

THE PROBLEM OF CAUSAL ORDERING: A PRELIMINARY EXAMINATION INTO THE STABILITY OF PERCEPTUAL DETERRENCE FOR A GROUP OF RECIDIVIST DRINK DRIVERS

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Abstract

This paper reports on an examination into the stability of a group of repeat offenders' ($N = 103$) perceptions of legal sanctions and their corresponding drink driving behaviours over time. The analysis indicated that perceptions of arrest certainty and swiftness of penalties appear to diminish, but perceptual severity remains stable while offenders were on a probation order. Although perceptions of deterrence appear to fluctuate, examination of offenders' drink driving behaviours remain much more stable over longer periods of time. The findings of the study provide support for the assertion that perceptions of risk apprehension change over time and may be found to be influenced by offending behaviours e.g., "experiential effect". The findings have direct implications for the development of effective drink driving countermeasures that attempt to combat habitual and/or resistant behaviour(s).

DRINK DRIVING & DETERRENCE

In regards to drink driving, the application of a number of deterrence-based countermeasures such as drink driving sanctions, random breath testing and well-publicized media campaigns have resulted in steady declines in the prevalence of drink driving on public roads over the past 15 years. For the general driving population, a considerable body of North American research has also demonstrated that deterrence-based sanctions such as licence disqualification periods to be one of the most effective methods for reducing further drink driving offences (Nichols & Ross, 1990). However for repeat offenders, there is a general consensus that the application of legal sanctions alone does not produce long-term behavioural change, and consequently, are not extremely effective in reducing drink driving amongst recidivist offenders (Beirness et al., 1997; Homel, 1988). As a result, it is common practice to increase the severity of sanctions for repeat offenders with each new offence in order to meet a deterrence threshold that may deter this group from committing further offences. However, preliminary results have failed to demonstrate that increasing the severity of sanctions reduces offending among convicted drink drivers (Weinrath & Gartell, 2001; Yu & Wilford, 1991), but may in fact produce a negative effect on traffic safety (Homel, 1988; Mann et al., 1991). In light of these counter intuitive results, there is a need to consider whether experiences and perceptions of legal sanctions remain constant over time, which will remain the focus of the current paper.

PERCEPTUAL STABILITY

A considerable dilemma for deterrence researchers has been the problem of causal ordering, as the majority of previous research has correlated individuals' *present* perceptions of sanction risk with self-reported *past* criminal behaviour (Minor & Harry, 1982; Paternoster, Saltzman, Waldo & Chiricos, 1982; Saltzman et al., 1982). A limitation of this approach is that the criminal behaviours actually occurred before the measurement of present perceptions, and thus these criminal behaviours may be affecting such perceptions, when in fact deterrence theory proposes that perceptions should affect criminal behaviours. As a result, researchers have argued that a considerable proportion of deterrence findings have displayed an "experiential" effect, as behaviours ultimately impact upon perceptions rather than perceptions influencing behaviours (Minor & Harry, 1982; Paternoster et al., 1982; Saltzman et al., 1982).

In the present case, recidivist drink drivers' perceptions of arrest certainty may be greatly influenced by the frequency with which they drink and drive while avoiding detection (e.g., punishment avoidance), and an examination of the deterrent influence of arrest certainty on past offending behaviours may produce a spurious result. That is, the perceived negative relationship between arrest certainty and offending behaviour may only indicate that individuals who frequently avoid detection reduce their perceptions of arrest certainty, rather than arrest certainty having a considerable influence on offending behaviours (Saltzman et al., 1982).

The problem of causal ordering within the field of deterrence research may be significantly diminished if it can be demonstrated that perceptions of deterrence are stable, and do not fluctuate over time. That is, the negative relationship between arrest certainty and past offending behaviours can be accepted as accurate if such perceptions do not change across time, but remain stable. A growing body of researchers have recognised the problem of causal ordering (Homel, 1988; Minor & Harry, 1982; Saltzman et al., 1982) and various attempts have been made to accommodate for such conceptual difficulties. For example, researchers have utilised retrospective perceptual questions (Teevan, 1976) as well as future behavioural questions (Tittle, 1977), although these approaches incorporate problematic assumptions such as the relationship between intentions and subsequent behaviours. As a result, it is suggested that an alternative method of solving the causal ordering problem is to implement longitudinal designs and examine the relationship between current perceptions of sanction risk and subsequent offending behaviours (Saltzman et al., 1982)¹.

The small amount of research that have utilised longitudinal designs have confirmed researchers concerns regarding causal ordering and demonstrated that perceptions of risk fluctuate over time (Minor & Harry, 1982; Paternoster et al., 1982; Saltzman et al., 1982), and that clear relationships do not exist between current perceptions and subsequent offending behaviours in the future (Saltzman et al., 1982). Research has indicated that arrest risk for petty crimes decline with college students (Minor & Harry, 1982; Saltzman et al., 1982), and early indications suggest that general motorists perceptual certainty of arrest for drink driving also decrease over time (Homel, 1988). In fact, research has demonstrated that *experiential* effects may be stronger and subsequently more influential than *deterrent* effects (Minor & Harry, 1982).

In the current context, very little research has utilised longitudinal designs to examine the deterrent impact of legal sanctions on drink driving behaviours over extended periods of time (Green, 1989; Homel, 1988), and as highlighted above, research has yet to consider the issue of causal ordering for repeat offenders. One major limitation within the deterrence literature is the lack of research that has examined convicted offenders (Decker, Wright & Logie, 1993; Klepper & Nagin, 1993). Instead, the vast majority of deterrence research has focused on college students and the general public (Klepper & Nagin, 1993). In fact, researchers have noted that the deterrence field needs to focus on convicted and active offenders to ensure that knowledge of current countermeasures designed to stop criminal activity remain "empirically faithful" (Decker et al., 1993; Nagin & Paternoster, 1991).

As a result, the present study aims to examine whether a group of drink driving repeat offenders' perceptions of deterrence factors (e.g., threat risk) as well as offending behaviours remain stable or fluctuate with time.

¹ However, it is noted that longitudinal studies also have problems such as the use of different scaling procedures at various stages and the high attrition rates among participants (Lundman, 1986).

Method

Participants

A total of 103 recidivist drink drivers participated in the study. Overall, 166 offenders volunteered for the study and were interviewed soon after the sanctioning process but 63 were unable or unwilling to be interviewed a second time². Participants in the study were placed on a probation order that required regular contact with their correctional officer to ensure compliance with the conditions of the order³. There were 94 males and 9 females in the study.

Demographic Survey

A questionnaire was developed to collect demographic information such as the age, employment, marital status, and level of income of participants. The Demographic Survey also incorporated questions that relate to the frequency of participants' past drink driving behaviours over their lifetime, and in the last six months, as well as intentions to drink and drive again in the future.

Deterrence Questionnaire

A second questionnaire employed in the study, referred to as the Deterrence Questionnaire (DQ), collected a variety of information focusing on participants' perceptions of legal sanctions and the stability of such perceptions across time. The DQ consists of 7 questions, with two items focusing on each of the three Classic Deterrence factors e.g., certainty, severity and swiftness. Examples of items include: "*The penalty I have received for drink driving has caused a considerable impact on my life*" (severity), "*The chances of getting caught for drink driving are high*" (certainty), "*The time between getting caught for drink driving and going to court was very short*" (swiftness)⁴. Similar to the research by Saltzman et al. (1982), an additional question was utilised that focused on an aggregated measure of risk for others (e.g., certainty for others) "*Out of the next 100 people who drink and drive in Brisbane, how many do you think will get caught?*" Participants also responded to a question regarding whether they believed they would drink and drive again in the future. Participants were required to respond on a 10-point scale (1 = strongly disagree, 5 = unsure, 10 = strongly agree).⁵

Procedure

All participants in the study were interviewed on two occasions. Interviews were conducted at participants' local Community Corrections regional centre immediately following a scheduled meeting with their probation officer. The time between the first and second interview was approximately 6 months⁶. Only the researcher and the participant were present during the interview. Data relating to previous traffic and non-traffic convictions were

² In general, researchers have experienced considerable difficulties recruiting repeat offenders, as this population appears extremely unwilling to present for interviews (Cavaiola & Wuth, 2002; Ferguson, 1997).

³ The present research formed part of a larger study that examined the implementation of an alcohol ignition interlock program in Queensland. The program consisted of a period of licence disqualification combined with a drink driving rehabilitation program before interlock installation.

⁴ Abstract words such as severity and certainty were excluded from the questionnaire as participants experienced comprehension difficulties during the piloting process.

⁵ 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 and non-legal sanctions, with 5-point likert scales reserved for the measurement of concrete factors (e.g., intentions to re-offend).

⁶ During this six month period participants usually completed the 11-week drink driving rehabilitation program.

provided by Queensland Police Service, Queensland Transport Department and the Queensland Department of Community Corrections, after consent from participants.

Results

Characteristics of Sample

The average age of the participants was 38, with a range from 20 to 67. In summary, the majority of participants were male Caucasians who were mostly employed (62%), on a full-time basis in blue-collar occupations, earning approximately \$12,000 - \$35,000pa. There was considerable variation in the level of participants' education and less than half the sample reported currently being in a relationship. On average participants were disqualified from driving for approximately 15 months (range 2-60mths), the majority received a \$500 fine⁷, and were placed on a probation order on average for 15 months (range 9-36mths). In general, participants had been convicted of approximately three drink driving offences ($M = 2.84$, range 2-7), and their BAC reading for the most recent offence was on average three times the legal limit ($M = .150$, range .05-.308 mg%).

Perceptions of Legal and Non-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 (51.5%), as 25.2% reported the probability as low, and 23.3% were undecided ($M = 6.27$). The mean score for the question that focused on how many individuals out of one hundred would be caught for drink driving in Brisbane was 29.33 ($S.D. = 19$). For perceived severity, the majority reported sanctions to be severe, indicating that recently incurred sanctions produced a considerable impact upon their lives (81.5%, $M = 8.35$). However, it is noted that 15 participants did not consider their penalties for drink driving to be severe. For perceived swiftness, a considerable proportion reported the time between apprehension and conviction to be long (43.8%), a further 41.7% were undecided, and only 14.5% considered the application of their sanctions to be swift.

Table 1. Self-reported Perceptions of Deterrence

Perceptions	Mean	(SD)	Low	Unsure	High
Certainty ¹	6.34	2.97	25.2% (n = 26)	23.3% (n = 24)	51.5% (n = 53)
Severity	8.35	2.22	14.7% (n = 15)	3.8% (n = 4)	81.5% (n = 84)
Swiftness	4.42	2.22	43.8% (n = 45)	41.7% (n = 43)	14.5% (n = 15)

Note. Certainty¹ = certainty for self

Correlations between Time One and Time Two

The first step taken to investigate the stability of perceived certainty, severity and swiftness was through the examination of gamma coefficients and Pearson's correlations, which are presented in Table 2. A high level of stability should be reflected in strong relationships between the measures at time one and time two. As indicated below, positive relationships do appear evident for perceptions of arrest certainty for self, arrest certainty for others, severity and swiftness. However, researchers have suggested that test-retest correlations of .80 or greater are needed to indicate a high level of stability over time (Saltzman et al., 1982; Selltiz

⁷ Magistrates usually waive the traditional monetary sanction in lieu of paying a \$500 fee to enrol in the 11-week drink driving rehabilitation program.

et al., 1959). In the current sample, the strength of the relationship between perceptions at time one and time two appear quite weak, and are comparable to previous research (Minor & Harry, 1982; Saltzman et al., 1982). In addition, while correlations inform of whether perceptions at Time 2 are consistent with those at Time 1, they do not fully address the issue of stability, as such analytic techniques do not indicate the level of difference between the interval, and whether such perceptions changed over time (Saltzman et al., 1982).

Table 2. The Stability of Perceptions over Time.

	Gamma	(<i>r</i>)
Certainty for self	.30**	.39**
Certainty for others	.59**	.59**
Severity	.50**	.50**
Swiftiness	.46**	.46**

Note. ** $p < .01$.

Similar to previous research (Minor & Harry, 1982; Saltzman et al., 1982), an additional assessment of the stability of the samples' perceptions was undertaken through Wilcoxon matched-pairs signed-rank test. In summary, large *Z* scores indicate low perceptual stability between time one and time two (Saltzman et al., 1982). In addition, similar to Minor & Harry (1982), *t*-tests were also implemented as the Wilcoxon test is potentially misleading as tied scores between Time 1 and Time 2 are ignored, despite providing the greatest indicator of stability. Table 3 presents the Wilcoxon matched-pairs signed-rank scores and *t* test scores for perceptual certainty, severity and swiftiness.

Taken together, the results indicate that perceptions regarding the certainty of apprehension reduced significantly over the 6 month period as did perceptions regarding the swiftiness of applied sanctions. Firstly, the results confirm that perceptions regarding the likelihood of apprehension decrease relatively soon after this group are sanctioned for their offence. Secondly, the perceived time between being caught and punished appeared to increase which is contrary to essential processes proposed within models of learning and experimental psychology that suggest short periods of time between stimulus and response are required to change behaviour. However once again, the analysis demonstrated that there was no significant reduction for the perceived severity of sanctions or certainty of apprehension risk for others. In regards to the latter finding, this result is not surprising as the majority of participants were still on a probation order and had not had their licence reinstated, which would have ensured some level of hardship over the course of the six month period.

Table 3. Wilcoxon matched-pairs signed-rank test values for the difference between Time 1 and Time 2.

	Ties/Cases	<i>Z</i> score	<i>t</i> test
Certainty for self	9/103	-3.20**	3.02**
Certainty for others	22/103	-1.74	-1.55
Severity	33/103	-1.07	-.29
Swiftiness	24/103	-2.21*	1.80

Note. ** $p < .01$, * $p < .05$.

The Stability of Behaviours

While the above analyses suggests some perceptions of deterrent factors are not stable across time, and that perceptions of arrest certainty may be affected by the frequency with which offenders drink and drive while avoiding detection (e.g., experiential effects), it was not possible to collect subsequent behavioural data of future drink driving events (after participants were re-licensed) and confirm this finding through the examination of zero-order deterrent and experiential effects⁸. Despite this limitation, the present study provided an ideal opportunity to investigate the stability of this groups' offending behaviour(s) through the examination of the frequency of their past drink driving behaviours and intentions to re-offend.

In regards to question structure, participants responded to two questions regarding the frequency of their drink driving behaviour over the last six months and over their lifetime on the following scale; never = 1, once or twice = 2, 3 to 5 times = 3, 6 to 10 times = 4, more than 10 times = 5. In addition participants responded to one question regarding their likelihood of re-offending in the future (extremely unlikely = 1 to extremely likely 5)⁹. The results are displayed in Table 4, and for self-reported offending behaviours, the majority reported drink driving more than 10 times in their lifetime and were offending regularly in the last 6 months before their most recent apprehension. In regards to intentions to re-offend in the future, a noteworthy finding was that despite recently being sanctioned and placed on a probation order, one participant reported it extremely likely they would re-offend, six reported it likely, a relatively large sample of 23 were unsure, whilst 21 believed it unlikely and 52 reported it extremely unlikely.

Table 4. *Self-reported Offending History*

Frequency	Over lifetime		Last 6mths		Intentions to Re-offend		
	n	%	n	%	n	%	
Never	0	0	45	43.7	Extremely unlikely	52	50.5
Once or twice	5	4.9	11	10.7	Unlikely	21	20.4
Three to five	15	14.6	14	13.6	Unsure	23	22.3
Six to ten	14	13.5	12	11.7	Likely	6	5.8
More than ten	69	67	21	20.3	Extremely Likely	1	1

Stability of Offending Behaviours over Time

The bivariate correlations and partial correlations between drink driving behaviour over their lifetime (B_0), in the last six months (B_1), and the likelihood that they will re-offend in the future (B_2) are depicted in Table 5. Although the possible responses to the questions are ordinal in nature (the first two questions are grouped interval scales), Pearson's r was also calculated to identify whether a linear relationship was evident between the variables, with the assumption that they take on an interval scale. The results indicate that positive correlations exist between different combinations of the variables. Furthermore, partial correlations exist between drink driving behaviour over their lifetime (B_0) and in the last six months (B_1) controlling for re-offending in the future (B_2), and drink driving behaviour in the last six

⁸ An attempt was made to locate and interview participants after re-licensing but the transient nature of the group and their general unwillingness to be interviewed significantly impacted on the accurate gathering of further drink driving behaviours.

⁹ Intentions to drink and drive again at Time One rather than Time Two were utilised as the behavioural measure to reduce the lag time between recent past behaviours (e.g., previous six months) and intentions to re-offend.

months (B_1) and the likelihood that they will re-offend in the future (B_2) controlling for drink driving in their lifetime (B_0).

Table 5. Correlations of the Behavioural Measures

<i>Behaviour</i>	<i>Gamma</i>	<i>Pearson's r</i>	<i>Partial Correlation</i>
B_0B_1	0.617**	0.413*	0.358*
B_1B_2	0.432**	0.345*	0.272*
B_0B_2	0.455**	0.254*	0.131

Note. * $p < 0.01$, ** $p < 0.005$

At a multivariate level, the general loglinear modelling procedure of SPSS (Statistical Package for Social Sciences, version 12) was utilised to confirm the above findings and examine whether 3-way interactions exist between the behavioural measures i.e., over lifetime, 6 months and intentions to re-offend. Since the behavioural measures were all ordinal, the uniform interaction model (Agresti, 1990) was obtained as the general loglinear modelling procedure considers all measures to be categorical. Uniform interaction modelling was achieved by multiplying the variables: (B_0xB_1), (B_1xB_2), (B_0xB_2), ($B_0xB_1xB_2$), which were then included as covariates in the general loglinear model. The results of the loglinear modelling for ordinal variables (see table 6) reveal that drink driving behaviour in their lifetime (B_0) and in the last six months (B_1) are partially associated. In addition, drink driving behaviour in the last six months (B_1) is also partially associated with the self-reported likelihood that they will re-offend in the future (B_2).

Table 6. Ordinal Loglinear Results for the Behavioural Measures

<i>Parameter</i>	<i>Estimate</i>	<i>P</i>
B_0B_1	0.269	0.030
B_1B_2	0.295	0.000

From the above findings, there appears to be a directional or causal effect between the behavioural measures which were subsequently examined through a series of ordinal regression analyses with negative log-log link functions. Not surprisingly, individuals who report a higher frequency of drink driving over their lifetime are also more likely to report drink driving in the last six months:

- Drink driving in their lifetime $\xrightarrow{0.731}$ drink driving in the last six months ($p=0.001$).

In addition, individuals who drink driving in the last six months are also more likely to report intending to drink and drive again in the future:

- Drink driving in the last six months $\xrightarrow{0.35}$ drink and drive in the future ($p=0.000$).

In summary, the ordinal regression model results are similar to the loglinear model, indicating that individuals who drink and drive regularly over their lifetime are naturally more likely to report drink driving frequently in the last six months since their most recent conviction, and a higher frequency of drink driving in the last six months appears associated with further drink driving behaviours in the future. Taken together, past behaviour is a good predictor of future behaviour, and thus, the groups' offending behaviours appear stable over time, despite the application of a number of punitive sanctions.

Discussion

The present study aimed to examine a group of repeat offenders' perceptions of deterrence factors and their corresponding drink driving behaviours over time to determine whether current perceptions and behaviours remain stable or fluctuate. In regard to the stability of participants' perceptions of deterrence factors over the six month period, it appears that both perceptions of arrest certainty and punishment swiftness reduced with time. These results support previous research that has demonstrated perceptions of risk are not stable over time (Minor & Harry, 1982; Paternoster et al., 1982; Saltzman et al., 1982). The results indicate that despite being apprehended on multiple occasions, offenders perceptions regarding the risk of future detection may reduce over time, as does their perceptions regarding the swiftness of subsequent penalties.

A number of factors may contribute to this finding. Firstly, the result may confirm a "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). Similarly, low perceptual certainty and reducing perceptions over time may reflect the high incidence that this group drink and drive while avoiding apprehension (e.g., punishment avoidance), which would ultimately reduce perceptions. If so, the results tentatively provide evidence of an "experiential effect", as offenders' behaviours are influencing subsequent perceptions of arrest certainty. Thirdly, a "beer culture" may exist whereby offenders associate with others who drink and drive and thus observe friends avoiding detection which ultimately influences perceptions of arrest certainty (MacDonald & Dooley, 1993; Mookherjee, 1984). This latter premise has been incorporated within "reconceptualised" models of deterrence (Stafford & Warr, 1993), as "indirect punishment avoidance" has been demonstrated to affect one's own perceptions of certainty (Paternoster & Piquero, 1995). Finally, the present results may be associated with "deterrence decay", as the short-term marginal deterrent effect of being punished subsides soon after the sanctioning process (Von Hirsch, Bottoms, Burney & Wikstrom, 1999).

In contrast, an encouraging finding was that the majority of the sample reported current penalties to be severe and these perceptions did not diminish over time. However, this result was to be expected as participants were still unlicensed and on probation, which would have—at the least—ensured a continued inconvenience upon their lives. The challenge for researchers is to design and implement programs of research which examine offenders' experiences of severity once their licence has been reinstated.

It was not possible to confirm an experiential effect as participants were not willing to be interviewed again after they were re-licensed, which would have facilitated an examination between current perceptions and future drink driving behaviours, and thus, differences between a "deterrent vs experiential" effect. Rather, subsequent analysis focused on the stability of participants drink driving behaviour by focusing on past and future self-reported offences. The results suggest that this group's self-reported offending behaviours were relatively stable, despite the threat, and often application, of punitive sanctions. While perceptions of risk may fluctuate with the seasons of time and the implementation of new drink driving detection methods (e.g., random breath testing & "holiday blitzes"), it appears that habitual, resistant behaviours remain stable over time. This result highlights that additional countermeasures are required, in addition to the application of legal sanctions, if the drinking and driving sequence is to be broken for this group. Further research may benefit from determining whether offenders' perceptions of deterrent processes continue to diminish once they are re-licensed, as well as the stability of other behaviours known to influence the offending behaviours, such as alcohol consumption levels.

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, especially responses that focus on further offending behaviours. It also remains uncertain whether stated intentions are effective predictors of future behaviours. The relatively small sample size limits statistical power and the inclusion of other variables in the analyses, but this factor remains a familiar problem with research that focuses on this group (Fetherston & Lenton, 2002; Smith, 2003). The measurement scale developed for the present research requires further validation and amendment with a larger sample size. Finally, it would have been ideal to incorporate a larger time period between Time One and Time Two, which was not possible in the current study due to scheduling restraints e.g., probation regulations. Despite these limitations, the results provide initial evidence for the possible disparity between offenders' fluctuating perceptions regarding the deterrent impact of sanctions and the stability of their entrenched, habitual behaviours.

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