distinction between total driving frequency and rating drink-drivers in relation to their intoxication level has been made throughout this research. A definitive decision on the most appropriate way to measure this construct is difficult. An argument could state that if someone drink-drives frequently, but only after a very small amount of alcohol, they are less dangerous than the person who drink-drives twice a year but is very drunk when doing so. On the other hand, to argue that in these two examples the likelihood of having an accident is very similar is also plausible. It is the opinion of the researcher that the first argument is the more valid of the two. To be consistantly driving after drinking a small amount of alcohol, but not enough to put you over the limit, may be dangerous. However, it is not as dangerous as doing so when your co-ordination has been completely undermined by extremely large amounts of alcohol, on even one occasion. However, research in to this measurement decision would be highly beneficial. Thus, analysis in the present study was performed on both total drink-driving frequency and drink-driving level, a variable that was defined by levels of intoxication. The five levels were; (1) never drunk-driven, (2) drunk-driven but not in the last six months, (3) only drunk-driven to a level where the alcohol effects could not be felt, (4) drunk-driven to a level of feeling slightly drunk, and (5) drunk-driven when they were definitely drunk.

In general analysis of demographic data yielded little in the way of critical discussion points. The only significant association was that Maori respondents were found to drink significantly more alcohol than European respondents. The demographic data collected was age of participants, ethnicity, years of formal education, and participants current occupation. None of these were found to have significant correlations or mean differences with any of the independent variables or drink-driving. The years of formal education variable suffered from rather ambiguous wording of the question. The

result was a very high number of participants reporting that they had a undergraduate degree, when in fact they were in the process of completing it. As the sample in the present study comprised a large number of white university students the demographic data was highly skewed. The ability to gain significant results from this type of data can be hindered when this is the case. If the researcher had gained a more random sample more of the mean differences between demographic variables and independent variables may have been significant.

As predicted physical aggression was highly correlated with drink-driving. However, it was not a significant predictor of drink-driving after the effect of alcohol consumption had been controlled. This is contrary to research by Arnett et al. (1996) and Donovan (1993). Donovan used the unrevised version of the Buss-Durkee hostility questionnaire on a sample very similar in age to the present study ($M = 21.3$ yrs), but that incorporated females. This leads to the theory that maybe the unrevised measure, developed in 1957, is infact a more reliable measure of aggression on a young sample. Donovan's sample was also made up of 58% full-time employed participants and only 10% students. Maybe the Buss-Durkee measure is a more valid measure of aggression for those who have experience in the work force. Arnett et al. (1996) used the eight-item Aggressiveness subscale of the California Psychological Inventory. Arnett et al. do not offer reliability alphas for this measure but claim that it is a 'well-validated measure used in many studies of personality' (pp 59). Arnett et als. sample was made up of 17 - 18 year olds, with a majority of females ($N = 64$, 41 females). This sample is very different from the one in the present study, and it is possible that the measure used by Arnett et al. was very effective for that sample. Analysis, of the contradiction between the results of the present study, and those found by Arnett et al. (19960 and Donovan (1993), offers the possibility that the best measure of aggression for the present sample was not found.

The problems with the measurement of sensation seeking have been discussed previously. The fact that this measure suffered from a number of possible measurement problems, means that the opportunity to further theories regarding the relationship between sensation seeking and drink-driving has been missed in the present study. The use of the Arnett Inventory of Sensation Seeking on such a non-random highly focussed sample was ineffective in the present study. However, research on more random, or larger, samples may prove this to be an excellent measure of sensation seeking.

Driving-related anger surprisingly appeared to have no significant correlation with drink-driving frequency or level, nor did it display significant predictive ability. Maybe the Driving Anger Scale is more a measure of general anger and not, as suggested, anger specific to motor vehicles. This may mean that it has little predictive validity relation to drink-driving because it merely measures anger, which hasn't necessarily been shown to affect drink-driving frequency. In general it appears that driving-related anger seems to have little relevance to drink-driving for the sample analysed in the present study. Deffenbacher et al. (1994) theorised that a relationship between driving-anger and drink-driving would exist, however, they didn't test for this relationship. The present study suggests that no significant relationship between these variables exists.

Jonah (1986) argued that drink-driving could in fact be a subset of a whole group of risky driving behaviours under taken by adolescents. These risky behaviours are not necessarily dictated by a need for emotional arousal. With this is mind the significant correlations and mean differences between risky driving style and drink-driving, may back up Jonah's argument. The presents studies results suggest that sensation seeking has less of an effect on drink-driving than previously thought. The problems with the measurement of this vaiable in the present study has been previouly documented. It may be that the real predictor of drink-driving behavior is the related construct of risk-

taking behavior. Therefore, further research in this area may wish to focus on Jonah's (1986) theory and assess general risk-taking behavior in relation to drink-driving.

Alcohol consumption was found to be significantly predictive of drink-driving when entered at step one in the regression analysis. This variable also showed significance in the ANOVA with drink-driving level. Therefore, it appears that off all the independent variables in the present study alcohol consumption was the most valid predictor of drink-driving behavior. Firstly, the fact that those who drink in large quantities drink-drive frequently has been reported in previous research (Pelz et al. 1975). It appears to follow logic that if you drink a lot, and own a car, you have many more opportunities to drink-drive, and more of these opportunities may be actioned. There can be no denying the fact that a large number of people, and young males in particular, are drink-driving frequently. The fact that only 6.2% of those who admitted drink-driving had actually been arrested and charged (DIC) may have some effect on this. If a person drives home frequently after drinking and never gets caught, the 'fear' factor in relation to making the decision whether or not to drive diminishes. The individual is merely playing the percentages, and the percentages appear to indicate you are very unlikely to get caught drink-driving.

In summary, the predicted relationships between aggression, driving style and alcohol consumption, and the dependent variable drink-driving behavior were not found to hold for the present study. Once alcohol consumption was controlled the 'personality' variables failed to significantly predict drink-driving behavior. Sensation seeking and driving related anger failed to reach any significant relationships with drink-driving and this appears to be due to a number of possible explanations, including measurement problems. The undeniable effects of alcohol consumption on many types of personality and behavior runs through this study.

The major effects of alcohol consumption is not necessarily an entirely new realisation. Vingilis et al. (1994) conducted a major study assessing psychosocial differences between alcohol involved injured drivers and those whose injuries occurred in a non-alcohol involved accident. The authors found only partial support for differences in aggression and risky behavior, in relation to whether alcohol was involved in the accident or not. However, they conclude categorically that the only significant difference between the two groups was alcohol consumption behavior. They found that alcohol involved accident victims: (a) had a greater self-perceived alcohol problem; (b) drank in larger quantities in the last month; and (c) admitted drink-driving more often in the last month. They also found these drivers showed more signs of possessing an alcohol problem than non-alcohol involved victims. Although Vingilis et al. didn't focus specifically on drink-driving behavior, it was measured as one of their dependent variables. They discovered that there were no significant differences between the two groups on most of the personality characteristics. The retrospective nature of this study means that some of the participants attitudes and answers could have been altered by their recent accident. There was a small retrospective aspect of the present study when respondents were asked about past drink-driving behavior. However, the present study aimed to avoid the problems inherent in retrospective studies by assessing self-reported attitudes towards the various behaviours, at a time when respondents were not effected by recent events pertaining to the research questions.

Similarly, Deery and Love (1996) concluded, from their intensive studies assessing the DEQ, that by far the best predictor of drink-driving behavior was alcohol consumption and drinking behavior. This is despite the fact that they found the DEQ to be a significant predictor of drink-driving behavior. They state "overall alcohol consumption was by far the single most powerful predictor of drink driving practices" (pp 200). In fact, Deery and Love found that frequent drink-drivers, and those who

had been DIC'd, confessed to drinking almost twice as much as the rest of their sample.

The highly significant correlations between aggression and both drink-driving and alcohol consumption converges with reported results from a number of studies. In particular Donovan (1993) concluded at the $p < .001$ level that more aggressive people drink-drive more often. Similarly, Steer and Fine (1978) found that non-alcohol involved accident victims were significantly more aggressive than alcohol involved accident victims. Again the retrospective nature of this study makes it more difficult to draw causal inferences about the data. Were they more aggressive because of impending legal action over their intoxicated driving? Arnett et al. (1997) conclude that not only do trait-aggressive adolescents drink-drive more often, but that they are more likely to drink-drive when in a state-aggressive mood. Therefore, as with these studies, the present study discovers a significant level of correlation between aggression and drink-driving. Many previous studies (Donovan et al. 1993; Steer and Fine 1978) failed to also measure alcohol intake, or drinking behavior. As previously discussed, this variable has definite effects on drink-driving behavior and needs to be taken in to consideration.

Perhaps most interestingly the present study fails to reinforce the existence of a relationship between sensation seeking and drink-driving. The problems with measuring this variable in the present study have been assessed previously. This variable has been put forward in research as possibly the strongest personality variable associated with drink-driving. Extremely persuasive support for this relationship can be found in research by Donovan et al. (1983), Jonah (1986) and Arnett et al (1997). The present study used a high focussed, non-random sample that appeared to lack variance in sensation seeking. As mentioned the drink-driving variable may have also encompassed some inherent measurement problems, as it was a retrospective measure

that asked some personal questions about an illegal act. This could help to explain the non-significant relationship between sensation seeking and drink-driving.

The present study differs in methodology from many studies (Vingilis et al. 1994; Steer and Fine 1978; Donovan et al. 1983) in that it identifies drink-driving behavior as the sole dependent variable. The method of many previous studies involves locating those who have been in an alcohol-involved accident, or who have previous drink-driving convictions, and then analysing whether these factors could predict significant differences in personality and behavior variables. Thus, the drink-driving variable becomes the independent variable. This method contains certain problems in relation to memory difficulties, and the effect of these experiences on the person. The present study aimed to remedy these problems by making the personality factors the independent variables, and seeing how changes in these effected self-reported drink-driving behavior. Hopefully this method has avoided the problems mentioned above as respondents can assess their drink-driving behavior free from any possible recriminations such as legal action.

The results of this study may have certain implications for not only drink-driving countermeasures, but also alcohol advertising in New Zealand. The New Zealand young adolescent male culture is intrinsically bound by drinking, aggression and driving, particularly in country areas. Our national sport, rugby union, is essentially and aggressive sport and is deeply intertwined with drinking alcohol. For example, the national rugby team, the 'All Blacks', are sponsored by a national beer company. Perhaps the most obvious conclusion the present study can offer is that heavy alcohol use forms a definite desire to drink-drive in young New Zealand males. Alcohol advertising has one aim, and that is to increase the amount of alcohol being consumed. As this study shows if you increase the amount of alcohol consumed you increase the amount of drink-driving perpetrated by young males. This liquor advertising often relies on targeting young males, and encouraging the notion that the way to really have

fun is to drink large amounts of alcohol with your friends at the pub. Perhaps we can see the major effects of this advertising come to fruition with the huge numbers of young men injured, and killed, on New Zealand roads after drink-driving. Sally Casswell provides much of the research in New Zealand on the effects of liquor advertising. Casswell (1995) states that countries that have banned spirit advertising have around 16% lower overall alcohol consumption than those with no bans. She also found that young men who express more liking for alcohol advertising got drunk more often and experienced more alcohol related problems. Casswell and Zhang (1998) performed a longitudinal studing the effect of alcohol advertising on young men at age 18, and then at age 21. They found that 18 year olds who liked alcohol advertising, and showed brand allegience at this age, were found to drink significantly more alcohol at age 21 years, compared to those who had no interest in alcohol advertising. Wyllie, Zhang and Casswell (1998) also found that in a sample of 791 males and females, positive responses to televised beer advertisements contributed to increased beer consumption, and increased alcohol related problems. Therefore, there is a developing body of New Zealand research that suggests liquor advertising has effects on alcohol consumption, and alcohol related problems.

Of all the participants who admitted drink-driving (N = 118) in the present study, only eight had ever been charged with drink-driving. Therefore, countermeasures that attempt to stop drink-driving need to take heed of the fact that the most prolific drink-drivers in New Zealand are not being stopped, breath tested, or charged with the offence. To take away a young males car may take away their freedom and their ability to socialise with peers. That is, the most effective countermeasure may be a massive increase in random breath-testing points, and more immediate harsher penalties. It seems the fear of injuring or killing someone, as current television campaigns attempt to highlight, isn't working for adolescent males in New Zealand. As mentioned in the present studies introduction, adolescent males drink-driving frequency is currently failing to significantly decline (Bailey 1991). Perhaps the

increased fear of losing personal freedom may provide the impetus law makers need to reduce drink-driving frequency. Adolescents are recognised as a relatively egotistical group in society (Myers 1995), if their potential personal losses are emphasised progress may be made.

The generalisability, or external validity, of the study is somewhat limited for various reasons. Firstly, although it was attempted to gain a sample that was representative of a larger section of society, incorporating white and blue collar workers, beneficiaries and students this wasn't necessarily the outcome. Seventy-eight percent of the sample were university students, which makes it impossible to apply the present studies results beyond this sample, given its non-random nature. This sample was easiest to gain in relation to the population and situation the researcher was most familiar with. Thus, in future a study like this would benefit from gaining a broader and larger sample. Benefits of this may include increased variance in the results, which may bring about more significant relationships, and the ability to apply the results to a larger section of society. In saying this it should be noted that the samples in studies by Donovan (1993), Arnett (1997) and Deffenbacher et al. (1994) were entirely made up of university students.

## *LIMITATIONS OF THE STUDY AND DIRECTIONS FOR FUTURE RESEARCH*

There are number of limitations of the present study that should be noted. As mentioned above the sample could have been selected more randomly with respondents representing a greater cross-section of society. Drink-driving is a problem for young males in general, not just university students. In order for law makers to make significant steps towards reducing the rate of drunk-driving a prediction theory that pertains to all sections of society would be highly valuable. University students are generally recognised as a societal group that consumes a lot of

alcohol (Donovan 1993), and this fact opens the results of the present study up to potential bias. As we have a sample of generally high consumers of alcohol the relative effects of this variable may have been overemphasised in the results.

One variable that the present study did not measure was the relative effects of peer pressure. The association between this variable and drink-driving has been researched by Hernandez, Newcomb and Rabow (1995) and Thomas and Siebold (1995). Both these studies found that adolescents decision to drink-drive can be influenced by peer pressure. This pressure can be either to drive after drinking, or conversely to not drive after drinking. Hernandez et al. (1995) argue that adolescents are greatly influenced by their peers, and a focus on peer pressure in relation to drink-driving may offer insights on how to best utilise peer pressure against drink-driving. This may help reduce the drink-driving rate. Thomas and Seibold (1995) assessed peer pressure by asking participants to record the details of an occasion when they applied pressure on a person to either drive after drinking, or tried to prevent a person from drink-driving. Participants were asked to record the situation, the characteristics of the target, their reasons for intervening and their success. Adolescents are very much influenced by the beliefs of their peers and their pressures to conform. Peer influences are likely to have an effect on how much a certain individual drinks, how often they drink-drive and it may even effect behaviours such as sensation seeking. Therefore, including a measure of this variable in future research would enable the researcher to analyse it effects on drink-driving and assess its predictive validity in relation to the other independent variables in the present study.

There should also be caution in interpreting the results for sensation seeking and driving-related anger. In hindsight the Arnett Inventory of Sensation Seeking measure was an ineffective measure of sensation seeking in this sample and the chance to further theories surrounding this construct was missed. This author believes it would be worthwhile conducting further research in this area in New Zealand, but utilising a

different sensation seeking measure such as the SSS. If sensation seeking continues to show non-significance in this relationship it may be advantageous to assess other related constructs. These could include impulsiveness, risk-taking or novelty seeking.

The Driving Anger Scale (Deffenbacher et al. 1994) was entered in to the present study on the recommendation of the authors in the above study. Although is appears highly feasible that driving-related anger may effect drink-driving behavior, the results of present study would suggest this is not so. Studies that measured driving anger in other ways were non-existent and this construct may not be as influential as previously thought. In future research main benefit from rejecting this variable in favour of peer pressure as discussed above.

The measurement of both the alcohol consumption and drink-driving variables also raises some questions. Firstly, the writing down of a specific number of alcohol beverages a respondent had consumed not only relied on a reasonable memory, but was susceptible to problems both with honesty, and with peer pressure. Although separate respondents were encouraged to fill out the questionnaire on their own it is likely that participants living in the same dwelling conferred about the answers to some questions. As previously discussed alcohol consumption can be a sign of 'machoism' in adolescent males, and this may have prompted some individuals to overestimate their alcohol intake. Similarly, the drink-driving variable required respondents to record how many times in the last six months they had driven after drinking. There are three possible problems with this: (a) it can be very difficult to remember the incidences of a particular behavior over a time span, and this may have prompted respondents to have a 'guess' at the number of times they had drunk-driven, rather than give an accurate assumption; (b) the legal context of drink-driving may have caused some respondents to record a lot less incidences than may have actually been the case; and (c) peer pressure influences, as discussed for alcohol consumption, may have prompted

respondents to over, or under, score the total number of times they had driven after drinking.

In future studies it may be advisable to use the Paulin et al. (1985) measure of alcohol consumption but maybe have subjects keep a log of their drinking over maybe three weeks and average out a weeks consumption from this. This may provide a more valid representation of drinking behavior. The author also feels more emphasis on filling out the questionnaire privately may prevent possible 'peer influenced' answers. Apart from these minor changes the Paulin et al. (1985) measure appears to adequate for this type of research. Analysis of drink-driving behavior would benefit from a definite decision on whether the research would focus on total frequency of drink-driving, or level of intoxication when drink-driving. Trying to incorporate both in the present study led to some problems deciphering how to score people for this variable. Donovan (1993) focussed mainly on the relative level of intoxication of the drinking driver, but asked how often the respondent had driven within an hour of consuming 1-2 drinks, or consuming 3+ drinks. These levels of measurement were used because 1-2 drinks generally keeps adolescents under the American legal blood alcohol limit, and 3+ drinks puts an adolescent over the legal limit. The present study may have gained a more concise, unambiguous measure of drink-driving behavior if it had followed a similar method as Donovan (1993). Therefore, to focus on the level of intoxication of the driver, the questionnaire would be better if it specified number of drinks consumed before drinking. This may avoid some of the ambiguity in the question due to peoples differing perceptions of what was meant by 'definitely drunk', and so on.

Donovan (1993) that states in relation to his research the correlations among the independent variables may be somewhat inflated due to common-method variance which can occur when all the measures are contained in a single questionnaire. This common-method variance is likely to have some influence on the correlations in the present study, as the research questionnaire used is similar to Donovan's.

The self-report questionnaire format was an effective way to gather data and would be an advisable research tool for future studies. The response rate of 47% is entirely satisfactory for research incorporating this design.

Therefore, in order to carry out effective research in the same area in the future there are changes that need to be made to the present study. The fact that risky driving was correlated to drink-driving but not sensation seeking may point to an increased focus on related constructs such as risk-taking and novelty seeking. Maybe if another measure of sensation seeking was used significant associations between sensation seeking and drink-driving would be achieved. If this was the case the research conclusions could be more expansive. Similarly the case for driving-related anger being assessed in following research is weak. It would be advisable to drop this construct in favour of trait anger which has been shown to affect drink-driving (Deffenbacher et al. 1996). It may also be worthwhile to drop this type of construct altogether and assess peer pressure as mentioned above. The problems with the measurement of drink-driving and alcohol consumption have been discussed, and possible remedies have been offered. Further research would benefit from use of a more random, non-focussed sample. This could lead to larger variance in the demographic make-up of participants and also offer greater variance in the independent variable measures. This could highlight more significant relationships and increase the generalisability of the results. Adherence to these suggestions concerning the limitations of the present study, would improve the ability of research in this area to gain meaningful conclusions.

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# APPENDIX ONE

In the following analyses there were a number of alterations made to the way the demographic data was interpreted. Ethnicity was restricted to either Maori or European, as there were only four participants in the other three catagories. Similalry, highest level of formal education was restricted to two groups. Participants were catagorised in to either school or university. Participants were also categorised in to either workers or students for the following analysis. This omitted the one beneficiary in the present study from this analysis. In the case of ethnicity, where the two groups were very different in size, a Mann-Whitney U test was incorporated. The results of this are presented in table 1(a).

**Table 1 (a)**

***Mann Whitney U Test for Ethnicity and the Independent Variables***

| Independent Variable | **ETHNICITY Z - Value** |
|---|---|
| Physical Aggression | 0.392 |
| Verbal Aggression | 0.774 |
| Sensation Seeking | 0.306 |
| Driving Anger | 0.857 |
| Driving Skill | 1.041 |
| Driving Style | 0.530 |
| Alcohol Consumption | 2.094* |
| Drink Driving Level | 0.230 |

*p < .05, **p < .01 (two-tailed tests).

Table 1 (b) contains the data from the T-Tests involving the education data and the independent variables.

**Table 1 (b)**

***T-Test results for education data and independent variables.***

| Independent Variable | **Education Level F - Value** | *df* |
|---|---|---|
| Physical Aggression | 1.36 | 127 |
| Verbal Aggression | 1.13 | 127 |
| Sensation Seeking | 1.07 | 127 |
| Driving Anger | 1.09 | 127 |
| Driving Skill | 1.18 | 127 |
| Driving Style | 1.01 | 127 |
| Alcohol Consumption | 1.43 | 127 |
| Drink Driving Level | 1.32 | 127 |

*p < .05, **p < .01 (two-tailed tests).

Table 1 (c) contains the results of the T-Tests between the occupation data and the independent variables.

**Table 1 (c)**

***T-Test results for occupation data and independent variables.***

| Independent Variable | **Occupation Level F - Value** | *df* |
|---|---|---|
| Physical Aggression | 1.89 | 125 |
| Verbal Aggression | 1.66 | 125 |
| Sensation Seeking | 1.32 | 125 |
| Driving Anger | 1.10 | 124 |
| Driving Skill | 1.04 | 125 |
| Driving Style | 1.62 | 125 |
| Alcohol Consumption | 1.20 | 125 |
| Drink Driving Level | 1.01 | 125 |

*p < .05, **p < .01 (two-tailed tests).

# APPENDIX TWO

## DRINK DRIVING RESEARCH QUESTIONNAIRE
## INFORMATION SHEET

*Please read this information sheet before you answer the questionnaire*

==========

This questionnaire is designed to help me gather information about drink driving practices in New Zealand. It is part of the research I am doing at Massey University to complete my MA degree. The research looks at different behaviour and personality factors and assesses how they relate to drink driving.

My name is Dave McKillop and you can contact me with any questions on (06) 354 - 1354 or through my supervisor, Ross Flett, at the School of Psychology, Massey University (ph. 350 - 4127). You can also contact me through Ross on Email at R.A. Flett@massey.ac.nz.

==========

This questionaire will take about ten minutes to finish and will ask about your drinking habits, your lifestyle in relation to socialising, and drink driving behaviour. No one apart from myself will ever see your answers, and because I never ask for your name there is no way anyone can link your name to your particular questionnaire.

==========

As a participant in this study you have certain rights. They are as follows:-

- You have the right to contact me or my supervisor at anytime during the study
- You have the right to decline to participate, to refuse to answer any questions or to pull out of the study at any time
- When you provide the information it is on the understanding that it is completely confidential to myself, and will only be used for the purpose of the study
- You have the right to recieve a summary of the results on the study's completion. See back sheet for details.

**DRINK DRIVING RESEARCH QUESTIONNAIRE**

# INSTRUCTION SHEET

1) Please do not write your name on the questionnaire.

2) Please answer the questionnaire by yourself giving your own answers.

3) In the questions with a series of numbers (as shown below) please circle the number with the accompanying statement that is best for you.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| extremely poor | poor | average | good | extremely good |

4) In the questions where it asks you to write a number please write clearly. In other questions you will be asked to tick an appropriate box.

5) Please complete all the pages of the questionnaire trying not to miss any, and the sooner you complete it the better.

6) Please return the questionnaire in the envelope provided as soon as you finish it.

7) Thanks for your time in completing the survey.

## NOTE

**If you would like to recieve a summary of the results of this study please complete the form at the back of the questionaire.**

# DRINK DRIVING RESEARCH QUESTIONNAIRE

## A: ALCOHOL CONSUMPTION QUESTIONNAIRE

| | Yes | No |
|---|---|---|
| 1) Do you ever drink alcohol? | ____ | ____ |
| | If yes go to question 2 | If no go to page 2 |

2) Do you drink alcohol:-

a) Only occasionally (eg weddings, Christmas etc) ____

b) Each month but not regularly each week ____

c) Regularly or fairly regularly ____

**If you answered (a) go to page 2. If you answered (b) or (c) go to question 3.**

3) Please indicate your average **weekly** alcohol intake. Please write the number of each measure in the space provided.

**(A) BEER**

**Stubbies/Cans** _____

**Jugs** _____

**Big Bottles** _____

**(B) WINE**

**Glasses** _____

**Bottles** _____

**(C) SPIRITS**

**Single nip glasses** _____

**Double nip glasses** _____

## B: BUSS-PERRY AGGRESSION QUESTIONNAIRE

Please indicate with a circle around the appropriate number how characteristic of **YOU** the following statements are.

---

**1)** I tell my friends openly when I disagree with them.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not very characteristic of me | | | | Very characteristic of me |

**2)** Once in while I can't control the urge to strike another person.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not very characteristic of me | | | | Very characteristic of me |

**3)** Given enough provocation I may hit another person.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not very characteristic of me | | | | Very characteristic of me |

**4)** I often find myself disagreeing with other people.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not very characteristic of me | | | | Very characteristic of me |

**5)** If someone hits me, I hit back.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not very characteristic of me | | | | Very characteristic of me |

**6)** I get in to fights a little more than the average person.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Not very characteristic of me** | | | | **Very characteristic of me** |

**7)** If I have to resort to violence to protect my rights, I will.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Not very characteristic of me** | | | | **Very characteristic of me** |

**8)** When people annoy me I tell them what I think of them.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Not very characteristic of me** | | | | **Very characteristic of me** |

**9)** There are people who pushed me so far we came to blows.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Not very characteristic of me** | | | | **Very characteristic of me** |

**10)** I can think of no good reason for hitting a person.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Not very characteristic of me** | | | | **Very characteristic of me** |

**11)** I can't help getting in to arguments with people who disagree with me.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Not very characteristic of me** | | | | **Very characteristic of me** |

**12)** I have threatened people I know.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Not very characteristic of me** | | | | **Very characteristic of me** |

**13)** I have become so mad that I have broken things.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Not very characteristic of me** | | | | **Very characteristic of me** |

**14)** My friends say I am somewhat argumentative.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Not very characteristic of me** | | | | **Very characteristic of me** |

## C: ARNETT INVENTORY OF SENSATION SEEKING

For each of the following items please indicate your response by circling the letter that corresponds with the best answer for **you**.

---

**1)** I can see how it would be interesting to marry someone from another country.

**A** Describes me very well
**B** Describes me somewhat
**C** Does not describe me very well
**D** Does not describe me at all

**2)** When the water is very cold I prefer not to swim, even on a very hot day.

**A** Describes me very well
**B** Describes me somewhat
**C** Does not describe me very well
**D** Does not describe me at all

**3)** If I have to wait in line I am usually very patient about it.

**A** Describes me very well
**B** Describes me somewhat
**C** Does not describe me very well
**D** Does not describe me at all

**4)** When I listen to music I like it loud.

**A** Describes me very well
**B** Describes me somewhat
**C** Does not describe me very well
**D** Does not describe me at all

**5)** When I take a trip I think it is best to make as few plans as possible and just take it as it comes.

**A** Describes me very well
**B** Describes me somewhat
**C** Does not describe me very well
**D** Does not describe me at all

**6)** I stay away from movies that are said to be frightening or highly suspenseful.

**A** Describes me very well
**B** Describes me somewhat
**C** Does not describe me very well
**D** Does not describe me at all

**7)** I think it is fun and exciting to perform or speak in front of a group.

**A** Describes me very well
**B** Describes me somewhat
**C** Does not describe me very well
**D** Does not describe me at all

**8)** If I was at an amusement park I would prefer to ride the rollercoaster or other fast rides.

**A** Describes me very well
**B** Describes me somewhat
**C** Does not describe me very well
**D** Does not describe me at all

**9)** I would like to travel to places that are strange and far away.

**A** Describes me very well
**B** Describes me somewhat
**C** Does not describe me very well
**D** Does not describe me at all

**10)** I would <u>never</u> like to gamble with money even if I could afford it.

**A** Describes me very well
**B** Describes me somewhat
**C** Does not describe me very well
**D** Does not describe me at all

**11)** I would have enjoyed being one of the first explorers of a unknown land.

**A** Describes me very well
**B** Describes me somewhat
**C** Does not describe me very well
**D** Does not describe me at all

**12)** I like movies where there are lots of explosions and car chases.

**A** Describes me very well
**B** Describes me somewhat
**C** Does not describe me very well
**D** Does not describe me at all

**13)** I don't like extremely hot and spicy foods.

**A** Describes me very well
**B** Describes me somewhat
**C** Does not describe me very well
**D** Does not describe me at all

**14)** In general, I work better under pressure.

**A** Describes me very well
**B** Describes me somewhat
**C** Does not describe me very well
**D** Does not describe me at all

**15)** I often like to have the TV or radio on while I'm doing something such as reading or cleaning up.

**A** Describes me very well
**B** Describes me somewhat
**C** Does not describe me very well
**D** Does not describe me at all

**16)** It would be interesting to see a car accident happen.

**A** Describes me very well
**B** Describes me somewhat
**C** Does not describe me very well
**D** Does not describe me at all

**17)** It is best to order something familiar when eating in a restaurant.

**A** Describes me very well
**B** Describes me somewhat
**C** Does not describe me very well
**D** Does not describe me at all

**18)** I like the feeling of standing next to the edge of a very high place and looking down.

**A** Describes me very well
**B** Describes me somewhat
**C** Does not describe me very well
**D** Does not describe me at all

**19)** If it was possible to visit another planet or the moon for free, I would be one of the first to sign up.

**A** Describes me very well
**B** Describes me somewhat
**C** Does not describe me very well
**D** Does not describe me at all

**20)** I can see how it must be exciting to be in a battle during a war.

**A** Describes me very well
**B** Describes me somewhat
**C** Does not describe me very well
**D** Does not describe me at all

## D: DRIVING EXPECTENCY QUESTIONNAIRE

Please indicate with a circle around the appropriate number the best response in relation to **your** driving.

---

**1)** My ability to steer a car.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Extremely Poor** | **Poor** | **Average** | **Good** | **Extremely Good** |

**2)** I take risks.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Not at all** | **Occasionally** | **Some of the time** | **Often** | **All of the time** |

**3)** My ability to judge distance.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Extremely Poor** | **Poor** | **Average** | **Good** | **Extremely Good** |

**4)** I race other cars.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Not at all** | **Occasionally** | **Some of the time** | **Often** | **All of the time** |

**5)** My ability to judge speed

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Extremely Poor** | **Poor** | **Average** | **Good** | **Extremely Good** |

**6)** I cut in and out of traffic.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Not at all** | **Occasionally** | **Some of the time** | **Often** | **All of the time** |

**7)** The speed of my reactions.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Extremely Poor** | **Poor** | **Average** | **Good** | **Extremely Good** |

**8)** I pass other cars.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Not at all** | **Occasionally** | **Some of the time** | **Often** | **All of the time** |

**9)** My ability to get out of tight situations.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Extremely Poor** | **Poor** | **Average** | **Good** | **Extremely Good** |

**10)** I get angry with people who drive slowly.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Not at all** | **Occasionally** | **Some of the time** | **Often** | **All of the time** |

**11)** The speed of the decisions I make.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Extremely Poor** | **Poor** | **Average** | **Good** | **Extremely Good** |

**12)** I like to drive fast.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Not at all** | **Occasionally** | **Some of the time** | **Often** | **All of the time** |

**13)** My ability to do more than one thing at a time.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Extremely Poor** | **Poor** | **Average** | **Good** | **Extremely Good** |

**14)** I obey the road rules.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Not at all** | **Occasionally** | **Some of the time** | **Often** | **All of the time** |

**15)** My concentration.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Extremely Poor** | **Poor** | **Average** | **Good** | **Extremely Good** |

**16)** I drive to the speed limit.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Not at all** | **Occasionally** | **Some of the time** | **Often** | **All of the time** |

**17)** My ability to notice situations that could cause an accident.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Extremely Poor** | **Poor** | **Average** | **Good** | **Extremely Good** |

**18)** I swear at other drivers

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **Not at all** | **Occasionally** | **Some of the time** | **Often** | **All of the time** |

## E: DEFFENBACHER ET AL. DRIVING ANGER SCALE (Short Form)

Please indicate with a circle around the best answer for **you**, how much anger each of the following situations would bring out in you.

---

**1)** Someone makes an obscene gesture towards you about your driving.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not angry at all | | Reasonably Angry | | Extremely Angry |

**2)** Someone honks at you about your driving.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not angry at all | | Reasonably Angry | | Extremely Angry |

**3)** Someone is weaving in and out of trafiic.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not angry at all | | Reasonably Angry | | Extremely Angry |

**4)** Someone runs a red light or a stop sign.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not angry at all | | Reasonably Angry | | Extremely Angry |

**5)** You pass a speed camera.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not angry at all | | Reasonably Angry | | Extremely Angry |

**6)** A police officer pulls you over.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not angry at all | | Reasonably Angry | | Extremely Angry |

7) A slow vehicle on a very steep road will not pull over and let people past.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not angry at all | | Reasonably Angry | | Extremely Angry |

8) Someone is slow in parking and is holding up the traffic.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not angry at all | | Reasonably Angry | | Extremely Angry |

9) Someone backs right out in front of you without looking.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not angry at all | | Reasonably Angry | | Extremely Angry |

10) Someone speeds up when you try to pass them.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not angry at all | | Reasonably Angry | | Extremely Angry |

11) A cyclist is riding in the middle of the road and slowing traffic.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not angry at all | | Reasonably Angry | | Extremely Angry |

12) You are stuck in a traffic jam.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not angry at all | | Reasonably Angry | | Extremely Angry |

13) A truck kicks up sand or gravel on to the car you are driving.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not angry at all | | Reasonably Angry | | Extremely Angry |

14) You are driving behind a large truck and cannot see around it.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not angry at all | | Reasonably Angry | | Extremely Angry |

## F: DRINK-DRIVING QUESTIONS

Please answer the following questions as is indicated

---

**1)** Have you ever driven a car or motorcycle after drinking alcohol? Yes ____ No ____

**2)** Please estimate **how many times** in the last **six months** you have driven in the following three situations by writing the number in the space provided. If you have not driven in the situation stated please write "0".

**(A) After drinking a small amount of alcohol, but not enough to feel the effects of the alcohol:-**

= _____

**(B) After drinking enough alcohol to feel slightly drunk:-**

= _____

**(C) After drinking enough alcohol to feel definitely drunk:-**

= _____

**3)** Have you ever been charged by the police for drink driving (DIC)?

Yes ____ No ____

If so how many times? _____

## F: DEMOGRAPHIC DATA

Please write your answers in the spaces provided.

---

**1)** What is your date of birth? / /19

**2)** What sex are you? **MALE / FEMALE**

**3)** What is your ethnic origin?

New Zealander of **European** Descent _____

New Zealander of **Maori** Descent _____

New Zealander of **Asian** Descent _____

New Zealander of **Pacific Island** Descent _____

Other _____

**4)** Please indicate your highest level of educational attainment by ticking the appropriate level.

Less than 3 years at secondary school _____

3 - 4 years at secondary school _____

5 years at secondary school _____

Undergraduate degree/diploma _____

Postgraduate degree/diploma _____

**5)** Please record any other formal qualifications you hold (e.g. Chartered Accountant, NZIM, NZCE, Trade Certificate etc)

_____

_____

_____

**6)** Please indicate your current occupation

_____

# SUMMARY OF RESULTS FORM

If you would like to recieve a summary of the results of this study please leave your name and address below and they will be posted out to you.

The questionaires are recieved by my supervisor and this form is **immediately** removed from the rest of the questionaire. This makes sure that we still cannot put your name to any particular questionaire and your confidentiality is maintained.

**NAME AND ADDRESS**

_____
_____
_____
_____
_____
_____
_____