

Re: Improving Road Safety through Deterrence-Based Initiatives

رد على: تحسين سلامة الطريق من خلال مبادرات
مبنية على الردع

ناصر العزري، عبد الله المنيري

To the Editor,

The review paper by Jeremy D. Davey and James E. Freeman on Improving Road Safety through Deterrence-Based Initiatives, published in SQU MJ in February 2011, is an interesting discussion and overview of this important topic.¹ The clarity of the presentation and the balanced view provided by the authors add much value to the paper. In addition, stressing the aspects of culture and cultural change in relation to road safety practices is of particular importance.

As asserted by the authors, the deterrence-based approach is not the magic panacea for road traffic accidents, nor does it provide lasting behavioural changes. Despite the theoretical appeal of deterrence as a control measure for the performance of the drivers, evidence shows repeatedly that legislation and deterrence-based approaches to change behavior of road users produce weak, marginal or transient results.^{2,3,4} Studies over several decades have shown inconsistent results. It appears that what is more potentially important in this context than deterrence-based legislations is a deeper understanding of required changes in the social atmosphere.⁵

Successful law enforcement is based on its capacity to build an effective deterrent peril to road users and its appeal to the culture. In this letter, we would like to share with you a basic analysis of the offences and crashes data reported by the Royal Oman Police (ROP) in the last 10 years, viz. 2000 to 2009.⁶ In the year 2000, ROP ticketed around 230,000 offences which is equivalent to around a half offence per registered vehicle during that year. By 2009, the number of offences had increased almost eight-fold exceeding 1,800,000 offences with around 2.5 offences per vehicle. During all those years, Omani male drivers were responsible for more than 90% of all offences.

If we focus on speeding, which is the highly cited cause of death from road traffic incidents (RTI) in Oman and elsewhere,⁷⁻⁹ we see that speeding related offences as a percentage of all traffic offences have increased from around 32% in 2000 to over 85% in 2009. At the same time, the number of crashes attributed to speeding increased from 39% to around 51% during the same period.

Elsewhere, longitudinal research has shown that receiving speeding fines is actually associated with increased risk of getting ensuing speeding tickets.¹⁰ This may indicate that enforcing speeding tickets alone may not be effective. There is, therefore, a need to consider other deterrence strategies that considers the context. Quoting Davey JD and Freeman JE, "the effectiveness of any deterrence-based enforcement practice is heavily dependent upon increasing motorists' perceptions regarding the risk of being apprehended for an offence, e.g., general deterrence". However, the question is what are the perceptions of "risk" and "speeding" of our young drivers?

Culturally determined bias is an important factor in the perception of risk and the causes of accidents.¹¹ As such, it is of paramount importance to address the socio-cultural aspects of accidents. For example, the core component of speed, i.e. time, needs to be considered within the broader social context. Traditional communities, like Oman and other Gulf countries, lived previously in a more relaxed manner as their time was

not dictated by the clock, but by social and religious events, such as daily prayers.¹² The rapid modernisation process has created a new perception of time with clock-time dominating some daily activities (e.g. work) and event-driven time continuing to play a role in some other parts of people's daily lives such as prayers and social affairs.¹³ Vehicles themselves have contributed to this profound change in the perception and collapse of time.^{14,15} Such socio-cultural dimensions of the speeding problem should not escape analysis when seeking deterrence strategies for this problem in our region.

Nasser Al-Azri and *Abdullah Al-Maniri

Epidemiology & Statistics Unit

Department of Family Medicine & Public Health

College of Medicine and Health Sciences

Sultan Qaboos University, Muscat, Oman

Corresponding Author email: almaniri@gmail.com

References

1. Davey JD, Freeman JE. Improving road safety through Deterrence-based initiatives. *SQU Med J* 2011; 11:29–37.
2. Bertelli AM, Richardson LE. The behavioral impact of drinking and driving laws. *Policy Stud J* 2008; 36:545–69.
3. Houston DJ, Richardson LE. Drinking-and-driving in America: A test of behavioral assumptions underlying public policy. *Polit Res Quart* 2004; 57:57–63.
4. Wilde GJS. *Target Risk 2: A new psychology of safety and health*. 2nd ed. Ontario: PDE Publications, 2001.
5. Evans L. *Traffic Safety and the Driver*. New York: Van Nostrand Reinhold, 1991.
6. Royal Oman Police. *Traffic Statistics Report, Muscat, Sultanate of Oman, Directorate General of Traffic*. Muscat: Royal Oman Police, 2009.
7. Al-Lamki L. Life loss and disability from traffic accidents: It is imperative we all act now. *SQU Med J* 2010; 10:1–5.
8. Suriyawongpaisal P, Kanchanasut S. Road traffic injuries in Thailand: trends, selected underlying determinants and status of intervention. *Inj Control Saf Promot* 2003; 10:95–104.
9. Moore VM, Dolinis J, Woodward AJ. Vehicle speed and risk of a severe crash. *Epidemiol* 1995; 6:258–62.
10. Lawpoolsri S, Li J, Braver ER. Do speeding tickets reduce the likelihood of receiving subsequent speeding tickets? A longitudinal study of speeding violators in Maryland. *Traffic Inj Prev* 2007; 8:26–34.
11. Kauoabenan DR. Beliefs and the perception of risks and accidents. *Risk Anal* 1998; 18:243–52.
12. D'Avanzo CE, Geissler EM. *Pocket guide to cultural health assessment*. 3rd ed. St. Louis: Mosby, 2003.
13. Aboelenein M. Time use in a changing Arab culture: A study in the United Arab Emirates. Paper accepted for presentation at the 99th Annual Meeting, American Sociological Association, San Francisco, California, USA, 14–17 August 2004.
14. Featherstone M. Automobilities: an introduction. *Theory, Cult & Soc* 2004; 21:1–24.
15. Knowles RD. Transport shaping space: differential collapse in time-space. *JTransp Geog* 2006; 14:407–425.

Authors' Response

Firstly, the authors would like to thank the editor for the opportunity to respond to Dr. Al-Azri's and Dr. Al-Maniri's letter. Secondly, while the current authors also accept that deterrence-based approaches should act as only one cornerstone of a suite of interventions and public policy initiatives designed to improve road safety, deterrence-based approaches have nonetheless consistently proven to be a valuable resource to improve road safety.^{1,2} Dr. Al-Azri and Dr. Al-Maniri reinforce their assertion about the limited utility of deterrence by citing drink driving research, and the issue of drink driving is particularly relevant within the current context given that the problem of driving after drinking has historically been addressed through deterrence-based approaches. While the effectiveness of deterrence-based approaches to reduce drink driving will always be dependent upon a range of situational and contextual factors (including police enforcement practices,

cultural norms, etc.), the utilisation of this approach has proven particularly effective within Queensland, Australia. For example, a relatively recent comprehensive review of Random Breath Testing in Queensland demonstrated that this initiative not only had a deterrent impact upon self-reported intentions to drink and drive, but was also found to have significantly reduced alcohol-related fatalities in the state.² However, the authors agree that deterrence-based approaches can be particularly transient and thus require constant “topping up” not least through sustained public reinforcement, which was clearly articulated in the seminal work by Homel.¹

Dr. Al-Azri and Dr. Al-Maniri reinforce their assertion regarding the weak link between deterrence-based approaches and positive road safety outcomes by focusing on speeding-related research, which is another central road safety concern that has been historically addressed through the application of deterrence-based sanctions e.g., speeding fines, loss of licence, etc. Additionally, the issue of utilising deterrence approaches to reduce speeding offences is arguable more relevant (compared to drink driving) for the current context in Oman. The authors cite a 10-year evaluation of speeding offences in Oman³ which demonstrated a sizeable increase in the number of recorded speeding offences and speeding-related crashes (even after considering offences per registered vehicle) as well as a Maryland study that provided preliminary evidence that receiving speeding fines may increase the risk of receiving further fines.⁴ In regards to the former, this study is similar to other research that has failed to find a positive relationship between fixed speeding penalties and improvements in driving behaviour,⁵ although it is noted that an opposing body of research does exist that has demonstrated that increases in the severity of penalties can lead to a decrease in accidents and injury rates.⁶ What remains evident is that a range of factors are likely to impact also upon what would seem a relatively simple analysis between speeding offences and crash outcomes, not least changes in policing activities and enforcement styles, modernisation of vehicles, improvements in road conditions, improvements in speeding detection procedures, etc. Additionally, the origins of this counter-intuitive effect may be found within a wider social sphere, as “cultural norms” may dilute any deterrent effect that is produced through the threat of sanctions, such as the cultural acceptance of speeding-related practices in order to meet increasing modern day deadlines. Additionally, researchers are beginning to demonstrate that there are a range of personal and social rewards that appear to contribute to speeding, which may ultimately have a counterproductive impact upon deterrent processes.⁷ Another particularly salient factor is the issue of punishment avoidance (e.g., committing an offence and avoiding detection) and it is noteworthy that recent speeding-related research has also demonstrated that the effectiveness of the severity of the penalty is also dependent upon the perceived certainty of punishment.^{8,9} In short, the effectiveness of any deterrence-based initiative to reduce speeding related offences will be heavily dependent upon its capacity to detect offences regularly, which will initially prove a particularly daunting task when a community increasingly embraces vehicles as a primary mode of transport.

In regards to the later study, the Maryland research also demonstrated that those who initially received a speeding fine during the sample period were significantly more likely to be younger males who were also more likely to be cited for a drink driving offence.⁴ This finding provides further evidence that sanctions are not an equally effective deterrent for all motorists, and may yet prove to be least effective among younger cohorts who are less inclined to calculate consequences associated with a utilitarian model. This is also in line with current research that continues to demonstrate that younger drivers are at an increased risk of engaging in other forms of deviant driving behaviour and thus are also overrepresented in crash statistics.¹⁰ This central issue also relates to Dr. Al-Azri’s and Dr. Al-Maniri’s question of what are the perceptions of “risk” and “speeding” of younger drivers? It is noted that both understanding and changing perceptions of risk has proven particularly difficult among younger cohorts, and thus a considerable amount of research is still required in this area to reduce crash-involvement among this high need group. However, similar to the central tenet of Dr. Al-Azri’s and Dr. Al-Maniri’s letter, the current authors agree that it is likely that researchers and practitioners will need to look beyond purely deterrence-based approaches to create change. For example, emerging research is beginning to illuminate the fact that younger drivers’ speeding behaviours may be more influenced by their peer support network than the threat of sanctions.¹¹

As a result, the current authors also assert that both research and policy increasingly need to consider

the wider socio-cultural factors that influence driving behaviours as well as crash risk. However, this will no doubt continue to prove a difficult task as it is widely accepted that a plethora of factors can influence any driving decision. These include the array of factors associated with both the modernisation of communities as well as technological improvements in vehicle design and performance. Therefore, it is imperative that deterrence-based approaches are complemented with well-informed and targeted media campaigns (as well as other public policy initiatives) that clearly highlight the heightened dangers which are associated with increased reliance on vehicles to meet the demands of modern living.

Finally, one of the greatest challenges that remains for road safety practitioners (that was not considered in the review paper or the corresponding letter) is the need to develop better methods to bridge the gap between theoretical understandings of behaviour modification (e.g., principles of deterrence) and the corresponding practical application of theory-based interventions to create lasting change among motorists. Additionally, there is a need to identify the conditions under which lasting deterrent effects can be achieved. Despite this substantial challenge, such efforts are clearly worthwhile when considering the tremendous personal and economic cost of road crashes worldwide.¹² Such efforts will also no doubt take the form of scientific inquiry as well as active debate, both of which have a complementary place in the pursuit of improvements in road safety.

Jeremy Davey and *James Freeman

Centre for Accident Research and Road Safety

Institute of Health & Biological Innovation

Queensland University of Technology, Australia

Corresponding Author email: je.freeman@qut.edu.au

References

1. Homel RJ. Policing and punishing the drinking driver. A study of specific and general deterrence. New York: Springer-Verlag, 1988.
2. Watson B, Hart S, Freeman J, Tay R, Davey J, Madden J, Goff A. Review of Random Breath Testing (RBT) in Queensland. Queensland University of Technology, 2005.
3. Royal Oman Police. Traffic Statistics Report, Muscat, Sultanate of Oman, Directorate General of Traffic. Muscat: Royal Oman Police, 2009.
4. Lawpoolsri S, Li J, Braver ER. Do speeding tickets reduce the likelihood of receiving subsequent speeding tickets? A longitudinal study of speeding violators in Maryland. *Traffic Inj Prev* 2007; 8:26–34.
5. Elvik R, Christensen P. The deterrent effect of increasing fixed penalties for traffic offences: the Norwegian experience. *J Safety Res* 2007; 38:689–95.
6. Tavares A, Mendes S, Costa C. The impact of deterrence policies on reckless driving: the case of Portugal. *Eur J Crim Policy Res* 2008; 14:417–29.
7. Fleiter J, Watson B, Lennon A, King M, Shi K. Speeding in Australia and China: a comparison of the influence of legal sanctions and enforcement practices on car drivers. In: *Proceedings of the 2009 Australasian Road Safety Research, Policing and Education Conference: Smarter, Safer Directions*. Sydney Convention & Exhibition Centre, Sydney, New South Wales, Australia, 2009.
8. Fleiter J, Watson B. The speed paradox: the misalignment between driver attitudes and speeding behaviour. *J Australasian Coll Road Safety* 2006; 17:23–30.
9. Ritchey M, Nicholson-Crotty S. Deterrence theory and the implementation of speed limits in the American states. *Policy Stud J* 2011; 39:329–46.
10. McCartt A, Mayhew D, Braitman K, Ferguson S, Simpson H. Effects of age and experience on young driver crashes: review of recent literature. *Traffic Inj Prev* 2009; 10:209–19.
11. Matthews K, Agnew R. Extending deterrence theory: do delinquent peers condition the relationship between perceptions of getting caught and offending? *J Res Crime Delinq* 2008; 45:91–118.
12. World Health Organization. Global Status Report on Road Safety: Time for Action. From: http://whqlibdoc.who.int/publications/2009/9789241563840_eng.pdf, 2009. Accessed Mar 2011.