

A PRELIMINARY INVESTIGATION INTO A GROUP OF RECIDIVIST DRINK DRIVERS' EXPERIENCES AND PERCEPTIONS OF LEGAL SANCTIONS

James Freeman (CARRS-Q)
Poppy Liossis (QUT)
Cynthia Schonfeld (CARRS-Q)
Mary Sheehan (CARRS-Q)

Centre for Accident Research and Road Safety – Queensland

Queensland University of Technology

Abstract

Concern remains regarding the ability of legal sanctions to produce behavioural change among recidivist drink drivers. This paper reports on an investigation into a group of repeat offenders' ($N = 166$) experiences and perceptions of legal sanctions, including the perceived purpose, fairness and effectiveness of penalties incurred for drink driving offences. Participants perceived legal sanctions to be severe and fair, but not entirely certain nor swift. The majority reported that penalties were designed for retribution rather than reform, and that current countermeasures are not extremely effective in reducing re-offending behaviour. The findings suggest that increasing the severity of sanctions may not guarantee behavioural change, and that additional countermeasures are required if the drinking and driving sequence is to be broken for this population.

The Present Context

Increased policing efforts in combination with the implementation of a range of sanctions and countermeasures have resulted in substantial reductions in the prevalence of drink driving in the past 15 years (Mayhew, Simpson & Beirness, 2002; Voas & Tippetts, 2002). However, current sanctions appear to be less effective in reducing drink driving among "hard-core" repeat offenders (Beirness et al., 1997; Hedlund & McCartt, 2002; Yu, 2000). This group is commonly known as recidivist drink drivers and may best be defined as motorists who drive repeatedly after drinking alcohol, have more than one proven drink driving offence, are often apprehended with high blood alcohol content (BAC) readings, and appear resistant to emotional appeal or the threat of criminal sanctions (Beirness et al., 1997).

The prevalence of repeat offending is surprisingly large, as research consistently demonstrates that between 20 to 30% of convicted drink drivers have a prior drink driving offence (Brewer et al., 1994; Hedlund & McCartt, 2002; Wiliszowski, Murphy, Jones & Lacey, 1996). Of concern is that this group are a major social and road safety threat, and are disproportionately represented in crash statistics (Beirness et al., 1997; Brewer, 1994; Hedlund & McCartt, 2002; Popkin, 1994). For example, a North American study estimated drink driving repeat offenders to be 36 times more likely to be involved in a fatal accident than drivers who do not have previous convictions (Brewer et al., 1994).

Drink Driving Countermeasures

A wide variety of countermeasures are currently employed to reduce the prevalence of drink driving offences, including: licence disqualification periods, fines, vehicle impoundment, offender confinement, special licence tags, publishing of offenders' names, electronic monitoring, rehabilitation programs and installation of alcohol ignition interlocks to offenders' vehicles (Beirness et al., 1997). Within Australia the major sentencing options remain sanctioning offenders with licence disqualification periods coupled with fines (which is the focus of the current paper), as well as rehabilitative alternatives incorporating some intervention programs for more serious offences.

Aim of Sanctions

Fines and licence loss aim to fulfil a number of objectives such as retribution, deterrence and incapacitation (Beirness et al., 1997; Ross, 1992; Watson, 1998). Firstly, retribution forms the foundation for criminal punishment and is a motivating factor for the application of fines and licence suspension to convicted drink drivers (Ross, 1992; Watson, 1998). That is, applying sanctions involves "balancing the damage caused by the act with the pain imposed on the offender" (Ross, 1992, p.61). Secondly, legal sanctions can act to reform convicted offenders to be less likely to drink and drive again in the future (Peck et al., 1985; Ross, 1992; Watson, 1998). For legal sanctions, reform operates primarily through the process of specific deterrence (Watson, 1998), which stems from the Classic Deterrence Doctrine. Specific deterrence refers to the process whereby an individual who has been apprehended and punished for a criminal act refrains from additional offending behaviour due to fear of incurring further punishment (Homel, 1988). The Classic Deterrence Doctrine proposes that legal threats are most effective when possible offenders perceive a high likelihood of apprehension, and believe that the impending punishment will be both severe and swift. Fines and licence disqualification periods can therefore produce a specific deterrent effect as convicted offenders fear being sanctioned again, and thus are expected to avoid further drink driving behaviours. Thirdly, legal sanctions (especially licence disqualification periods) act to incapacitate offenders by preventing them from committing the offence again, even if they wish to do so (Beirness et al., 1997; Peck et al., 1985; Ross, 1992).

Effectiveness of Sanctions

A considerable body of North American research has demonstrated licence disqualification periods coupled with fines to be one of the most effective methods for reducing further drink driving offences for the general driving population (Nichols & Ross, 1990; Sadler & Perrine, 1984). More specifically, compared to other sanctions, disqualification periods have proven to be the most effective short-term countermeasure that can be applied to drink drivers (Nichols & Ross, 1990; Ross, 1992; Sadler & Perrine, 1984).

However for repeat offenders, there is a general consensus that the application of legal sanctions alone fails to produce long-term behavioural change, and consequently, are not extremely effective in reducing drink driving amongst recidivist offenders (Beirness et al., 1997; Brewer et al., 1994; Homel, 1988; Marques et al., 1998; Morse & Elliot, 1992; Ross, 1992; Yu, 2000). Few studies have specifically examined the direct effects of legal penalties on repeat offenders' drink driving behaviour (Yu, 2000). However, overwhelming evidence of high levels of repeat

offending in a number of countries (Brewer et al., 1994; Hedlund & McCartt, 2002; Wiliszowski et al., 1996), demonstrates that licensing sanctions generally fail to deter habitual offenders from continuing to drink and drive (Yu, 2000).

Outcome Measures

Apart from general assumptions regarding the limited long-term effect of sanctions, little is known about the immediate deterrent impact that penalties have on repeat offenders' drink driving behaviour (Beirness et al., 1997), how this population perceive the countermeasures (e.g., certain, severe & swift), nor their perceptions regarding the effectiveness of such countermeasures. Rather the majority of previous research has focused heavily on summative outcomes such as recidivism, crash and fatality rates (Fitzpatrick, 1992; Popkin, 1994). While archival data such as recidivism rates, are perhaps the simplest and most accessible outcome measure (Buchanan, 1995), a number of researchers have highlighted difficulties associated with using recidivism rates as an outcome measure (Beirness et al., 1997; Fitzpatrick, 1992; Hedlund & McCartt, 2002; Popkin, 1994; Ross, 1992). Primarily, questions have been raised regarding the validity of the approach to provide an accurate reflection of the prevalence of drink driving on public roads. Specifically, the probability of being apprehended for drink driving remains relatively low (Fitzpatrick, 1992; Homel et al., 1988; Voas, 1982) and is highly dependent upon the level and effectiveness of law enforcement activities in a particular jurisdiction. As a result, it may be of value to look beyond archival data and consider additional data sources to gain a greater understanding of the impact of current sentencing practices on habitual offenders.

Aims of Study

In summary, the present study aims to explore a group of repeat offenders' experiences and perceptions of legal sanctions in an attempt to gain greater insight into the effect current sanctioning practices have on habitual drink driving offenders. The study focuses on three main research questions:

- What are repeat offenders' perceptions of legal sanctions?
- Is there a relationship between the actual size of sanctions and perceptions of such sanctions?
- Does the size of sanctions have an effect on intentions to re-offend?

Method

Participants

A total of 166 recidivist drink drivers volunteered to participate in the study. The overall response rate for the study was 44.75% as 371 repeat offenders were placed on a probation order in Queensland over the course of the 24-month data collection period. There were 149 males and 17 females in the study.

Materials

Demographic Survey

A questionnaire was developed to collect demographic information such as the age, employment, marital status, and level of income of participants.

Deterrence Questionnaire

The Deterrence Questionnaire (DQ), assessed participants' experiences and perceptions of legal and non-legal sanctions. The DQ consists of 19 questions, with two items focusing on each of the three deterrent factors (e.g., certainty, severity & swiftness), the perceived fairness of the sanctions, the beliefs regarding the purpose of sanctions (e.g., retribution, reform, incapacitation), and one question each for attitudes regarding the effectiveness of current countermeasures (e.g., fines, licence loss, rehabilitation programs, ignition interlocks & random breath testing). Participants were required to respond on a 10-point scale (1 = strongly disagree, 5 = unsure, 10 = strongly agree). The piloting process revealed that participants experienced difficulty responding to large numbers of likert scaled questions. As a result, a 10-point scale was predominantly implemented to measure perceptions of legal sanctions, with 5-point likert scales reserved for the measurement of concrete factors (e.g., intentions to re-offend). Examples of items include: "The penalty I have received for drink driving has caused a considerable impact on my life" (severity)¹, "The legal sanctions I have received for drink driving have been fair" (fairness), "Legal sanctions are designed to deter people from drink driving again" (reform) ".

Procedure

Participation was on a voluntary basis and withdrawal was permitted from the study at any time, without inquiry. Individuals convicted of a drink driving offence in South East Queensland were asked by their probation officer (during a scheduled meeting) to participate in the research program. Probation officers provided a list of individuals who agreed to participate in the research and data were collected through structured interviews via two procedures. Firstly, the majority of participants (79.5%, $n = 132$) were interviewed at their local Community Corrections regional centre after they had met with their probation officer. Only the researcher and the participant were present during the interview. Secondly, when face-to-face interviews were not possible due to logistical problems (e.g., time and travel) telephone interviews were conducted at a convenient time for participants (20.5%, $n = 34$)². Both forms of interviews took approximately 20-30 minutes to complete³. Participants signed a "Statement of Release" consent form that allowed the researcher to obtain information regarding previous traffic and non-traffic convictions that was provided by the Queensland Police Service and Queensland Transport.

Results

Characteristics of Sample

The average age of the participants was 37, with a range from 20 to 67. In summary, the majority of participants were male Caucasians who were mostly employed (66.3%), on a full-time basis in blue-collar occupations, earning approximately \$12,000 - \$35,000. There was considerable variation in the level of participants' education and more than half the sample reported currently being in a relationship. The socio-demographic characteristics of the sample are comparable to recent

¹ Abstract words such as severity and certainty were excluded from the questionnaire as participants experienced comprehension difficulties during the piloting process.

² Interviews ranged from one to thirty two weeks after participants' sentencing date..

³ Between groups analysis revealed no significant differences between those who were interviewed face-to-face compared to over the phone on a number of key research outcomes such as perceptual deterrence factors or self-reported offending behaviour(s).

studies that have focused on drink driving repeat offenders apprehended in Queensland (Buchanan, 1995; Ferguson et al., 2000). On average participants were disqualified from driving for approximately 15 months (range 6-60mths), the majority received a \$500 fine, and were placed on a probation order on average for 16 months (range 6-36mths)⁴. In general, participants had been convicted of approximately three drink driving offences ($M = 2.86$, range 2-7), and their BAC reading for the most recent offence was on average three times the legal limit ($M = .155$, range .05 -.317mg%).

1. Perceptions of Legal Sanctions

Participants' self-reported perceptions of legal and non-legal sanctions are presented in Table 1. The procedure to divide respondents' scores on the 10-point scale into low, medium and high categories was based on the principle of natural breaks in the distribution of scores. In regards to Classical Deterrence, only half the sample perceived the chances of being apprehended for drink driving to be high (51.8%), as 26.5% reported the probability as low, and 21.7% were undecided ($M = 6.27$). For perceived severity, the majority reported sanctions to be severe, indicating that recently incurred penalties produced a considerable impact upon their lives (86.2%, $M = 8.35$). However, it is noted that 23 participants did not consider their penalties for drink driving to be severe. Similar to perceived certainty, a considerable proportion reported the time between apprehension and conviction to be long (43.4%), a further 41% were undecided, and only 15.6% considered application of sanctions to be swift. For the perceived fairness of penalties, three quarters of the sample considered their period of licence loss, probation order and monetary sanction as reasonable. This was to be expected as the traditional fine imposed for repeat offenders was waived in return for enrolling in the UTL program and paying the \$500 attendance fee.

In regards to the purpose of sanctions, the majority believed penalties were a form of punishment designed to "get back" at offenders for their crime (91.5%) (e.g., retribution). Interestingly, only one third believed sanctions were enforced to re-form offenders (34.4%), and a similar proportion believed sanctions were applied to restrict or incapacitate drivers from committing further offences (37.3%). In regards to the self-reported effectiveness of current countermeasures to stop drink driving, the majority of participants did not agree with the statement that monetary fines are effective in reducing drink driving, while only slightly more than half agreed with the statement that licence loss was effective in reducing the offence. Similarly, fifty percent agreed that the alternative approach of implementing rehabilitation programs and interlocks were effective, while a moderately larger proportion indicated Random Breath Testing to be successful in reducing drink driving.

⁴ In the current setting, magistrates usually waive the traditional monetary sanction in lieu of paying a \$500 fee to enrol in an 11-week drink driving rehabilitation program ("Under the Limit"), which participants in the current study were also required to complete while they were on a probation order.

Table 1. Self-reported Measures of Legal Sanctions and Drink Driving Countermeasures

Perceptions	Mean	(SD)	Low	Unsure	High
Certainty	6.34	2.97	26.5% (n = 44)	21.7% (n = 36)	51.8% (n = 86)
Severity	8.35	2.22	9.0% (n = 15)	4.8% (n = 8)	86.2% (n = 143)
Swiftness	4.42	2.22	43.4% (n = 72)	41% (n = 68)	15.6% (n = 26)
Fairness	7.38	2.64	17% (n = 29)	9% (n = 15)	74% (n = 122)
Retribution	7.94	1.65	4.2% (n = 7)	4.2% (n = 7)	91.5% (n = 152)
Reform	4.58	2.43	50% (n = 83)	15.6% (n = 26)	34.4% (n = 57)
Incapacitation	5.10	2.55	39.2% (n = 65)	23.5% (n = 39)	37.3% (n = 62)
Fines	3.41	2.46	65.7% (n = 109)	16.2% (n = 27)	18.1% (n = 30)
Licence Loss	6.44	2.70	19.9% (n = 33)	22.2% (n = 37)	57.9% (n = 96)
Programs	6.03	2.09	10.8% (n = 18)	39.2% (n = 65)	50% (n = 83)
Interlocks	6.33	2.62	20.5% (n = 34)	22.3% (n = 37)	57.2% (n = 95)
RBT	6.47	2.74	20.5% (n = 34)	16.9% (n = 28)	62.6% (n = 104)

Note. Programs = Rehabilitation Programs, Interlocks = Alcohol Ignition Interlocks & RBT = Random Breath Testing.

2. Objective and Subjective Deterrence

The second aim of the study was to examine the relationship between offenders' subjective perceptions regarding the severity of their sanctions and the actual objective size of such penalties. Deterrence theory relies heavily on perceptions of sanctions, and thus it is of value to examine the relationship between subjective perceptions of legal sanctions (e.g., perceptual severity) and the actual objective⁵ punitive sanctions incurred by offenders (e.g., periods of licence loss). As highlighted in a previous section, there was considerable variability in the length of licence loss and period of probation applied to offenders in the sample. Despite this variability, examination of the bivariate relationships depicted in table 2 reveal that perceptions of severity were not significantly associated with participants': length of licence loss ($\tau = .01$), period of probation ($\tau = -.02$), or the amount of fine ($\tau = .01$)⁶. Also, these perceptions of severity did not appear to deteriorate since the time of actual sentencing⁷ ($\tau = .03$). That is, individuals recently sanctioned were not more likely to report higher levels of severity compared to those who had been on probation for a longer period of time. A closer examination of the differences in perceptions between participants who were to install an interlock compared to individuals who were ordered to complete only the drink driving rehabilitation program (i.e., UTL) revealed no differences on perceived severity or fairness of the imposed sanctions. Finally, there appeared to be little association between perceptual severity and the number of previous drink driving convictions ($\tau = -.04$) or the existence of criminal convictions ($\tau = .03$). Furthermore, perceptual severity was not highly correlated with demographic characteristics such as age ($\tau = .05$), income levels ($\tau = -.09$), employment ($\tau = -.03$), nor relationship status ($\tau = -.02$).

⁵ The length of sanctions are referred to as "objective" as they can be measured without considering how they are perceived by convicted offenders (Gibbs, 1979).

⁶ Kendall's Tau was computed in the place of Pearson's correlations to reduce the influence of distribution anomalies.

3. Predictors of Intentions to Re-offend

The third aim of the study was to investigate whether the size of incurred sanctions had a deterrent effect on self-reported intentions to re-offend. A noteworthy finding of the study was that despite recently being sanctioned and placed on a probation order, three participants reported it extremely likely they would re-offend (1.8%), six report it likely (3.6%), a relatively large sample of 30 were unsure (18.1%), whilst 58 (34.9%) believed it unlikely and 69 (41.6%) reported it very unlikely. That is, approximately 25% were not confident of avoiding drink driving again in the future. Once again, despite the variability of applied sanctions, there appears to be little relationship between the penalties incurred by participants and future intentions to drink and drive. That is, those who reported not intending to drink and drive again did not incur larger punitive sanctions. Specifically, intending to re-offend was not highly associated with the length of licence loss ($\tau = .06$), period of probation ($\tau = -.03$), nor the amount of fine ($\tau = .08$). Logistic and linear regression analyses confirmed that present sanctions, socio-demographic factors (e.g., income and employment) or past offence history did not contribute to the prediction of perceptual severity nor intentions to re-offend.

Table 2. Intercorrelations between magnitude of sanctions, socio-demographics and intentions to re-offend

	1	2	3	4	5	6	7	8	9	10	11	12
1. Severity ^a	1	.01	-.02	.01	.03	-.04	.03	.05	-.09	-.03	-.02	-.11
2. Licence loss ^b		1	.19**	-.03	.03	.49**	-.08	.19**	-.02	.02	.06	.06
3. Probation ^b			1	.02	.00	.08	-.15*	-.02	-.02	-.01	.05	-.03
4. Fine ^b				1	.01	-.10	-.10	-.04	-.11	.05	-.07	.08
5. Time					1	.08	-.13*	-.04	-.07	-.12	-.03	.12
6. # Convictions						1	.12	.20**	-.08	.13	.03	.05
7. Crim Offence							1	.02	.01	.07	-.05	-.14
8. Age								1	-.01	.08	.04	-.02
9. Income									1	-.53**	.21**	-.05
10. Employment										1	-.13	.04
11. Relationship											1	-.09
12. Re-offend												1

Note. ^a = self-reported; ^b = magnitude of sanction; Time = time between conviction and interview, Re-offend = self-reported intentions to re-offend; * $p < .05$; ** $p < .01$ (two-tailed).

Discussion

Self-reported Experiences

The present research aimed to explore a group of repeat offenders' experiences and perceptions of legal sanctions, and the relationship such sanctions have with further self-reported offending behaviours. In regard to participants' experiences of legal sanctions, the majority of the sample reported current penalties to be severe but fair, although not entirely certain nor swift. The first finding is positive, as severe sanctions have proven vital for establishing deterrence, and in general, the reduction of future drink driving offences (Sadler et al., 1991; Vingilis et al., 1990). However, despite being recently apprehended and convicted of another drink driving offence, a considerable proportion did not consider the chances of being apprehended to be high. One possible explanation for such an effect may be the frequency with which this population drink and drive while avoiding apprehension, which ultimately reduces perceptions of arrest certainty. Conversely, the findings may confirm the "resetting effect" or "gambler's fallacy" phenomena, as individuals consider it extremely unlikely that they will be apprehended soon after being recently detected (Pogarsky &

Piquero, 2003). As highlighted in previous research (Homel, 1988; Minor & Harry, 1982) questions remain regarding the stability of such perceptions over longer periods of time.

Next, an examination was undertaken to determine the relationship between objective sanctions (e.g., length of penalties) and perceptual severity, as well as intentions to re-offend. Firstly, it appears that larger licence disqualification and monetary sanctions were not perceived as more severe than shorter and/or lesser sanctions. For example, short licence disqualification periods were reported to have the same considerable impact on participants' lives to those who received larger periods of licence loss. In practical terms, shorter licence disqualification periods may still have the potential to be perceived as severe. For up-coming Australian interlock trials and the ongoing debate regarding appropriate lengths of licence disqualification, the results provide initial support for the assertion that shorter periods of licence loss before interlock installation can still produce a beneficial effect.

Finally, a relationship was not evident between the objective severity of sanctions and intentions to re-offend in the future. While the majority of the sample reported their penalties to be severe, those who reported not intending to drink and drive again did not incur the largest punitive sanctions. Whilst it is difficult to make firm conclusions given the small sample size, the results suggest that some repeat offenders are not heavily influenced by the threat or application of severe legal sanctions, and/or that the conditions necessary to deter this population are not being achieved. These findings lend support to the theory that re-offending rates for persistent drink drivers may not be dependent on the level or intensity of sanctions (Taxman & Piquero, 1998; Yu, 2000).

Study Limitations

Some limitations of the study were identified. Participants were not randomly selected. The accuracy of the self-reported data remains susceptible to self-reporting bias, and it remains uncertain whether stated intentions are effective predictors of future behaviours. The DQ scale developed for the present research requires further validation and amendment with a larger sample size. In addition, the findings may be heavily influenced by a positive "experiential" effect, as the majority of participants were recently sanctioned and on probation, and the stability of offender perceptions over longer periods of time has yet to be determined. Finally, questions remain whether the current sample were representative of the larger population of recidivist drink drivers, especially individuals who continue to drink and drive while avoiding apprehension.

Conclusion

Taken together, the program of research indicates that while legal sanctions were reported to have a considerable impact on the participants in the current sample, some offenders will continue to drink and drive regardless of the sanctions imposed on them. This finding confirms the assertion that legal sanctions applied in isolation are not extremely effective in reducing drink driving among repeat offenders (Beirness et al., 1997; Hedlund & McCartt, 2002; Marques et al., 1998; Yu, 2000). While the principles of deterrence should remain a driving force in the reduction of re-offending, a need remains to look beyond punishment and continue to develop

additional countermeasures to increase the possibility of long-term behavioural change.

References

- Beirness, D.J., Mayhew, D.R., & Simpson, H.M. (1997). *DWI Repeat Offenders: A Review and Synthesis of the Literature*. Canada: Health Canada.
- Brewer, R.D., Morris, P.D., Cole, T.B., Watkins, S., Patetta, M.J., & Popkin, C. (1994). The risk of dying in alcohol related automobile crashes among habitual drunk drivers. *New England Journal of Medicine*, 331(8), 513-517.
- Buchanan, D.A. (1995). *Recidivism rates of a cohort of drink-drivers in Queensland – A basis for comparison*. Unpublished Masters Thesis, University of Queensland.
- Ferguson, M., Schonfeld, C., Sheehan, M., & Siskind, V. (2000). *The Impact of the "Under the Limit" drink driving rehabilitation program on the lifestyle and behaviour of offenders*. Road Safety Research Report: CR187, Canberra. Federal Office and Road Safety.
- Fitzpatrick, J.L. (1992). Problems in the evaluation of treatment programs for drunk drivers: Goals and outcomes. *The Journal of Drug Issues*, 22, 155-167.
- Hedlund, H., & McCartt, A.T. (2002). Drunk driving in the United States. A roadmap for progress. *Proceedings of the 16th International Conference on Alcohol, Drugs and Traffic Safety*, Montreal, Canada, [CD-ROM], ICADTS.
- Homel, R.J. (1988). *Policing and punishing the drinking driver. A study of specific and general deterrence*. New York: Springer-Verlag.
- Homel, R.J., Carseldine, D., & Kearns, I. (1988). Drink-driving countermeasures in Australia. *Alcohol, Drugs and Driving*, 4 (2), 113-144.
- Marques, P.R., Voas, R.B., & Hodgins, D. (1998). Vehicle interlock programs: protecting the community against the drunk driver. *Journal of Prevention and Intervention in the Community*, 17 (1), 31-44.
- Mayhew, D.R., Simpson, H.M., & Beirness, D.J. (2002). Are the declines in drinking driving fatalities in Canada being overestimated? *Proceedings of the 16th International Conference on Alcohol, Drugs and Traffic Safety*, Montreal, Canada, [CD-ROM], ICADTS.
- Minor, W.W., & Harry, J. (1982). Deterrent and experiential effects in perceptual deterrence research: a replication and extension. *Journal of Research in Crime and Delinquency*, 19, 190-203.
- Nichols, J.L., & Ross, H.L. (1990). The effectiveness of legal sanction in dealing with drinking drivers. *Alcohol, Drugs and Driving*, 6, 33-60.

Peck, R.C., Sadler, D.D., & Perrine, M.W. (1985). The comparative effectiveness of alcohol rehabilitation and licensing control actions for drunk driving offenders: A review of the literature. *Alcohol, Drugs and Driving: Abstracts and Reviews*, (4), 14-40.

Pogarsky, G., Piquero, A. (2003). Can punishment encourage offending? Investigating the "resetting" effect. *Journal of Research in Crime and Delinquency*, 40(1), 95-120.

Popkin, C.L. (1994). The deterrent effect of education on DWI recidivism. *Alcohol, Drugs and Driving*, Vol 10 (3-4), 287-294.

Ross, H.L. (1992). Are DWI sanctions effective? *Alcohol, Drugs and Driving*, 8, (1), 61-69.

Sadler, D., & Perrine, M.W. (1984). Evaluation of the California drunk driving countermeasures system. Volume 2: *The long-term traffic safety impact of a pilot alcohol abuse treatment as an alternative to license suspension*. Report no. 90. Sacramento, CA: Department of Motor Vehicles.

Sadler, D., Perrine, M.W., & Peck, R.C. (1991). The long-term traffic safety impact of a pilot alcohol abuse treatment as an alternative to license sanctions. *Accident Analysis and Prevention*, 23, 203-224.

Taxman, F.S., & Piquero, A. (1998). On preventing drunk driving recidivism: an examination of rehabilitation and punishment approaches. *Journal of Criminal Justice*, 26 (2), 129-143.

Vingilis, E.R., Mann, R.E., Gavin, D., Adlaf, E., & Anglin, L. (1990). Effects of sentence severity on drinking driving offenders. *Alcohol, Drugs and Driving*, 6(3-4), 189-197.

Voas, R.B. (1982). *Drinking and driving: Scandinavian laws, tough penalties and United States alternatives*. National Highway Traffic Safety Administration Report No.DOT-HS-806-240. Springfield, Virginia: National Technical Information Center.

Voas, R.B., & Tippetts, A.S. (2002). BACs of U.S. drivers in fatal crashes: have they changed in the last 20 years? *Proceedings of the 16th International Conference on Alcohol, Drugs and Traffic Safety*, Montreal, Canada, [CD-ROM], ICADTS.

Watson B. (1998). The effectiveness of drink driving licence actions, remedial programs and vehicle-based sanctions. *Proceedings of the 19th ARRB Research Conference*. Melbourne: Australian Road Research Board.

Wiliszowski, C., Murphy, P., Jones, R., & Lacey, J. (1996). *Determine Reasons for Repeat Drinking and Driving*. Virginia : National Highway Traffic Safety Administration.

Yu, J. (2000). Punishment and alcohol problems recidivism among drinking-driving offenders. *Journal of Criminal Justice*, 28, 261-270.