

Predicting health outcomes and safety behaviour in taxi drivers

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Abstract

Hazards have been a major cause of concern in the taxi industry and management has been actively involved in trying to reduce the hazards faced by taxi drivers. However, there has not been sufficient emphasis placed on the physical health and emotional well-being of drivers. This research projects integrates the various factors that influence the safety behaviour, physical health and emotional well-being of taxi drivers into a theoretical model that shows hazards, perceptions of risk-taking, aggression, and drivers' perceptions of management's commitment to health and safety as directly influencing physical health, emotional well-being, and safety behaviour of taxi drivers. Three separate multiple regressions were conducted and the results indicated that the amount of hazards taxi drivers encountered did contribute to the prediction of their physical and emotional well-being but not to safety behaviour. Hazards was the strongest predictor of the amount of physical symptoms of ill health that drivers reported, while the individual factors (perceptions of risk-taking and aggression) were the strongest predictors of emotional well-being and safety behaviour. It is recommended that the industry would benefit from future research that takes a similar integrative approach to include other factors that may be important in predicting taxi driver health and safety.

Predicting health outcomes and safety behaviour in taxi drivers

The taxi industry is quite different to conventional occupations. For example, the employer is ambiguous, work hours and income fluctuate on a daily basis, and the frequency and severity of hazards range from verbal abuse to homicide (Dalziel & Soames Job, 1997; Easteal & Wilson, 1991; Haines, 1997; Radbone, 1997). The work place of today is transforming due to factors such as globalisation, technological advancements, and decentralisation (Chu & Dwyer, 2002). Such influences may see more organisations operating as the taxi industry does with less supervision, more flexible hours, and less control from management. Traditional approaches may be inadequate for dealing with health and safety issues in the dynamic workplace of the future (Rollenhagen, 2000). Thus the importance of researching workplace health and safety in an unconventional industry such as taxi driving may be pivotal in promoting health and safety behaviour in the workplace of the future.

Traditional approaches to promoting safety in the workplace focused on the need for management to improve the physical work environment. In contrast, maintaining employee health was seen as the responsibility of the worker (Quinlan & Bohle, 1991). In recent times however, researchers have begun to take an integrative approach to improving workplace health and safety (Barling & Hutchinson, 2000; Chu & Dwyer, 2002; Dugdill, 2000; Ettner & Grazywack, 2001; Glendon, 1998; Rollenhagen, 2000; Yule, Flin, & Murdy, 2001). This has lead to the development of integrated models of safety climate which investigate various organisational and individual factors influencing employee safety behavior (Cheyne, Oliver, Tomás, & Cox , 2002; Tomas, Melia, & Oliver, 1999).

One such integrative model of safety climate developed by Oliver, Cheyne, Tomás, and Cox (2002) was used as a guide to develop the current exploratory model of taxi driver health and safety behaviour (see Figure 1). This model proposes that the frequency and

severity of hazards encountered by taxi drivers will be directly related to drivers' physical health, emotional well-being, and safety behaviour, and may also be a predictor of the individual and the organisational factors (indicated by the dashed arrows). The two individual difference variables, perception of risk-taking and aggression, and the organisational factor of drivers' perceptions of management commitment to health and safety will each be influential in predicting the physical health, emotional well-being, and safety behaviours of taxi drivers.

Method

Participants

The participants for this study were Brisbane Taxi Drivers working for both Black and White Cabs and Yellow Cabs (the only two taxi companies in Brisbane). From a total of 97 surveys distributed 91 valid responses were received representing approximately a 94% response rate. The majority of respondents were male (94.5%). The age of the participants ranged from 18 years and upwards with 62% of the participants between 36 and 55 years of age. Seventy-two percent of the participants were from English speaking backgrounds. In terms of participants work details approximately 42% had two or more years of experience, while 32 % indicated having ten or more years of experience. Most of drivers (46%) worked for a taxi base while 23 % were owners. On average taxi drivers in this sample worked 54.88 hours per week with a standard deviation of 17.96, and a range from 12 to 82. Demographic data from the present sample were compared to data from Dalziel and Job's (1997) survey of taxi drivers in Sydney and the present sample appears to be representative of taxi drivers in other parts of Australia in terms of demographics and employment.

Measures

The Taxi Driver Safety Survey was developed to identify the factors being measured in this study. The Taxi Driver Safety Survey was a paper-and-pencil questionnaire consisting

of seven sections that took approximately 20 to 30 minutes to complete. A copy of the questionnaire is available from the authors.

Demographic and Work Related Questions. Section one of the questionnaire contained demographic questions (e.g. age, gender, and whether English was the respondent's first language) and some work related questions (e.g., years of experience, weekly work pattern such as hours, days, and shifts worked, and whether they pick up clients from hails, ranks, city, or suburbs). These questions were based on part of the Taxi Driver Survey developed by the Victorian Taxi Directorate (Haines, 1997). Similar questions were included in a survey developed by Dalziel and Job (1997) while assessing taxi driver safety in New South Wales.

Management commitment to health and safety. The second section of the questionnaire assessed taxi driver perceptions of management commitment to health and safety issues taken from the Health and Safety Climate Survey Tool developed by the Health and Safety Executive (HSE, 1997). Examples of the statements included are "The company cares about the health and safety of employees"; "Management is serious about health and safety issues"; and "There is good communication between management and employees about health and safety issues". The Cronbach's alpha reliability coefficient for this scale was .85.

Aggression. Part one of section three assessed the general personality trait of aggression using the Aggression Questionnaire by Buss and Perry (1992). The scale was previously used by Dalziel and Job (1997) in the research on taxi driver safety. The scale comprised 33 items that divided into four subscales: physical aggression, verbal aggression, anger, and hostility. The physical and verbal components represent the behavioural component, anger represents the emotional response, while the hostility component represents the cognitive component (Buss & Perry). Examples of statements include, "I get into fights more than the average person"; "I tell my friends openly when I disagree with them"; and "I

often find myself disagreeing with people”. The Cronbach’s alpha reliability coefficient for the Total Aggression score was .84.

Perceptions of risk-taking behaviour. Part two of section three assessed perceptions to risk-taking behaviour specific to the job of taxi driving and comprised some of the questions from the taxi driver risk-taking scale developed by Dalziel and Job (1997). Six questions relating to general risk-taking while driving were included, such as: “running a red light”; “keep driving even though you are very tired”; and “do an illegal U-turn”. The Cronbach’s alpha reliability coefficient for this scale was .74.

Hazards in the workplace. Section four provides a measure of workplace hazards specific to the job of taxi driving and is based on the Taxi Driver Survey developed by the Victorian Taxi Directorate (Haines, 1997). The respondent is asked to indicate if they have had to deal with any of five hazardous situations (i.e., verbal abuse, verbal or physical threat, physical assault, robbery, and fare evasion). Participants were required to indicate the number of times in the past year they have had to deal with these situations and whether they considered it to be minor, moderate, or serious. For the current study, the score for the total number of hazardous situations faced for the whole sample was used in the analysis. No details regarding the reliability and validity of this scale are available as the items were not designed to measure a single construct.

Safety Behaviour. The fifth section of the questionnaire assesses unsafe behaviour and included a total of fourteen questions. Ten of the items were taken from a risk-taking measure developed by Dalziel and Soames (1997), which included general driver behaviours as well as behaviours specific to the job of taxi driving. Examples of the items are: “cut across traffic to get to someone hailing you even when there is a slight risk of an accident”; “ignore safety regulations to get the job done”; “run a red light”; “turn right across a busy road even when there is a small chance of collision”. Cronbach’s alpha reliability reported by Dalziel and Job

for this scale was .79. Four questions were included from the Offshore Safety Questionnaire (OSQ) by Mearns, Whitaker, and Flin (2001). The Cronbach alpha reliability coefficient for this scale was .87.

Emotional well-being. Section six consisted of the Job-Related Affective Well-being Scale (JAWS) developed by Van Katwyk, Fox, Spector and Kelloway (1999) which was designed to assess employee's emotional reactions to their job. The scale is comprised of 30 questions of job related emotional states. It includes questions such as "my job made me feel at ease"; "my job made me feel angry"; "my job made me feel content"; and "my job made me feel fatigued". For the current sample, the Cronbach alpha reliability coefficient was .89.

Physical Health. Section 7 of the questionnaire is comprised of the Physical Symptoms Inventory (PSI) developed by Spector and Jex (1998) to assess employee physical and somatic health symptoms. The PSI is a self-report measure in which respondents are asked to indicate whether or not in the past 30 days they had suffered any of 18 symptoms, and whether or not they had seen a doctor. Three scores are computed, the number of symptoms each respondent reported suffering ("Have" symptom), the number for symptoms for which they saw a doctor ("Doctor" symptom), and the sum of the "Have" symptoms and the "Doctor" symptoms provides the Total PSI score. Total PSI scores can range from 0 to 18 with higher scores indicating more physical symptoms of ill health. Some examples of symptoms included on the scale are, headache, backache, fatigue, eye strain, and trouble sleeping. Only Total PSI scores were utilised for the purpose of the current study. Spector and Jex state that a measure of the scales reliability would be meaningless due to the fact the scale is a causal indicator rather than a measure of a construct in which case it would require internal consistency.

Procedure

Taxi drivers were approached while waiting at the taxi ranks. They completed and returned the questionnaire while the researcher was present. In an effort to obtain a representative sample surveys were conducted during the day at the Brisbane Airport taxi rank, and during the night at taxi ranks in the Brisbane central business district. The majority of the surveys were completed in the presence of one of the researchers. Eighteen participants had partly completed the survey but had to terminate when passengers arrived thus these respondents were given the questionnaires to complete and return in a reply-paid envelope provided allowing postage from any location without cost.

Results

The means, standard deviations and Intercorrelations of each of the variables of interest in the current study are presented in Table 1.

Insert Table 1 about here

The first multiple regression investigated how much variance in physical symptoms could be explained by the number of hazards at work, the individual difference variables and perceptions of management commitment to safety. Table 2 reports the results for this analysis.

Insert Table 2 about here

The results revealed that hazards in the work environment, individual factors, and the organisational factor together explained a statistically significant 20% (adjusted $R^2 = .16$, $F(4, 86) = 5.26$, $p < .01$) of the variance in the amount of physical symptoms of ill health reported by taxi drivers. Hazards was the most significant predictor of the outcome ($\beta = .29$, $t = 2.88$, $p < .01$) uniquely accounting for 8% ($sr^2 = .08$) of the variance in Physical Health. Risk-taking perceptions was also a significant predictor ($\beta = .23$, $t = 2.31$, $p < .05$) with a unique contribution of 5% ($sr^2 = .05$).

The second multiple regression investigated how much variance in Emotional Well-being could be explained by the number of hazards at work, the individual difference variables and Perceptions of management commitment to safety. Table 3 reports the results for this analysis.

Insert Table 3 about here

The results revealed that hazards in the work environment, individual factors, and the organisational factor together explained a statistically significant 32% (adjusted $R^2 = .29$, $F(4, 86) = 9.96$, $p < .01$) of the variance in Emotional Well-being. Hazards was a significant predictor ($\beta = -.26$, $t = -2.73$, $p < .01$) with a unique contribution of 6% ($sr^2 = .06$). However, Aggression ($\beta = -.32$, $t = -3.37$, $p < .01$) and the Perceptions of management commitment to safety ($\beta = .30$, $t = 3.32$, $p < .01$) were the strongest predictors, both with unique contributions of 9% ($sr^2 = .09$).

The third multiple regression investigated how much variance in Safety Behaviour could be explained by the number of hazards at work, the individual difference variables and Perceptions of management commitment to safety. Table 4 reports the results for this analysis.

Insert Table 4 about here

The results revealed that hazards in the work environment, individual factors, and the organisational factor together explained a statistically significant 34% (adjusted $R^2 = .31$, $F(4, 86) = 10.96$, $p < .01$) of the variance in Safety Behaviour. Perception of risk-taking was the strongest predictor ($\beta = .47$, $t = 5.21$, $p < .01$), uniquely accounting for 21% ($sr^2 = .21$) of the total variance in Safety Behaviour. Both Aggression ($\beta = .20$, $t = 2.19$, $p < .05$) and Perception of management commitment to safety ($\beta = -.24$, $t = -2.73$, $p < .01$) were significant predictors, uniquely contributing 4% ($sr^2 = .04$) and 6% ($sr^2 = .06$) respectively of the total

variance in Safety Behaviour. Hazards did not make a significant contribution to the prediction of Safety Behaviour.

Discussion

The main aim of the current study was to take an integrative approach in investigating the relative and combined influence of work environment, individual, and organisational factors on taxi drivers' physical health, emotional well-being, and safety behaviour. Because taxi driving is an occupation with one of the highest rates of assault and homicide, most research relating to the taxi industry has focused on hazards and individual factors as important issues relating to taxi driver safety. Safety climate researchers have found that, within other industries, employees' perceptions of management's commitment to health and safety is also an influential factor in predicting safety behaviour. However, this factor has not been considered in past research on taxi driver safety. The taxi industry research has also neglected to consider the physical health and emotional well-being of employees.

It was hypothesised that hazards would contribute significantly to the prediction of physical symptoms, job-related emotional well-being, and safety behaviour. Contrary to the model of accidents presented by Tomas et al. (1999), hazards was not a significant predictor of safety behaviour. However as expected, hazards was related to the general health and emotional-well being of taxi drivers. The more hazards taxi drivers reported experiencing, the more physical symptoms of ill health they reported and the more negative was their emotional reaction to their work. This finding is similar to the model proposed by Oliver et al. (2002), in which hazards in the work environment were related to the general health of workers in the manufacturing industry.

It was also hypothesized that perceptions of risk-taking would be a significant predictor of physical symptoms, job-related emotional well-being, and safety behaviour. The results supported parts of this hypothesis. Individual perceptions of risk-taking were a

significant predictor of physical ill-health and safety behaviour, such that when taxi drivers perceived risky behaviours to be the less dangerous, the higher the number of physical symptoms of ill health they reported and the greater the number of unsafe actions reported. These results are consistent with research by Cheyne et al. (in press) connecting individual factors with safety behaviour in the manufacturing industry, and Morrow and Crum (1998) where individual attitudes and perceptions influenced safety activity in the rail transport industry. Similarly, Dalziel and Job's research found that taxi drivers who were assessed as being higher risk takers also continued to work when they were tired with the knowledge that it may increase the chances of them being involved in an accident. Future research should look at whether it is the actual individual difference in perception of risk-taking that contribute to unsafe behaviour, or whether it is mediated by other variables such as the rewards of extra earnings. Focusing on the individual is important but broader factors that implicitly reward unsafe behaviours must also be considered and policy makers should realize the importance of the motivation behind why drivers take risks and behave in an unsafe manner.

It was also hypothesized that aggression would be a significant predictor of physical symptoms, job-related emotional well-being, and safety behaviour. The results indicated that the higher scores on aggression were associated with more negative emotional well-being and more unsafe behaviours. These results suggest that drivers with an aggressive personality are less happy about their job and perform their day-to-day tasks in a more unsafe manner. It is important to consider this specific personality trait when considering taxi driver health and safety since it related to the way individuals behave, and the way they respond emotionally. Future strategies to improve the health and safety of the taxi industry may require management to take the person-environment-fit approach in screening new applicants for the

job. It could also be that ill health and/or negative emotions about their job may be influence extent to which an individual behaves aggressively.

Finally, it was hypothesized that perceptions of management's commitment to health and safety would be a significant predictor of physical symptoms, job-related emotional well-being, and safety behaviour. In line with other research (Oliver, et al., 2002), perceptions of management's commitment to health and safety were related to emotional well-being and safety behaviour. Having a higher perception of management's commitment to health and safety was related to more positive emotional well-being and reporting less unsafe behaviours. However, contrary to expectations and to other research by Oliver et al., this variable was not a significant predictor of physical symptoms of ill health.

One of the limitations of the current study was in its use of regression analyses, which meant that cause and effect could not be implied. This is an inherent problem in social science research. However, regression analyses do provide a useful way of gaining knowledge about the relative strength of relationships between variables, and the combined ability of various factors to predict certain outcomes. Although these may not be the only factors that influence the outcomes, at the least these analyses provide a foundation of knowledge for future research. In the current study, the variables hypothesised to predict the three outcomes accounted for between 19 and 34 percent of variance in the outcomes. This suggests that other variables need to be included in the investigation of taxi driver health and safety.

Much research has focused on implementing technical improvements, or providing training on skills to reduce the probability of hazards and improve safety in the taxi industry, yet no research has been conducted on how these factors influence the health of taxi drivers. However, one of the important findings of the current study was that taxi drivers relate hazards with physical and emotional well-being. Thus more research on the impact on hazards on taxi driver health is required.

Another interesting finding was in the relationship between the perceptions of management's commitment and the other variables in the study. As in other industries, positive perceptions of management's commitment to health and safety were associated with less unsafe behaviour and positive feelings about the job.

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Table 1

Means, standard deviations, and intercorrelations of all variables.

Variable	<i>M</i>	<i>S.D.</i>	1	2	3	4	5	6
1. Hazards	14.68	27.51	--					
2. Risk-taking perceptions	11.91	3.68	-.06	--				
3. Aggression	84.29	15.12	.29**	.15	--			
4. Mgt commitment	16.14	6.61	.02	.09	-.07	--		
5. Physical health	4.45	3.16	.31**	.22*	.27**	-.11	--	
6. Emotional well-being	92.34	17.18	-.35**	.05	-.40**	.32**	-.43**	--
7. Safety behaviour	27.6	8.25	.07	.48**	.30**	-.22*	.42**	-.29**

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

Table 2

Multiple Regression of Physical Health (N = 91)

Variables entered	<i>B</i>	β	<i>R</i>	<i>R</i> ²	<i>sr</i> ²	<i>F</i>
Step 1			.44	.20**		5.26**
Hazards	.74	.29**			.08	
Risk-taking perceptions	.20	.23*			.05	
Aggression	.03	.14			.02	
Management commitment	-.06	-.12			.01	

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

Table 3

Multiple Regression of Job-related Affective Well-being (N = 91)

Variables entered	<i>B</i>	β	<i>R</i>	<i>R</i> ²	<i>sr</i> ²	<i>F</i>
Step 1			.56	.32**		9.56**
Hazards	-3.52	-.26**			.06	
Risk taking perceptions	.24	.05			.00	
Aggression	-.36	-.32**			.09	
Management commitment	.78	.30**			.09	

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

Table 4

Multiple Regression of Safety Behaviour (N = 91)

Variables entered	<i>B</i>	β	<i>R</i>	<i>R</i> ²	<i>sr</i> ²	<i>F</i>
Step 1			.58	.34**		10.96**
Hazards	.20	.03			.00	
Risk-taking perceptions	1.05	.47**			.21	
Aggression	.11	.20*			.04	
Management commitment	-.30	-.24**			.06	

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

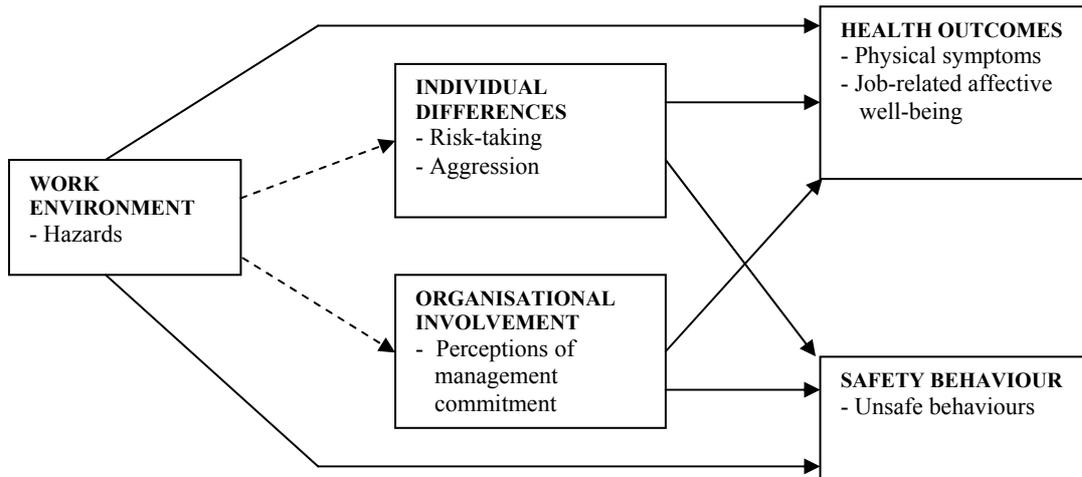


Figure 1. Proposed model of factors influencing taxi driver health outcomes and safety behaviour.