Applying Stafford and Warr's Reconceptualization of Deterrence Theory to Drug

Driving: Can it Predict those Likely to Offend?

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Abstract

In December 2007, random roadside drug testing commenced in Queensland, Australia. Subsequently, the aim of this study was to explore the preliminary impact of Queensland's drug driving legislation and enforcement techniques by applying Stafford and Warr's [Stafford, M. C., & Warr, M. (1993). A reconceptualization of general and specific deterrence. *Journal of Research in Crime and Delinquency, 30*, 123-135] reconceptualization of deterrence theory. Completing a comprehensive drug driving questionnaire were 899 members of the public, university students, and individuals referred to a drug diversion program. Of note was that approximately a fifth of participants reported drug driving in the past six months. Additionally, the analysis indicated that punishment avoidance and vicarious punishment avoidance were predictors of the propensity to drug drive in the future. In contrast, there were indications that knowing of others apprehended for drug driving was not a sufficient deterrent. Sustained testing and publicity of the legislation and countermeasure appears needed to increase the deterrent impact for drug driving.

1. Introduction

No country is content with its road safety performance, with a myriad of safety problems persisting (Elvik, 2008). There is a growing concern about the deleterious effects that driving while impaired by drugs is having for road safety (Aitken et al., 2000). Consumption of cannabis, amphetamines, cocaine, and heroin produces a number of dangerous impairments including aggressive driving and impaired psychomotor abilities (e.g., Aitken et al., 2000; Jones, 2007; Ramaekers et al., 2004). Subsequently, an increasing body of research identifies the involvement of drugs in many road crashes (Darke et al., 2004; Drummer et al., 2004; Ramaekers et al., 2004).

1.1 Prevalence of Drug Driving

There are two methods that have mainly been used to assess the prevalence rates of drug driving: self-report measures and biological markers of drug use present in saliva, blood, or urine samples.

1.1.1 Self-report measures. Within Australia, the National Drug Strategy Household Survey describes that 20.9% of Australians reported driving a motor vehicle whilst influenced by an illicit drug (Australian Institute of Health and Welfare, 2007). Similarly, Davey et al. (2005) investigated the drug driving habits of a university student sample, where 25% of participants reporting previous drug driving. Finally, Davey et al. (2007) found that the most prevalent drugs used by drivers of the general public was cannabis (16%), then amphetamine type substances (4.5%), cocaine (.4%), and heroin (.4%).

1.1.2 Biological markers. In addition to self-report data, valuable information has been attained through testing bodily fluids of Australian drivers. For example, Longo et al. (2000) collected blood samples from 2500 injured Australian drivers, finding detections of cannabis (7.1%), benzodiazepines (1.8%), and stimulants

(0.8%). Additionally, 13.3% of the sample had more than one drug in their system. Similarly, Drummer et al. (2004) reviewed toxicology reports from 3398 fatally injured drivers over a ten year period across three Australian states: Victoria, New South Wales, and Western Australia. Approximately a quarter of drivers (23.5%) tested positive to psychoactive drugs, including detections of cannabis (13.5%), opioids (4.9%), stimulants (4.1%), and benzodiazepines (4.1%). A culpability analysis established that drivers testing positive for any type of drug were significantly more likely to be found culpable for the crash.

1.2 Influences, Social Context and Modeling

Influences that lead to a greater prevalence of drug driving are formed from previous positive experiences, including that of an individuals peer's experiences. Regular drug users believe that they are unlikely to be caught for drug driving due to the low levels of apprehension (Darke et al., 2004). Additionally, peer experiences of avoiding apprehension for drug driving reaffirms the individuals' perception of low levels of apprehension (Aitken et al., 2000; McIntosh et al., 2007).

Fellow drug users and criminal social networks often sustain and support aberrant behaviors of the deviant individual (Hammersley, 2008). Modeling is one mechanism involved in the initiation of drug use (Heaven & Virgen, 2001; Spooner, 1999) and criminal behaviors (Caudill & Kong, 2001; Hammersley, 2008). When the rewards from a behavior are favorable, the sense of self-efficacy for these behaviors increases (Bandura, 1977). The attainment and maintenance of addictive and or illicit behaviors is largely due to vicarious learning (Caudill & Kong, 2001). It can be seen that personal as well as vicarious experiences impact profoundly on aberrant behaviors; therefore any theoretical account of drug driving will need to account for these influences.

1.3 Deterrence Theory

Laws' making it an offence to drive after the consumption of drugs (i.e., zero-tolerance laws) sends a strong message about the dangers of drug driving and facilitates a deterrent effect (Schwilke et al., 2006). The underlying principle of classical deterrence theory proposes that the perceived consequences of engaging in illegal behaviour will dissuade the illegal behaviour (Homel, 1988). Specifically, it has been proposed that when an individual perceives the certainty of punishment as high, the punishment as severe, and the administration of punishment as swift the committing of criminal acts will be deterred (Taxman & Piquero, 1998). Perceptions of certainty, severity and swiftness are conditional on the intensity and effectiveness of enforcement (Homel, 1988; Taxman & Piquero, 1998) as well as a high level of publicity of legal sanctions and penalties (Elvik & Christensen, 2007).

Classical deterrence theory has been critiqued on a number of aspects. The cornerstone of classical deterrence is the experiencing of legal punishment, yet it neglects the influence of punishment avoidance. Also, classical deterrence theory fails to account for the effect of vicarious experiences on an individuals perceptions. As evidence has accrued deterrence theory has undergone a number of conceptual and theoretical changes.

1.4 Stafford and Warr's (1993) Reconceptualization of Deterrence Theory

A reconceptualization of deterrence theory was postulated by Stafford and Warr (1993) proposing to account for the limitations of classical deterrence theory. This theory includes both the direct and vicarious effects of punishment as well as punishment avoidance. The authors assert that specific deterrence needs to be considered as the direct effects of punishment and punishment avoidance on an individual, with general deterrence being the vicarious experiencing of punishment

and punishment avoidance. Last, the effects of general and specific deterrence can affect an individual concurrently, and these factors are examined in more detail below.

 1.4.1 Experience of punishment. Consistent with classical deterrence theory, the effects of punishment are believed to act as a deterrent for future offending. Additionally, the experiencing of punishment affects the perceptions of certainty and severity of punishment. Counter-intuitively, the majority of published studies utilising Stafford and Warr's (1993) theory have found a positive and significant relationship between the experiencing of punishment and the likelihood of offending (e.g., Paternoster & Piquero, 1995; Piquero & Pogarsky, 2002; Sitren & Applegate, 2007). This positive punishment effect is likely due to the resetting effect, which involves the decision making bias known as the gambler's fallacy. After apprehension, an offender lowers their certainty of apprehension estimate, believing that being apprehended again in a short period of time is extremely unlikely (Piquero & Pogarsky, 2002; Pogarsky & Piquero, 2003). Nonetheless, not all studies have discovered a positive punishment effect. Piquero and Paternoster's (1998) examination of drinking and driving found that experiences of punishment resulted in participants reporting being unlikely to drink drive in the future, although this relationship was non-significant. As for the present context, random roadside drug testing in itself is perceived to be a deterrent for some drug drivers (Stevenson et al., 2001).

 1.4.2 Experience of punishment avoidance. Punishment avoidance is argued to be a major component affecting the deterrent process. The effect of punishment and punishment avoidance influences the predisposition to commit crimes in disparate trends (Stafford and Warr, 1993). It is likely that punishment avoidance reinforces illegal behaviors (Paternoster & Piquero, 1995) and reduces perceptions of the

certainty of punishment. Most studies utilising Stafford and Warr's (1993) theory have also found that punishment avoidance has had the strongest relationship with the propensity to offend (Freeman & Watson, 2006; Paternoster & Piquero, 1995; Piquero & Paternoster, 1998; Piquero & Pogarsky, 2002; Sitren & Applegate, 2007). Research shows that a great number of individuals would discontinue their drug driving due to the implementation of roadside drug testing (Degenhardt et al., 2006).

 1.4.3 Vicarious experience of punishment. Stafford and Warr (1993) have also acknowledged the importance of vicarious learning in their theory. Knowing of others that have experienced legal sanctions for illegal behaviours, can be a deterring factor for others considering committing a similar crime and increases an individual's perception of certainty of punishment (Paternoster & Piquero, 1995; Stafford & Warr, 1993). Nonetheless, the perceived risk of others has been proposed to be less influential to the individual than their own perceived risk (Jensen et al., 1978; Paternoster & Piquero, 1995). Studies investigating the effects of vicarious experience of punishment have found (like experiences of punishment) that vicarious experiences of punishment have been related to increases in the propensity to commit offences (e.g., Piquero & Paternoster, 1998; Piquero & Pogarsky, 2002; Sitren & Applegate, 2007). However, Freeman and Watson (2006) found a non-significant relationship with vicarious punishment, yet the direction of the relationship indicated a reduction in offending. Therefore, the evidence is equivocal regarding vicarious experiences of punishment avoidance.

 1.4.4 Vicarious experience of punishment avoidance. Finally, and similar to punishment avoidance, the vicarious experience of punishment avoidance weakens the effectiveness of deterrence and increases the propensity of offending (e.g., Freeman & Watson, 2006; Piquero & Pogarsky, 2002; Sitren & Applegate, 2007).

The extent of the influence of vicarious punishment avoidance is less than that of direct punishment avoidance. Last, knowing of others that have avoided punishment for committing an offence has been found to reduce the perception of certainty of apprehension (Piquero & Pogarsky, 2002). Regular drug users believe that they are unlikely to be caught for drug driving (Darke et al., 2004), a belief that is reinforced via knowledge of friends who have avoided apprehension for drug driving (McIntosh et al., 2007).

1.5 The Current Study

Queensland's drug driving legislation allows police to conduct random roadside drug testing via saliva samples. The recent implementation of testing in Queensland (i.e., December, 2007) provides a unique opportunity to explore the initial impact of this new legislation and subsequent enforcement techniques, as there exists a paucity of studies that assesses the outcome of how new policies effect perceptions. Additionally, given the infancy of drug driving research, little is known or understood about the factors that impact and may possibly deter motorists from consuming illicit drugs and driving. Last, Stafford and Warr's (1993) theory has been not been subjected to extensive empirical examination. The current study will investigate the propensity to drug drive in a sample of Queensland motorists utilising Stafford and Warr's (1993) reconceptualization of deterrence theory. This study sought to firstly explore the samples awareness of the drug driving legislation and testing techniques; secondly, it was hypothesized that:

(a)   punishment would be related to a decrease in the likelihood of drug driving

(b)   punishment avoidance would be related to an increase in the likelihood of drug driving;

(c)   vicarious punishment would be related to an decrease in the

likelihood of drug driving;

(d)   vicarious punishment avoidance would be related to an increase of

in the likelihood drug driving

2. Method

2.1 Participants

In total, 899 participants volunteered to participate in the study, with the ratio of

males (51.9%) to females (48.1%) being approximately equal. Participants were

comprised of individuals from: the general public ($n = 523$: male 55.6%, female

44.4%), university students ($n = 323$: male 44%, female 56%), and individuals of a

drug referral program ($n = 53$: male 64.2%, female 35.8%). The inclusion criterion for

participation was possessing a Queensland driver's license.

2.2 Materials

The collection of data utilised the 57-item self-report Drug Driving

Questionnaire (DDQ). The DDQ was developed by the Centre for Accident Research

and Road Safety - Queensland (CARRS-Q) and included both purpose designed and

existing measures from previous studies (e.g., Davey et al., 2007; Freeman & Watson,

2006).

The DDQ assesses demographic details (e.g., gender, age, and employment

status), awareness of the legislation and detection techniques, and participants own as

well as their peer's drug driving behaviours. Deterrence variables were measured via

a 10-point Likert-scale (i.e., 1 'strongly agree', 5 'unsure', and 10 'strongly

disagree'). Experiences of punishment was assessed via the item 'Have you ever been

convicted of a drug driving offence?'. Participant's perceptions of direct punishment

avoidance was assessed via the item 'I regularly take drugs and drive and don't get

caught'. Vicarious experiences of punishment were assessed via two items 'I know people who have been caught and lost their license for drug driving' and 'I know people who have been caught and fined for drug driving'. Subsequently, these two items were combined by calculating the mean of the two items to produce the vicarious punishment variable (Cronbach's alpha = .92). Finally, vicarious experiences of punishment avoidance was assessed via the item 'My friends often take drugs and drive without being caught'.

Certainty of punishment was assessed by the item 'Out of the next 100 people who drug drive after taking drugs, how many do you think will be caught?'. Severity of punishment was assessed via the item 'I think the penalties for drug driving would be quite lenient'. This was a negatively worded item and was reversed scored for the analysis. Last, the outcome variable is the propensity to drug drive in the next six months that was assessed via the item 'How often do you think you will drive after taking drugs in the next six months', this item was scaled on a range of 0-182.

2.3 Procedure and Design

Following approval from the Queensland University of Technology (QUT) research ethics committee, the general public participants were recruited utilising a snow-ball technique. The student proportion was recruited from three QUT campuses and were randomly approached and asked to participate. The general public and student participants completed either a paper based or online version of the DDQ. Finally, the drug referral program participants were approached by a member of CARRS-Q. Participants were given an information sheet to peruse, which explained the purpose of the research and the procedure to ensure confidentiality and anonymity of responses, given the sensitive nature of the data being collected. The online

procedure includes all of the previously mentioned information but was conveyed electronically.

It was discovered that only 12 participants (i.e., 1.33% of the sample) reported experiences of personal punishment, therefore this variable was removed from the analyses. Many variables had non-normal distributions such that the data breached the assumptions of normality and linearity; consequently Kendall's Tau (τ) and a logistic regression were performed to reduce the influence of distribution anomalies. The outcome variable propensity to drug drive in the next six months was changed to a dichotomous variable for the logistic regression analysis to those who would and would not drug drive in the future.

3. Results

3.1 Demographics and Characteristics

The average age of the participants was 31 years ($SD = 13$; range = 16-81 years). The majority of the participants were employed (80.3%) and did not have a criminal record (88.7%). Approximately three quarters (76.3%) of the participants reported driving daily. Pertaining to gender differences, 18% of males and 4.2% of females reported having a criminal record. A greater proportion of males (26.1%) reported of intentions to drug drive in the next six months than females (7.9%).

3.2 Awareness of the Legislation and Testing Techniques

Pertaining to participant's knowledge of the existence of the drug driving legislation, 44.8% of participants reported that they were aware, 26.3% were not sure, and 28.9% were unaware. It was found that 64.2% of the participants were aware of the testing methods for drug driving, 14.7% were not sure, and 21.1% were unaware. Around a third of participants (36.2%) knew of the penalty if convicted for drug

driving (i.e., a fine and license loss), the remainder were ambiguous of the specific penalty.

3.3 Self-reported Drug Driving

The percentage of participants reporting drug driving or being a passenger of a drug driver at least once in the last six months was 19.4% and 31.3% respectively. Cannabis was found to be the most prevalent drug reported by participants when drug driving. Table 1 shows the frequency of participant's self-reported drug driving.

Table 1

The Percentage of Self-reported Drug Driving by Illicit Substance

Frequency of driving	Type of illicit substance			
	Cannabis	MATS	Heroin	Cocaine
Once or twice	9.7%	6.1%	.8%	2.2%
Three to ten times	3.2%	1.7%	.1%	.6%
11 to 20 times	2.2%	.7%	.1%	.2%
About once a week	1.2%	.4%	.1%	.3%
More than once a week	2.1%	.6%	.1%	0%
Everyday	2.1%	.2%	.2%	.1%

Note: MATS = Meth/amphetamines type substances

3.4 Descriptive Statistics

The means and standard deviations of the variables will now be examined. Assessment of experiences of punishment avoidance ($M = 2.5$, $SD = 2.61$) indicates that participants are not inclined to report having done this activity. Experiences of vicarious punishment ($M = 2.61$, $SD = 2.57$) shows that participants were unlikely to

know of someone having experienced legal sanctions for drug driving. Participants experiences of vicarious punishment avoidance ($M = 4.51$, $SD = 3.26$) indicates that participants were slightly more likely to know of someone that has drug driven and avoided apprehension.

Regarding certainty of punishment ($M = 12.25$, $SD = 16.77$) participants believed that out of the next 100 people who drug drive approximately 12% will be apprehended. The severity of punishment measure ($M = 6.91$, $SD = 2.61$) indicated that most participants believe the penalties for drug driving would to be fairly severe. Participants reports of their propensity to drug drive in the next six months ($M = 6.62$, $SD = 29.04$) indicated that the sample would drug drive for approximately seven out of the next 182 days. Approximately 80% of the participants reported never drug driving and this is reflected in the large amount of variances of the previously statistics.

Table 2

Bivariate Correlations between Deterrence Variables and the Self-reported

Propensity to Drug Drive in the Next Six Months

Deterrence variables	1	2	3	4	5	6
1. Propensity to drug drive in the next six months	1.0	.46**	.023	.38**	-.14**	-.008
2. Punishment avoidance		1.0	.14**	.35**	-.065*	-.058*
3. Vicarious punishment			1.0	.14**	-.088**	-.049
4. Vicarious punishment avoidance				1.0	-.13**	-.003
5. Certainty of punishment					1.0	.048
6. Severity of punishment						1.0

Note: *p < .05 (two-tailed), **p < .01 (two-tailed). 3.5 Intercorrelations of Variables

Table 2 displays the correlations between the deterrence variables and the propensity to drug drive. Punishment avoidance was correlated with the propensity to drug drive in the next six months (τ = .46, *p* < .01). Punishment avoidance was also negatively correlated with perceptions of certainty (τ = -.065, *p* < .05) and perceptions of severity (τ = -.058, *p* < .05) though slight in magnitude. A moderate and positive relationship existed between vicarious punishment avoidance and the propensity to drug drive in the next six months (τ = .38, *p* < .01). A negative and significant correlation existed between the experiencing of vicarious punishment avoidance and perceptions of certainty (τ = -.13, *p* < .01). Nonetheless, it should be noted that the previously mentioned correlation and several other small correlations exist between

the variables and are significant from a statistical point of view which is likely due to the large sample size.

3.6 Predictions to Drug Drive

A series of logistic regression analyses were utilised to evaluate which variables were predictors of the propensity to drug drive. Table 3 displays the regression coefficients, Wald statistics, odds ratios (OR), and 95% confidence intervals for OR.

Table 3

Deterrence Variables Logistic Regression Co-efficients for the Self-reported Propensity to Drug Drive in the next six Months.

Deterrence variables	B	S.E.	Wald	OR	95% Confidence interval for OR	
					Lower	Upper
Model 1						
Gender	1.13	.22	27.37**	3.01	2.03	4.73
Age	-.03	.01	8.89*	.97	.96	.99
Criminal record	1.74	.24	54.95**	5.72	3.61	9.07
Constant	-1.77	.32	30.9**			
Model 2						
Gender	1.07	.26	16.86**	2.9	1.75	4.82
Age	-.02	.01	4.16*	.98	.96	.99
Criminal record	1.01	.3	11.02*	2.73	1.51	4.94
Punishment avoidance	.33	.04	64.92**	1.39	1.28	1.5
Vicarious punishment	-.07	.05	2.5	.93	.85	1.02
Vicarious punishment avoidance	.34	.04	64.12**	1.41	1.29	1.53
Certainty	-.01	.01	1.54	.99	.98	1.01
Severity	.07	.05	2.22	1.07	.98	1.18
Constant	-5.04	.64	62.55**			

Note: $^*p < .05$, $^{**}p < .001$; OR = Odds Ratio.

To control for the influence of gender, age, and criminal record variables these were included in the first step of the logistic regression and were significant predictors of the outcome variable ($\chi^2(1, 4) = 111.17$, $p < .001$). The full model accounted for 19.3% of the variance for the propensity to drug drive and correctly classified 83.2% of the participants. Although, it must be noted that the Hosmer and Lemeshow test was significant, indicating that the classification accuracy was inadequate utilising the variables of gender, age, and criminal record.

The second step included the addition of the variables of punishment avoidance, vicarious punishment, vicarious punishment avoidance, perceptions of certainty and severity of apprehension variables into the model and was a significant predictor of the outcome variable ($\chi^2(1, 9) = 335.53$, $p < .001$). An additional 32.4% of the variance (51.7% total) was accounted for, with 88.4% of participants correctly classified. The Hosmer and Lemeshow test was not significant ($\chi^2(1, 9) = 13.04$, $p = .11$).

Supporting Stafford and Warr's (1993) contention to include experiences (both personal and vicarious) of punishment avoidance into their reconceptualization of deterrence theory, experiences of punishment avoidance (OR = 1.39, $p < .001$) and experiences of vicarious punishment avoidance (OR = 1.41, $p < .001$) were significant predictors of the intentions to drug drive in the future. However, contrary to Stafford and Warr's (1993) theory vicarious experiences of punishment avoidance was a more influential predictor than personal experiences of punishment avoidance. Gender, age, and criminal record remained significant predictors after the inclusion of the deterrence variables. The variables of vicarious punishment, certainty of apprehension, and severity of punishment were not significant predictors of future intentions to drug drive.

4. Discussion

This study applied Stafford and Warr's (1993) reconceptualization of deterrence theory to a sample of Queensland motorists to account for reported intentions to drug drive in the future. This study also contributes to the paucity of studies to evaluate the deterrent impact of zero-tolerance laws for drug driving. Last, this study assessed the samples awareness of the legislation and the testing techniques.

The current study found partial support for Stafford and Warr's (1993) theory. Specifically, direct punishment avoidance and vicarious punishment avoidance were found to be significant predictors of reported intentions of future drug driving. The low levels of awareness of the legislation and the testing methods may contribute to negating the efficacy of deterrence.

4.1 Awareness of the Legislation and Testing

This study sought to examine the samples' awareness levels of the drug driving legislation and testing techniques. Deterrence is partly reliant on knowledge of the legislation and legal sanctions (Elvik & Christensen, 2007). Less than half of the sample was aware of the current legislation with almost two-thirds of the sample aware of the testing methods. An objective of the education campaign was to reach an 85% awareness of the roadside drug testing (Queensland Transport, 2008). An integral component of deterrence effectiveness is the need for sustained educational campaigns of the legal sanctions (Dula et al., 2007; Homel, 1988).

4.2 Experiences of Punishment Avoidance

It was hypothesized that experiences of punishment avoidance would be related to increases in the likelihood of drug driving, which was supported. That is, experiences of punishment avoidance was a significant predictor of future intentions

to drug drive. The current study findings support previous studies that has found that avoided apprehension for drug driving has encouraged this behaviour (e.g., Darke et al., 2004; Davey et al., 2001; Degenhardt et al., 2006). However it must be noted that these studies utilised a descriptive or qualitative analyses and as such could not provide predictive findings. Pertaining to the findings with prior studies utilising Stafford and Warr's (1993) theory the current studies findings are congruent with a number of studies (e.g., Freeman & Watson, 2006; Paternoster & Piquero, 1995; Piquero & Paternoster, 1998; Piquero & Pogarsky, 2002; Sitren & Applegate, 2007) that have discovered punishment avoidance to be predictive of future illegal behaviours. Also, consistent with prior studies punishment avoidance was related to reduced perceptions of certainty and severity (e.g., Freeman & Watson, 2006; Piquero & Pogarsky, 2002; Sitren & Applegate, 2007).

An alternate explanation for drug driving can be found from the aspect of impulsivity. Impulsive individuals may drug drive repeatedly and the infrequency of random roadside drug testing facilitates their avoidance of apprehension. Also, the effects of the particular drug can mediate the impulsivity of an individual. Drug taking has been found to impair cognition (Ramaekers et al., 2004) and increases risk taking (Jones, 2007).

An alternate influence that may have contributed to the current findings is that of sensation seeking. A number of studies have found that sensation seeking is linked to dangerous driving and to drug use (Zuckerman, 2007). Further, sensation seeking has been found to have a moderate sized positive relationship with the propensity to drug drive (Ames et al., 2002; Richer & Bergeron, 2009).

The role of perceived peer rewards can additionally provide an account for the propensity to drug drive. Fellow drug users provide a rewarding and normative frame

of reference for the individual drug user (Hammersley, 2008). The committing of

illegal activities is facilitated when the individual drug user perceives the social

rewards from their peers to be pertinent (Duff & Rowland, 2006).

4.3 Experiences of Vicarious Punishment

The third hypothesis postulated that the experiencing of vicarious punishment

would be related to decreasing the likelihood of drug driving, which was not

supported. The multivariate analysis showed that vicarious experiences of punishment

was not a significant predictor of future drug driving. Therefore, the present data

suggests that the knowledge of others having been apprehended for drug driving does

not produce an effective deterrent message. The current finding is not an isolated

occurrence. Previous research has found that experiences of vicarious punishment

have been significantly and positively correlated to the propensity to commit future

indiscretions (e.g., Piquero & Paternoster, 1998; Piquero & Pogarsky, 2002; Sitren &

Applegate, 2007).

The finding of this study and of others mentioned previously raises questions

regarding the effectiveness of punishment as a deterrent. Currently, the penalties for

conviction for drug driving are a fine of up to $1,050 and loss of license for up to nine

months (Queensland Transport, 2007). It seems those having experienced vicarious

punishment may not perceive the penalties for drug driving as severe. Previously

noted was that the effectiveness of deterrence is reliant in part, by the perception or

experiencing of punishment as being severe (Taxman & Piquero, 1998).

The role of defiance may elucidate processes behind the facilitation of

criminal behaviour. Defiance is expressed by increased engagement in the sanctioned

behaviour by the individual, particularly when the sanctioned behaviour is considered

malum prohibitum (Piquero & Pogarsky, 2002). The role of defiance is salient for

drug driving as many drug drivers believe that they can safely drive when influenced by drugs (Duff & Rowland, 2006). Further, many experienced drug drivers believe compensatory strategies can reduce the risks when drug driving (Darke et al., 2004).

4.4 Experiences of Vicarious Punishment Avoidance

It appears that vicarious learning has taking place within the current sample. The fourth hypothesis of this study was that experiencing indirect punishment avoidance would be related to an increase of the likelihood of drug driving, which was supported. This finding is congruent with other studies utilising Stafford and Warr's (1993) theory (e.g., Piquero & Paternoster, 1998; Piquero & Pogarsky, 2002; Sitren & Applegate, 2007). Last, vicarious punishment avoidance was negatively related to perceptions of certainty.

The multivariate analysis revealed that for the deterrence variables, vicarious punishment avoidance was a more influential predictor of future intentions of drug driving than personal experiences of punishment avoidance. Although, it must be noted that the variables of gender and criminal record were even more influential predictors of future intentions to drug drive. Social Learning Theory stipulates that vicarious reinforcement is dependant on the amount and types of influences for any particular situation (Bandura, 1977). However, Gray et al. (1985) have described that vicarious experiences can potentially be more influential than personal experiences for subsequent deviant behaviour. As drug use is illegal per se and fellow drug users provide a normative frame of reference (van Dijk, 2008), vicarious experiences may have greater salience within a drug culture. The negative correlation between vicarious punishment avoidance and certainty of apprehension is also consistent with this interpretation.

This study and prior research has found that vicarious punishment avoidance reduces perceptions of certainty more than personal experiences of punishment avoidance (e.g., Freeman & Watson, 2006; Piquero & Pogarsky, 2002; Sitren & Applegate, 2007). In relation to perceived risk, it has been found that personal experiences have more salience than vicarious experiences to the individual (Jensen et al., 1978; Paternoster & Piquero, 1995). However, the current findings and those of others previously mentioned have shown this effect to be inverted for punishment avoidance. Therefore, subsequent research is required with this phenomenon.

4.5 Limitations and Future Research

A limitation of the study was that participants were not randomly selected for involvement in the study. Second, the use of self-report measures for this study leaves it susceptible to self-reporting bias and may not reflect participants' true behaviours. While no significant differences were found between the three populations for intentions to drug drive in the future, the pooling of the three populations may have differentially influenced the obtained results and requires further examination. Last, this study does not allow for inferences of causality to be made from the obtained results.

The interpretation that vicarious experiences have more salience in a drug culture requires further investigation. Additionally, the outcome that vicarious experiences of punishment avoidance were correlated greater with perceptions of certainty of apprehension requires further enquiry. Such a study should be sensitive of possible developmental stages, as during adolescence influences from peers may be more salient than before or after this period (Aseltine, 1995; Piquero & Pogarsky, 2002).

4.6 Conclusion

In summary, this study aimed to explore the preliminary impact of Queensland's drug driving legislation and the subsequent enforcement techniques. An application of Stafford and Warr's (1993) reconceptualization of deterrence theory was undertaken to identify aspects that contribute to the behaviour of drug driving. The results provided partial support of Stafford and Warr's (1993) theory. Specifically, punishment avoidance and vicarious punishment avoidance were predictive of intentions to drug drive in the future. As such, the instigation of random road side drug testing would appear to be an important countermeasure to deter drug driving.

The results of this study have shown that drug driving is facilitated more for vicarious experiences of punishment avoidance than from personal experiences of punishment avoidance. From a theoretical perspective it seems possible that Stafford and Warr's (1993) theory is sensitive to the population and deviant act that are being examined. Further research can only provide answers to this matter. Pertaining to an applied standpoint, the current findings can inform interventions aimed at ceasing an individuals drug driving. More importantly the current findings can shape media campaigns that are aimed at dissuading individuals from drug driving. These efforts are an invaluable endeavour that can curtail the deleterious indecencies of drug driving and provide a safer road environment for Australians.

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