Social Influences on Risky Driving Behaviours among Young Drivers in Oman

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Abstract

Young drivers represent approximately 20% of the Omani population, yet account for over one third of crash injuries and fatalities on Oman's roads. Internationally, research has demonstrated that social influences play an important role within young driver safety, however, there is little research examining this within Arab gulf countries. This study sought to explore young driver behaviour using Akers' social learning theory. A self-report survey was conducted by 1319 (72.9% male and 27.1% female) young drivers aged 17-25 years. A hierarchical regression model was used to investigate the contribution of social learning variables (norms and behaviour of significant others, personal attitudes towards risky behaviour, imitation of significant others, beliefs about the rewards and punishments offered by risky behaviour), socio-demographic characteristics (age and gender), driving experience (initial training, time driving and previous driving without supervision) and sensitivity to rewards and punishments upon the self-reported risky driving behaviours of young drivers. It was found that 39.6% of the young drivers reported that they have been involved in at least one crash since the issuance of their driving licence and they were considered 'at fault' in 60.7% of these crashes. The hierarchical multiple regression models revealed that socio-demographic characteristics and driving experience alone explained 14.2% of the variance in risky driving behaviour. By introducing social learning factors into the model a further 37.0% of variance was explained. Finally, 7.9% of the variance in risky behaviour could be explained by including individual sensitivity to rewards and punishments. These findings and the implications are discussed.

Introduction

The overrepresentation of youth in traffic crashes is a global road safety problem. Road traffic injuries are estimated as the leading cause of death among young road users aged 15-19 years and the second leading cause of death among those aged 20-24 years (Toroyan & Peden, 2007). Accounting for 10% of the population in the OECD countries, 27% of crash fatalities occurred among young road users aged 15-24 years (Organization for Economic Co-operation and Development, [OECD], 2006). The situation in Oman is not dissimilar with traffic crashes forming one of the main threats to life within the young population. Young road users aged 16-25 years have the highest magnitude of road mishap in Oman. They represent approximately 20% of the Omani population, yet

account for 37% of crash injuries and 31% of crash fatalities on Oman's roads (Royal Oman Police, 2014).

Epidemiological evidence regarding the occurrence of risky driving behaviours amongst young drivers is concerning (Ivers, Senserrick & Boufous et al., 2009; Williams, 2006). Researchers have focused on the vast range of factors that are likely to impact young driving behaviour particularly during the early driving period. Akers' Social Learning Theory (SLT) is one of the psychosocial theories that emerged within the criminological domain to provide a better understanding of the initiation and maintenance of deviant behaviour. It is a broad-based theory that mainly focuses on the social reinforcement of the behaviour assuming that deviant and conforming behaviour are produced through a similar learning process that operates in a context of social structure, interaction and situation. It is a general theory that can be utilized to understand the learning process of several types of deviant behaviour (Akers & Sellers, 2004).

The concept of Akers' SLT operates within four fundamental social variables that influence the likelihood of the deviant or conforming behaviour occurring including differential association, definitions, imitation and differential reinforcement. Engaging in deviant behaviour is more likely when individuals interact (i.e. differentially associate) with significant others who promote, accept or engage in such deviant behaviour. Differential association with intimacy groups initiates the social context for the exposure to other's norms, attitude and orientation (i.e. definitions or personal attitude) which in turn leads individuals to acquire their own definitions. They reflect the one's beliefs (both general and specific) about what is considered appropriate behaviour. Modeling of significant other's behaviour is referred to as imitation which is essential for the initiation of the behaviour, while, the continuity of the behaviour is dependent on the anticipated social and non-social consequences and is referred to as differential reinforcement. It is the balance between anticipated rewards (i.e. favourable consequences) and anticipated punishments (i.e. unfavourable consequences) (Akers & Sellers, 2004).

Akers' SLT has been tested with a large number of scholars on a range of deviant behaviours including adolescent substance users (Hwang & Akers, 2003; Bonino, Cattelino, & Ciairano, 2005) and adolescent smoking cessation (Chen, White, & Pandina, 2001). In the field of road safety, DiBlasio (1987) found a significant relationship between the four concepts of Aker's SLT and the choice of American youths aged less than 15 years to travel as passengers with drinking drivers. Watson (2004) demonstrated differential association to be the strongest predictor of unlicensed driving among Australian's adults. Fleiter and Watson (2006) revealed that differential association, definitions and punishment were the most significant predictors of speeding behaviour among drivers aged 17-79 years. Among learner driver, Bates, Watson and King (2009) verified that behavioural differential association of friends, definitions and anticipated reward were the most significant social predictors for their compliance to the law, while, for their future driving intention only anticipated reward was the most social predictors. In the prediction of self-reported risky driving behaviours among young new drivers aged 17-24 years, Akers' SLT constructs were able to explain additional 42% of the variation above and over the sociodemographic characteristics with imitation, anticipated reward

and anticipated punishment were the significant predictors (Scott-Parker, Watson & King, 2009).

Akers' theory focuses mainly on the balance between anticipated reward and punishment as a reinforcement of the behaviour. Thus, investigating personality differences in the sensitivity to rewards and sensitivity to punishments could advance the use of Akers' theory. According to the reinforcement sensitivity theory (RST) of personality (Gray, 1993), two neurological mechanisms are thought to regulate individual's behaviour. The behavioural approach/activation system (BAS) is thought to regulate an individual's sensitivity to reward, while the behavioural inhibition system (BIS) is thought to regulate an individual's sensitivity to punishment. Response variations between the two systems yield the personal differences that motivate the engagement in certain behaviour (Corr, 2008; Vermeersch, Kaufman & Houtte, 2013). The most recent attempt to measure the two behavioural systems influence was made by Carver and White (1994). They developed a validated tool to examine the personal difference according to the function of the two systems guided by the principles of Gray's theory. The scale has been used widely in order to investigate a number of risky health behaviours (Davis, Patte & Levitan et al., 2007; Danielle, James & Kurt et al., 2009). Recently, Scott-Parker, Watson, King and Hyde (2013) found sensitivity to reward was a strong predictor of risky driving behaviour among novice drivers.

Theoretical investigation of risky driving behaviours as mentioned in the literature has been guided successfully by Akers' theory and personality theory. Thus, it is hypothesized that the utilization of both theories could yield a better insight into the risky driving behaviour within the context of young Omani drivers. The general aim of the research was to identify the influence of social learning variables, sensitivity to reward and punishment, and socio-demographic characteristics on the risky driving behaviour among Omani young drivers.

Methods

A cross-sectional survey was conducted within the period from January to March, 2015 to investigate the social influence upon risky driving behaviours among young Omani drivers. A total of 1319 Omani young drivers (72.9% males & 27.1% females) aged 17-25 years (M=21.8, SD=2.1) with a valid driving licence volunteered to participate in the study from all over Oman. Oman does not have a graduated licencing system so all participants held a full, non-restricted, driver's licence, which they received after passing driving tests while holding a learners' license. A convenience snowballing sampling technique was used extensively to get access to the widely distributed young drivers. A number of students from Sultan Qaboos University (SQU), who lived in the 11 different governorates of Oman were recruited to distribute the questionnaires in their governorate. These students also recruited others from different areas within these governorates to further distribute the questionnaire. These individuals distributed the questionnaires through personal contacts (in villages, sport clubs, colleges, work places in these governorates etc.), allowing access to a broad range of participants in the general population. Further, this ensured the participation of a range of people with different driving experiences and socio-demographic backgrounds. All participants responded

anonymously, and the study received ethical approval from the Ethics Committee at the college of medicine and health science, SQU (MREC#733).

To achieve the objectives of the study, a self-reported questionnaire was developed. It consisted of four dimensions: socio-demographic characteristics, risky driving behaviour, social learning variables, and sensitivity to reward and punishment. The risky driving behaviour scale consists of 39 items tapping various types of common on-road risky driving behaviours. A list of items measuring common risky driving behaviours was developed guided by literature review and Oman's traffic regulation. These questions were drawn from past research using the driver behavior questionnaire (Al Reesi, Al Maniri & Plankermann et al., 2013; Scott-Parker, 2012). Participants were asked to provide a judgment on the question "In the last twelve months, how often have you done the following behaviours while driving?" on a Likert-type scale ranging from 1 (never) to 5 (Always). Steps were undertaken to ensure the content validity of the list including face validity (i.e. experts' opinions) and a pilot study (i.e. receiving comments from participants), and then the final draft was prepared. Participants were also asked to provide their judgement on 38 items measuring the four social learning variables: differential association (12 items), definitions (personal attitudes, 9 items), imitation (3 items) and differential reinforcement (rewards (7 items), punishments (7 items). Finally, they were asked to provide their judgement on 14 items measuring the sensitivity to rewards (7 items) and punishments (7 items) resulted from involvement in risky driving behaviours. The social learning theory and sensitivity to rewards and punishments questions were also drawn from past research using these theories for young drivers (Scott-Parker, 2012) and modified for the Omani context. The reliability of all scales (one for behavior, and one for each aspect of the two theoretical constructs) was checked using Cronbach's alpha and is presented in the results section.

The Statistical Package for the Social Sciences (SPSS) version 21 was used in the analysis of the data. The internal consistency of the study scales was evaluated through Cronbach's alpha coefficient. Descriptive statistics of the scales were calculated including mean, standard deviation, skewness and kurtosis. Bivariate correlations were conducted using Pearson's product moment correlation coefficients. Independent sample t tests and one way ANOVA were used as required. A hierarchical regression model was used to investigate the contribution of social learning variables and sensitivity to rewards and punishments (while controlling for socio-demographic characteristics) upon the self-reported risky driving behaviour of young drivers. As the goal of this analysis was to determine the benefit of using these theories in the Omani context, rather than create a single predictive model, this technique was deemed more suitable than alternative approaches. For the first step socio-demographic variables were added, followed by social learning variables and finally sensitivity to rewards and punishments. The contribution of each theory was measured R^2 change. After these three steps, a fourth step was added in which variables which were not significant predictors at step three were removed and the unique contribution of each variable was examined using semi-partial R^2.

Results

Descriptive statistics of the study scales

Table 1 depicts the descriptive statistics of the study scales. The distributions of the scales were approximately symmetrical to slightly skewed with skewness ranged between -0.54 and 0.58 and mesokurtic (normal) in shape with kurtosis ranged between of -0.41 and 0.57. All scales showed a good internal consistency with Cronbach's alpha values ranged between (α=0.72) and (α=0.94). Young drivers reported more anticipated punishment (*M*= 24.79) than anticipated rewards (*M*=16.41). In addition, they reported more sensitivity to punishment (*M*=18.99) than sensitivity to rewards (*M*=16.31).

Table 1. Number of items, Cronbach's alpha, means, standard deviations, means per item, Skewness and Kurtosis for the study scales.

Social variables	N. Items	Cronbach's alpha	Mean	SD	Mean per item	Skewness	Kurtosis
RDB	39	0.94	93.98	24.77	2.41	0.58	0.57
DA	12	0.86	30.64	8.86	2.55	0.321	0.125
Attitude	9	0.90	21.16	7.83	2.35	0.400	-0.272
Imitation	3	0.72	6.71	2.69	2.24	0.544	-0.153
Reward	7	0.92	16.41	6.85	2.34	0.487	-0.411
Punishment	7	0.91	24.79	6.94	3.54	-0.545	-0.306
SR	7	0.87	16.31	6.12	2.33	0.46	-0.26
SP	6	0.77	18.99	4.99	3.17	-0.19	-0.26

RDB: Risky driving behaviour, DA: Differential Association, SR: Sensitivity to Rewards, SP: Sensitivity to Punishment

Risky driving behaviours according to the socio-demographic characteristics

Table 2 presents the distribution of drivers in the study sample according to their socio-demographics and the bivariate analysis with risky driving behaviour. Males reported significantly higher levels of risky driving behaviour than females. The level of risky driving behaviour significantly decreased with increased age. Unmarried drivers reported significantly higher level of risky driving behaviour compared to married drivers. Unemployed young drivers reported higher level of risky driving behaviour compared to employed drivers. Drivers initially trained by drivers other than official instructors (i.e. family members or friends) showed higher level of risky driving behaviour compared to drivers trained under official driving instructors (i.e. those that hold training licence). Drivers with prior history of unsupervised driving before receiving an open licence (including both unsupervised driving before and after receiving a learner's licence) showed a higher level of risky driving behaviour than drivers without prior history of unsupervised driving. The level of risky driving behaviour significantly increased with both years of driving experience (years since receiving an open licence) and weekly hours of on-road driving. In addition, crash involvement was statistically associated with higher reported levels of risky driving behaviour.

Table 2. Socio-demographic Characteristics (frequency and percentage) and the association with risky driving behaviour.

Characteristics	Frequency (1319)	Percent (%)	Risky Driving Behaviour (RDB)		
			Mean	SD	Sig*
Gender					
Male	962	72.9	96.7	24.0	(t=6.59, p<0.01)
Female	357	27.1	86.7	25.5	
Age					
17-19 Yrs.	205	15.5	98.4	27.0	(F=11.34, p<0.01)
20-22 Yrs.	623	47.2	95.7	24.8	
23-25 Yrs.	491	37.2	90.0	23.2	
Marital Status					
Single	1032	78.2	95.4	24.5	(t=3.94, p<0.01)
Married	287	21.8	88.9	25.3	
Working Status					
Unemployed	691	52.4	96.3	24.9	(t=3.51, p<0.01)
Employed	628	47.6	91.5	24.4	
Initial Driving Instructor					
Official Driving Instructors	564	42.8	88.4	23.7	(t=-7.17, p<0.01)
Other	755	57.2	98.1	24.8	
Prior Unsupervised Driving					
Yes	597	45.3	100.6	23.6	(t=9.02, p<0.01)
No	722	54.7	88.6	24.4	
Driving Experience in Years					
(0-1.99) Years	512	38.8	91.8	25.0	(F=3.73, p=0.024)
(2.00-3.99) Years	484	36.7	94.6	23.7	
(> = 4.00) Years	323	24.5	96.5	25.8	
# of Driving Hours per					
0-3 hours	259	19.6	88.1	24.9	(F=18.69, p<0.01)
4-7 hours	436	33.1	92.1	23.5	
8-11 hours	291	22.1	91.9	22.2	
12-15 hours	149	11.3	98.7	24.3	
>= 16 hours	184	14.9	106.4	27.0	
Crash History					
Have been Involved	522	39.6	96.7	24.2	(t=3.21, p<0.01)
Never been Involved	797	60.4	92.2	25.0	

Correlation between risky driving behaviours, social learning variables, and sensitivity to rewards and punishments

Pearson's product moment correlation coefficients between the study scales are shown in Table 3. Risky driving behaviour (RDB) was positively correlated with differential association, attitude, imitation and reward while it showed insignificant negative correlation with punishment. All correlations between the four social learning variables

and the two types of personality, sensitivity to rewards (SR) and sensitivity to punishment (SP), were significant and they were positively correlated while it was negatively correlated between sensitivity to rewards and anticipated punishment. Risky driving behaviour correlated positively with both sensitivity to rewards (SP) and sensitivity to punishment (SP).

Table 3. Correlations between social learning variables, sensitivity to rewards and punishments, and risky driving behaviour.

	1	2	3	4	5	SR	SP	RDB
1- D.A	-							.57**
2-Attitude	.66**	-						.63**
3-Imitation	.71**	.63**	-					.56**
4-Reward	.57**	.55**	.57**	-				.51**
5-Punishment	.05	-.16**	-.11**	-.07*	-			-0.03
SR	.52**	.63**	.55**	.55**	-.12**	-		.69**
SP	.22*	.06*	.06*	.10**	.36**	.17**	-	.18**

* p<0.05, ** p<0.01

Psychosocial influences on risky driving behaviours

A hierarchical regression was conducted to assess the influence of socio-demographics (step 1), social learning variables (step 2), sensitivity to rewards and punishments (step 3) on risky driving behaviours among young Omani drivers (Table 4). In the first step, the model was significant with the socio-demographics and explained 14.2% of the variance. In the second step, the social learning variables were incorporated into the model and explained additional 37.0% of the variance. In the final step, incorporating sensitivity to rewards and punishments into the model explained additional 7.9% of the variance. Overall, the final model was significant and explained 59.1% of the variance in risky driving behaviours and the significant predictors were differential association, attitude, imitation, rewards, punishment, sensitivity to rewards and sensitivity to punishment, gender, age, prior unsupervised driving, driving experience and driving hours. Examining the unique contribution of significant predictors, Sensitivity to rewards was the strongest predictor and uniquely explained 6.9% of variance in young driving behaviours followed by attitude which explained 1.6% of variance.

Table 4. Hierarchical multiple regression results for the three analyses predicting self-reported risky driving behaviour by young drivers

Model	Step 1		Step 2		Step 3		Step 4***		
	β	Sig.	β	Sig.	β	Sig.	β	Sig.	sr^2
Socio-demographics									
Gender	-.053	.058	-.042	.049	-.044	.025	-.044	.004	.002
Age	-.166	.000	-.088	.000	-.068	.002	-.073	.009	.004
Marital Status	-.045	.108	.005	.808	.016	.407	-		

Working Status	-.065	.023	-.038	.076	-.031	.119	-		
First Driving Instructors	.094	.001	.016	.466	.016	.429	-		
Prior Unsupervised Driving	-.142	.000	-.085	.000	-.062	.002	-.067	.009	.004
Driving Experience	.130	.000	.072	.002	.063	.003	.062	.007	.003
Driving Hours	.178	.000	.121	.000	.095	.000	.093	.019	.008
Social learning variables									
Differential Association	-	-	.115	.000	.092	.002	.094	.008	.003
Attitude	-	-	.322	.000	.193	.000	.196	.037	.016
Imitation	-	-	.178	.000	.118	.000	.116	.013	.006
Reward	-	-	.134	.000	.051	.033	.051	.003	.001
Punishment	-	-	.059	.004	.050	.013	.047	.004	.002
Sensitivity to rewards and punishments									
SR	-	-	-	-	.374	.000	.373	.144	.069
SP	-	-	-	-	.052	.010	.054	.006	.002
Adjusted R²	0.137		.507		0.586		0.586		
R² Change	0.142**		0.370**		.079**				

Step 1: F=27.18**, *Step 2:* F=105.35**, *Step 3:* F=125.43** , *Step 4:* F=156.49** , * *p<0.05,* **

*** *In step 4, only significant variables from step 3 included in the model, sr²:semi-partial R²*

Discussion

The study presents some insight into the risky driving behaviour as a main contributory factor in crash involvement among young drivers and confirmed the finding of previous research that multiple factors influence the engagement in risky driving behaviour. Socio-demographics predicted approximately 13.7% of the variance in self-reported risky driving behaviour. Risky driving behaviour decreased with age reflecting the contribution of age related factors or the maturity of young drivers as one of the reasons behind their risky driving behaviour (Ivers, Senserrick & Boufous et al., 2009; Williams, 2006). Driving experience found as a significant factor in risky driving behaviour which supports the literature findings (Al Reesi, Al Maniri & Plankermann et al., 2013). The reported on-road time of driving exposure was quite high among the current sample reflecting the level of driving conducted by young drivers due to the absence of alternative public transportation in Oman (Islam & Al Hadhrami, 2012). The study found prior unsupervised driving before licencing as a significant predictor of risky driving behaviour after licencing. This is in line with previous findings in literature (Scott-Parker, Watson & King, 2009; Bates, Watson & King, 2009). Given that nearly half of the participants reported unsupervised driving prior to receiving a licence, this represents a major concern for road safety in Oman.

All Akers' social learning variables (differential association, imitation, personal attitude, anticipated rewards and anticipated punishments) were significant predictors of the self-reported risky driving behaviours among young drivers, explaining 37.0% of the variance. In previous findings not all of the Akers' social learning variables were found

as significant predictors. Imitation wasn't a significant predictor in one Australian learner drivers' study (Bates, Watson & King, 2009), while, differential association and personal attitude weren't significant predictors in an Australian novice drivers' study (Scott-Parker, Watson & King, 2009). However, the remaining factors have been shown to have a significant association with risky driving behaviour.

The anticipated reward significantly reinforced the engagement in deviant driving behaviours, which is expected based on previous findings (Scott-Parker, Watson & King, 2009; Bates, Watson & King, 2009). However, the results indicated that despite more social punishments reported than social rewards, punishments did not significantly reduce engagement in risky driving behaviour. Previous studies have demonstrated that anticipated punishments reduce drug driving (Armstrong, Wills & Watson, 2005), and speeding (Fleiter & Watson, 2006).

Reward sensitivity and punishment sensitivity explained significantly another 7.9% of the variation in the self-reported risky driving behaviour. Sensitivity to rewards as expected was strongly and positively correlated with risky driving behaviour which supports the finding of Scott-Parker, Watson, King and Hyde (2013). The sensitivity to punishment was also found to be a significant predictor, however, greater punishment sensitivity was associated with increased risky driving behaviour. This is contrary to the findings of Scott-Parker, Watson, King and Hyde (2013), who found sensitivity to punishments was insignificantly correlated with risky driving behaviour.

The combination of the findings about anticipated punishments and punishment sensitivity may indicate problems with the effectiveness of current punishments, either social (i.e. parents and peers) or non-social (i.e. police). Specifically the results showed that even though participants may expect punishment and be sensitive to punishment, the existing punishments did not deter risky driving behaviours. This may indicate a lack of severity and swiftness within the current traffic police sanctions which is expected to vary across jurisdictions. For example, in Oman offenders pay their fines when renewing the vehicle registration, and thus there can be long delays between offending and payment of fines.

Strengths and Limitations

Methodological limitations need to be considered while interpretation of the results. Data was collected through a self-reported questionnaire and thus response bias, recall bias and stability of response are of concerns. The results are representative of the young driving population participated and not the overall driving population in Oman. Notwithstanding such limitations, with the shortage in research examining young driving behaviours within the social context in Oman, the current research is expected to provide a theoretical and practical contribution to the research knowledge in the field of young driver's road safety in Oman. Based on theoretical guidance, the research is anticipated to provide further understanding of factors underlying risky driving behaviours among young drivers to be considered in future intervention.

Conclusions and Future Directions

The above discussion revealed the capacity of Akers' SLT to bring additional understanding of risky driving behaviours within Omani context as well as the inclusion of sensitivity to rewards and punishments which also gave additional benefit. Sensitivity to rewards and personal attitudes were the strongest predictors of risky driving behaviours among young Omani drivers. The role of punishments to deter the engagement in risky driving behaviours was weak and thus, required further investigation. This research is preliminary in nature within Omani context and needs to be followed by further research investigating separately the role of parents and peers as primary sources of influences as embedded in Akers' SLT. Understanding the social mechanisms through which parents and peers influence young driving behaviours is important for the interventions in this area.

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