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DETERRING THE IMPAIRED DRIVER

BY

© BARBARA A. ALLEN

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of MASTER OF ARTS.

DEPARTMENT OF SOCIOLOGY

EDMONTON, ALBERTA

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled DETERRING THE IMPAIRED DRIVER submitted by BARBARA A. ALLEN in partial fulfilment of the requirements for the degree of MASTER OF ARTS IN SOCIOLOGY.

W C H

Supervisor - W. A. Harrell

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NOTE

This analysis is based on the Health and Welfare Canada edition of Statistics Canada's microdata tape for the 1988, DRIVING WHILE IMPAIRED SURVEY. All computations on these microdata were prepared by BARBARA ALLEN and the responsibility for the uses and interpretation of these data is entirely that of the author.

ABSTRACT

Deterring the Impaired Driver
By
Barbara A. Allen

The potential effectiveness of Deterrence Theory is assessed in this paper. Using secondary data obtained from a National Survey, this research examines the effects of direct and indirect certainty of apprehension, direct and indirect severity of punishment, as well as the multiplied effects of alcohol consumption and amount driven. on steps taken to avoid drinking and driving. Regression analysis was used to test these variables.

In all cases the additive effects of the certainty and severity variables were stronger than the interactive effects. By including the multiplied effects of alcohol consumption and amount driven, the predictive power increased. The indirect effects were stronger than the direct effects; however, this could be explained by the use of inadequate predictors. The multiplied effects of direct and indirect experience were stronger than the independent effects.

Analysis shows support for the deterrence model. The paper concludes with a discussion regarding future research as well as future social policies regarding drinking and driving countermeasures.

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CHAPTER 1

Introduction to the Thesis

Thesis Outline

The purpose of this study is to examine the effect of formal sanctions on impaired driving. To this aim, this thesis will be divided into six chapters. The first chapter will introduce the problem of drinking and driving and establish why it is one that should be addressed. The theoretical foundation of deterrence theory will be introduced in Chapter 2 and how it relates to impaired driving. The literature review in Chapter 3 will give rise to nine hypotheses examined in this project. Chapters 4 and 5 will deal with the methodology of the study and the results found. Finally, in Chapter 6 theoretical, empirical and policy implications of the results will be discussed.

Why Address Drinking and Driving?

Traffic accidents are a major cause of deaths and serious injuries in Canada. As in other countries where the two behaviors of drinking and driving are done extensively, it has long been recognized that drinking and driving is a prominent factor in many of these accidents. (1) During the 1960 and 1970's research and statistics established that alcohol impairs driving skills and thus increase your chances of being involved in a motor vehicle accident (Ross, 1984; and Snortum, 1988). Consequently, drinking and driving has been recognized as a serious social problem causing great social and economic harm to all Canadians.

> On the basis of roadside surveys, the Road Safety Directorate of Transport Canada estimates that one in four drivers on a typical weekend evening has been drinking, and that one in 20-25 is illegally impaired by the effects of alcohol. The Traffic Injury Research Foundation estimates that 25-30% of all drivers injured in motor vehicle accidents are impaired and that almost half of all traffic fatalities involve someone who had been drinking (Johnson, 1989; p.3).

In response to this social problem numerous voluntary groups such as MADD (Mothers Against Drunk Driving), RID (Remove Intoxicated Drivers), or RIDE (Reduce Impaired Driving Everywhere), (Bungey and Frauenfelder, 1986; p.105), PAID (Parents Against Impaired Drivers) and SAID (Students Against

Impaired Drivers) organized a new movement against drinking and driving. These groups were made up of people who had relatives or friends who had been injured or killed by a drunk driver. Their pain and work to avenge the innocent people who were hurt appealed to the Canadian public.

The movement was also successful in appealing to legislators. Members of these groups lobbied for countermeasures aimed at reducing drinking and driving and focused on the deterrence-based measures of drunk driving legislation (meaning the impact of the criminal justice system on the behavior of drinking drivers and potential drinking drivers), educational programs and rehabilitation programs. Specifically, these groups have been successful in publicizing their viewpoints and in obtaining implementation of harsher laws for impaired drivers. The principal goal of these laws has been to deter drunk driving through punishment or threat of punishment (Liban, Vingilis, Blefgen, 1985; p. 2-3).

Numerous countries, including Canada, adopted the Scandinavian model. (2) In practice, the adoption of this model means that a subjective measure of impaired driving is no longer necessary. Police were now able to set up roadblocks and submit drivers to a breath test for blood alcohol concentration. The tolerated blood-alcohol concentration (BAC) in Canada is 0.08 percent. (3) The breath test in Canada is mandatory, refusal being punished by fines and imprisonment identical to penalties for failing a test. The breath test is a quantitative and evidentiary one, not requiring a subsequent blood test, but in practice requiring the use of stationary testing equipment at police stations instead of portable equipment in patrol vehicles. Penalties for failing the breath test include fines up to $2,000.00 and/or prison for up to six months for a first offense. Licence suspension originally was at the discretion of the court, but changed to mandatory suspension following a 1973 Supreme Court decision (Ross, 1982; p.48).

The reasoning behind the Scandinavian laws is that the fear of detection and subsequent penalty will deter the general public from driving after drinking - acting as a general deterrence - and for drivers who do exceed the statutory BAC limit, it is expected that the impact of legal punishment will prevent subsequent re-offending - acting as a specific deterrence, (Bungey and Frauenfelder, 1986; p.105). In essence, the aim is to make the drinking driver aware that detection is likely, enforcement is certain, and punishment is severe (Bungey and Frauenfelder, 1986; p.106).

Since the adoption of these laws, and subsequent revisions in 1985, Canada has reported such figures as 112,925 persons charged with impaired driving in 1990. This was a decrease of 5% from the previous year, and many people attribute this decrease to increased enforcement and harsher penalties. Ninety-one percent (91%) of these persons charged were males (9% were females) and 70% were found to be under 40 years of age. Twenty-five to twenty-nine year olds were the most over-represented group, making up 19%, while comprising only 11.5% of the population. (Locke, 1991)

It is estimated that only a small proportion of people who drive under the influence of alcohol are actually stopped, arrested, charged, or convicted. In Canada the odds of being arrested for a drinking driving offense have been estimated to be somewhere between 1 in 1000 or 1 in 2000. (A report by the Alberta Branch, Canadian Bar Association Committee on Impaired Driving, 1986; p.39.) Ross (1982; p. xviii) also states "the chance that an intoxicated driver will be apprehended is extremely small - estimates place the likelihood at only one chance in hundreds, if not thousands, of such trips".

It has since been argued that documented reductions in impaired driving (Johnson, 1989; p.3) are proof of deterrence. It logically follows that by increasing the certainty of apprehension and the severity of punishment, drunk drivers could be further deterred. However, the writer contends that this may not be so. For example, this reasoning does not take into account the attitude of society. Until Canadians view the act of impaired driving as a serious offence, they may not be further deterred, regardless of how certain the likelihood of apprehension or how severe the punishments become.

Perhaps the harsher more certain penalties would be ineffective for that group of people known as the chronic impaired drivers. It may be this group that considers both of the behaviors of drinking and driving as a right (not a privilege) who may be the most dangerous group with respect to motor vehicle accidents. An interesting argument is that chronic impaired drivers may be better drivers than occasional impaired drivers. In other words, to avoid detection and motor vehicle accidents chronic impaired drivers take special care in driving. Or, it may be that this group of chronic impaired drivers are the people who are being missed in the diverse detection programs. The checkstops are set up on main thoroughfares and the chronic impaired driver may avoid these streets in order to avoid detection. He is the person who is in the high risk category but he is probably the one who is most aware of specific times and places where check stops occur.

With respect to severity of punishment and the chronic impaired driver, it may be that punishments of fines, licence suspensions and jail terms do not affect him the way they might affect the occasional impaired driver. In short, a fine may not be important to the chronic impaired driver because he avoids paying the fine and serves time in jail instead. If the chronic impaired driver goes to jail, it may no longer be a serious threat. Certainly he is deterred when incarcerated, but it may not deter him once he is out of jail. Licence suspension to the chronic impaired driver may be irrelevant, as he may continue to drive while under suspension. Liban et al. (1985; p. 11) report that International studies indicate that 40% to 80% of those drivers whose licences have been suspended or revoked continue to drive. Thus, it may be that the chronic impaired driver is a unique group and should be targeted separately.

Following this argument - the adoption and success attached to the Scandinavian-type laws, the estimates of the low probability of detection, the still high accident rates, and the fact that some groups may be undeterrable - it is understandable that much discussion has occurred. These discussions center on whether harsher laws and more active enforcement actually deter drunk driving and thus reduce motor vehicle accidents, whether the enforcement should be greater and the penalties harsher, or whether new solutions should be examined. Recently, Canadians have again called for harsher penalties to control their perceived increase in crime. Consequently, the current mounting concern over the increase in crime makes further examination of the deterrence of impaired drivers both timely and important.

The Research Problem

As a result of the foregoing, this thesis aims to examine the deterrence doctrine as it relates specifically to impaired driving in Canada. Using survey data, this study will examine the relationship between certainty and severity; a reconceptualization of general and specific deterrence as outlined by Stafford and Warr (1993); and finally another model that includes the value placed on these two behaviors of drinking and driving and how it impacts steps taken to avoid drinking and driving.

NOTES FOR CHAPTER 1

1 Drinking and driving, drunk driving, impaired driving and driving under the influence of alcohol will be used interchangeably in this proposal. These terms will all stand to mean driving a motor vehicle after a person has indulged in alcoholic beverages, whether or not the person is legally impaired.

For the purpose of this thesis the writer has adopted the policy of using the masculine form when referring to the drinking driver. This is not due to any antifeminist bias, but to the fact that the majority of drinking drivers are men.

2 The Norwegian legislation of 1936 and the Swedish legislation of 1941 furnish a model of controlling drinking drivers. Fundamental to this model is a redefinition of the offense and subsequent model of proof - that is the model refers to blood-alcohol concentrations rather than subjective descriptions of intoxicated behavior. These laws are often referred to as "per se" laws. The model also provides sanctions considered severe and depriving, such as imprisonment and loss of licence and promptness in the disposition of cases. These characteristics of the law are in accord with practical suggestions for behavior control derived from the theoretical model of deterrence. The large majority of alcohol and traffic experts and government officials in Scandinavia have made strong claims for the effectiveness of their laws. This widespread impression that the Scandinavians had developed a legal approach that, through its conformity to the deterrence model, had resolved or largely ameliorated the drinking and driving problem led to imitative laws in numerous countries. (Ross, 1982; p.24)

3 The term "Blood Alcohol Concentration" or BAC refers to the amount of alcohol in a person's blood. BAC can be determined by measuring the weight of alcohol in a fixed volume of blood. In Canada, BAC is usually expressed as the number of milligrams of alcohol (weight) in 100 millilitres of blood (volume). Canadian law specifies that the maximum allowable amount of alcohol in the bloodstream of a driver is 80 milligrams in 100 millilitres of blood - 80 mg%.

BAC can also be measured in a person's breath by using an instrument called a "Breathalyzer." Breath tests are just as accurate as blood tests for measuring BAC. This is because blood flows through the lungs, and alcohol molecules pass into air held in the lungs. When a person blows into the Breathalyzer, these alcohol molecules are expelled with the air. Because the alcohol concentration in the blood is always about 2100 times greater than in expired air, the Breathalyzer can automatically measure the concentration of alcohol in the

blood.

BAC is important because it relates to how much you drink; how strongly alcohol affects you; how much greater risk you face on the road; and how close you are to breaking the law. The more you drink, the higher your BAC. The higher your BAC, the more physically and mentally impaired you become. The more impaired you are, the higher your risk of a crash. If you drive impaired, however, you break the law, no matter what your BAC.

When you have a drink, the alcohol is absorbed directly into your bloodstream through the stomach and small intestine. The more you drink, the more alcohol will be absorbed and your BAC will continue to rise. Once alcohol has entered your bloodstream, it must be broken down and eliminated. Most alcohol is destroyed by a process called oxidation, which breaks alcohol down into carbon dioxide and water. More than 90 per cent of the alcohol is oxidized in the liver and the rest is eliminated, unchanged, through the lungs and kidneys. Because the liver's capacity to break down alcohol is limited, it takes time to dispose of the alcohol - roughly one hour for a standard serving of alcohol or about 15 mg% per hour.

A number of factors influence how fast alcohol is absorbed into your bloodstream. If you sip your drink instead of gulping it, or if you have food in your stomach, your BAC peak will be lower. Peak BAC also varies with body weight and muscle tissue meaning it takes less alcohol for a light person to reach the legal BAC limit and because women have more fatty tissue it takes less alcohol for women to reach the legal BAC limit than men. (Traffic Injury Research Foundation of Canada and Road Safety and Motor Vehicle Regulation, Directorate Transport Canada, 1987; p. 9-12)

CHAPTER 2

THEORETICAL FRAMEWORK

DETERRENCE THEORY

Deterrence Theory is a special case of Social Control Theory and is often referred to as a doctrine rather than a theory. It assumes that people are motivated to violate norms but are constrained by social controls. It generally ignores inner controls and emphasizes punishment as a means of social (outer) control, particularly state-administered punishment. Consequently, its focus is on law violations rather than norm violations. Deterrence theory assumes that people are rational and that crime is the result of rationally calculating the costs and benefits of law violations. As Shapiro and Votey (1984; p.253) state: "Deterrence theory is a theory about how people respond to the likelihood of threatened punishment", and Green (1986; p.62) states: "it is grounded in the utilitarian perspective which views people as 'weighers' of potential costs and rewards from contemplated acts". Williams and Hawkins (1986; p.546-547) state:

> the individual is presented as a rational calculator, motivated to maximize (or at least optimize) personal gain. Given the opportunity to commit a criminal act, the person presumably weighs the costs and rewards of doing so in comparison to other behavioral options. The more the individual perceives legal sanctions as certain, swift, and/or severe, the greater the perceived cost of crime and, thus, the probability of deterrence.

It is recognized that the definition of deterrence refers to other preventive mechanisms, not only the effects of legal sanctions in inhibiting drinking and driving. These mechanisms include such measures as incapacitation, retribution, habituation, stigmatization and reformation. However, in this thesis deterrence will refer to **the effects of legal sanctions on behavior through the mechanism of fear of legal punishments** (Homel, 1988; p.30).

Distinction Between General and Specific Deterrence

Deterrence researchers widely recognize and accept the distinction between general and specific deterrence. This conventional distinction is:

> Whereas general deterrence refers to the effects of legal punishment on the general public (i.e., potential offenders), specific deterrence pertains to the effects of legal punishment on those who have suffered it (i.e., punished offenders) (Stafford and Warr, 1993; p.1).

General deterrence investigators focus on persons who have never suffered any legal punishment for any crime, on the grounds that such persons have knowledge of punishment, if at all, only indirectly from experiences of others. In this paper this type of behavior is also referred to as indirect experience, perceived experience or subjective experience. Specific deterrence investigators commonly assume that an offender's direct experience with suffering a punishment is the only operative variable when it comes to predicting future behavior. For the purposes of this paper this type of behavior is also referred to as direct experience, actual experience, or objective experience. In addition to ignoring the offender's experience with avoiding punishment, such an assumption overlooks the possibility that one can suffer a legal punishment and at the same time have knowledge of punishment from the experiences of others (i.e., have indirect experience with punishment).

Predictions of Deterrence Theory

Deterrence theory, when explaining solutions to crime, focuses on certainty, severity and celerity of punishment. Certainty of punishment refers to the probability of experiencing punishment (being the probability of apprehension, arrest, prosecution and incarceration). Deterrence theory assumes that the more certain the punishment, the lower the level of law violations. Severity refers to the harshness or degree of punishment, such as the length of incarceration or the amount of a fine. Deterrence theory assumes that the more severe the punishment the lower the level of law violations. Celerity of punishment refers to the swiftness of punishment or the interval of time between committing a law violation and experiencing a punishment. Deterrence theory assumes that the more immediate the punishment, the lower the level of law violations. Thus, Deterrence theory predicts that law violations are highest when these three are the lowest (Liska, 1987; p.94).

Therefore, in order to reduce an illegal behavior, certainty, severity and celerity must be high enough to deter potential offenders.

Thus, it is argued to be effective deterrence must communicate the following to a potential offender. If he commits a criminal act the probability he will be detected and punished is certain and swift, that the severity of the punishment will offset any gains he might achieve through the criminal act, and that others are being punished as an example to himself both frequently and continuously. (From this reasoning unresolved questions have arisen from deterrence theory. For a brief list of these concerns see endnote (1) as it will not be the purpose of this paper to examine all of these concerns.)

It then follows that for drinking and driving, the decision whether or not to drink and drive seems best framed as a choice between benefits and losses. The individual may see the costs and inconveniences entailed in finding alternative transportation or losing his job, if he loses his licence for impaired driving. He may experience a loss of competency as a "drinker" and/or a "driver" in the eyes of his peers if he chooses to drink and drive and gets caught. This would be a definite loss or a cost. Thus, it is argued that if one values the two behaviors, then one will take steps to avoid the penalties because he may value them too much to risk losing them. Besides being able to drink and drive, the individual may see the avoidance of an accident and/or harming himself or others, also, as a definite benefit. Following this reasoning, it is assumed that a person who values these two activities will not easily give them up under any circumstances so will weigh the cost of losing them very carefully. However, the other side of the argument states that if one values the two behaviors, then one is more likely to drink and drive. In other words, if one values drinking one may have a "problem" and will not readily give it up, or if one drives frequently he may think he is too good a driver to get caught. Also, if he values drinking and driving he may not want to be inconvenienced with finding another way home, leaving his car and having to return for it, or quitting drinking early and, thus, may be more likely to drive when impaired.

NOTES FOR CHAPTER 2

1 Briefly, the unresolved questions arising from deterrence theory research are:

(1) The shape of the effect of each dimension is assumed to be linear, that is the higher the level of punishment, the lower the level of law violations. However, the effect may be nonlinear; each dimension may have no effect until a certain level of punishment is reached. (See Tittle and Rowe 1974 "Tipping Effect"; Liska, 1987; p.99.)

(2) It is important to note that celerity has not received a great deal of attention in research so the focus has been limited to certainty and severity of punishment.

(3) Should the deterrence doctrine be expanded to include such extralegal concepts as moral commitment and/or social disapproval? In other words, are the informal laws unimportant, as important as formal laws, or more important than the formal laws in deterring law violations? According to Stafford and Warr (1993) extralegal punishments may operate as deterrence variables, so controlling for them would reduce or eliminate the association between certainty and crime. For example, peer influence may not be a nondeterrent variable but could reflect indirect experience with punishment and punishment avoidance (general deterrence). The idea that peer involvement effects perceptions of the certainty and severity of punishment is consistent with Sutherland's (1947) theory of differential association. Thus, people are not limited to their own personal experiences when judging certainty and severity of punishment (pp. 131-132).

(4) Is aggregate level research or individual level research more effective?

(5) There are ambiguities concerning the relative effects of the three dimensions. This means that the theory does not specify the relative effects of the dimensions, such as which dimension has the strongest or weakest effect - certainty, severity or celerity? In other words, would it be more effective to increase severity (length of a prison sentence) or certainty (probability of a prison sentence)?

(6) Do each of the dimensions have an independent effect on law violations, or do the effects of one depend on the others? That is, the level of severity may not enter into people's decision-making when the certainty of punishment is low. Relatively high levels of certainty may be necessary before people consider the effect of severity of law violations.

(7) General deterrence and specific deterrence have been treated as separate distinct groups of offenders. As Stafford and Warr (1993) suggest, perhaps these can be combined in order to reconceptualize the deterrence doctrine. Stafford and Warr (1993) argue that people are likely to have a mixture of indirect (general deterrence) and direct (specific) experience with punishment and punishment avoidance. However, by adopting the conventional distinction between general and specific deterrence, investigators perpetuate the notion that the two forms of deterrence occur among distinct populations (p.126). Stafford and Warr (1993) argue that the advantages of the reconceptualization of general and specific deterrence are:

(a) it recognizes the possibility that <u>both</u> general and specific deterrence can operate for any given person or in any population;

(b) it treats punishment avoidance as analytically distinct from the experience of suffering punishment. In other words, persons who commit a crime but are not punished, persons who never commit a crime, persons who have committed a crime and have been punished, and persons who have not committed the crime but have been wrongly punished, will all have a different perception of certainty and severity and should thus be treated differently; and

(c) its compatibility with contemporary learning theory, particularly the distinction between observational/vicarious learning and experiential learning.

CHAPTER 3

Literature Review

Introduction

The purpose of all stages of the literature review is to assess the evidence for deterrence and its manner of operation, while ultimately leading to the purpose of this thesis - to examine the effects of certainty and severity of punishment on drinking and driving behavior. In this chapter most of the attention will be paid to drinking and driving research, unless it is necessary to make a point and research on drinking and driving is unavailable. It should be noted that much of the existing literature on deterrence pertains to criminal behavior. It is the writer's opinion that there is a vast difference between deterring persons from homicide and deterring persons from traffic violations. Therefore, it is impossible to make the generalization from a study on homicide that formal sanctions will or will not be effective for other crimes. In other words, deterrence research must be carried out for a particular deviant behavior and conclusions cannot be generalized to other behaviors. As stated by Silverman, Teevan Jr. and Sacco (1991; p.109):

> Even if criminologists were to agree on a definition of crime, a second problem in explaining crime stems from the fact that criminal behaviour is so diverse that any theory or explanation will almost certainly be inadequate. We need different explanations for the behaviour of a man who murders his wife than of a student who uses marijuana.... Because of the diverse nature of criminal behaviours, some criminologists have argued that instead of seeking one theory for all crime there should be separate theories for different crimes ... or even several theories for each and every crime.

Consequently, crime-specific research is necessary and drinking and driving behavior must be studied separately from other behaviors.

Because there is a debate in the literature about the validity of conclusions concerning deterrence to date, it is necessary to initially devote some space to methodological problems generated by the survey research. This short discussion will justify the worthiness of this study that employs cross-sectional methodology.

The next section of this chapter will deal mainly with the work of Ross and Homel which examines the effects of legal intervention on traffic accidents and specifically looks at certainty, severity and celerity of punishment. It is the writer's opinion that each country may show a variation in deterrence as each person's perception and reaction to formal control is largely dependent on cultural attitudes, as noted by Berger, Snortum, Homel, Hauge and Loxley (1989). They used a sample of 4,316 drivers from Norway, United States and Australia probing individual, social, and legal factors that contribute to control of alcohol-impaired driving. Using the framework of general deterrence (control in response to a fear of punishment) and general prevention (control through internalization of moral inhibitions and socialization of preventive habits). Striking differences were found in social norms, attitudes and behaviors surrounding drinking and driving in the three countries. Norway has progressed farthest toward general prevention, whereas Australia relies more on general deterrence and both general deterrence and general prevention are relatively weak in the United States. Therefore, caution should be exercised when generalizing across countries as to the effectiveness of formal sanctions on drinking and driving behavior, and more research is required as country-specific with regard to drinking and driving. It is noted that Canada has its unique norms, attitudes and behaviors, and thus drinking and driving should be researched with Canadian data. For instance, the rural nature of Canada may result in more driving because of the lack of public transportation. Also, the nature of the liquor laws may result in fewer neighbourhood pubs that could reduce drinking and driving behaviors.

Following the above examination, various studies will be outlined as they pertain to the additive or interactive effects of certainty and severity of punishment and Stafford and Warr's reconceptualization of deterrence whereby they integrate general and specific deterrence. Finally a model for testing the additive, interactive effects as proposed by Gray, Menke and Ward (1986); a value effect; as well as a model for testing Stafford and Warr's reconceptualization will be proposed as they relate to the drinking and driving phenomenon.

As will be reflected in this literature review, there is an absence of research focusing on the drinking and driving

experience in Canada. Since drinking and driving is seen as a social problem that can and should be deterred, at least to a certain extent, the lack of research in this area makes this study a worthwhile endeavour. This literature review exposes some of the fundamental weaknesses of the existing literature and gives rise to the hypotheses examined in this study.

Methodological Concerns

As Williams and Hawkins (1986) explain, investigations have consistently found a negative association between perceived certainty and self-reported involvement in crime, but little evidence that perceived severity had such an effect (for reviews see Jensen, Erickson & Gibbs, 1978 and Paternoster, Saltzman, Chiricos & Waldo, 1982 a & b). Only one study reported evidence of a significant negative association between the perceived severity of sanctions and crime (Grasmick and Bryjak, 1980). These mixed results motivated some researchers to explore methodological issues. Following is a brief summary of some of these concerns.

Experiments. In the classical experiment, an intervention is applied to individuals or subgroups at random. Those experiencing the intervention compose the experimental group. An equivalent control group is created by withholding the intervention from randomly chosen individuals. The experimental model, for reasons of practicality and ethics, as well as the cost, is rarely usable for studies of innovations in the formal law (Ross, 1982; p.14-15). In an experiment in the United States, a study was limited to first offenders for drinking and driving. The police were given the option of issuing a mandatory court ticket or a standard ticket and were given such prescriptions to follow. Also, depending on the month in question, the trial judges agreed to sentence the offender to a fine of some amount, to probation of some duration, or to some educational or clinical program available to the court and deemed appropriate to the defendant, such as a course in alcohol problems or outpatient treatment for alcoholism at the city hospital. The researchers found that their study was compromised by a failure of decision-makers (judges and police officers) to follow experimental rules. In other words, they found a strong need for random or arbitrary procedures and concluded that "choice must be eliminated from non-scientific personnel, no matter how well motivated they may appear to be" (Ross and Blumenthall 1975; p. 154). However, Friedland, Trebilock and Roach (1990; p. 186) suggest that, "in spite of many studies of deterrence...more research is in fact needed, particularly controlled experiments".

Cross-Sectional vs Longitudinal. For the most part, cross-sectional deterrence studies have found that perceived threat of legal punishment is inversely and significantly

related to involvement in drinking and driving (Homel, 1988; p.72). Since data reported in cross-sectional perceptual deterrence literature are collected at one point in time there is considerable ambiguity regarding the correct causal interpretation (Is the causal order Perceived Sanctions -> Behavior or is the causal order Behavior -> Perceived Sanctions?) Typically researchers asked subjects about current perceptions of punishment and criminal behavior in the preceding year. It was stated that this process misspecified the causal ordering.

As a result, panel designs became the preferred method of study, whereby perceptions of future behavior are collected at Time 1 and self-reported behavior is collected at Time 2. These multi-wave studies found evidence suggesting that findings from cross-sectional studies indicate an "experiential effect" of past behavior on current perceptions of legal punishment and only a weak deterrence effect. (See Paternoster et al., 1982 a,b, 1983 a,b; Minor and Harry, 1982; Saltzman, Paternoster, Waldo & Chiricos, 1982; and Snortum, 1988.) In other words, rather than reporting the effect of perceived threat of legal punishment on subsequent behavior, cross-sectional studies have been reporting the effect of past involvement in illegal behavior on current perceptions of legal threat. In 1987, Paternoster (p.209) still maintains that cross-sectional designs may have limited utility but also concedes that researchers employing one-wave data should continue to explore the feasibility of cross-sectional approximations to panel designs as well as researchers conducting panel studies should assist in this exploration.

Green (1986, 1989, 1990) has done extensive research in deterrence theory and specifically impaired driving. He focused on the methodological problems related to cross-sectional studies whereby they utilized self-reports of past behavior or estimated future behavior. He argued that the recent deterrence researchers employed longitudinal designs to allow for actual future illegal behavior, but no perceptual deterrence research employed panel design to compare deterrence theory findings for future estimates of involvement in driving while under the influence of alcohol at Time 1 with actual future behavior at Time 2. His findings suggest that the substantive conclusions are similar to the cross-sectional conclusions. He concludes that given the numerous problems facing longitudinal deterrence research (i.e., costs, sample attrition and appropriate lag times) similar results from future panel studies might generate a renewed confidence in cross-sectional design.

<u>Quasi-Experimental Studies or Time Series</u>. Most investigations of the effects of legal threat in deterring drunk driving have been based on aggregate data, such as

arrest rates and accident statistics. However, Berger and Snortum (1986; p.140) and Homel (1988; p.75) suggest that survey methods are necessary in order to access the way individuals perceive and evaluate risks, laws and violations. Homel (1988) states that since drinking and driving is an offense committed by a large number of people fairly often and is not in practice regarded as a particularly heinous crime, it is reasonable to expect that respondent motivation to conceal drink-drive episodes would not be as great a problem as for more serious offenses. Probably the greatest threat to validity arises from the simple act of forgetting occasions of impaired driving.

In summary, Homel (1988; p.75) states:

> the dependent variable of self-reported criminality appears from the literature to be rather more robust, in terms of validity and reliability, than might initially be expected. There are some grounds for believing that self-reports of behaviors which are viewed as only mildly deviant (such as minor acts of delinquency, smoking, and drink-driving) are more valid than reports of serious offenses, although it is likely that arrests, even for minor offenses, are substantially underreported.

International Adoption of Scandinavian Laws

The 1936 law in Norway and the 1941 law in Sweden serve to define the Scandinavian approach to drinking and driving. Since this time, a widespread impression that Scandinavians had developed a legal approach that, through its conformity to the deterrence model, had resolved or largely ameliorated the drinking and driving problem led to imitative laws in numerous countries. Subsequent adoptions of similar laws in the United Kingdom, on the European continent, in Australia and New Zealand, and in North America have been evaluated. (For a review of this evaluation see Ross, 1982, Chapter 4.)

The Drinking and Driving Literature

Of the three components of official attempts at deterrence, certainty of punishment has been identified as the most important element in the drinking and driving research (Ross, McCleary and Epperlein, 1981-1982; Jernigan and Mosher, 1987). It is not that severity cannot work but only with

heightened certainty of apprehension and punishment can the severity variable become operative in people's minds. This statement means that the probability of encountering a police officer and in turn leading to prosecution and conviction for the offense must be high in order to deter the impaired driver. Severity refers to the punishment itself, whether it is a licence suspension, fines, or imprisonment. In order for severity to be effective, people must perceive certainty as high. Ross, McCleary and Epperlein (1981-1982) evaluated the French Law of July 12, 1978 when it applied the Scandinavian approach to drinking and driving and Ross (1987) looked at Britain's Christmas Crusade against drinking and driving. These authors concluded, based on an interrupted time-series analysis, that the law produced an abrupt but temporary deterrence of alcohol-impaired driving in France and Britain. They argued that since the law was advertised and was new, it made an abrupt change in people's drinking and driving. However, the deterrent effect was lost because the threat was not fulfilled, due to law enforcement officials hesitating to enter into this controversial issue, and people gradually learned this fact. Consequently, the severity of the punishment became negligible. However, when the certainty was seen as a real probability or threat, then the severity of licence suspension became more important. For example, one of the most effective campaigns against driving under the influence kept up its effectiveness longer than most others due to its high level of publicity and resulting perceptions of a higher certainty of punishment (Shore and Maguin, 1988; Vingilis, Blefgen, Lei, Sykora and Mann, 1988).

> Even though perceived certainty of punishment may be the key to deterrence, most deterrence research concludes that neither certainty nor celerity, nor severity of punishment has significant long-term effects (Friedland, Trebilock, and Roach 1990; Vingilis, 1990).
>
> (Keane, Maxim, & Teevan Jr., 1993; p. 31)

Research by H. L. Ross. The most extensive research on impaired driving has been done by H. Laurence Ross in 1982 in a book entitled "Deterring the Drinking Driver: Legal Policy and Social Control". Ross found legislation was aimed at laws that increased the severity of punishment and laws that increased certainty. For example, Canada adopted the Scandinavian model in December, 1969 and thus with respect to certainty of punishment the law introduced the use of chemical tests for blood-alcohol concentrations and mandatory licence suspension, fines and imprisonment. Ross concluded that neither approach had a long term effect on drinking and driving. The laws addressing punishment for drinking and driving resulted in decreases in arrest and conviction rates,

but the effect was not sustained beyond a year or two after implementation. Those laws that only increased penalties but did not address certainty showed no impact on rates of arrest or conviction. Using an interrupted time-series analysis, Ross concludes that in the case of law-enforcement campaigns (certainty) there is a convergence of findings favorable to deterrence theory, but the experiences of severity of punishment do not support the deterrence model. Following is a summary of his findings.

Certainty

England - The Cheshire Blitz. In adopting the Scandinavian model, England passed the Road Safety Act of 1967 to deter impaired driving. By 1975 the Road Safety Act of 1967 was considered a failure. Indicators such as the ratio of nighttime to daytime crashes and the proportions of illegal blood-alcohol concentrations among drivers killed in crashes returned to and even surpassed levels prevailing in 1966. (Ross, 1982; p. 71)

As a result Chief Constable William Kelsall of Cheshire County was concerned about the falling off of the drinking and driving law's effectiveness and decided to conduct an experiment. In the United Kingdom police are given considerable discretionary powers. Chief Kelsall decided to go as far as they could within the law to breathalyse all people driving between 10:00 at night and 2:00 A.M. He required his policemen to administer the screening breath tests in all investigations of crashes and traffic law violations during these hours for one week in July. He found that alcohol-influenced drivers had been escaping detection. Chief Kelsall expanded the hours from 9:00 P.M. to 4:00 A.M. and maintained the campaign for the month of September 1975 which resulted in the level of breath testing rising to six times the national average (Ross, 1982; p.73). Because his campaign met with numerous protests it took on the characteristics of a visible and notorious enforcement campaign. Like the Road Safety Act, the Cheshire Blitz showed a diminution in serious crashes interpreted as a deterrence effect (Ross, 1982; p.72).

The New Zealand Blitzes. New Zealand conducted two campaign blitzes heralded by much advertisement in radio, television and newspapers. Both involved increased police activity. The number of screen tests was quadrupled in the first campaign and doubled in the second. In the second campaign, publicity generated public consternation, and the automobile association complained that random checks were being made under the pretext of vehicle equipment checks (Ross, 1982; p.76).

Following numerous analyses, the conclusion reached was that "each of the two enforcement blitzes reduced the road losses that normally accrue from alcohol impaired driving" (Ross, 1982; p. 80). One might note that no analyses were performed to identify the working of the mechanism, whether through decreased driving, decreased alcohol consumption, or the separation of drinking and driving. One might also note the limited nature of these "blitzes" as in the Cheshire blitz, was that they had definite terminations and all the indices show that either immediately or after a short lag things looked much as before. No permanent change seems to have been achieved (Ross, 1982; p.80-83). The evaluation of New Zealand's Scandinavian-type drinking and driving laws concluded that little, if any, deterrence was accomplished, but Ross saw more evidence of deterrence but not a strong case.

Australia - Victoria. The state of Victoria was the first to adopt "random" breath testing of drivers in 1976 in Australia. (Testing drivers without the need for police to suspect alcoholic influence was permitted in predetermined roadblocks). The law was little used at its inception. However, in 1973, two periods of intensified enforcement occurred when patrol hours were quadrupled and in 1978 roadblock patrol was increased. Evaluations of the Victorian campaigns yield conclusions that resemble those reached in most other studies of short-term enforcement efforts - a deterrence effect. The Victorian report yields evidence of a predicted change in perceptions of risk of apprehension (Ross, 1982; p. 83-85).

Canada - RIDE. RIDE was a program concerned with "reducing impaired driving in Etobicoke", a part of the city of Toronto in the province of Ontario. Police established roadblocks at over 100 locations chosen for visibility, the occurrence of crashes, and the estimated likelihood of yielding drinking drivers. The campaign was planned for 18 months. If alcohol was suspected, a policeman requested a breath test that, if positive, led to further steps toward prosecution. Only a small fraction of drinking drivers was apprehended by this program.

RIDE was publicized by a pamphlet mailed to every household but surveys revealed that media or personal experience of the roadblock was the main source of knowledge. Estimates of actual drinking and driving in the district showed no clear evidence of deterrence; however, there was a demonstrated perceived risk of apprehension for the "average man's risk" (but not the individual's personal risk) which may be as a result of the publicity campaign (Ross, 1982; p.85-86).

United States - ASAP. Aspects of the Scandinavian model appear in the formal laws of all United States jurisdictions. In a study of the relationship between alcohol and highway safety conducted by the United States Department of Transport in 1978 it was made public that even moderate drinking and driving is associated with strongly increased crash risk and heavy drinkers play a major role in the problem. Alcohol Safety Action Projects (ASAP's) were launched in response to this problem. Changes associated with the ASAPs were increases in police patrol and improvements in the efficiency of processing drinking drivers in the courts (increased certainty of apprehension and conviction, along with increased celerity of conviction). No effort was made to increase penalties. Arrests for drinking and driving increased.

Evaluations conducted were difficult to interpret due to the heterogeneity of ASAP programs and sites and the quality of the ASAP evaluations was poor. Some sites showed a decrease but not a significant one; however, a significant decrease occurred in the proportion of illegal blood alcohol concentrations. A final evaluation supplied evidence supporting the proposition that some programs involving enforcement of prevailing United States laws could, in the short-run, produce declines in drinking and driving (Ross, 1982; p. 86-89).

Summary

In summary, enforcement campaigns can produce deterrent effects by increasing public perception of the likelihood of punishment. It should be noted that all the examples are limited in time and are not analyzed in a way that would permit determining whether the effects diminish as the campaigns continue. The effects of the laws are found to diminish over time and the enforcement campaigns have been terminated with no evidence of posttermination effects (Ross, 1982; p.90).

Considerable evidence shows the positive effect of increments in perceived certainty of punishment due to the introduction of Scandinavian-type laws and as a consequence of enforcement campaigns. Publicized and newsworthy interventions designed to increase the actual probabilities of punishment for drinking and driving seem almost always to be accompanied by corresponding declines in the variables indicating this behavior. However, in the long run the declines are countered by tendencies to return to the status quo ante, whether or not the increased actual probabilities of detection, conviction and punishment are maintained (Ross, 1982; p. 105).

The deterrence effect of Scandinavian-type laws and enforcement campaigns is due to an exaggerated perception of the probability of apprehension of violators (Ross, 1982; p.107).

Severity

We theoretically expect the violators perceiving more severe penalties will refrain more from law violation behavior. A few reported studies by Ross (1982) involve increasing the threatened severity of punishment for drinking and driving in the absence of simultaneous changes in certainty and celerity.

Finnish Law of 1950. Finnish approach to controlling drinking and driving through law was quite different from that of Norway and Sweden. Finland had not adopted the Scandinavian model of per se provisions of the laws. (This model is explained in notes for Chapter 1 (2). In short, the model refers to blood-alcohol concentrations rather than subjective descriptions of intoxicated behavior.) The drinking and driving offense was defined in classical terms as driving "when drunk or under the influence of alcohol". Under the 1937 law, penalties were set at a maximum of two years' imprisonment, but in 1950 this penalty was doubled to four years with provisions for six years imprisonment in the event that bodily injury was caused and seven years in the event that death was caused through the prohibited behavior, and in 1957 the maximum penalty in the event of a crash producing death was raised to eight years. Actual sentences also were severe. Also, convicted Finns were punished with loss of a driver's license for 2-3 years with permanent revocation on the second offence (Ross, 1982; p.91-92).

Ross conducted an interrupted time series analysis of the effects of the doubling of the maximum penalty in 1950. He found that the marked increase in the severity of threatened punishment for violation of a drinking and driving law did not have observable deterrence consequences. It was found that although the maximum penalty was doubled in 1950, actual penalties meted out by judges did not increase (Ross, 1982; p.93).

The Chicago Crackdown. Arcund Christmas 1970 Chicago Judge Raymond Berg attempted to increase penalties received by convicted drinking drivers by decreeing that these people would receive automatic seven-day jail sentences. The program was extended to six months due to its presumed success found by comparisons of previous years. Ross did an interrupted time series analysis of crash data and concluded that the Chicago crackdown was not effective in deterring

drinking and driving (Ross, 1982; p.94-95). One possible cause of the failure was that the judicial threat was not fulfilled in practice. An unanticipated consequence was a decline in convictions primarily among drivers who had not been tested - judges failed to follow through. Although police arrested more drinking drivers, the total number of people jailed was less. Both consequences show a tendency of the legal system to shield offenders from sanctions considered too severe.

Traffictown in New South Wales. The local magistrate of Traffictown (not its real name) handed down tough penalties in drinking and driving cases. Evaluations found that serious crashes did not drop during the judge's campaign, but:

(1) there was a decrease in total reported crashes. Likely the decrease indicates that drivers involved in minor crashes failed to report these in order to avoid punishment;

(2) the average value of insurance claims increased, also indicating the suppression of minor crashes;

(3) crash-involved drivers charged by the police dropped significantly even though these crashes were on the average more serious, indicating police efforts in avoiding the judge.

Both offenders and enforcers appear to shield themselves and others from punishment, the consequence being avoiding any punishment at all.

Summary

In summary, studies do not support the deterrence model regarding severer penalties. There are many points of discretion in the application of legal sanctions, e.g., police may reduce arrests, prosecutors may fail to charge, judges and juries may fail to convict. Thus, it is necessary to maintain penalties that are deemed by the judicial system to fit the crime (Ross, 1982; p.96-97). It is interesting that all Ross' analysis treats certainty and severity separately. In other words, Ross examines the additive effects of certainty and severity of punishment.

Celerity

The literature is unenlightening as few programs were concerned with celerity (Ross. 1982; p.105); however one study does focus on the swiftness of the punishment.

Ontario 12 Hour License Suspension. In an article published in 1988, Vingilis, Blefgen, Lei, Sykora and Mann give an evaluation of the celerity component of deterrence theory. The introduction of Bill 178 in December, 1981 in Canada, gave police forces in Ontario the authority to:

(1) conduct random spot-checks to detect drinking and

driving; and

(2) suspend a driver's licence for 12 hours if a driver registered .05 percent or more on a roadside screening device or evidentiary breath tester. The purpose of the 12-hour licence suspension was to introduce an immediate punishment for drinking and driving without the time-consuming arrest process and the high cost of adjudication. It was hypothesized that more drinking-drivers would be stopped by police because of the quick licence suspension, which would have a deterrent effect on drinking-driving crashes. No organized media campaign occurred in concert with the law change. Using intervention analysis the authors evaluated the impact of the 12 hour licence suspension law and found that it may have had a small, short-term effect on the proportion of Ontario's alcohol-related fatalities (p.16).

Conclusion

In conclusion, Ross' international review found legislation was aimed at laws that increased the severity of punishment and laws that increased certainty. Ross concluded that neither approach had a long term effect on drinking and driving. This conclusion was also reached by Ross, McCleary and Epperlein (1981-1982) when conducting an interrupted time-series analysis of French data on crash-related injuries and fatalities. It showed that the 1978 law had a notable effect, but the effect was not permanent. The laws addressing punishment for drinking and driving resulted in decreases in arrest and conviction rates, but the effect was not sustained beyond a year or two after implementation. Those laws that only increased penalties but did not address certainty showed no impact on rates of arrest or conviction. These effects are short term because drinking drivers soon learn from experience that the real chance of being apprehended is small (Bungey and Frauenfelder, 1986; p.106).

Research by R. Homel

In 1988 Homel reported an extensive study in Australia in his book entitled "Policing and Punishing the Drinking Driver: A Study of General and Specific Deterrence". He examined the ways the enforcement of the RBT (random breath testing which involves arbitrarily selected checkpoints varied from time to time and not announced publicly prior to operation) and the punishments imposed by judges on convicted drinking drivers influenced the drinking and driving behavior. Theoretically Homel sees deterrence as a process so was interested in how the causal links were made.

He conducted two empirical studies. The first looked at general deterrence and how RBT in New South Wales deters potential offenders. The second looked at marginal specific

deterrence and studied whether heavy penalties imposed on convicted offenders in New South Wales were better than light penalties.

The RBT longitudinal study, conducted in two stages, was based on interviews with randomly selected residents of New South Wales. Interviews included questions on perceptions of sanctions, exposure to RBT and behavioral responses to RBT. The results showed a strong support for a simple deterrence effect (short-term). There was evidence of a decline in the perceived probability of being randomly tested over the 6 weeks between interviews, although there was no decline overall in the number of attempts which respondents were making to avoid drinking and driving. This finding supports the deterrence model, but shows that the perceived severity of punishment appears to be a better predictor of such behavior than the perceived probability of being randomly tested.

The penalties study used data from official records. A sample of 1000 offenders was selected. Offender/offense and penalty variables were correlated and measures of entitlement for punishment and severity of penalty were constructed. An analysis of the relationship between penalties and reconviction rates was carried out in terms of the measure of perceived severity of penalty and actual penalties imposed. According to the deterrence model, those offenders who have been punished should be more responsive to the threat of punishment than offenders without a conviction (absolute specific deterrence), and those who have received severe penalties should be more responsive than those who received light penalties (marginal specific deterrence). The evidence for marginal specific deterrence was rather weak, however. That is, the study showed little support for deterrence in that the impact of severe punishments was greater than the impact of lenient punishments.

In 1990 in an article entitled "Crime on the Roads", Homel argued that the RBT program of New South Wales, called the "boots and all" program (which refers to the type of program with intensive, visible and continuous enforcement and extensive, continuous publicity) had been unambiguously successful. As a result of the 1988 findings this "RBT boots and all model" was perceived as the optimum model and all Australian states have begun to emulate this approach.

Homel argued that, although only a short term effect had been observed, the long-term value of RBT will be not so much the direct reduction in deaths and injuries but the changes in drinking practices and attitudes which it may have helped to bring about. It dramatized the role of alcohol in road deaths, had been an acceptable countermeasure in that country, and had perhaps begun to change attitudes. However, Homel

stated that although the RBT program had been successful in Australia it may not be adaptable to other countries due to the issue of civil liberties.

Other Researchers

Other researchers such as Shapiro and Votey Jr. (1984) found that an arrest experience reduces the probability that a person will drive while drunk. The results suggest that an arrest increased a person's perceived probability of arrest and/or the unpleasantness of an arrest and thus leads to a reduced chance of acting illegally. This study supports the certainty of arrest.

Shore and Maguin (1988), using a time-series analysis, evaluated the revised Kansas law of July, 1982. One important aspect of this law was the prohibition of plea bargaining in driving under the influence of alcohol cases. This provision was viewed as increasing the certainty of apprehension and the severity of the ensuing consequences. The law change was accompanied by large scale advertising campaigns. It was hypothesized that the DUI law change produced a decline in fatal accidents.

The direct effect of the change in the DUI law was found to be significant, with the onset of the new law associated with a 20.1% reduction in traffic fatalities. This decline lasted the entire 18 month follow-up period.

The authors, Shore and Maguin (1988; p. 253) concluded:

> The Kansas experience supports deterrence theory in that the increase in certainty and severity of punishment provided by the change in the state's Driving Under the Influence law was associated with a reduction in those accidents which are most frequently linked with the combination of drinking and driving. However, the law change alone would not have had this effect if it had not been accompanied by widespread publicity and media coverage and an increase in actual DUI arrests

New York State, in November 1981, implemented a law which standardized and increased penalties for drinking and driving (Legge, 1990). The new reform was known as (STOP-DWI) -

Special Traffic Options Program against Driving While Intoxicated. Included in the provisions were immediate and automatic licence suspension if two or more alcohol-related driving violations occurred within 3 years, a mandatory fine of $250 ($350 if over the .10 blood alcohol limit), and the possibility of prison for the first offense; progressively steeper fines and penalties for more than one violation; and heavier mandatory punishments for those convicted of driving with a revoked or suspended licence. The law was enforced vigorously.

The impact on the traffic fatalities, in combination with the DWI, showed a 17.1 percent reduction. Results indicated a long-term decline in traffic fatalities. This finding contradicts previous research which indicated that stricter drunk driving laws were effective only in the short term.

However, several researchers have since argued that reducing drinking and driving is a more complex phenomenon than Ross claims and that its causes should be studied using more than national fatality data as a test for deterrence, such as the use of perceptual research (Homel, 1988; p.90). Homel (1988) further states that researchers seem to have made a good case that the interrupted-time series approach, although appropriate for determining the short-run impact of an intervention, is less useful in determining long-term effects. Ross supports this assumption as he states that direct evidence of changes in drinking and driving would be shown in competent roadside sample surveys using screening breath tests. Indirect evidence of drinking and driving behavior is presented with statistics on crashes and casualties (Ross, 1982; p.104).

Predictions

Direct and Indirect Effects. Following this review of deterrence theory as it relates to drinking and driving, it is evident that most research on drinking and driving deals with motor vehicle accidents or fatalities. It is, therefore, argued that research is needed on self-reported behavior of drinking and driving in order to examine the certainty and severity effects. It is further argued that actual (subjective or direct) experience with certainty and severity will be inversely related to drinking and driving. "Direct involvement" means that the individual has had personal experience with the certainty and severity of punishment. An example would be, if the individual answered "yes" to the question asking if he/she had ever been charged with impaired driving and if he/she had ever had his/her licence suspended.

It is further argued that perceived (subjective or indirect) experience with certainty and severity will be

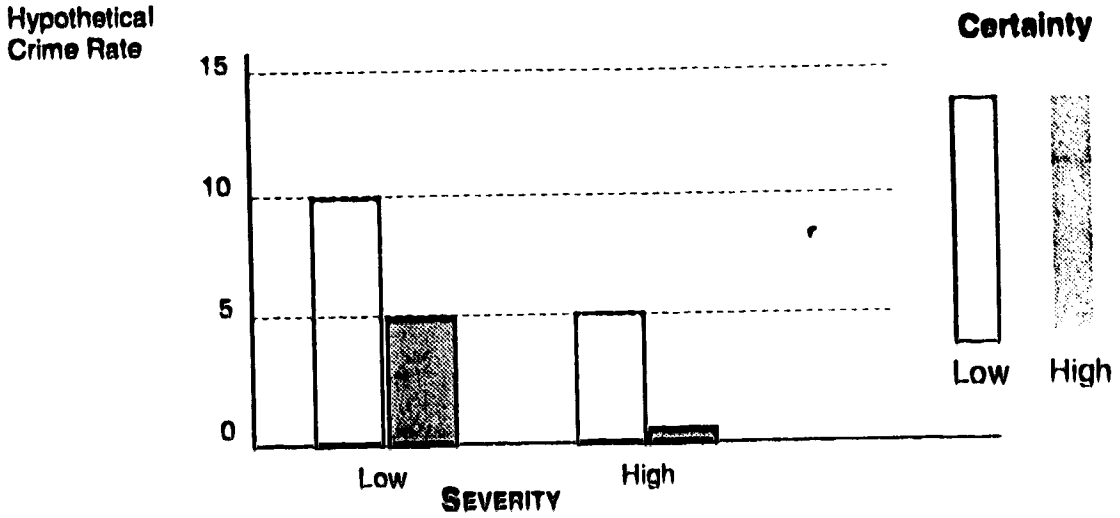
inversely related to drinking and driving. "Perceived experience" means that the individual has had an indirect or vicarious experience with the certainty and severity of punishment. An example would be, if the respondent answered "yes" when asked if a close friend or spouse had been charged with impaired driving and what that individual believes is the usual penalty for impaired driving. It is predicted that if both the direct and indirect effects of certainty and severity of punishment are high, then the behavior of drinking and driving will be low.

Additive or Interactive Effects. Ross (1982) states that because the offense of drinking and driving is one in which the level of certainty of punishment is extremely low, this suggests an interaction between severity and certainty. In other words, if the probability of punishment is so low as to be negligible, then severity of the threatened punishment cannot be expected to influence behavior. (For explanation of additive and interactive effects see Figure 1).

Figure 1

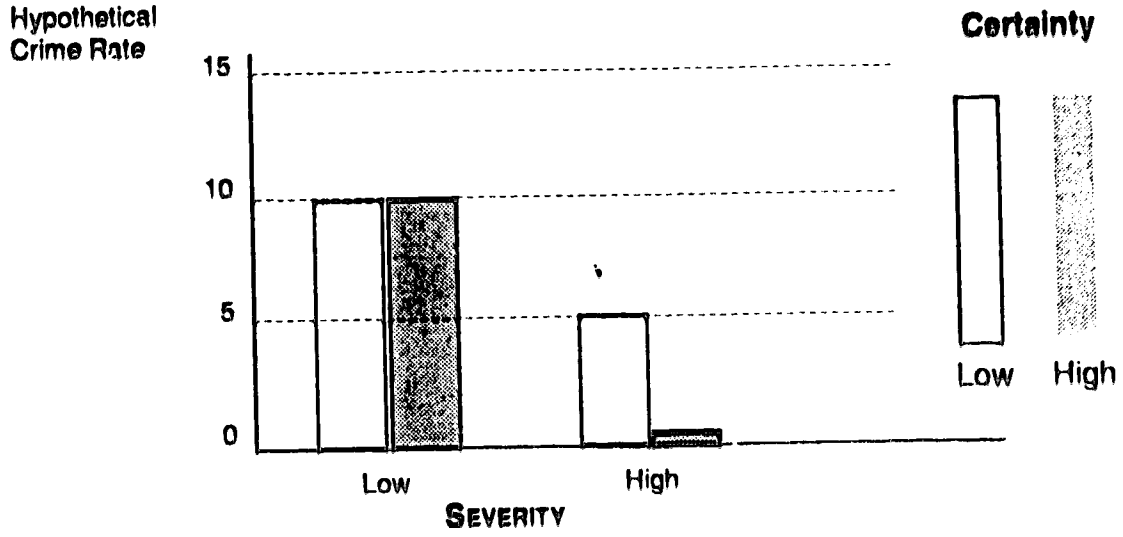
Additive and interactive models for estimating the effects of severity and certainty on crime rate.

Additive:



The Hypothetical Crime Rate can be reduced by either high certainty or high severity or a combination of both.

Interactive:



The Hypothetical Crime Rate can be reduced by both high certainty and high severity; either by itself would not lower the crime rate.

(Liska, 1987: pg. 95)

Deterrence theory implies that perceptions of certainty of legal punishment will not affect individual involvement in drinking and driving if severity of the punishment in terms of the cost to the individual is zero. Likewise, the theory implies that perceptions of severity of legal punishment will not affect drinking and driving if the certainty of being caught is zero (Grasmick and Green, 1980). In other words, perceived threat of legal punishment should exist only if both perceptions of certainty and severity are above zero. Previous studies have shown mixed results when testing for an interaction between these two deterrence variables (Anderson, Chiricos, Waldo, 1977; Bailey and Lott, 1976; and Teevan Jr., 1976 a, b). However, many researchers (Grasmick and Bryjak, 1980; Grasmick and Green 1980, 1981; Green 1986; and Stafford, Gray, Menke and Ward, 1986) found that perceived threat of legal punishment should be measured as a product of perceived certainty and severity.

Grasmick and Bryjak (1980), using the refined measure of penalty severity and both prior criminal involvement and estimated future involvement as the dependent variable, produced evidence for a significant interaction between perception of arrest certainty and perception of penalty severity. However, Paternoster (1987) argued that this was due to the experiential effect and that the true deterrent effects are much smaller.

Homel (1988; p.50-51) argues that the most theoretically central hypothesis is one that predicts an interaction between perceptions of arrest certainty and of penalties. The argument is that if people do not expect to get caught, severe penalties will not be a deterrent, and conversely if the penalties are regarded as inconsequential, a perceived high likelihood of arrest will not serve as a deterrent.

Following this interactive argument, Stafford et al. (1986) tested an interactive model using experimental and non-experimental data. Data for the non-experimental model were obtained from Gibbs' (1968) homicide rate for 1959-1961. The objective certainty of imprisonment was measured by dividing the number of persons admitted to prison on a criminal homicide sentence by the average annual number of homicides. The severity of imprisonment was measured by the median number of months served on a homicide sentence. The data for the experimental model used 150 college students. They were told that they could earn up to $6.00 for playing a computer simulated game. Subjects were asked to choose between a 1 or a 2 and this score combined with the computer's choice, determined the number of points he/she won or lost. Prior to choosing, subjects could also press a preview button allowing

them to see the computer's choice. But there was a risk involved in using the preview button. The behavior was the use of a preview button. Regarding the preview button, subjects were told:

> From now on, the computer will occasionally scan your button pushes for use of the preview button. It will detect your use of the preview button about __percent of the time (certainty). If you use the preview button on a particular trial and if you are detected using it in the trial, you will be fined __ points for that trial (severity).

The authors tested the experimental and nonexperimental data and found that a satisfaction balance model provided the best fit for both. This model specifies that the frequency of the behavior equals the inverse of the costs and the reinforcements or benefits. This model predicted that certainty and severity have interactive effects and also specifies how values and costs combine to influence behavior.

Thus, it is predicted that the interactive effects of certainty and severity on drinking and driving, both direct and indirect certainty and severity, would be stronger than any additive effects.

A Reconceptualization of General and Specific Deterrence

From the previous literature review, it is evident that researchers generally recognize the conventional distinction between general and specific deterrence as all studies focus on either one. However, researchers such as Homel (1988), Friedland et al. (1990) and Stafford et al. (1993) express some concerns about this distinction.

Homel (1988; p. xvi) states that a fundamental assumption of his deterrence model is that general and specific deterrence are one and the same phenomenon and that it is appropriate to consider them together within a single theoretical framework. However, he clarifies this statement as accurate at the level of theory but because two different populations are involved (potential offenders and those who have been convicted and punished), the different populations necessitate different research designs. However, Homel (1988; p.53) does say that "experience with the law, either through arrest or through undetected law-breaking is also a form of exposure".

According to Homel (1988; p.53), there appears to be only one study in which the authors have attempted to link actual and perceived certainty of punishment at the individual level. Parker and Grasmick (1979) investigated the effects of newspaper crime stories, personal experiences with crime and the personal experiences of one's acquaintances on arrest perceptions. They found that people's estimates of the official arrest rate for burglary were influenced by their experiences as victims, particularly by the number of arrests which they knew took place as a result of these experiences, provided they knew of at least one arrest. Newspaper stories did not appear to influence perceptions.

Friedland et al. (1990; p. 182) state that specific deterrence refers to the impact on a specific individual of a penalty or a potential penalty directed against that individual. General deterrence refers to the impact of a penalty or a potential penalty on others. Both may be operative in a particular case. A person may be subject to deterrence by a sentence he or she had personally received as well as by knowledge of how others have been dealt with.

As Stafford and Warr (1993) point out, the logical and empirical grounds for this general and specific deterrence distinction are not as clear as they might appear, and the conventional conception has done more to obfuscate than to clarify the deterrence process.

The conventional distinction between general and specific deterrence is:

> Whereas general deterrence refers to the effects of legal punishment on the general public (i.e., potential offenders), specific deterrence pertains to the effects of legal punishment on those who have suffered it (i.e., punished offenders)
>
> (Stafford & Warr, 1993; p. 123).

Both definitions recognize the importance of some kind of experience with legal punishment in deterring persons from committing crimes. But for members of the general public (general deterrence) it is indirect experience with punishment (observing or otherwise having knowledge of the punishment of others) that deters, whereas for punished offenders (specific deterrence) it is direct (personal) experience.

General deterrence-investigators focus on persons who have never suffered any legal punishment for any crime, on the grounds that such persons have knowledge of punishment, if at

all, only indirectly from experiences of others. However, there are two kinds of people who have never suffered a legal punishment:

(1) those who have never committed any crime (ignoring the possibility that innocent persons can be punished) (DIRECT EXPERIENCE) and

(2) those who have committed crimes but have avoided punishment, (INDIRECT EXPERIENCE)

Stafford and Warr state that experience with avoiding punishment is likely to affect perceptions of the certainty and severity of punishment. In crime, offenders will experience punishment or punishment avoidance, and it is doubtful that only punishment impacts subsequent behavior. (It is possible that punishment avoidance does more to encourage crime - an offender may believe that he or she is immune from punishment - than punishment does to discourage it.)

Specific deterrence-investigators commonly assume that an offender's direct experience with suffering a punishment is the only operative variable when it comes to predicting future behavior. In addition to ignoring the offender's experience with avoiding punishment, such an assumption overlooks the possibility that one can suffer a legal punishment and at the same time have knowledge of punishment from the experiences of others (i.e., have indirect experience with punishment).

> People are likely to have a <u>mixture</u> of indirect and direct experience with punishment and punishment avoidance...However by adopting the conventional distinction between general and specific deterrence, investigators perpetuate the notion that the two forms of deterrence occur among distinct populations (p.126).

The authors' consequently propose that:

> If deterrence is defined as the omission or curtailment of a criminal act out of fear of legal punishment, then general deterrence refers to the deterrent effect of <u>indirect experience with punishment and punishment avoidance</u> and specific deterrence refers to the deterrent effect of <u>direct experience with punishment and punishment avoidance</u> (p.127).

The basic premise of the proposed reconceptualization is that the rate of crime in virtually any population will be a function of both general and specific deterrence (p. 128). The implication is that individuals can be viewed as falling along a continuum characterized by general deterrence at one extreme and specific deterrence at the other.

Stafford and Warr argue that the advantages of the above reconceptualization are:

(1) it recognizes the possibility that both general and specific deterrence can operate for any given person or in any population;

(2) it treats punishment avoidance as analytically distinct from the experience of suffering punishment; and

(3) its compatibility with contemporary learning theory, particularly the distinction between observational/vicarious learning and experiential learning.

To further their conception of this single theory of deterrence, Stafford and Warr discuss the applications of such a theory.

Direct experience (consequences of one's criminal behavior) may be difficult to separate empirically from the effects of indirect experience with punishment and punishment avoidance (consequences of criminal behavior of others).

Conclusion

In conclusion, the proposed reconceptualization suggests that it is unnecessary to formulate separate theories of general and specific deterrence. Rather a single theory is possible that centers on indirect experience with legal punishment and punishment avoidance and direct experience with legal punishment and punishment avoidance.

Based on Stafford and Warr's (1993) reconceptualization, it is predicted that actual and perceived certainty of punishment and actual and perceived severity should be treated as a product to test the impact on drinking and driving, or that the behavior of drinking and driving is a result of the multiplied effects of the direct and indirect certainty and severity of punishment.

Alcohol Consumption and Amount Driven

Combined with the notion of the utilitarian perspective, which views people as 'weighers' of potential costs and rewards, is the notion of the value or reward a person places on the activities of drinking and driving.

Jacobs (1989; p. 14) states:

> Drunkenness, if not an admirable feature of personal and social life, tends to be accepted as a normal human weakness and treated leniently, if not humorously.

In Canadian society it would seem that frequently social life revolves around drinking and it would therefore be an imposition if one were unable to do so freely without fear of being labelled as one with a problem. Often if a person is charged or convicted with impaired driving, the person is also seen as having "a problem" with alcohol. If one is labelled "alcoholic" there are certain benefits that he is excluded from. Therefore, one would presumably not risk losing the ability to drink without stigmatization. This reasoning is corroborated by the fact that a minority of people labelled alcoholics have been associated with drunk driving, according to Jacobs (1989; p. 49).

Norstrom (1983; p. 518) developed a causal model of Swedish drivers using, age, sex, marital status and two opportunity variables (mileage and alcohol consumption). He used a LISREL model (a method of combining factor and regression analysis) and found the individual's alcohol consumption was strongly and positively related to his proneness to drink and drive, whereas, contrary to what was expected, his degree of motoring is of minor importance in this respect.

In Berger and Snortum's (1986; p. 140) article the researchers try to replicate Norstrom's findings. They found the mileage variable to have a modest relationship. They expected the Swedish sample to show how the Swedish separate driving from drinking. However, they reasoned that if Americans exercise little control over driving after drinking, one would expect Americans who drive the most to also be most likely to drive while intoxicated. The data did not support this notion. Also, Snortum (1988) in a "contextual analysis" used alcohol consumption and annual mileage as an independent variable in a drinking and driving model of deterrence.

Thus, it appears that any research that has looked at alcohol consumption and kilometers driven has, firstly, treated them as individual variables. It is argued that Canadians may not separate the two activities and they should be combined. Secondly, these variables have been found to increase drinking and driving. In other words, the more a person drinks and the more a person drives increases the likelihood of him drinking and driving. It is the writer's position that these behaviors will work in the opposite

direction. By multiplying these two activities, it is postulated that a person who drinks a lot and drives a lot will tend to value both these activities and will ultimately take steps to avoid losing the privilege to do so. In other words, either for employment or social reputation he will consider these two activities important enough not to jeopardize losing them and will take steps to avoid drinking and driving.

Summary

In light of the previous literature review and the writer's predictions, the following hypotheses have been generated:

H1: Actual (objective or direct) certainty of apprehension and actual (objective or direct) severity of punishment is inversely related to drinking and driving.

H2: The interactive effects of actual (objective or direct) certainty of apprehension and actual (objective or direct) severity of punishment on drinking and driving are stronger than the additive effects.

H3: When actual (objective or direct) certainty of apprehension and actual (objective or direct) severity of punishment are involved, the value a person places on the behaviors of drinking and driving will be inversely related to drinking and driving.

H4: Perceived (subjective or indirect) certainty of apprehension and perceived (subjective or indirect) severity of punishment is inversely related to the behavior of drinking and driving.

H5: The interactive effects of perceived (subjective or indirect) certainty of apprehension and perceived (subjective or indirect) severity of punishment on drinking and driving are stronger than the additive effects.

H6: When perceived (subjective or indirect) certainty of apprehension and perceived (subjective or indirect) severity of punishment are involved, the value a person places on the behaviors of drinking and driving will be inversely related to drinking and driving.

H7: Actual (objective or direct) and perceived (subjective or indirect) certainty of apprehension and actual (objective or direct) and perceived (subjective or indirect) severity of punishment is inversely related to drinking and driving.

H8: The interactive effects of actual (objective or direct) and perceived (subjective or indirect) certainty of apprehension and actual (objective or direct) and perceived (subjective or indirect) severity of punishment on drinking and driving are stronger than the additive effects.

H9: When actual (objective or direct) and perceived (subjective or indirect) certainty of apprehension, and actual (objective or direct) and perceived (subjective or indirect) severity of punishment are involved, the value a person places on the behaviors of drinking and driving will be inversely related to drinking and driving.

CHAPTER 4

Research Design

Data and Sampling

This will be secondary analysis. The data on impaired driving were available from Dr. T. L. Burton of the Faculty of Physical Education and Recreation at the University of Alberta in Edmonton, Alberta. The data were obtained in a National Survey on Drinking and Driving undertaken by the Health Promotion Directorate of Health and Welfare Canada and conducted on its behalf by Statistics Canada in March, 1988. This telephone survey used random-digit dialling technology to contact households all across Canada. The survey targeted Canadians aged between 16 and 69. Residents of the Yukon and the Northwest Territories were not included nor were full-time residents of institutions. The response rate was over 80%. In total, 9,943 Canadians participated in the survey.

The questionnaire targeted three main areas of behaviour - driving; drinking; and drinking and driving. In addition, demographics were obtained such as age, marital status, education, occupation, income, as well as opinion questions regarding social issues, knowledge of prevention programs and lifestyle activities. This thesis will focus on the questions related to the combined behavior of drinking and driving. Consequently, the sample size used for this thesis was 6,818. This was the group of people who had the potential to drink and drive. They were people who reported that they did both activities - they drank and they drove (not necessarily at the same time).

Variables

Criteria used to choose the variables for this study were correlations, stepwise regression and personal assumptions.

Dependent Variable. The concept of drinking and driving will be operationalized by using the following variable:

COMP - This was created by asking the respondent questions of what steps he/she has taken to avoid drinking and driving and only the yes responses were counted. The respondent was asked "During the past 12 months have you done any of the following to avoid driving after you had too much to drink? Have you: (Responses were Y/N)

DRD58A - asked someone else to drive?
DRD58B - taken a taxi, bus, subway or walked?
DRD58C - stayed overnight?
DRD58D - stopped drinking early/waited at least one hour before driving?

DRD58E - used a breathalyzer test before driving? These variables were added together, thus indicating the higher the scores (the more yes responses) the more steps were taken to avoid drinking and driving. The fewer steps taken, the less avoidance and the more likely the respondent will drink and drive.

The variable has the qualities of face validity (it measures avoidance), reliability (Cronbach Alpha Reliability Test - see Table 3), utility (it gives an indication of those who will likely drink and drive), and unidimensionality or homogeneity (only one dimension is measured - avoidance of drinking and driving - and not some mixture of factors).

Independent Variables. Several concepts were included as independent variables. These were: (1) actual certainty of apprehension; (2) actual severity of punishment; (3) perceptual certainty of apprehension; (4) perceptual severity of punishment; and (5) value placed on drinking and driving behaviors. The variables used as measures of these concepts come directly from the questionnaire. The measurement of each of these concepts will be detailed below.

Actual (Objective or Direct) Severity. Pearson correlations were computed between the variables DRD64, DRD65A, DRD66AA, DRD67A and COMP. All were found to be correlated; however, when a stepwise regression was conducted, DRD65A and DRD66AA were found not to add significantly to the equation. Only **DRD64** was chosen as a result. Although **DRD67A** was also found not to add significantly, it was kept in the equation because of a lack of another suitable objective severity indicator. It asked the question: "During the past 3 years, have you had your licence suspended for more than 24 hours for a drinking and driving offense?" The respondents answered "Yes" or "No". It should be noted that licence suspension was the most severe penalty asked regarding drinking and driving penalties.

Actual (Objective or Direct) Certainty. The DRD64 variable asked the question "During the past 3 years, have you been stopped and checked by the police because they suspected you of drinking and driving?" The respondents answered "Yes" or "No". This question was taken as an indicator of the actual certainty concept.

Perceived (Subjective or Indirect) Certainty. For testing perceptual certainty of apprehension, the independent variables DRD71 and DRD72 were used. The DRD71 question asked: "Within the past 30 days, has your spouse or partner, or have any of your close friends or relatives driven after they have had too much to drink?" The respondents answered "Yes" or "No". The DRD72 question asked: "Has your spouse or

partner, or have any of your close friends or relatives been in court and found guilty of a drinking and driving offense during the past 3 years?" The respondents answered "Yes" or "No". These two variables were added and renamed **PERCP** with values of 1 to 4 to measure perceptual certainty of apprehension. In other words, the higher the score the more likely a person would perceive the certainty of arrest as high. When adding these two variables together, a hierarchy was assumed. The hierarchy implies that if a respondent answered "yes" to both questions, this would be the greatest threat of being caught. If the respondent answered "yes" to a friend or spouse being convicted for drunk driving, this would be greater threat than a friend or spouse drinking and driving.

Perceived (Subjective or Indirect) Severity.
Perceived severity of punishment was measured by adding three variables, and was renamed as **PENALTY**. The respondents were asked: "What do you think are the usual penalties for a first drinking and driving conviction where there is no accident?" The respondents were asked "Yes" or "No" to licence suspension (DRD73BA1), fine (DRD73BB1), or a jail sentence (DRD73BC1). The PENALTY variable has values of 1 to 4, which indicates the higher the score the higher a person perceives severity of punishment. For this variable, it was assumed that the jail term would be considered more severe than a fine, and a fine would be more severe than a licence suspension. (1)

Value. In order to measure a value variable, a variable called **REWARDS** was created by multiplying the frequency of driving by the alcohol consumption. These variables were multiplied because they conceptually measure different things, i.e., there is no unidimensionality permitting them to be added into a single index. The variable DRIVE17 asked: "During the past 12 months, how often, on average, did you drive? Was it:

everyday (1)
4-6 days a week (2)
2-3 days a week (3)
once a week (4)
once or twice a month (5)
less often than once a month. (6)"

The DRNK46 variable asked: "During the past 12 months, how often, on average, have you had a drink? Was it:

every day (1)
4-6 times a week (2)
2-3 times a week (3)
once a week (4)
once or twice a month (5)
less often than once a month. (6)"

For both variables, the range of scores was from 1 to 6. It was reasoned that these two variables would indicate how much value a person placed on these two behaviors. The lower the score, the more a person does these two activities and thus the more he values these activities. However, by multiplying these two variables there is the potential for analyzing the multiplicative combination of the two, e.g., when a respondent scores high on the amount of driving but low on the amount of drinking or vice versa.

Table 1 summarizes the variables analyzed in this thesis.

TABLE 1 ABOUT HERE

TABLE 1

MEASUREMENT ITEMS FOR DEPENDENT VARIABLE AND INDEPENDENT VARIABLES

BEHAVIOR	NAME	DEPENDENT VARIABLE QUESTIONS
Steps taken to avoid drinking and driving	COMP	During the past 12 months, have you done any of the following in order to avoid driving after you had too much to drink? Have you (choices were Y/N with possible values 1,2) DRD58A-asked someone else to drive? DRD58B-taken a taxi, bus, subway or walked? DRD58C-stayed overnight? DRD58D-stopped drinking early, waited at least one hour before driving? DRD58E-used a breathalyzer test before driving? The Yes responses were added to create the COMP variable. (Values 0-5)

CONCEPT	NAME	INDEPENDENT VARIABLES QUESTIONS
Actual Certainty	DRD64	During the past 3 years have you been stopped and checked by the police because they suspected you of drinking and driving? (N/Y, values, 1,2)
Actual Severity	DRD67A	During the past 3 years, have you had your license suspended for more than 24 hours for a drinking and driving offense? (N/Y, values 1,2)
Perceptual Certainty	PERCP	Created by adding: DRD71-Within the past 30 days, has your spouse or partner, or have any of your close friends or relatives driven after they have had too much to drink? (Y/N, values 1,2) DRD72-Has your spouse or partner, or have any of your close friends or relatives been in court and found guilty of a drinking and driving offense during the past 3 years? (Y/N, values 1,2) (Values now 1 to 4)

TABLE 1, CONTINUED

INDEPENDENT VARIABLES

CONCEPT	NAME	QUESTIONS
Perceptual Severity	**PENALTY**	Created by adding the Yeses of three variables. For a first drinking and driving conviction where there is no accident what do you think are the usual penalties? DRD73BA1-Licence Suspension (Y/N) DRD73BB1-Fine (Y/N) DRD73BC1-Jail (Y/N) (Values 1 to 4)
Value	**REWARDS**	Created by multiplying alcohol consumption and the amount driven. DRIVE17-During the past 12 months how often, on average, did you drive? Was it every day (1) 4-6 days a week (2) 2-3 days a week (3) once a week (4) once or twice a month (5) less often than once a month (6) DRNK46-During the past 12 months, how often, on average, have you had a drink? Was it every day (1) 4-6 times a week (2) 2-3 times a week (3) once a week (4) once or twice a month (5) less often than once a month (6) (Values 1 to 36)
Actual and Perceptual Certainty	**CERT**	Created by multiplying DRD64 and PERCP (Values 1,2,3,4,6,8)
Actual and Perceptual Severity	**SEV**	Created by multiplying DRD67A and PENALTY (Values 1,2,3,4,6,8)

TABLE 1, CONTINUED

INDEPENDENT VARIABLES

CONCEPT	NAME	QUESTIONS
Actual Certainty and Actual Severity	IINT	Created by multiplying DRD64 and DRD67A (Values 1,2,4)
Actual and Perceptual Certainty and Actual and Perceptual Severity	INT2	Created by multiplying CERT and SEV (Values 1,2,3,4,6,8,9,12,16,18,24, 32,36,48 and 64)
Perceptual Certainty and Perceptual Severity	INT3	Created by multiplying PERCP AND PENALTY (Values 1,2,3,4,6,8,9, 12,16)

NOTES FOR CHAPTER 4

1 Since it can be argued that a licence suespension may be more severe than a fine, the **PENALTY** variable was recoded. The recoding again placed a jail term more severe than the licence suspension or a fine. However, the licence suspension was recoded to be more severe than a fine. When the regression analysis was computed for Hypothesis 4, the results were poorer.

CHAPTER 5

Findings and Interpretations

Introduction

The following chapter will present the findings and discussion specific to the hypotheses. The method of analysis in this study consisted of pearson correlations and multiple regression analyses. Pearson correlations were calculated between the independent variables and the dependent variable to see the strength and direction of the relationships. Multiple regressions were performed to see whether an independent variable might influence the dependent variable and if the independent variable had additive effects on the dependent variable.

Since regression analysis assumes that the independent variables and the dependent variable are linearly related, a test for non-linearity was performed. Natural logs of all variables were taken and multiple regressions were performed. It was noted that the natural log did not improve the regressions in most cases. If there was an improvement, the improvement was so minimal that it rendered itself insignificant. As a result, these non-linear findings will not be reported.

Because the literature suggests the possibility of interactive effects, tests for interaction were also conducted. Interaction refers to the situation in which the nature of the relationship between the dependent variable and independent variable changes for different levels of the other independent variables. This test involves introducing the cross-product term for each pair of variables assumed to be involved in the interaction. In other words, a multiplicative term is a product of two or more other terms. It is a new predictor variable created by multiplying scores on one predictor by correspondent scores on one or more others.

The level of significance used in this project is .05, meaning anything less than this is probably not due to chance. This means that the probability of this occurring by chance will be less than 5 in 100.

In addition, a one-tailed test is used as the writer predicted the direction of the relationship. The regression slopes reported in this analysis are standardized regression coefficients or Beta Weights.

It should be noted that the large sample size will tend to make most tests statistically significant. This should be considered with caution when viewing the results.

Descriptive Statistics

The group of people targeted were those people who had the potential to drink and drive. In other words, those people who do both activities. Most people (4647 or 68.2%) drove every day; however, only 4.6% (314) drank every day.

There were 54.9% (3741) males in this group and 45.1% (3077) females.

The ages of this group were combined into categories of 18 and younger, 19-30 years, 31-40 years, 41-50 years, 51-60 years, and over 61 years. Most provinces have a legal drinking age of 18 years; however, there were 321 or 4.7% that did both activities while in the category of 18 years and younger. The largest group ranged from 19-30 years being 33.5% (2283) of the people.

The largest group of drinkers and drivers were married, being 64.9% (4428) of the people.

The people with secondary schooling or a high school diploma were the heaviest group represented, being 30.1% (2050).

Most people (71.2% or 4857) were working.

A majority of people felt that drinking and driving was a more important social issue than cigarette smoking and pornography; and equally as important as drug use, family violence and juvenile delinquency. Whereas a minority believed it to be as important or equally as important as racism, unemployment and aids.

TABLE 2 ABOUT HERE

TABLE 2

DESCRIPTIVE STATISTICS

	TOTAL	PERCENTAGE
People who drove every day	4647	68.2%
People who drank every day	314	4.6%
Provinces		
Newfoundland	114	1.7%
Prince Edward Island	29	.4%
Nova Scotia	217	3.2%
New Brunswick	169	2.5
Quebec	1794	26.3%
Ontario	2372	34.8%
Manitoba	284	4.2%
Saskatchewan	277	4.1%
Alberta	711	10.4%
British Columbia	850	12.5%
Sex		
Males	3741	54.9%
Females	3077	45.1%
Age		
18 years and younger	321	4.7%
19 - 30 years	2283	33.5%
31 - 40 years	1808	26.5%
41 - 50 years	1190	17.5%
51 - 60 years	772	11.3%
over 61 years	443	6.5%
Marital Status		
Single	1871	27.4%
Married	4428	64.9%
Living with Partner	45	.7%
Separated	146	2.1%
Divorced	199	2.9%
Widowed	109	1.6%
Not Stated	20	.3%

TABLE 2, CONTINUED

	TOTAL	PERCENTAGE
Education		
No Schooling	9	.1%
Elementary	355	5.2%
Some Secondary/High School	1411	20.7%
Secondary/High School Diploma	2050	30.1%
Some College	482	7.1%
College Diploma	714	10.5%
Some University	636	9.3%
University Degree	1046	15.3%
Other Education/Training	85	1.2%
Not Stated	29	.4%
Life Activity		
Working	4857	71.2%
Looking for Work	147	2.2%
Student	707	10.4%
Retired	290	4.3%
Keeping House	739	10.8%
Other	64	.9%
Not Stated	14	.2%

Social Issues - drinking and driving is	More Important Than		Equally Important As	
Cigarette Smoking	5200	76.3%	1275	18.7%
Drug Use	2023	29.7%	3864	56.7%
Family Violence	1460	21.4%	3936	57.7%
Juvenile Delinquency	2257	33.1%	3533	51.8%
Pornography	3581	52.5%	2111	31.0%
Racism	3226	47.3%	2198	32.2%
Unemployment	3006	44.1%	2193	32.2%
Aids	2018	29.6%	2831	41.5%

*N=6818 - comprises the group that do both activities - drink and drive (not necessarily together)

Means, Standard Deviations and Ranges.

Means, standard deviations, and ranges were calculated for all variables used in the analyses. These are shown in Table 3. A Cronbach Reliability Test was done when applicable in order to test the reliability when multiple item variables were added together.

TABLE 3 ABOUT HERE

TABLE 3

MEANS, STANDARD DEVIATIONS, RANGES AND RELIABILITY TESTS

	MEAN	STANDARD DEVIATION	RANGE	CRONBACH'S ALPHA RELIABILITY TEST
COMP Avoidance - drinking\driving	1.187	1.311	5.000	.6477
DRD64 Actual Certainty	1.047	.211	1.000	N/A
DRD67A Actual Severity	1.010	.098	1.000	N/A
PERCP Perceived Certainty	1.586	.970	3.000	.4069
PENALTY Perceived Severity	2.295	.902	3.000	.2855
REWARDS Value drinking/driving	6.916	5.644	35.000	N/A
CERT Actual * Perceived Severity	1.689	1.223	7.000	N/A
SEV Actual * Perceived Severity	2.322	.964	7.000	N/A
INT Actual Certainty * Actual Severity	1.062	.308	3.000	N/A
INT2 Certainty * Severity - Actual & Perceived	4.175	4.381	63.000	N/A
INT3 Perceived Certainty * Perceived Severity	3.779	3.054	15.000	N/A

N= 6818

Correlations

Pearson correlations were calculated between all the variables used in the dependent variable **COMP**. All variables were positively and highly correlated, except one correlation. The variables DRD58D - have you stopped drinking early?; and DRD58E - have you used a breathalyzer test before driving? were significantly correlated. These two variables were positively correlated with a correlation of .0758. This is a low correlation, which is probably due to the fact that only a few people (114) reported that they had used a breathalyzer test.

TABLE 4 ABOUT HERE

TABLE 4

PEARSON CORRELATIONS - DEPENDENT VARIABLE

	DRDS8A	DRDS8B	DRDS8C	DRDS8D	DRDS8E
DRDS8A	1.0000 (6799) P=.				
DRDS8B	.3804 (6799) P=.000	1.0000 (6799) P=.			
DRDS8C	.4018 (6797) P=.000	.3703 (6797) P=.000	1.0000 (6797) P=.		
DRDS8D	.3867 (6799) P=.000	.2412 (6799) P=.000	.3096 (6797) P=.000	1.0000 (6799) P=.	
DRDS8E	.1244 (6795) P=.000	.1099 (6795) P=.000	.1028 (6794) P=.000	.0758 (6795) P=.000	1.0000 (6795) P=.

one-tailed test

Correlations for all Variables.

Pearson correlations were also calculated between all the independent variables and the dependent variable used in this study. They indicate the direction and strength of the correlations between all the variables used.

TABLE 5 ABOUT HERE

TABLE 5

PEARSON CORRELATIONS BETWEEN THE VARIABLES

	[illegible] Avoidance -drinking \driving	[illegible] Actual Certainty	[illegible] Actual Severity	[illegible] Perceived Certainty	[illegible] Perceived Severity	[illegible] Value drinking /driving	[illegible] Actual* Perceived Certainty	[illegible] Actual* Perceived Severity	[illegible] Actual Certainty * Actual Severity	[illegible] Certainty* Severity- Actual & Perceived	[illegible] Perceived Certainty * Perceived Severity
[illegible] Avoidance -drinking\ driving	1.0000 (6518)										
[illegible] Actual Certainty	.1523 (6518) P= .000	1.0000 (6518)									
[illegible] Actual Severity	.0538 (6518) P= .000	.2684 (6519) P= .000	1.0000 (6518)								
[illegible] Perceived Certainty	.2620 (6464) P= .000	.1402 (6464) P= .000	.0979 (6464) P= .000	1.0000 (6464)							
[illegible] Perceived Severity	.2215 (6518) P= .000	.0694 (6518) P= .000	.0621 (6518) P= .000	.1446 (6464) P= .000	1.0000 (6518)						
[illegible] Value drinking/ driving	-.1407 (6797) P= .000	-.0450 (6797) P= .000	-.0591 (6797) P= .001	.0267 (6450) P= .016	-.0454 (6797) P= .000	1.0000 (6797)					
[illegible] Actual * Perceived Severity	.2790 (6464) P= .000	.4914 (6464) P= .000	.1889 (6464) P= .000	.9261 (6464) P= .000	.1544 (6464) P= .000	-.0375 (6450) P= .001	1.0000 (6464)				
[illegible] Actual * Perceived Severity	.2255 (6518) P= .000	.1410 (6518) P= .000	.3486 (6518) P= .000	.1653 (6464) P= .000	.9559 (6518) P= .000	-.0542 (6797) P= .000	.2013 (6464) P= .000	1.0000 (6518)			
[illegible] Actual Certainty * Actual Severity	.1527 (6518) P= .000	.9653 (6518) P= .000	.7000 (6518) P= .000	.1416 (6464) P= .000	.0783 (6518) P= .000	-.0478 (6797) P= .000	.4428 (6464) P= .000	.2739 (6518) P= .000	1.0000 (6518)		
[illegible] Certainty* Severity - Actual & Perceived	.2969 (6464) P= .000	.4858 (6464) P= .000	.4361 (6464) P= .000	.7267 (6464) P= .000	.4494 (6464) P= .000	-.0570 (6450) P= .000	.9654 (6464) P= .000	.5533 (6464) P= .000	.5727 (6464) P= .000	1.0000 (6464)	
[illegible] Perceived Certainty* Perceived Severity	.3076 (6464) P= .000	.1659 (6464) P= .000	.1192 (6464) P= .000	.8617 (6464) P= .000	.5552 (6464) P= .000	-.0497 (6450) P= .000	.8944 (6464) P= .000	.5559 (6464) P= .000	.1664 (6464) P= .000	.8530 (6464) P= .000	1.0000 (6464)

Objective (Direct or Actual) Deterrence Indicators

Additive Model

H1: Actual (objective or direct) certainty of apprehension and actual (objective or direct) severity of punishment is inversely related to drinking and driving.

Y= A + B1C + B1S
C=Certainty; S=Severity

Correlational Analysis. The association between actual certainty and avoidance was (r=0.15) and between actual severity avoidance was (r=0.05).

Regressional Analysis. Multiple regression showed partial empirical support for the above hypothesis (F=.000). The **DRD64** (Actual Certainty) variable was significantly related to the avoidance variable for drinking and driving (p=.000); however, **DRD67A** (Actual Severity) variable was not (p=.2620). As Table 6 indicates, these two variables explained 2.3% of the variation in the dependent variable.

Whether or not a person had been stopped and checked for suspicion of drinking and driving (Actual Certainty - DRD64) was the strongest predictor, with a Beta weight of .15. The positive sign of this coefficient indicated that respondents who had been stopped and checked were more likely to take steps to avoid drinking and driving. This finding supported the hypothesis as it suggested that if the certainty of apprehension was high (respondent answered Yes, I was stopped), then one would take more steps to avoid drinking and driving.

Whether or not a person had his license suspended (Actual Severity - DRD67A) had a Beta weight of .01. Again, the positive sign indicated that respondents who had their license suspended took more steps to avoid drinking and driving; however, this variable was not statistically significant.

TABLE 6 ABOUT HERE

TABLE 6

REGRESSION EQUATION FOR AVOIDING DRINKING AND DRIVING

Actual (Objective or Direct) Deterrence

ADDITIVE MODEL

N=6818
R squared = 2.3%

Y=A + B1C + B1S

Y=(.03) + (.92C)* + (.19S) - Unstandardized slopes
[.15C]* + [.01S] - Standardized slopes

FOOTNOTE Y=PREDICTED BEHAVIOR
C=CERTAINTY OF APPREHENSION
S=SEVERITY OF PUNISHMENT

*SIGNIFICANT AT P<.05, ONE TAIL TEST.

Interactive or Multiplicative Model

H2: The interactive effects of actual (objective or direct) certainty of apprehension and actual (objective or direct) severity of punishment on drinking and driving are stronger than the additive effects.

Y=A + B1CS
C= Certainty; S=Severity; CS=Certainty * Severity (IINT)

Correlational Analysis. The interactive variable **(IINT)** was created by computing the cross-product of DRD64 and DRD67A. The association between actual certainty and actual severity multiplied together, and avoidance was (r=.13).

Regressional Analysis. The interactive term was significantly related to the avoidance variable (p=.000). As Table 7 shows, this variable explained 1.8% of the variation in the avoidance variable. Since the additive model's explained variance was 2.3% of the variance, these results were weaker than the additive effects of these two variables; therefore, they did not support the hypothesis. The Beta weight was .13 for the interactive term.

Since this analysis was significant, further analysis was carried out to see how combinations of the variables composing the interaction term might affect avoidance. When selecting the group of people who experienced low certainty (those who had never been stopped), severity was found to be significant (p=.0050), with a Beta weight of .034 and an R squared of .12%. This result indicated that if certainty of apprehension was low, then severity positively affected the steps taken to avoid drinking and driving. For the group of people experiencing high certainty, severity did not impact avoidance (p=.4202). This finding is inconsistent with theory as previous research has shown that severity impacts drinking and driving at high levels of certainty.

TABLE 7 ABOUT HERE

TABLE 7

REGRESSION EQUATIONS FOR AVOIDING DRINKING AND DRIVING

Actual (Objective or Direct) Deterrence

INTERACTIVE MODEL

N=6816

Y=A + B1CS R squared = 1.8%

Y=(.59) + (.57CS)* - Unstandardized slope

[.13CS]* - standardized slope

DECOMPOSITION OF INTERACTION

Low Certainty (DRD64 - No, I have never been stopped)

N=6499

Y=A + B1S R squared = .12%

Y=(.42) + (.72S)* - Unstandardized slope

[.03S]* - Standardized slope

High Certainty (DRD64 - Yes, I have been stopped)

N=319

Y=A + B1S R squared = .2%

Y=(2.3) + (-.19S) - Unstandardized slope

[-.05S] - Standardized slope

FOOTNOTE Y=PREDICTED BEHAVIOR
C=CERTAINTY OF APPREHENSION
S=SEVERITY OF PUNISHMENT

*SIGNIFICANT AT P<.05, ONE TAIL TEST.

Value Model

H3: When actual (objective or direct) certainty and actual (objective or direct) severity are involved, the value a person places on the behaviors of drinking and driving will be inversely related to the behavior of drinking and driving.

Y=A + B1C + B1S + B1R
C=Certainty; S=Severity; R=Rewards

Correlational Analysis. The association between the value variable, **REWARDS**, and avoidance was (r=-.14).

Regressional Analysis. The above hypothesis was supported (F=.000). A regression analysis showed two of the hypothesized predictors were significantly related to the avoidance variable. As Table 8 indicates, the three variables explained 4.1% of the variation in the avoidance variable. Whether or not a person had been stopped and checked for drinking and driving (actual certainty) was the strongest predictor with a Beta weight of .14 (p=.000). The positive sign of this coefficient indicated that if a person was stopped and checked, then that person took more steps to avoid drinking and driving. How much a person values drinking and driving (the Rewards variable) was the next strongest predictor with a Beta weight of -.13 (p=.000). Taken together, all variables were statistically significant (F=97.96; p<.05); however, again the DRD67A variable was not statistically significant and showed a very low Beta weight (.01).

Since the Rewards variable (how much the two behaviors were valued) was significant, a further analysis was conducted to ascertain how the two variables impact avoidance. A group of light drinkers was examined and then a group of heavy drinkers was examined to see how driving impacts avoidance. Both groups were significant (p=.0003 and p=0072, respectively). Beta weights for the driving variable were -.10 for both groups. These results indicated that there was no difference between the drinking groups. The negative sign of the DRIVE17 variable (frequency of driving) indicated that as the amount driven increased, so did the steps taken to avoid drinking and driving, whether or not a person was a heavy or light drinker.

When controlling for driving instead of drinking, there was very little difference found between the low level of driving group and the high level of driving. Both groups were significant (p=.000 and p=.002, respectively). Beta weights for the drinking variable were -.14 for the low driving group

and -.20 for the high driving group. The negative sign of the DRNK46 variable (alcohol consumption) indicated that as the amount of alcohol consumed increased, so did the steps taken to avoid drinking and driving, whether or not a person drove infrequently or frequently.

TABLE 8 ABOUT HERE

TABLE 8

REGRESSION EQUATIONS FOR AVOIDING DRINKING AND DRIVING

Actual (Objective or Direct) Deterrence

VALUE MODEL

N=6797
R squared=4.1%

Y=A + B1C + B1S + B1R
Y=(.33) + (.89C)* + (.14S) + (-.03R)*-Unstandardized slopes
[.14C]* + [.01S] + [-.13R]*-Standardized slopes

DECOMPOSITION OF INTERACTION

Light Drinkers (high value)

N=1362
R squared=1.5%

Y=A + B1C + B1S + B1DR
Y=(.27) + (.75C)* + (-.33S) + (-.08DR)*-Unstandardized slopes
[.08C]* + [-.01S] + [-.10DR]*-Standardized slopes

Heavy Drinkers (low value)

N=708
R squared=1.9%

Y=A + B1C + B1S + B1DR
Y=(1.7) + (.56C)* + (-.72S) + (-.12DR)*-Unstandardized slopes
[.09C]* + [-.06S] + [-.10DR)*-Standardized slopes

Light Driving Group (high value)

N=457
R squared=4.3%

Y=A + B1C + B1S + B1DK
Y=(.48) + (1.002C)* + (.03S) + (-.14DK)*-Unstandardized slopes
[.13C]* + [.001S] + [-.14DK]*-Standardized slopes

Heavy Driving Group (low value)

N=4641
R squared=6.1%

Y=A + B1C + B1S + B1DK
Y=(1.10) + (.79C)* + (.08S) + (-.19DK)*-Unstandardized slopes
[.13C]* + [.006S] + [-.20DK]-Standardized slopes

FOOTNOTE Y=PREDICTED BEHAVIOR
C=CERTAINTY OF APPREHENSION
S=SEVERITY OF PUNISHMENT
R=REWARDS
DR=DRIVE17 (AMOUNT DRIVEN)
DK=DRNK46 (ALCOHOL CONSUMPTION)
*SIGNIFICANT AT P<.05, ONE TAIL TEST.

Perceptual (Subjective or Indirect) Deterrence Indicators

Additive Model

H4: Perceived (subjective or indirect) certainty of apprehension and perceived (subjective or indirect) severity of punishment is inversely related to the behavior of drinking and driving.

Y=A + B1C + B1S
C=Certainty (PERCP); S=Severity (PENALTY)

Correlational Analysis. The relationship between perceived certainty and avoidance was (r=.26) and between perceived severity and avoidance was (r=..22).

Regressional Analysis. Findings regarding the perceived deterrence supported this hypothesis. Both certainty and severity variables were statistically significant (p=.000 for both). As Table 9 demonstrates, these two variables explained 10.4% of the variation in the avoidance variable. Perceived certainty was the strongest predictor, with a Beta weight of .23. The positive sign indicated that respondents who had friends convicted of drinking and driving (high certainty), took more steps to avoid drinking and driving. The penalty variable, with a Beta weight of .19, indicated that those who believed the more severe the usual penalty was for drinking and driving, the more steps those people took to avoid drinking and driving.

TABLE 9 ABOUT HERE

TABLE 9

REGRESSION EQUATION FOR AVOIDING DRINKING AND DRIVING

Perceived (Subjective or Indirect) Deterrence

ADDITIVE MODEL

N=6464
R squared=10.4%

Y=A + B1C + B1S
Y=(.64) + (.32C)* + (.28S)* - Unstandardized slopes
[.23C]* + [.19S]* - Standardized slopes

FOOTNOTE Y=PREDICTED BEHAVIOR
C=CERTAINTY OF APPREHENSION
S=SEVERITY OF PUNISHMENT

*SIGNIFICANT AT P<.05, ONE TAIL TEST

Interactive or Multiplicative Model

H5: The interactive effects of perceived (subjective or indirect) certainty of apprehension and perceived (subjective or indirect) severity of punishment on drinking and driving are stronger than the additive effects.

Y=A + B1CS
C=Certainty (PERCP); S=SEVERITY (PENALTY);
CS=Certainty * Severity (INT3)

Correlational Analysis. The variable **INT3** (the interactive term) was created by taking the cross-product of the variables PERCP and PENALTY (the perceived certainty and perceived severity variables). The relationship between the interactive term **(INT3)** was (r=.31).

Regressional Analysis. Findings regarding this hypothesis did not support the hypothesis, as the interactive results were weaker than the additive results. As Table 10 indicates, this variable explained 9.5% of the variation in the dependent variable, whereas in the additive model the explained variance was 10.4%. The results were statistically significant, therefore further analysis was needed.

To decompose the interaction, those people who experienced high perceived certainty were selected, as well as a group whom experienced low perceived certainty. A regression analysis was conducted on each group to show how severity impacted avoidance. Significant results were found in both groups (p=.0057 for high certainty; p=.000 for low certainty). The explained variance (4.0%) and Beta weight (.20) was a bit higher for low certainty. These results indicated that for people who experienced low certainty, severity positively impacted avoidance steps. However, there was very little difference between the low and high perceived certainty groups.

TABLE 10 ABOUT HERE

TABLE 10

REGRESSION EQUATIONS FOR AVOIDING DRINKING AND DRIVING

Perceived (Subjective or Indirect) Deterrence

INTERACTIVE MODEL

N=6464
R squared=9.5%

Y=A + B1CS
Y=(.68) + (.13CS)*-Unstandardized slope
[.31CS]*-Standardized slope

DECOMPOSITION OF INTERACTION

Low Certainty (percp)

N=4420
R squared=4.0%

Y=A + B1S
Y=(.36) + (.26S)* - Unstandardized slope
[.20S]* - Standardized slope

High Certainty (percp)

N=515
R squared=1.5%

Y=A + B1S
Y=(1.4) + (.23S)* - Unstandardized slope
[.12S]* - Standardized slope

FOOTNOTE Y=PREDICTED BEHAVIOR
C=CERTAINTY
S=SEVERITY

* SIGNIFICANT AT P<.05, ONE TAIL TEST

Value Model

H6: When perceived (subjective or indirect) certainty of apprehension and perceived (subjective or indirect) severity of punishment are involved, the value a person places on the behaviors of drinking and driving will be inversely related to drinking and driving.

Y= A + B1C + B1S + B1R
C=Certainty (Percp);S=Severity (Penalty);R=Rewards

Regressional Analysis. These findings supported the hypothesis. A regression analysis showed all three of the hypothesized predictors were significantly related to the avoidance variable. As Table 11 indicates, these three variables explained 12% of the variation in the avoidance variable (p=.000). Perceived certainty was the strongest predictor, with a Beta weight of .23. The positive sign indicated that if a person had friends or relatives who were convicted of drinking and driving, the more likely that person was to take steps to avoid drinking and driving. The next strongest predictor, with a Beta weight of .18, was the severity variable (penalty). The positive sign indicated that a person who believed the usual penalty for drinking and driving was severe (jail), the more steps he would take to avoid drinking and driving. The weakest predictor was REWARDS, with a Beta weight of -.12.

Since drinking and driving behaviours were multiplied together, they constitute an interactive term. Because this variable was significant, a decomposition was calculated to see how drinking and driving behaviors interact. Both groups of people, the heavy drinkers and the light drinkers, were separately held constant and a regression analysis was conducted with the other variables. Both groups were significant (light drinkers=p=.0002; heavy drinkers=p=.0070). Both have Beta weights of (-.10), indicating that driving a lot increases avoidance steps for both heavy and light drinkers. However, for the heavy drinking group, high levels of driving explained 19% of the variation in the avoidance variable. This result showed that the amount of driving was a better predictor for avoidance for the heavy drinking group rather than for light drinking group, but only marginally.

Again, the heavy drivers and the light drivers were separately held constant and a regression analysis was conducted with the other variables. Both groups were significant (light drivers=p=.005; heavy drivers=p.000). Both have Beta weights of (-.13 and -.18 respectively), indicating that drinking a lot increases avoidance steps for both heavy and light drivers. For the heavy driving group, high levels of drinking explained 14% of the variation in the avoidance

variable. This result showed that the amount of drinking was a better predictor for avoidance for the heavy driving group rather than for the light driving group, but again only marginally.

In the drinking groups, the Beta weight for the perceived certainty of apprehension increased dramatically between the light drinkers and the heavy drinkers; however, it did not in the driving groups.

TABLE 11 ABOUT HERE

TABLE 11

REGRESSION EQUATIONS FOR AVOIDING DRINKING AND DRIVING

Perceived (Subjective or Indirect) Deterrence

VALUE MODEL

N=6450
R squared=12.0%

Y=A + B1C + B1S + B1R
Y=(.26) + (.32C)* + (.27S)* + (-.03R)* - Unstandardized slopes
[.23C]* + [.18S]* + [-.12R]* - Standardized slopes

DECOMPOSITION OF INTERACTION

Light Drinkers (high value)

N=1304
R squared=8%

Y=A + B1C + B1S + B1DR
Y=(-.01) + (.17C)* + (.22S)* + (-.09DR)*-Unstandardized slope
[.15C]* + [.20S]* + [-.10DR]*-Standardized slope

Heavy Drinkers (low value)

N=664
R squared=19%

Y=A + B1C + B1S + B1DR
Y=(.06) + (.47C)* + (.32S)* + (-.11DR)*-Unstandardized slopes
[.34C]* + [.21S]* + [-.10DR]*-Standardized slopes

Light Drivers (high value)

N=444
R squared=11.8%

Y=A + B1C + B1S + B1DK
Y=(.43) + (.37C)* + (.21S)* + (-.12DK)*-Unstandardized slopes
[.27C]* + [.13S]* + [-.13DK]*=Standardized slopes

Heavy Drivers (low value)

N=4396
R squared=14%

Y=A + B1C + B1S + B1DK
Y=(.85) + (.30C)* + (.26S)* + (-.17DK)*-Unstandardized slopes
[.23C]* + [.18S]* + [.-.18DK]*-Standardized slopes

FOOTNOTE Y=PREDICTED BEHAVIOR
C=CERTAINTY OF APPREHENSION
S=SEVERITY OF PUNISHMENT
R=REWARDS
DR=DRIVE17 (AMOUNT DRIVEN)
DK=DRNK46 (ALCOHOL CONSUMPTION)

*SIGNIFICANT AT P<.05, ONE TAIL TEST.

Actual and Perceptual Deterrence Model

Additive Model

H7: Actual (objective or direct) and perceived (subjective or indirect) certainty of apprehension and actual (objective or direct) and perceived (subjective or indirect) severity of punishment is inversely related to drinking and driving.

Y=A + B1DCIC + B1DSIS
DC=Direct Certainty (DRD64); IC=Indirect Certainty (PERCP); DCIC=Direct Certainty * Indirect Certainty (CERT); DS=Direct Severity (DRD67A); IS=Indirect Severity (SEV)

Correlational Analysis. A new certainty variable called **CERT** was created by multiplying the actual certainty variable and the perceived certainty variable together. A new severity variable called **SEV** was created by multiplying the actual severity variable and the perceived severity variable. The association between actual and perceived certainty of apprehension and avoidance was (r=.28) and between actual and perceived severity of punishment and avoidance was (r=.22).

Regressional Analysis. These findings supported the hypothesis (F=.000). These new variables explained 10.7% of the variation in the dependent variable (COMP). The Beta weights for CERT were .24 and .18 for SEV. Since the results were significant, it was necessary to decompose the interactive terms.

The group of people who experienced low actual certainty were selected. (Those people who said, "No, I have never been stopped"). Also, those people who experienced high actual certainty were selected. (Those people who said, "Yes, I have been stopped"). A regression analysis was done with predictor variables. There was very little difference found between the two groups of people. Both groups were significant p=.000. For both groups (low actual certainty and high actual certainty), increased perceived certainty increased avoidance steps.

To decompose the severity interactive term, a group of people who experienced low actual severity were selected (those people who had not lost their licence). Also, the group of people who experienced high actual severity (those people who lost their license), were selected. A regression analysis with the predictors revealed that only the low actual

severity group was significant (p=.000). This finding revealed that perceived severity positively and significantly impacted steps taken, when actual severity was low. When actual severity was high, perceived severity had no impact on avoidance.

TABLE 12 ABOUT HERE

TABLE 12

REGRESSION EQUATIONS FOR AVOIDING DRINKING AND DRIVING

Actual and Perceived Deterrence

ADDITIVE MODEL

N=6464
R squared=11%

Y=A + B1DCIC + B1DSIS
Y=(.18) + (.27DCIC)* + (.24DSIS)* - Unstandardized slopes
[.24DCIC]* + [.18DSIS]* - Standardized slopes

DECOMPOSITION OF INTERACTION

Low Actual Certainty

N=6161
R squared=9%

Y=A + B1IC + B1DSIS
Y=(.09) + (.30IC)* + (.25DSIS)* - Unstandardized slope
[.22IC]* + [.22DSIS]* - Standardized slope

High Actual Certainty

N=303
R squared=11%

Y=A + B1IC + B1DSIS
Y=(.99) + (.31IC)* + (.13DSIS)* - Unstandardized slope
[.27IC]* + [.12DSIS]* - Standardized slope

Low Actual Severity

N=6400
R squared=11%

Y=A + B1DCIC + B1IS
Y=(.09) + (.28DCIC)* + (.27IS)* - Unstandardized slope
[.25DCIC]* + [.18IS]* - Standardized slope

High Actual Severity

N=64
R squared=5%

Y=A + B1DCIC + B1IS
Y=(.30) + (.09DCIC) + (.43IS) - Unstandardized slope
[.15DCIC] + (.14IS] - Standardized slope

FOOTNOTE Y=PREDICTED BEHAVIOR
DC=DIRECT CERTAINTY OF APPREHENSION
IC=INDIRECT CERTAINTY OF APPREHENSION
DS=DIRECT SEVERITY OF PUNISHMENT
IS=INDIRECT SEVERITY OF PUNISHMENT

* SIGNIFICANT AT P<.05, ONE TAIL TEST

Interactive or Multiplicative Model of Deterrence

H8: The interactive effects of actual (objective or direct) and perceived (subjective or indirect) certainty of apprehension and actual (objective or direct) and perceived (subjective or indirect) severity of punishment on drinking and driving are stronger than the additive effects.

Y=A + B1DCICDSIS = Y=A + B1CS
DCIC=Direct Certainty * Indirect Certainty (CERT);
DSIS=Direct Severity * Indirect Severity (SEV);
DCICDSIS=CERT * SEV (INT2)

Correlational Analysis. The variable **INT2** was created by multiplying the CERT and SEV variables together, which stated that direct and indirect certainty and direct and indirect severity, when multiplied, will impact the dependent variable. The association between certainty and severity and avoidance was (r=..29).

Regressional Analysis. This new variable explained 8.4% of the variation in the dependent variable. These findings did not support the hypothesis as the additive model showed 10.7% explained variance. This interactive variable was statistically significant and had a Beta weight of .29, as shown in Table 13. Since this variable was statistically significant, further analysis was necessary to decompose the interaction.

If certainty was either low or high, severity positively and significantly impacted steps taken (p=.000 and p=.051, respectively); however, when certainty was low, severity was a better predictor. It explained 3.6% of the variance in the dependent variable and had a Beta weight of .19.

These findings revealed that it made very little difference if you had been, or had not been, stopped, or if you had a friend who had or had not drunk and drove; a person would take more avoidance steps if the penalty was severe. However, the small difference indicated a person who had not been stopped or had not had a friend who had driven drunk, would take more steps when the penalty was severe.

TABLE 13 ABOUT HERE

TABLE 13

REGRESSION EQUATIONS FOR AVOIDING DRINKING AND DRIVING

Actual and Perceptual Deterrence

INTERACTIVE MODEL

N=6464

Y=A + B1DCICDSIS R squared=8.5%

Y=(.82) + (.09DCICDSIS)* - Unstandardized slope

[.29DCICDSIS]* - Standardized slope

DECOMPOSITION OF INTERACTION

Low Actual and Perceived Certainty

N=4291

Y=A + B1DSIS R squared=3.5%

Y=(.39) + (.24DSIS)* - Unstandardized slope

[.19DSIS]* - Standardized slope

High Actual and Perceived Certainty

N=614

Y=A + B1DSIS R squared=.9%

Y=(1.7) + (.12DSIS)* - Unstandardized slope

[.10DSIS]* - Standardized slope

FOOTNOTE Y=PREDICTED BEHAVIOR
DC=DIRECT CERTAINTY OF APPREHENSION
IC=INDIRECT CERTAINTY OF APPREHENSION
DS=DIRECT SEVERITY OF PUNISHMENT
IS=INDIRECT SEVERITY OF PUNISHMENT

* SIGNIFICANT AT P<.05, ONE TAIL TEST

Value Model of Deterrence

H9: When actual (objective or direct) and perceived (subjective or indirect) certainty of apprehension and actual (objective or direct) and perceived (subjective or indirect) severity of punishment are involved, the value a person places on the behaviors of drinking and driving will be inversely related to drinking and driving.

Y=A + B1DCIC + B1DSIS + B1R
DCIC=Direct Certainty * Indirect Certainty (CERT);
DSIS=Direct Severity * Indirect Severity (SEV);
R=Rewards.

Regressional Analysis. These findings supported the hypothesis. All the variables were statistically significant and explained 12.3% of the variation in the avoidance variable, as presented in Table 14. Since the results were significant (F=.000), a decomposition of the interactive term was calculated to see how drinking and driving behaviors interact.

Both groups of people, the heavy drinkers and the light drinkers were selected, and a regression analysis was computed on the other variables. Both groups were significant (light drinkers and heavy drinkers p=.000), and both groups had similar Beta weights (light drinkers -.10; heavy drinkers -.09), indicating that driving negatively impacted the avoidance steps for both groups. However, the R squared increased to 4.3%, which revealed that for the heavy drinkers driving was a better predictor for avoidance steps, than it was for light drinkers. This was not a dramatic improvement.

Again, the both groups of people, the heavy drivers and the light drivers were selected, an a regressional analysis was computed on the other variables. Both groups were significant (light drivers p=.007; heavy drivers p=.000). Beta weights for the two groups were (light drivers -.12; heavy drivers -.18), indicating that drinking negatively impacted the avoidance steps for both driving groups. However, the R squared increased to 13.9% =, which revealed that for the heavy drivers drinking was a better predictor for avoidance, but only marginally.

In this model there was a dramatic increase in the certainty of apprehension from the light drinkers to the heavy drinkers; however, no increase was noted in the driving groups.

TABLE 14 ABOUT HERE

TABLE 14

REGRESSION EQUATIONS FOR AVOIDING DRINKING AND DRIVING

Actual and Perceptual Deterrence

VALUE MODEL

N=6450
Y=A + B1DCIC + B1DSIS + B1R R squared = 12.3%
Y=(.40)+(.26DCIC)*+(.23DSIS)*+(-.03R)*-Unstandardized slopes
[.24DCIC]* +[.17DSIS]* +[-.12R]*-Standardized slopes

DECOMPOSITION OF INTERACTIONS

Light drinkers (DRNK46 - high value)

N=1304
Y=A + B1DCIC + B1DSIS + B1DR R squared=8%
Y=(-.00)+(.16DCIC)*+(.21DSIS)*+(-.00DR)*-Unstandardized slopes
[.15DCIC]*+[.20DSIS]*+[-.10DR]*-Standardized slopes

Heavy drinkers

N=664
Y=A + B1DCIC * B1DSIS + B1DR R squared=14.3%
Y=(.47)+(.29DCIC)*+(.24DSIS)*+(-.10DR)*-Unstandardizedslopes
[.29DCIC]*+[.17DSIS]*+[-.09DR]*-Standardized slopes

Light Driving (DRIVE17 - high value)

N-444
Y=A + B1DCIC + B1DSIS + B1DK R squared=11.1%
Y=(.58)*+(.29DCIC)*+(.17DSIS)*+(-.12DK)*-Unstandardized slopes
[.25DCIC]*+[.12DSIS]*+[-.12DK]*-Standardized slopes

Heavy Driving (DRIVE17 - low value)

N=4396
Y=A + B1DCIC + B1DSIS + B1DK R squared=13.9%
Y=(.98)+(.24DCIC)*+(.22DSIS)*+(-.17DK)*-Unstandardizedslopes
[.23DCIC]*+[.17DSIS]*+[-.18DK]*-Standardized slopes

FOOTNOTE Y= PREDICTED BEHAVIOR
DC=DIRECT CERTAINTY OF APPREHENSION
IC=INDIRECT CERTAINTY OF APPREHENSION
DS=DIRECT SEVERITY OF PUNISHMENT
IS=INDIRECT SEVERITY OF PUNISHMENT
DR=DRIVE17 (AMOUNT DRIVEN)
DK=DRNK46 (ALCOHOL CONSUMPTION)
R= REWARDS

* SIGNIFICANT AT P<.05, ONE TAIL TEST.

CHAPTER 6

Conclusions of the Findings

Summary of Findings

Most results of this study were significant, but, again, due to the sample size these should be viewed cautiously. The R squared values ranged from 1.8% to 12.3% for the deterrence models. The best model was the non-linear one that looked at actual and perceived certainty and actual and perceived severity as a multiplicative term and the rewards or value variable. This finding shows that the direct and indirect experiences, as well as the amount of both drinking and driving a person does impacts how many steps he takes to avoid drinking and driving. This model gives support for Stafford and Warr's (1993) reconceptualization of specific and general deterrence.

Perceived certainty and severity impact the avoidance of drinking and driving more than the actual certainty and severity. In other words, vicarious experience seemed to prompt a person to take more steps to avoid drinking and driving than actual experience. There could be a couple of explanations for this finding.

The first explanation involves the accuracy of the variables. The variables used could be inadequate indicators for actual certainty and actual severity. The variable DRD67A used as a measure of actual severity of punishment, when taken alone, was not significant. One could conclude that this variable was not a good indicator of actual severity. Because this was the only possible severity of punishment indicator for direct experience, this exemplifies one of the limitations of using secondary data. This particular survey did not have other questions that could be used as a severity measure so therefore may not be an accurate test of the deterrence model. Also, this variable only measured licence suspension and therefore it could be argued that the actual experience of losing one's licence would not be as great a deterrence as the actual experience of going to jail.

The next explanation is that this finding could indicate that the risk of apprehension and the severity of punishments is greater if one only hears about it, rather than experiencing it directly. If this is the case, perhaps efforts should be made to increase media reporting of impaired driving incidents. Such efforts are being made on television advertisements that simulate the aftermath of a motor vehicle accident caused by an impaired driver.

The interactive model for the actual, perceived, and actual x perceived certainty and severity, was the weakest model. In each case, the interactive model showed weaker results than the additive model. The interactive terms were significant, indicating some interaction; but since the results were weaker than the additive, it would appear that the variables could have better predictive power used independently. In all cases, severity positively impacted avoidance, when certainty was low; and either did not make much difference or did not impact avoidance at all, when certainty was high. Thus, if certainty was low, then severity had to be high to increase steps taken to avoid drinking and driving.

Logically, this does make sense. Even if the certainty of being caught is low or perceived as low, people should take steps to avoid drinking and driving when the severity of punishment is high. This, however, is contrary to what some researchers, such as Ross (1982) have found. This could be explained by the fact that Ross used official crime records, whereas this study used self-reported data. This may indicate that Canadians, although they are aware that detection is low, may be more deterred by the severity of the law. There may be something unique in how Canadians view the law.

When the Rewards variable was introduced, it improved the predictive power significantly, in each model. When decomposed, the interactive term showed little difference between heavy and light drinkers, indicating the variables are probably better used independently. There was a marginal difference when the heavy drinking group was selected; driving was found to negatively effect the steps taken to avoid drinking and driving. However, there was a dramatic increase in the certainty of apprehension between the light and heavy drinkers. It is not clear why this occurred, but perhaps it indicates that heavy drinkers perceive the certainty of apprehension higher and thus take more steps to avoid impaired driving. These two variables, drinking and driving, have been given insufficient attention in impaired driving research. It may be that they should be looked at independently; however, they should be considered. The whole notion of whether the privilege of both drinking and driving is considered valuable by Canadians is an important concept that should not be ignored when studying impaired driving.

When the interactive effects of actual and perceived certainty were decomposed, it was found that perceived certainty positively impacted avoidance, when actual certainty was low or high. In other words, for a person who had been stopped (high actual certainty) or had not been stopped (low actual certainty) more avoidance steps were taken when perceived threat of apprehension was high. When the

interactive effects of actual and perceived severity were decomposed, it revealed that perceived severity positively impacted avoidance, when actual severity was low but not when it was high. Thus, if a person did not lose his license (actual severity), more avoidance steps were taken when the perceived penalty was high (the person believed the usual penalty was jail). The research done in this regard has been given little attention, as most studies focus on either direct experience or indirect experience. These results clearly indicate that more work should be done looking at both the direct and indirect experiences of people at the same time.

Limitations of the Study

At this point the writer wants to caution the reader as to the purpose of the study and the implications of the findings. The variables used were continuous variables; however, they were not, in some cases, interval scales but were ordinal. These ordinal measurements were used as interval whereby they showed rank order but did not have a metric. Thus, they could be interpreted as higher or lower, but could not be said to have a specific unit of measurement. When used in the regression equation, the Beta weights were reported. Since the variables were used to compare models, this was an acceptable analysis. However, this data and analysis could not be used to predict avoidance of impaired driving.

Although the exploratory nature of the research is well suited to secondary data analysis and allows for an affordable research design, as well as a large randomly drawn sample; there are also some major constraints. One restraint is that the researcher must compromise on the operationalization and measurement of certain concepts. In this case it is the actual certainty of apprehension and the actual severity of punishment variables, as discussed earlier.

Other limitations of the study are as follows:

(1) People's perceptions may not be accurate - they may forget, lie or distort actual occurrences in order to put themselves in the best light. It is believed that people will be more likely to admit involvement in a criminal behavior if they think it is a non-serious offense. It could be argued that people are more likely to report involvement in drinking and driving as often this crime is not seen as particularly heinous. On the other hand, studies have revealed that people readily admit to driving everyday, but are more reluctant to admit to drinking every day. Therefore, heavy drinking may be underrreported. Also, admitting to alcohol consumption may be age and gender specific. Females are less likely to report drinking and driving and are less likely to report heavy

drinking. It should be kept in mind that females do not drive as much as males and therefore should not drink and drive as much as men. Also, younger people tend to report more drinking as they believe that it is okay to get drunk once in awhile. (Wilson, 1984; p.44)

(2) There is little variability in the responses to the questions. Most questions are answered by a yes or no; or were left blank or checked.

(3) Due to the large sample, statistically significant findings may, in fact, not manifest very high degrees of association.

(4) Questions are lacking in future drinking and driving behavior and questions pertaining to the respondent's perception of his own risk as well as the respondent's perception of the risk to others.

(5) The absence of respondents from correctional institutions may ignore impaired drivers who are receiving treatment or who are incarcerated.

(6) This is a very long and complicated survey. The respondents may have become bored and answered incorrectly or the investigator may have become bored or mixed up in interviewing.

(7) Variables to test the impact of celerity on drinking and driving are missing. It could be that celerity is the intervening variable that connects certainty and severity together, at least in people's minds.

(8) There are no open-ended questions. One important question could be "What stops or deters you from drinking and driving?" This could have been an insightful question.

It is suggested that other variables, such as the value predictor used in this study (alcohol consumption and amount of driving), may improve a deterrence model or as Homel (1988; p.71) concludes, a legal intervention may influence non-legal sanctions or non-legal sanctions may influence legal sanctions. They argue that informal sanctions, such as moral commitment, peer influence, lifestyle behaviors, or risk behaviors, may be better indicators of deterrence, or that these variables may influence the formal indicators. This argument has been suggested by many researchers (Keane, 1993; Snortum, 1988; Williams and Hawkins, 1986; Silberman, 1976; and Anderson, Chiricos & Waldo, 1975).

Although common sense would appear to indicate that punishment must have some effect in preventing drinking and

driving, the empirical results are not that clear. It may be that legal sanctions do deter, but not generally. In other words, for specific results for particular offenders, maybe other factors must be considered to fill this void for specific offenses. According to Griffiths and Verdun-Jones (1989; p.326) the threat of punishment is a central and multi-dimensional factor of information processed by individuals faced with various motivations. Thus, it could be that each offence must consider different factors for different individuals.

In response to deterrence theories, it has been argued that a too narrow of a view has been used to explain how legal threats discourage crime. Researchers (Homel, 1988; and Williams and Hawkins, 1986) argue that the legal intervention may influence non-legal sanctions. Williams and Hawkins argue that deterrence effects of legal interventions may be affected by informal sanctions such as commitment costs, attachment costs, and the stigma of arrest. Commitment costs refer to the possibility that arrest may jeopardize a person's investment in a legitimate activity. For instance, a person may lose his job if he is arrested for impaired driving. Attachment costs refer to the costs associated with losing the respect of friends or family members if one is arrested for impaired driving. Finally, the stigma of arrest relates to the fact that being arrested for impaired driving may injure one's reputation. Williams and Hawkins emphasize there is a lower stigma associated with driving while impaired than there is with being arrested for this action. Thus, it could be the fear of embarrassment of arrest rather than the fear of arrest that deters one from drinking and driving. Sometimes, having formal sanctions in place make it easier for a person to resist the behavior of drinking and driving.

Suggestions for Future Research

It has been argued that knowledge about the person who drinks and drives should guide the design of more effective programs and direct countermeasures toward this high risk group. According to Jacobs (1989; p. 53), the profile of a person who drinks and drives is a male, white, rural driver, of no specific socioeconomic background. Seventy percent of those charged with impaired driving were found to be under 40 years of age with 25-29 year olds the most over-represented group (Locke, 1990; p.2). Jacobs concludes: "There is neither a single explanation for drunk driving nor a single type of drunk driver". He believes that it is impossible to determine the precise amount of drunk driving and the precise identity of drunk drivers. Following these statements, it would appear that drunk driving is a complex activity that includes many, many factors. Although it may be an activity that is never eliminated completely, it is one that can be reduced. The aim

then must be to select those factors that are most salient. Thus, it would appear that there is a need for other types of research than survey. Experiments or case studies that utilize in-depth interviews may shed more light on why some people are deterred from drinking and driving and why some reoffend.

In an attempt to test Gottfredson and Hirschi's (1990) "General Theory of Crime", Keane, Maxim and Teevan Jr. (1993) examined drinking and driving, self-control, and gender. Central to the General Theory is the assumption that most criminal behavior is impulsive and reflects a lack of self-control. Thus criminals are seen as risk takers who are less restrained than noncriminals from illegal activities. Keane et al. use secondary analysis of data from a roadside traffic survey and examine the relationship between self-control and driving under the influence of alcohol. Using several indicators of self-control, the results support the existence of a relationship for both men and women between low self-control and driving under the influence of alcohol. While this examination is interesting and should be tested further, it would be wise to explore the theoretical notion of a general theory for all crime. A general theory pursues the idea of the commonalties of all crime, but tends to forget the differences. In other words, to argue that theft and murder are both acts that invade the privacy of individuals may be true; however, there appears to be quite a difference between the two behaviors. Those people who are involved in theft may have very different reasons for not murdering than a person who is involved in murder but refrains from theft. Consequently, one may see the common behavior of risk takers in people who drink and drive as well as people who steal; however, the explanations for deterring these two activities may be quite different.

It is not the intention of this paper to examine this issue fully. Suffice it to say that with respect to drinking and driving, research should be conducted on lack of self-control predictors; however, other causes should not be ignored.

Such other causes to be considered may include a social psychology theory that suggests the frequency of a behavior matches the frequency of reinforcement. Stafford et al. (1986) tested a satisfaction balance model which is a modified matching equation and found that the interactive effects of certainty and severity were greater than the additive model. They concluded that a theory of deterrence should include formal punishments, informal punishments, as well as normative constraints on behavior. Stafford et al.'s satisfaction balance model deserves further study with respect to drinking and driving.

Finally, concentrated research should be done on the chronic impaired driver. This group of drivers may require special efforts of deterrence and may prove to be a unique group that should be separated from the occasional impaired driver. This group of impaired drivers is the most serious group of impaired drivers and one that Canadians should be wanting to deter because they are the most at risk for being involved in motor vehicle accidents.

Suggestions for Future Deterrence of Drinking and Driving

It may be that it is more realistic to expect a restrictive deterrence (Homel, 1988). This means there is a curtailment or reduction in a criminal activity for a period of time because of the fear of punishment. (This is contrary to absolute deterrence which denotes instances where an individual has refrained throughout life from a particular criminal act at least in part because of fear of punishment.) (Homel, 1988; p. 28) It may be more realistic to aim for restrictive deterrence with drinking and driving as it still is not considered a serious offense and most people who drink and drive report having driven when they have had too much to drink, at least once. This may be more realistic until such time as the attitude changes toward drinking and driving and becomes encultured in our society.

Other researchers, such as Ross (1982; p. 113-115) argue that:

> impaired driving cannot be curbed with programs based on deterrence theory... that other environment strategies such as air bags, better road designs, and an ignition inter-lock fitted with a breath testing device so the vehicle will not start unless the driver has 'passed'; would be more effective.

Researchers (Friedland et al., 1990; Jacobs 1989; Sleet, Wagenaar & Waller, 1989; Liban, Vingilis and Blefgen, 1985; and Ross, 1982) suggest the need for a multi-disciplinary dimension, including education and environmental designs, to deter the heterogenous drinking driver. They suggest:

(1) deterrence through social control strategies - both formal and informal;
(2) deterrence through civil liability and insurance surcharges;
(3) deterrence through incapacitation;
(4) deterrence through public education;
(5) deterrence through opportunity blocking strategies making it more difficult to offend; i.e., restructure of the environment, such as closing bars

earlier, raising the drinking age, using interlocking devices that make the vehicle inoperable if the driver is intoxicated, making vehicles safer with air bags, making road designs safer;

(6) deterrence through treatment strategies - change future behavior by rehabilitation that focuses on:
(a) Therapy that aims to cure pathological drinking by stressing personality and emotional traits.
(b) Education that aims to cure poor judgment by stressing the facts.

Finding the right balance between all the listed countermeasures is one of the most important issues in the use of drinking and driving strategies. It is, perhaps, naive that a resurgence of deterrence in recent reform movements emphasizes extending and strengthening the criminal justice system rather than limiting its scope and focusing on a combination of other countermeasures.

Whatever future policies are proposed, it would appear beneficial to implement those that attempt to increase social control, rather than decrease the behavior of drinking and driving. Recent trends in education and child rearing are now focusing on positive reinforcement, rather than punishment, in order to shape behavior. This new approach is meeting with much success. Thus, future social policy for drinking and driving may look at strengthening the controls that govern positive behavior as a way to reduce the drinking and driving behaviour.

REFERENCES

Anderson, L., Chiricos, T., and Waldo, G. (1977). Formal and informal deterrent effects. Social Problems, 25: 103-114.

Bailey, W. C. and Lott, R. P. (1976). Crime, punishment and personality: An examination of the deterrence question. Journal of Criminal Law and Criminology, 67: 99-109.

Berger, D. E. and Snortum, J. R. (1986). A structural model of drinking and driving, alcohol consumption, social norms and moral commitments. Criminology, 24(1): 139-153.

Berger, D. E., Snortum, J. R., Homel, R. J., Hauge, R. and Loxley, W. (1989). Paper presented at the 11th International Conference on Alcohol, Drugs and Traffic Safety, Chicago. Deterrence and Prevention of Alcohol-Impaired Driving in Australia, the United States and Norway. Science Quarterly: Academy of Criminal Justice Science, 7(3),(September): 453-465.

Bungey, J. B. and Frauenfelder, J. L. (1986). Modifying drink driving behavior. Australian Journal of Social Issues, 21(2): 105-118.

Canadian Bar Association. (1986). The Role of the Minimum Drinking Age and Imprisonment in Controlling Impaired Driving in Alberta. Alberta Branch.

Friedland, M., Trebilock, M. and Roach, K. (1990). Regulating traffic safety, pp. 165-324. In Securing Compliance: Seven Case Studies. Edited by M. L. Friedland. Toronto: University of Toronto Press.

Grasmick, H. G. and Bryjak, G. J. (1980). The deterrence effect of perceived severity of punishment. Social Forces, 59(2): 471-491.

Grasmick, H. G. and Green, D. E. (1980). Legal punishment, social disapproval and internalization as inhibitors of illegal behavior. The Journal of Criminal Law and Criminology, 71(3): 325-335.

Green, D. E. (1986). The Social Control of the Drinking Driver. Minnesota: Faculty of the Graduate School of the University of Minnesota. In partial fulfillment of the requirements for the Degree of Doctor of Philosophy.

Green, D. E. (1989). Measures of illegal behavior in individual-level deterrence research. Journal of Research in Crime and Delinquency, 26(3): 253-275.

Green, D. E. (1990). Measuring self-reported deviance: Cross-sectional or panel data? Social Science Research, 19: 301-321.

Griffiths, C. T. and Verdun-Jones, S. N. (1989). Canadian Criminal Justice. Ontario: Butterworths Canada Ltd.

Homel, R. (1988). Policing and Punishing the Drinking Driver: A Study of General and Specific Deterrence. New York: Springer-Verlag.

Homel, R. (1990). Crime on the Roads: Drinking and Driving, pp. 67-82. Proceedings of a conference held 4-6 April, 1989. Australian Institute of Criminology Canberra, ACT, edited by J. Vernoon.

Jacobs, J.B. (1989). Drinking and Driving: An American Dilemma. Chicago: University of Chicago Press.

Jensen, G. F., Erickson, M. L., Gibbs, J. P. (1978). Perceived risk of punishment and self-reported delinquency. Social Forces, 57(1), (September): 57-78.

Jernigan, D. H. and Mosher, J. F. (1987). Preventing alcohol-related motor vehicle crashes: A policy agenda for the nation. Contemporary Drug Problems, (Summer): 243-278.

Johnson, H. (1989). Impaired driving offenses. Canadian Social Trends. Ottawa: Statistics Canada: 2-5.

Keane, C., Maxim, P.S., Teevan, J. J. Jr. (1993). Drinking and driving, self-control, and gender: Testing a general theory of crime. Journal of Research in Crime and Delinquency, 30(1), (February): 30-46.

Legge, J. S. Jr. (1990). Reforming highway safety in New York State: An evaluation of alternative policy interventions. Social Science Quarterly, 71(2): 373-382.

Liban, C. B., Vingilis, E., and Blefgen, H. (1985). Drinking-Driving Countermeasure Review: The Canadian Experience. Toronto: Addiction Research Foundation.

Liska, A. E. (1987). Perspectives on Deviance. 2nd ed. New Jersey: Prentice-Hall Inc.

Locke, D. (1991). Trends in impaired driving statistics 1990. Juristat. Ottawa: Statistics Canada, 11(13): 1-13.

Minor, W. and Harry, J. (1982). Deterrent and experiential effects in perceptual deterrence research: A replication and extension. Journal of Research in Crime and Delinquency, (July): 190-203.

Norstrom, T. (1983). Law enforcement and alcohol consumption policy as countermeasures against drunken driving: Possibilities and limitations. Accident Analysis and Prevention, 15(6): 513-521.

Paternoster, R., Saltzman, L. E., Chiricos, T. G., and Waldo, G. P. (1982a). Causal ordering in deterrence research: An examination of the perceptions/behavior relationship. Deterrence Reconsidered:Methodological Innovations. J. Hagan (ed.). Beverly Hills: Sage Publications.

Paternoster, R., Saltzman, L. E., Chiricos, T. G., and Waldo, G. P. (1982b). Perceived risks and deterrence methodological artifacts in perceptual deterrence research. Journal of Criminal Law and Criminology, 73: 1238-58.

Paternoster, R., Saltzman, L. E., Waldo, G. P., and Chiricos, T. G. (1983a). Perceived risk and social control: Do sanctions really deter? Law and Society Review, 17: 457-79.

Paternoster, R., Saltzman, L. E., Waldo, G. P., and Chiricos, T. G. (1983b). Estimating perceptual stability and deterrent effects: The role of perceived legal punishment in the inhibition of criminal involvement. Journal of Criminal Law and Criminology, 74: 270-297.

Paternoster, R. (1987). The deterrent effect of perceived certainty and severity of punishment: A review of the evidence and issues. Justice Quarterly, 4(2): 173-217.

Ross, H. L. (1982). Deterring the Drinking Driver: Legal Policy and Social Control. Toronto, Canada: Lexington Books.

Ross, H. L., McCleary, R. and Epperlein, T. (1981-1982). Deterrence of drinking and driving in France: An evaluation of the Law of July 12, 1978. Law & Society Review, 16(3): 345-374.

Ross, H. L. and Blumenthal, M. (1975). Some problems in experimentation in a legal setting. The American Sociologist, 10, (August): 150-155.

Ross, H. L. (1987). Britain's Christmas crusade against drinking and driving. Journal of Studies on Alcohol, 48(5): 476-482.

Saltzman, L., Paternoster, R., Waldo, G. P., and Chiricos, T. G. (1982). Deterrent and experiential effects: The problem of causal order in perceptual deterrence research. Journal of Research in Crime and Delinquency, (July): 172-189.

Shapiro, P. and Votey, H. L. Jr. (1984). Deterrence and subjective probabilities of arrest: Modelling individual decisions to drink and drive in Sweden. Law and Society Review, 18(4): 583-604.

Shore, E. and Maguin E. (1988). Deterrence of drinking-driving: The effect of changes in the Kansas Driving Under the Influence Law. Evaluation and Program Planning, 11: 245-54.

Silberman, M. (1976). Toward a theory of criminal deterrence. American Sociological Review, 41 (June): 442-461.

Silverman, R. A., Teevan, J. J. Jr., and Sacco, V. F. (1991). Crime in Canadian Society, 4th ed. Vancouver: Butterworths.

Sleet, D. A., Wagenaar, A. C., and Waller, P. T. (1989). Introduction: Drinking, driving and health promotion. Health Education Quarterly, 16(3), (Fall): 329-333.

Snortum, J. R. (1988). Deterrence of alcohol-impaired driving: An effect in search of a cause, pp. 189-226. In M.D. Laurence, J. R. Snortum and F. E. Zimring (eds.). Social Control of the Drinking Driver. Chicago: University of Chicago Press.

Stafford, M. C., Gray, L. N., Menke, B. A., and Ward, D. A. (1986). Modelling the deterrent effects of punishment. Social Psychology Quarterly, 49(4): 338-347.

Stafford, M.C. and Warr, M. (1993). A reconceptualization of general and specific deterrence. Journal of Research in Crime and Delinquency, 30(2): 123-135.

Teevan, J. J. Jr. (1976a). Deterrent effects of punishment: Subjective measures continued. Canadian Journal of Criminology and Corrections, 18: 153-160.

Teevan, J. J. Jr. (1976b). Subjective perception of deterrence (continued). Journal of Research in Crime and Delinquency, (July): 155-164.

Traffic Injury Research Foundation of Canada and Road Safety and Motor Vehicle Regulation Directorate Transport Canada. (1987). Smashed: The Magazine on Drinking and Driving. Ottawa: Ontario: 1-40.

Vingilis, E. (1990). A new look at deterrence model, pp. 99-115. In Drinking and Driving Advances in Research and Prevention. Edited by R. J. Wilson and R. E. Mann. New York: Guilford.

Vingilis, E., Blefgen, H., Lei, H., Sykora, K. and Mann, R. E. (1988). An evaluation of the deterrent impact on Ontario's 12 hour licence suspension law. Accident Analysis and Prevention, 20: 9-17.

Williams, K. R. and Hawkins, R. (1986). Perceptual research on general deterrence: A critical review. Law and Society, 20(4): 545-572.

Wilson, J. (1984). A National Household Survey on Drinking and Driving: Knowledge, Attitudes and Behaviour of Canadian Drivers. A Report Prepared for the Road Safety and Motor Vehicle Directorate.

Statistics Canada Statistique Canada **APPENDIX 1**

Survey on Drinking and Driving

Confidential when completed

FORM 90

1: | | | | - | | | | - | | | | | Telephone number 4: | | Stratum 5: | | | | | | Sequence number

Interviewer Name:

INTRODUCTION:

(Hello, I'm .... from Statistics Canada. We are doing a survey on peoples' attitudes about drinking and driving.)

This survey is being conducted by Statistics Canada for Health and Welfare Canada. Your answers will help us better understand and deal with the issue of drinking and driving. While your participation is voluntary, it is essential if the results of the study are to be accurate. All your answers will be kept strictly confidential.

1. I am going to ask your opinion on a number of issues. Do you think the issue of drinking and driving is more important, less important or equally important as . . .

	More important	Equally important	Less important	Don't know
cigarette smoking?	01( )	02( )	03( )	04( )
drug use?	05( )	06( )	07( )	08( )
family violence?	09( )	10( )	11( )	12( )
juvenile delinquency?	13( )	14( )	15( )	16( )
pornography?	17( )	18( )	19( )	20( )
racism?	21( )	22( )	23( )	24( )
unemployment?	25( )	26( )	27( )	28( )
AIDS?	29( )	30( )	31( )	32( )

2. Now I'm going to read some things that could be done to reduce drinking and driving. Tell me if you strongly agree, agree, disagree or strongly disagree with each of the following:

	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
There should be more educational programs to teach people about drinking and driving	01( )	02( )	03( )	04( )	05( )
The police should set up more roadblocks and spot checks	06( )	07( )	08( )	09( )	10( )
There should be stricter enforcement of existing laws	11( )	12( )	13( )	14( )	15( )
The drinking age should be raised	16( )	17( )	18( )	19( )	20( )
The age at which people can drive should be raised	21( )	22( )	23( )	24( )	25( )
There should be more advertising against drinking and driving	26( )	27( )	28( )	29( )	30( )
The sale of alcohol should be more strictly controlled	31( )	32( )	33( )	34( )	35( )
Free transportation should be provided to drivers who have had too much to drink	36( )	37( )	38( )	39( )	40( )
More bars and taverns should set up designated driver programs	41( )	42( )	43( )	44( )	45( )
Driver education should include information on drinking and driving	46( )	47( )	48( )	49( )	50( )
There should be more treatment services for problem drinkers	51( )	52( )	53( )	54( )	55( )

APPENDIX 1

Now I'm going to describe a drinking situation; then I'd like to ask you a few questions about it. Suppose that:

Phil lives in your community. Friday on his way home from work, Phil stops at a bar to drink with his friends. He drinks enough to be impaired and then at around 7:00 p.m. he gets in his car and drives five miles home.

3. What do you think the chances are that he will be stopped by the police? Do you think the chances are low, medium or high?

1 ( ) Low
2 ( ) Medium
3 ( ) High
4 ( ) Don't know

4. If he is stopped by the police, what do you think the chances are that the police will charge him with impaired driving? Do you think they are low, medium or high?

5 ( ) Low
6 ( ) Medium
7 ( ) High
8 ( ) Don't know

5. If he is charged with impaired driving, what do you think the chances are that he will be convicted? Do you think they are low, medium or high?

1 Low
2 Medium
3 High
4 Don't know

6. What do you think the chances are that he will have a car accident on his way home? Do you think they are low, medium or high?

5 Low
6 Medium
7 High
8 Don't know

7. During the past 12 months, have you been in the company of someone who had drunk too much but intended to drive anyway?

1 ( ) Yes —▸ Go to 9
2 ( ) No

8. During the past 12 months, have you seen a stranger or anyone else attempt to drive when they had had too much to drink?

3 ( ) Yes
4 ( ) No —▸ Go to 16

9. The following are some ways to prevent people from driving after they have had too much to drink. During the past 12 months, have you done any of the following:

	No	Yes
Asked someone not to drive?	01 ( )	02 ( )
Offered to drive someone else home yourself?	09 ( )	08 ( )
Asked someone to take a taxi, bus or subway?	15 ( )	16 ( )
Tried to take someone's car keys?	22 ( )	23 ( )
Asked someone to stay at your home?	29 ( )	30 ( )

10. The last time you did this, was the person a friend, a family member or someone else?

	Friend	Family	Someone else
Asked someone not to drive?	03 ( )	01 ( )	05 ( )
Offered to drive someone else home yourself?	10 ( )	11 ( )	12 ( )
Asked someone to take a taxi, bus or subway?	17 ( )	18 ( )	19 ( )
Tried to take someone's car keys?	24 ( )	25 ( )	26 ( )
Asked someone to stay at your home?	31 ( )	32 ( )	33 ( )

11. Were you successful?

	Yes	No
Asked someone not to drive?	04 ( )	07 ( )
Offered to drive someone else home yourself?	13 ( )	14 ( )
Asked someone to take a taxi, bus or subway?	20 ( )	21 ( )
Tried to take someone's car keys?	27 ( )	28 ( )
Asked someone to stay at your home?	34 ( )	35 ( )

12. During the past 12 months, were you actually a passenger in a motor vehicle in which you thought the driver had too much to drink?

1 ( ) Yes
2 ( ) No —▸ Go to 16

13. The last time this happened, were you concerned about your safety because the driver had too much to drink?

3 ( ) Yes
4 ( ) No
5 ( ) Don't know
— ▸ Go to 15

14. Even though you were concerned about your safety, why did you choose to be a passenger?

1 ( ) No alternative transportation
2 ( ) Did not want to say no/afraid to say no
3 ( ) Not far to go
4 ( ) Everyone was doing it/peer pressure
5 ( ) Did not want to leave driver/to keep driver alert
6 ( ) Other (specify)
7 ( ) Don't know/don't remember

15. What was the driver's relationship to you?

1 ( ) Spouse/partner
2 ( ) Other family member or relative
3 ( ) Boyfriend/girlfriend
4 ( ) Other friend
5 ( ) Other

APPENDIX 1

DRIVING QUESTIONS

16. In the past 3 years, have you driven a motor vehicle? By motor vehicle, I mean a car, truck, van or motorcycle.

1( ) Yes 2( ) No ——▶ *Go to 37*

17. During the past 12 months, how often, on average, did you drive? Was it . . .

1( ) every day?
2( ) 4-6 days a week?
3( ) 2-3 days a week?
4( ) once a week?
5( ) once or twice a month?
6( ) less often than once a month? ——▶ *Go to 19*
7( ) haven't driven in past 12 months ——▶ *Go to 18*

18. Why did you not drive in the past 12 months?

1( ) Felt I was too old
2( ) Had an accident/car was wrecked
3( ) My licence was suspended
4( ) Didn't have a car
5( ) Didn't need a car
6( ) Other ——▶ *Go to 31*

19. Do you have a regular or a commercial driver's licence?

1( ) Regular licence
2( ) Regular learner's permit
3( ) Commercial licence
4( ) No licence

20. About how many kilometers or miles have you driven in the past 12 months? (Include all driving – job related, or any driving in cars you don't own, including rentals.)

1( ) 1,600 km or less (1,000 miles or less)
2( ) 1,601 to 8,000 km (1,001 to 5,000 miles)
3( ) 8,001 to 16,000 km (5,001 to 10,000 miles)
4( ) 16,001 to 24,000 km (10,001 to 15,000 miles)
5( ) 24,001 to 32,000 km (15,001 to 20,000 miles)
6( ) More than 32,000 km (more than 20,000 miles)
7( ) Don't know

21. How many years have you been driving?

1( ) Less than 1 year
2( ) 1-3 years
3( ) 4-6 years
4( ) 7-10 years
5( ) 11-15 years
6( ) 16-20 years
7( ) More than 20 years

22. Did you ever take a driver education course?

1( ) Yes 2( ) No ——▶ *Go to 24*

23. Was information about drinking and driving presented as part of the course?

1( ) Yes 2( ) No 8( ) Don't know

24. What kind of motor vehicle do you drive most often – is it a car, a van, a light truck, motorcycle or something else?

1( ) Car 3( ) Light Truck 5( ) Something else (specify)
2( ) Van 4( ) Motorcycle

APPENDIX 1

26. Whose motor vehicle do you drive most often? *(Mark only one.)*

- [1] ( ) My own
- [2] ( ) Parent's vehicle/family vehicle
- [3] ( ) Friend's vehicle
- [4] ( ) Company vehicle
- [5] ( ) Rental or leased vehicle
- [6] ( ) Other (specify)

28. During the past 12 months, have you participated in a designated driver program offered at a bar or tavern?

[1] ( ) Yes [2] ( ) No

27. Other than this program, have you agreed beforehand to be the non-drinking driver for an occasion involving drinking?

[1] ( ) Yes [2] ( ) No

29. The following are some statements about the way people drive. Tell me if each statement was often, sometimes, seldom or never true for you during the past 12 months.

	Often	Sometimes	Seldom	Never
I swear out loud at other drivers	[1] ( )	[2] ( )	[3] ( )	[4] ( )
I like to pass other cars on the highway even if I'm not in a hurry	[1] ( )	[2] ( )	[3] ( )	[4] ( )
I lose my temper when driving	[1] ( )	[2] ( )	[3] ( )	[4] ( )
Driving at high speeds is exciting	[1] ( )	[2] ( )	[3] ( )	[4] ( )
I make rude signs at other drivers who annoy me	[1] ( )	[2] ( )	[3] ( )	[4] ( )
It is fun to manoeuvre and weave through traffic	[1] ( )	[2] ( )	[3] ( )	[4] ( )

30. During the past 12 months, have you driven any other kind of motorized vehicle such as a snowmobile, a boat or an all-terrain vehicle?

[1] ( ) Yes [2] ( ) No ——▸ *Go to 31*

32. During the past 12 months, did you drive any of these vehicles for reasons other than pleasure or recreation?

[1] ( ) Yes [2] ( ) No

31. Have you been in any motor vehicle accidents during the past 3 years (that is, since March 1988) with you as the driver, even if it wasn't your fault?

[1] ( ) Yes ——▸ How many accidents? | | | [2] ( ) No ——▸ *Go to 33*

33. During the past 3 years (that is, since March 1988), have you been in any motor vehicle accidents that resulted in damage of more than $1,000 or injury requiring medical attention to anyone involved?

[1] ( ) Yes ——▸ How many times? | | | [2] ( ) No [3] ( ) Don't know

33. During the past 3 years, have you received a ticket from the police, other than a parking ticket?

[1] ( ) Yes ——▸ How many times? | | | [2] ( ) No

34. During the past 3 years, has your driver's licence been suspended for more than 24 hours for any reason?

[1] ( ) Yes ——▸ How many times? | | | [2] ( ) No

35. During the past 3 years, have you been stopped by the police during a road check?

[1] ( ) Yes ——▸ How many times? | | | [2] ( ) No ——▸ *Go to 37*

36. Do you think (this/any of these) was a check for drinking and driving?

[1] ( ) Yes [2] ( ) No [3] ( ) Don't know

37. How often did you wear a seatbelt the last ten times that you were a passenger or a driver of a motor vehicle? Was it . . .

[1] ( ) always? [2] ( ) usually? [3] ( ) sometimes? [4] ( ) never?

APPENDIX 1

DRINKING QUESTIONS

38. Now I would like to ask you some questions about alcohol consumption. In these questions, when we use the word "**Drink**", it means one bottle of beer or glass of draft, one small glass of wine, or one shot or mixed drink with hard liquor.
During the past 12 months, have you had a drink?
1( ) Yes ——► *Go to 40* 2( ) No

39. During the past 3 years would you say that you drank often, sometimes, seldom or never?
1( ) Often 3( ) Seldom
2( ) Sometimes 4( ) Never
——► *Go to 71*

40. Why did you not drink in the past 12 months? *(Mark all that apply)*
1( ) It was a source of conflict with friends/family
2( ) It was affecting my health/to lose weight
3( ) It was too expensive
4( ) I had a bad experience because of drinking
5( ) It was affecting my day-to-day activities (i.e. job, studies, etc.)
6( ) I joined AA or other treatment program
7( ) No particular reason
8( ) Other

41. *INTERVIEWER CHECK ITEM:*
- *If Q18 marked "Yes" (code 1)* 1( ) *Go to 42*
- *Otherwise* 2( ) *Go to 71*

42. During the past 3 years, have you been **stopped and checked** by the police because they suspected you of drinking and driving?
1( ) Yes 2( ) No

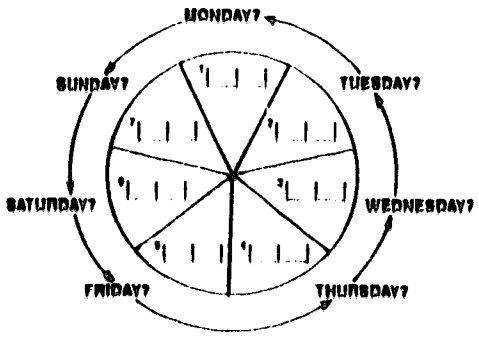
43. During the past 3 years, have you been **charged** for a drinking and driving offense such as driving while impaired, or for having a blood alcohol level over .08 percent, or for refusing a breathalyzer test?
1( ) Yes ——► How many times? |__|__| 2( ) No ——► *Go to 71*

44. During the past 3 years, have you been **convicted or found guilty** of a drinking and driving offence?
1( ) Yes ——► How many times? |__|__| 2( ) No ——► *Go to 71*

45. During the past 3 years, have you had your licence suspended for more than 24 hours for a drinking and driving offence?
1( ) Yes ——► How many times? |__|__|
2( ) No
——► *Go to 71*

46. During the past 12 months, how often, on average have you had a drink? Was it ...
1( ) every day? 5( ) once a week?
4( ) 4-6 times a week? 7( ) once or twice a month?
3( ) 2-3 times a week? 6( ) less often than once a month?

47. Thinking back over the past 7 days, how many drinks did you have on each day? Let's start with yesterday.
How many drinks did you have on . . . Did not have any drinks in the past 7 days 1( ) Go to 50



APPENDIX 1

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48. During the past 7 days, did you have an alcoholic drink . . .

	No	Yes		At any time in these 7 days, did you drive after having 3 or more drinks in the previous hour . . . ? Yes	No
In a bar, tavern or pub?	01 ○	02 ○	→	03 ○	04 ○
In a restaurant?	05 ○	06 ○	→	07 ○	08 ○
At home?	09 ○	10 ○	→	11 ○	12 ○
At someone else's home?	13 ○	14 ○	→	15 ○	16 ○
At a social event such as a party, dance, wedding or club?	17 ○	18 ○	→	19 ○	20 ○
At a public event such as a concert, sports event or festival?	21 ○	22 ○	→	23 ○	24 ○
Out of doors, e.g., while fishing, hiking or skiing?	25 ○	26 ○	→	27 ○	28 ○
In a motor vehicle?	29 ○	30 ○	→	31 ○	32 ○
Anywhere else? (specify) _____	33 ○	34 ○	→	35 ○	36 ○

49. In the past 7 days, have you had a drink together with any of the following people (that is, these people were also drinking)?

	Yes	No
Your spouse/partner or boyfriend/girlfriend?	01 ○	02 ○
Relatives other than your spouse?	03 ○	04 ○
People you work with or business associates?	05 ○	06 ○
Friends of both sexes?	07 ○	08 ○
Only friends of the same sex as you?	09 ○	10 ○
Only friends of the opposite sex?	11 ○	12 ○
Strangers or people you met after you started drinking?	13 ○	14 ○
Alone, no one else was around?	15 ○	16 ○

50. The following are some reasons why people drink. For each one tell me if it was often, sometimes, seldom or never true for you during the past 12 months.

	Often	Sometimes	Seldom	Never
Drinking makes me feel happy	01 ○	02 ○	03 ○	04 ○
I drink because I enjoy the taste	05 ○	06 ○	07 ○	08 ○
I drink because it adds to the enjoyment of social occasions	09 ○	10 ○	11 ○	12 ○
I drink when I have been under stress	13 ○	14 ○	15 ○	16 ○
I drink when my friends are drinking	17 ○	18 ○	19 ○	20 ○
I feel more in control of my life when I drink	21 ○	22 ○	23 ○	24 ○
Drinking puts me in a "party" mood	25 ○	26 ○	27 ○	28 ○
I drink when I am sad, lonely or depressed	29 ○	30 ○	31 ○	32 ○

51. The following are some statements about drinking. For each one indicate if it was often, sometimes, seldom or never true for you during the past 12 months.

	Often	Sometimes	Seldom	Never
I feel I should cut down on my drinking	01 ○	02 ○	03 ○	04 ○
People annoy me by criticizing my drinking	05 ○	06 ○	07 ○	08 ○
I feel bad or guilty about my drinking	09 ○	10 ○	11 ○	12 ○
I have a drink first thing in the morning to steady my nerves or to get rid of a hangover	13 ○	14 ○	15 ○	16 ○

52. During the past 12 months, have you tried to reduce your drinking?

1 ○ Yes 2 ○ No → *Go to 54*

APPENDIX 1

53. During the past 12 months, have you done any of the following things in order to reduce the amount you drink? Have you . . .

	Yes	No
skipped parties or other social events?	01( )	02( )
avoided being with friends who drink a lot?	03( )	04( )
gone to bars and taverns less often?	05( )	06( )
limited the number of drinks you have?	07( )	08( )
switched from liquor to beer or wine?	09( )	10( )
started drinking low alcohol beer or wine?	11( )	12( )
started drinking non-alcoholic beverages?	13( )	14( )
looked for help to stop drinking such as A.A., or sought medical assistance?	15( )	16( )

54. *INTERVIEWER CHECK ITEM:*

- *If Code 1-6 in item 17 (i.e. has driven in past 12 months)* 1( ) *Go to 55*
- *Otherwise* 2( ) *Go to 71*

DRINKING AND DRIVING QUESTIONS

55. During the past 12 months, have you driven a motor vehicle after having two or more drinks in the previous hour?

1( ) Yes ——▸ How many times in the past 30 days? | | | |

2( ) No ——▸ *Go to 58*

56. During the past 12 months, were there any situations in which you had to drive after having too much to drink?

1( ) Yes 2( ) No ——▸ *Go to 58*

57. What were they? *(Mark all that apply)*

1( ) Alternatives available but not desirable
2( ) Didn't want to leave car/needed car
3( ) Responsible for driving others home
4( ) Unexpected emergency
5( ) No public transportation
6( ) Other (specify) _____

58. During the past 12 months, have you done any of the following in order to avoid driving after you had too much to drink? Have you . . .

	Yes	No
asked someone else to drive?	01( )	02( )
taken a taxi, bus, subway or walked?	03( )	04( )
stayed overnight?	05( )	06( )
stopped drinking early/waited at least one hour before driving?	07( )	08( )
used a breathalyzer test before driving?	09( )	10( )

59. *INTERVIEWER CHECK ITEM:*

- *If any "yes" in item 58* 1( ) *Go to 60*
- *Otherwise* 2( ) *Go to 61*

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90. Why did you try to avoid driving after you had too much to drink? *(Mark all that apply)*

1 ○ I was afraid of getting caught by the police

2 ○ I was involved with the police for driving while impaired

3 ○ I was afraid of having an accident

4 ○ I was involved in an accident after drinking or my friends or family were involved in an accident

5 ○ I was afraid of losing my licence or going to jail

6 ○ I felt that it was wrong to drive while impaired

7 ○ Personal reasons, pressure from family, friends, work

---

91. During the past 12 months has anyone tried to prevent you from driving because they thought you had too much to drink?

1 ○ Yes 2 ○ No ⟶ Go to 94

---

92. Who tried to prevent you from driving the last time this happened? Was it . . . *(Mark all that apply)*

1 ○ your spouse/partner?

2 ○ some other relative?

3 ○ a friend?

4 ○ a bartender/waiter/waitress?

5 ○ a stranger?

6 ○ someone else?

---

93. Were they successful?

1 ○ Yes 2 ○ No

APPENDIX 1

64. During the past 3 years, have you been stopped and checked by the police because they suspected you of drinking and driving?

[3]( ) Yes [4]( ) No

65. During the past 3 years, have you been charged for a drinking and driving offense such as driving while impaired, or for having a blood alcohol level over .08 percent, or for refusing a breathalyzer test?

[5]( ) Yes ——▸ How many times? | | | [6]( ) No ——▸ *Go to 66*

66. During the past 3 years, have you been convicted or found guilty of a drinking and driving offense?

[7]( ) Yes ——▸ How many times? | | | [8]( ) No ——▸ *Go to 68*

67. During the past 3 years, have you had your licence suspended for more than 24 hours for a drinking and driving offense?

[1]( ) Yes ——▸ How many times? | | | [2]( ) No

68. The following are some statements about drinking and driving behaviour. In these statements when we say someone is "impaired" we mean they had too much to drink to drive safely. Please indicate if you strongly agree, agree, disagree or strongly disagree with each statement.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
It usually takes a lot of drinks to make me feel impaired	[01]( )	[02]( )	[03]( )	[04]( )	[05]( )
Some people drive better after a few drinks	[06]( )	[07]( )	[08]( )	[09]( )	[10]( )
My friends or family would disapprove of me for driving while impaired	[11]( )	[12]( )	[13]( )	[14]( )	[15]( )
There is no excuse for driving while while impaired	[16]( )	[17]( )	[18]( )	[19]( )	[20]( )

69. About how many drinks do you think you can have, over a 2-hour period, before your ability to drive becomes impaired?

| | | Drinks Don't know [98]( )

70. About how many drinks do you think you can have, over a 2-hour period, before you are over the legal limit of .08 percent?

| | | Drinks Don't know [98]( )

71. Within the past 30 days, has your spouse or partner, or have any of your close friends or relatives driven after they have had too much to drink?

[1]( ) Yes [2]( ) No [3]( ) Don't know

72. Has your spouse or partner, or have any of your close friends or relatives been in court and found guilty of a drinking and driving offense during the past 3 years?

[1]( ) Yes [2]( ) No [3]( ) Don't know

APPENDIX 1

73. For a first drinking and driving conviction where there is no accident...

A. What do you think are the legal maximum penalties?	B. What do you think are the usual penalties?	C. What do you think the penalties should be?
01( ) Licence Suspension	01( ) Licence Suspension	01( ) Licence Suspension
How long do you think the maximum suspension is?	How long do you think the usual suspension is?	How long do you think the suspension should be?
01( ) 12 hours or less	01( ) 12 hours or less	01( ) 12 hours or less
01( ) 13-24 hours/one day	01( ) 13-24 hours/one day	01( ) 13-24 hours/one day
01( ) 2-7 days	01( ) 2-7 days	01( ) 2-7 days
01( ) 2-3 weeks	01( ) 2-3 weeks	01( ) 2-3 weeks
01( ) 1-2 months	01( ) 1-2 months	01( ) 1-2 months
01( ) 3-5 months	01( ) 3-5 months	01( ) 3-5 months
01( ) 6 months - 1 year	01( ) 6 months - 1 year	01( ) 6 months - 1 year
01( ) More than 1 year	01( ) More than 1 year	01( ) More than 1 year
01( ) Don't know	01( ) Don't know	01( ) Don't know
01( ) Fine	01( ) Fine	01( ) Fine
How much do you think the maximum fine is?	How much do you think the usual fine is?	How much do you think the fine should be?
01( ) $50 or less	01( ) $50 or less	01( ) $50 or less
01( ) $51-$100	01( ) $51-$100	01( ) $51-$100
01( ) $101-$200	01( ) $101-$200	01( ) $101-$200
01( ) $201-$500	01( ) $201-$500	01( ) $201-$500
01( ) $501-$1,000	01( ) $501-$1,000	01( ) $501-$1,000
01( ) $1,001-$2,000	01( ) $1,001-$2,000	01( ) $1,001-$2,000
01( ) Over $2,000	01( ) Over $2,000	01( ) Over $2,000
01( ) Don't know	01( ) Don't know	01( ) Don't know
01( ) Jail Sentence	01( ) Jail Sentence	01( ) Jail Sentence
How long do you think the maximum sentence is?	How long do you think the usual sentence is?	How long do you think the sentence should be?
01( ) 24 hours/oneday/overnight	01( ) 24 hours/oneday/overnight	01( ) 24 hours/oneday/overnight
01( ) 2-7 days	01( ) 2-7 days	01( ) 2-7 days
01( ) 2-3 weeks	01( ) 2-3 weeks	01( ) 2-3 weeks
01( ) 1-2 months	01( ) 1-2 months	01( ) 1-2 months
01( ) 3-5 months	01( ) 3-5 months	01( ) 3-5 months
01( ) 6 months or more	01( ) 6 months or more	01( ) 6 months or more
01( ) Don't know	01( ) Don't know	01( ) Don't know
01( ) Insurance cancelled/rates raised	01( ) Insurance cancelled/rates raised	01( ) Insurance cancelled/rates raised
01( ) Loss of points	01( ) Loss of points	01( ) Loss of points
01( ) There are no penalties	01( ) There are no penalties	01( ) There are no penalties
01( ) Other (specify)	01( ) Other (specify)	01( ) Other (specify)
01( ) Don't know	01( ) Don't know	01( ) Don't know

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74. What do you think the penalties should be for a first drinking and driving conviction in which there was an accident and somebody was seriously hurt or killed? Anything else?

- 01( ) Licence Suspension
  - How long do you think the suspension should be?
  - 02( ) 12 hours or less
  - 03( ) 13-24 hours/one day
  - 04( ) 2-7 days
  - 05( ) 2-3 weeks
  - 06( ) 1-2 months
  - 07( ) 3-5 months
  - 08( ) 6 months - 1 year
  - 09( ) More than 1 year
  - 10( ) Don't know
- 11( ) Fine
  - How much do you think the fine should be?
  - 12( ) $50 or less
  - 13( ) $51-$100
  - 14( ) $101-$200
  - 15( ) $201-$500
  - 16( ) $501-$1,000
  - 17( ) $1,001-$2,000
  - 18( ) Over $2,000
  - 19( ) Don't know
- 20( ) Jail Sentence
  - How long do you think the sentence should be?
  - 21( ) 24 hours/one day/overnight
  - 22( ) 2-7 days
  - 23( ) 2-3 weeks
  - 24( ) 1-2 months
  - 25( ) 3-5 months
  - 26( ) 6 months or more
  - 27( ) Don't know
- 28( ) Insurance cancelled/rates raised
- 29( ) Loss of points
- 30( ) There are no penalties
- 31( ) Other (specify)
- 32( ) Don't know

75. During the past 12 months, have you used any of the following substances?

	No	Yes		The last time this was used, did you drive within 2 hours of using it? Yes	No	Don't know
Prescription drugs such as sleeping pills, diet pills, tranquilizers or antidepressants?	01( )	02( )	▶	03( )	04( )	05( )
Other prescription drugs such as heart medication, insulin or antibiotics?	06( )	07( )	▶	08( )	09( )	10( )
Over-the-counter drugs such as codeine, antihistamines or cold medications?	11( )	12( )	▶	13( )	14( )	15( )
Marijuana or hashish?	16( )	17( )	▶	18( )	19( )	20( )
Other drugs such as LSD, heroin, mescalin or cocaine?	21( )	22( )	▶	23( )	24( )	25( )

APPENDIX 1

CLASSIFICATION QUESTIONS

76. Now I'd like to ask you a few questions about yourself.

INTERVIEWER: Ask or confirm

How old were you on your last birthday?

| | | | years

77. Sex:

INTERVIEWER: Ask or confirm

1( ) Male 2( ) Female

78. How much do you currently weigh?

| | | | lbs or | | | | kgs

79. What is your current marital status?

1( ) Single (never married)
2( ) Married, including common-law
3( ) Living with partner
4( ) Separated
5( ) Divorced
6( ) Widowed

80. What is the highest level of education you have ever attended or completed?

1( ) No schooling
2( ) Elementary school
3( ) Some secondary or some high school
4( ) Secondary or high school diploma
5( ) Some college
6( ) College diploma
7( ) Some university
8( ) University degree
9( ) Other education or training

81. Which of the following best describes your main activity during the past 12 months? Were you mainly...

1( ) working at a job or business? ——— ▶ *Go to 83*
2( ) looking for work? ——— ▶ *Go to 82*
3( ) a student?
4( ) retired?
5( ) keeping house? ——— ▶ *Go to 86*
6( ) other ———

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82. Did you have a job or business at any time during the past 12 months?

7. Yes 9. No ▶ *Go to 86*

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83. For whom do (did) you work?

---

84. What kind of business, industry or service is (was) that?

---

85. What kind of work do (did) you do?

---

86. What is the language you first learned and still understand?

1. English
2. French
3. Other

---

87. What was your household's total income from all sources before taxes and deductions for 1987? Was it . . .

10. less than $20,000?
    - 11. less than $10,000?
      - 13. less than $5,000?
      - 14. $5,000 or more?
    - 12. $10,000 or more?
      - 15. less than $15,000?
      - 16. $15,000 or more?
20. $20,000 or more?
    - 21. less than $40,000?
      - 23. less than $30,000?
      - 24. $30,000 or more?
    - 22. $40,000 or more?
      - 25. less than $60,000?
      - 26. $60,000 or more?

97. No income

98. Don't know

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AWARENESS QUESTIONS

88. Within the past 12 months, do you recall having seen or heard any advertising messages dealing with drinking and driving?

1 ( ) Yes 2 ( ) No ——▶ *Go to 91*

89. Where did you see or hear these messages? Anywhere else? *(Mark all that apply)*

01 ( ) In a newspaper
02 ( ) On a billboard
03 ( ) On the radio
04 ( ) On the television
05 ( ) On public transportation
06 ( ) In a magazine
07 ( ) On a bumpersticker
08 ( ) Other (specify) _____
09 ( ) Don't know

90. What do you recall most from the messages you saw or heard? *(Mark all that apply)*

1 ( ) Don't drink and drive
2 ( ) Accidents happen/people can get hurt when you drink and drive
3 ( ) Penalties for driving while impaired
4 ( ) Friends don't let friends drink and drive
5 ( ) Personal responsibility to stop drinking and driving
6 ( ) Specific ad or image (Do not specify)
7 ( ) Other (specify) _____
8 ( ) Don't know/don't remember

91. Are you aware of any groups or organizations that have been campaigning against drinking and driving?

1 ( ) Yes 2 ( ) No ——▶ *Go to 94*

92. Which ones? *(Mark all that apply)*

01 ( ) MADD, parents of victims groups
02 ( ) SADD, student groups
03 ( ) Government departments (federal, provincial or municipal)
04 ( ) AA (Alcoholics Anonymous)
05 ( ) EAP (Employee Assistance Programs)
06 ( ) Breweries and distillers
07 ( ) Police
08 ( ) Radio, TV stations, public personalities
09 ( ) Church groups
10 ( ) Local community groups
11 ( ) Counterattack (B.C. only)
12 ( ) Other (specify) _____
13 ( ) Don't know

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93. Are you presently involved with any of these groups or organizations?

1( ) Yes ——▶ *Go to 95*

2( ) No

94. Would be prepared to support, either financially or with your time, activities in your community designed to reduce drinking and driving?

1( ) Yes 2( ) No 9( ) Don't know

95. Are you aware of any programs that provide alternative transportation to people who have had too much to drink?

1( ) Yes 2( ) No ——▶ *Thank respondent and end interview*

96. Which ones?

1( ) University-based programs

2( ) Municipal transportation (e.g., buses, subways)

3( ) Brewery/distiller-sponsored program

4( ) Hotel/tavern-operated program (e.g., designated driver program)

5( ) Municipal program (e.g., Nez Rouge)

6( ) Volunteer organizations in the community

7( ) Other (specify) _____

9( ) Don't know

97. Have you ever used these alternative transportation services?

1( ) Yes 2( ) No

Thank respondent

98. Comments: