

A Comparison of the Driving Behavior Between Remunerated and Volunteer Drivers

Sharon Newnam, PhD
Postdoctoral Research Fellow
Centre of Accident Research and Road Safety
Queensland University of Technology
Kelvin Grove, Queensland, Australia 4059
Tel: 61-7-3138 8423
Fax: 61-7-3138 0112
Email: s.newnam@qut.edu.au

Barry Watson, PhD
Director
Centre of Accident Research and Road Safety
Queensland University of Technology
Kelvin Grove, Queensland, Australia 4059
Tel: 61-7-3138 4955
Fax: 61-7-3138 4907

In press, Safety Science

Newnam, S., Watson, B. (in press). A comparison of the driving behavior between remunerated and volunteer drivers. Safety Science.

Abstract

Introduction: Past research suggests that some groups of work-related drivers practice more safe driving behavior than others. However, no research to date has compared the driving behavior of those remunerated for their services and volunteer work-related drivers. As such, based on a theoretical discussion of the organizational and social contexts in which work-related driving occurs, this study hypothesized that volunteers would report safer driving behavior compared with remunerated drivers.

Methods: One-hundred and ninety remunerated drivers and fifty-nine volunteers completed a self-reported driving behavior questionnaire. *Results:* Some support was found for the hypotheses, as volunteers reported more safe driving behavior than remunerated drivers. Specifically, volunteers reported less inattention and tiredness while driving compared to remunerated drivers. *Conclusions:* The results suggested that organizations need to formalize the roles and responsibilities of the work-related driver, and better integrate driving within the wider occupational health and safety system.

Keywords: work-related driving, safety, volunteers, fleet vehicles

A Comparison of the Driving Behavior Between Remunerated and Volunteer Drivers

1. Introduction

Work-related driving crashes have become the leading source of work-related death in Australia (Haworth, Tingvall, & Kowadlo, 2000; Murray et al., 2003) and overseas (Bureau of Labor Statistics, 2004; Downs, Keigan, Maycock, & Grayson, 1999). Specifically, in the United States approximately seven out of ten of the fatally injured work-related drivers were killed on public roadways or surrounding areas (Bureau of Labor Statistics, 2004). Similar trends have also been found in the United Kingdom and Australia, even after adjusting for driving exposure (Downs et al., 1999; Lynn & Lockwood, 1998; Haworth, Tingvall & Kowadlo, 2000; Murray et al., 2003).

These figures suggest that safety in the work vehicle should be an important concern for all organizations employing work-related drivers. Work-related drivers are commonly defined as those who drive at least once per week for work-related purposes (Haworth et al., 2000). These drivers range from truck drivers, couriers, police and emergency service drivers, to sales people (Collingwood, 1997). Work-related drivers include senior executives provided with salary sacrificed vehicles, and those regarded as pooled vehicle drivers, who are employed to drive fleet cars, vans, or other specialist vehicles (Dimmer & Parker, 1999). Another group of work-related drivers are volunteers who use their own or a fleet vehicle to deliver a variety of community based services.

Given there are varied groups of work-related drivers, attention should be given to those who are more likely to represent a safety risk on the road. Chapman, Roberts, & Underwood (2000) found that the risk of crash involvement among company vehicle drivers is not uniformly spread across all groups of work-related

drivers. In particular, Chapman et al found that salary sacrificed drivers and those who receive a car as a requirement of their job was particularly at risk of crash involvement. As such, this research suggests that groups of work-related drivers perform differently on the road. Extending on Chapman et al research, this study proposes to examine differences in driving behavior between those individuals remunerated for their driving services and volunteer drivers. In this study, remunerated drivers are referred to those groups of drivers who are either given a vehicle as part of their salary package (i.e., salary sacrificed drivers) or those who drive a company vehicle which is shared by other drivers within the organisation (i.e., pooled vehicle drivers).

For the comparison sample, we chose to focus on volunteers as the nonprofit sector represents 6.8% of the workforce in the Australian economy, and volunteer drivers represent a significant proportion of voluntary activity involvement in Australia (exceeding 25%) (Australian Bureau of Statistics, 2006). Safety while volunteering is a particularly important issue in the Australian context due to some of the unique legal liability issues surrounding volunteers, particularly in regards to the protection of volunteers from personal civil liability and its transfer to the supervising organization [McGregor-Lowndes, 2003(a); 2003(b); McGregor-Lowndes & Nguyen, 2005; McGregor-Lowndes & Edwards, 2004]. As such, there is a need for research to explore the safety of volunteer drivers.

Only one research paper to date has examined the safety of volunteer drivers through identifying the internal motivational factors influencing self-reported speeding when driving for work purposes (i.e., Newnam, Newton, & McGregor, 2009). This paper identified the psychological functions underlying volunteering and found that particular motivations for volunteering were associated with poorer driving

behavior. Although a unique contribution, research is yet to examine whether the driving behavior of volunteers is different to those who are remunerated for their driving services. This issue represents an important empirical question as remunerated and volunteer drivers are likely to identify differently with their role as a work-related driver given they are influenced by different contexts, namely the social and organizational contexts. Through explicating the social and organizational driving contexts influencing the safe driving practices of the volunteer and remunerated driver research can identify the social-psychological mechanisms influencing safe driving behavior.

The aim of this study is to examine this issue by drawing on relevant organizational and social psychology literature to describe the work-related driving context within which remunerated and volunteer driver groups operate. Specifically, we explore the organizational psychology literature to describe the work context of the remunerated driver, and the social psychology literature to explore links between volunteerism and driving. The following review will develop the argument and provide a foundation for distinguishing the driving contexts and the role of unsafe driving for these two driver groups.

1.1 The Remunerated Driving Context

Griffin, Neal and Parker (2007) identified uncertainty and interdependence as characteristics of the organizational context which are important in shaping and constraining those behaviors that are valued and considered important. We argue that these contextual features of the organizational context are not well managed within the work-related driving context, and that they can provide a theoretical explanation as to why safe driving practices are not valued or considered important for effectiveness.

Within an organizational context uncertainty refers to the extent to which valued work roles are formalized (Ilgen & Hollenbeck, 1991). Uncertainty occurs when effectiveness is achieved through adapting to and initiating change, rather than complying with requirements of the work role (Griffin et al., 2007). In uncertain contexts, performance is less predictable as individuals adapt to the changing demands and conditions. In the work-related driving setting, the basic requirements for driving a vehicle are arguably predictable. However, the predictability in the driving task is not necessarily well managed by organizations. Rather, uncertainty in the roles and responsibilities of the work-related driver allow individuals to achieve their goals without clear guidelines on how to correctly perform the driving task.

In contrast to commercial vehicle fleets (i.e., trucks and motor coaches) (e.g., Arboleda, Morrow, Crum, & Shelley, 2003; Arnold & Hartley, 2001; Morrow & Crum, 2004; Sullman, Meadows, Pajo, 2002), organisations operating light vehicle fleets are not governed under federal laws and regulations and, as a result, workplace safety has not been well integrated within the Occupational Health and Safety (OHS) sector (Haworth et al., 2000; Murray et al., 2003). Organisations operating light vehicle fleets have a legal obligation and duty of care under the OHS regulations to provide a safe and healthy workplace; however, this has not been strongly enforced (Murray et al., 2003).

The safety management of driving behavior is further complicated as supervisors are rarely in close proximity to their employee when driving a vehicle, and as such, it is difficult for supervisors to collect objective information on drivers and give appropriate feedback. Furthermore, traffic infringement notices often go directly to the driver, rather than through the supervisor to the driver and, as such, there is limited acknowledgement of unsafe driving practices. Given this situation,

few organizations operating light vehicle fleets have formalized the role requirements of individuals in the work vehicle. Safety management in light vehicle fleets primarily address issues relevant to fleet procurement and vehicle maintenance, rather than enforcement and monitoring of safety driving practices. As such, from a psychological perspective, drivers adapt to this uncertain organizational context of changing demands and conditions by prioritizing production over safety requirements.

Specifically, it is argued that there is a high level of uncertainty within the work-related driving role, and as little attention has been given to safe driving practices in the work vehicle, effectiveness translates into production demands rather than safety outcomes. That is, individuals are more motivated to reduce the performance deficits associated with production demands, which in turn has a negative influence on safe driving practices. In support, work-related drivers have been found to report a higher frequency of crashes than those driving for personal purposes (e.g., Downs et al., 1999; Newnam, Watson, & Murray, 2002). One possible explanation to explain the differences in safe driving practices across the work and personal contexts is the value given to safe driving practices [i.e., safety climate perceptions (e.g., Zohar, 2000; Neal & Griffin, 2006)] within the organization. In support, it has been found that the value given to safety at multiple levels within the organizational context (i.e., individual driver and workgroup levels) has an influence on self-reported crashes (Newnam, Griffin, & Mason, 2008). As such, the value given to safety contributes to the emergence of an uncertain organizational context where drivers adapt to the changing conditions by prioritising production demands over safe driving behavior.

Interdependence within the organizational context refers to a social system where effectiveness is achieved through shared goals (Cummings & Blumberg, 1987).

Interdependence is achieved when individual behavior contributes to the shared goals of the work group or organization, rather than the responsibilities of his or her own individual task (Griffin et al., 2007). Within the work-related driving context, it is argued that driving is independent of other members of the organization, as driver behavior has a larger impact on the individual rather than the workgroup or organization.

As work-related driving behavior is not well integrated within the OHS sector, there are few policies and practices in place to monitor aberrant driving behavior. For example there are few systems in place that have been found to be effective in recognizing safe driving behavior, such as reward or recognition programs (Murray, 2007). As such, safe driving is not recognized as a behavior that influences the effectiveness of the broader safety system within an organization. As a result, driving behavior within the organizational context is independent of other members and the organization as a whole, and thus there is little incentive/reinforcement for individuals to practice safe driving.

In summary, there is a high level of uncertainty and a low level of interdependence in relation to the role of those who drive for work purposes. Specifically, we argue that these contextual features are not well managed, which in this context has a negative influence on safe driving practices. However, it is likely that these contextual features and their impact on driver behavior may vary across groups of work-related drivers, including volunteer drivers.

1.2 The Volunteer Driving Context

In comparison to remunerated employees, volunteers are not traditionally paid for their services within an organization. Furthermore, motivations for performing the primary job role are different to that of a remunerated employee. As such,

volunteering performance would be governed by a system external to the organizational context. Indeed, research suggests that the social context is important in understanding volunteerism (e.g., Grube & Piliavin, 2000; Finkelstein, 2006; Penner, 2002).

One perspective identifying the social context in volunteerism emphasises an individuals' self-concept and their identification with a particular role (Finkelstein, 2006). Role identity theory states that individuals develop a concept of their self as a volunteer, and they strive to make their behavior consistent with this identity (see Piliavin & Callero, 1991). The theory contends that an individuals' identity becomes internalized over time and this identification drives future actions. In support, Finkelstein, Penner, and Brannick (2005) found that individuals who engage in ongoing, discretionary helping are those who have internalized a prosocial role.

Given the ambiguous context surrounding the roles and responsibilities of the work-related driver, we argue that remunerated drivers are more likely to identify with the task demands (i.e., speed of production) associated with their role as a work-related drivers as opposed to the value given to their own safety and their social responsibility as a work-related driver. In comparison, volunteers are more likely to have internalized a prosocial behaviour (see Penner & Brannick, 2005), which in this context influences safe driving practices. In other words, a volunteers' identity is more likely to be created within a social structure, where driving behavior is influenced by the function served through their motivations for volunteering. In support, Newnam et al. (2009) found that individuals who were more likely to report volunteering for altruistic purposes were less likely to report speeding while driving for work purposes. As such, we argue that volunteers are more likely to report safer driving behaviour than remunerated drivers as they are more likely to identify with

their social responsibility as a work-related driver, as opposed to the remunerated drivers who are more likely to identify with the task demands inherent in their role as a work-related driver.

In summary, the aim of this paper is to examine the differences in driving behavior between remunerated drivers and those who volunteer their driving services. Owing to the development of a prosocial volunteer driver identity, volunteers will report safer driving behaviors compared to remunerated work-related drivers. As such, it is hypothesised that;

Hypothesis 1: Volunteers will report safer driving behavior than remunerated work-related drivers;

This study will also examine differences between volunteer and remunerated drivers in relation to individual driving behaviors. The driving behaviors under investigation in this study include speeding, rule violation, inattention and driving while tired. We chose to focus on these driving behaviors as they have been found to be influential on the work-related driving task. Based on our rationale, we hypothesise the following:

Hypothesis 1: Volunteer drivers will report less speeding than remunerated work-related drivers;

Hypothesis 2: Volunteer drivers will report engaging in less rule violations than remunerated work-related drivers;

Hypothesis 3: Volunteer drivers will report less inattention to the driving task than remunerated work-related drivers;

Hypothesis 4: Volunteer drivers will report being less tired than remunerated work-related drivers.

1.3 Control Variables

This study included kilometres driven per week and vehicle ownership as control variables. Work-related drivers, on average, accumulate higher mileage in comparison to the average private motorist. Above average annual mileage has been suggested as a potential factor contributing to work-related vehicle crashes (Downs et al., 1999). In addition, a number of volunteers use their own vehicle, which can have implications on their perceptions of public liability [National Council of Social Services (NCOSS), 2004]. These findings constituted an argument for using these variables as controls within the current study.

2. Methods

2.1 Participants and Procedure

The research was conducted in partnership with two large nonprofit agencies in a state of Australia. Participants were involved in community-based work, which required them to drive for work purposes. The criteria used for driver selection was that the individual drove at least once per week for work-related purposes.

The method of distributing the questionnaires was different for the remunerated work-related drivers than for and volunteer driver sample. In the case of the remunerated drivers, a list of drivers' names and work delivery details was obtained from the Human Resource department within the agencies under investigation. Using this information, the study questionnaire and a reply paid envelope was distributed to each of the drivers.

Completed questionnaires were returned by 190 individuals who were classified as remunerated work-related drivers, representing a 54% response rate. These individuals reported that their driving role included driving to and from work, between offices for work meetings, and to clients' residences. All of the participants drove their vehicle at least once per week for work-related purposes. The majority of

the participants were female (65%), with an average age of 44.28 years ($SD = 9.59$; Range = 22 to 68 years). The average time the remunerated participants held a drivers' licence was 25.53 years ($SD = 9.76$; Range = 2 to 49 years), while they drove an average of 344 kilometres per week ($SD = 306.65$; Range = 5 to 1300 km/week).

For reasons of confidentiality, the researchers were not able to obtain a list of the drivers who were classified as volunteer drivers. As such, the fleet managers within each agency were responsible for distributing the questionnaires. The researchers asked the fleet managers to distribute the questionnaire on a random basis to as many volunteer drivers within their workplace. The questionnaires were only distributed to individuals who drove at least once per week for work-related purposes, and to those who were classified as volunteer drivers. Due to the method of distribution we were unable to calculate a response rate for this group.

In regard to the volunteer sample, 59 individuals completed the questionnaire. The primary driving task of the volunteer driver involved travelling to and from clients' residences from their organization's service centre. The majority of the participants were male (54%), with an average age of 55 years ($SD = 17.34$; Range = 17 to 80 years). The average time the participants in this group held a drivers' licence was 34.71 years ($SD = 16.99$; Range = 1 to 60 years), and they drove an average of 57 kilometres per week ($SD = 69.48$; Range = 5 to 400 km/week). The majority of volunteers reported driving their own vehicle (72%), with the remaining driving their agency's vehicle.

2.2 Measures

As no scale has yet been developed to measure unsafe driving behavior in the work-related driving context, scales were developed to measure four aspects of unsafe driving behavior when driving for work purposes. A number of studies have assessed

work-related driving behavior using questionnaires (e.g., Davey, Wishart, Freeman, & Watson, 2007; Wills, Watson, & Biggs, 2004). However, the questionnaires utilized in these studies were developed for the general driving population (e.g., Driving Behavior Questionnaire; Reason et al., 1990) and adapted to the work-related driving context. The problem associated with adapting driving behavior measures from the general driving population is that job performance is believed to be a function of the goals established by the organization, and so by adapting measures from a context with different goal perspectives it may produce a contaminated source of variance (Campbell, McCloy, Oppler, & Sager, 1993). Furthermore, research has assumed that the unsafe behaviors individuals display when driving for personal purposes are the same as those displayed within the workplace context (Newnam et al., 2002). However, this assumption neglects the impact that the broader workplace context plays on safety at work.

As such, a work-related driving questionnaire needs to identify the unsafe driving behaviors that emerge in the work-related driving setting through identifying the driving performance decrements that are likely to occur under conditions that are dependent on the organizational context (e.g., overload and high demand). Given this argument, it is argued that the following measures of unsafe driving behavior are sufficient for this context. Please contact the first author for full details of the measures listed below.

2.2.1 Self-reported speed: Speeding was assessed with three items specifically developed for this study. An example was “In a typical week when driving for work purposes how often do you deliberately exceed the speed limit on a residential road,” All items were measured on a 5-point Likert scale, ranging from Rarely or Never (1)

to Very Often (5). Alpha reliabilities for this scale were .71 for volunteer drivers and .86 for remunerated drivers.

2.2.2 Rule violation: Rule violations were assessed with three items specifically developed for this study. An example item was “In a typical week when driving for work purposes how often do you fail to use your indicators to change lanes,” All items were measured on a 5-point Likert scale, ranging from Rarely or Never (1) to Very Often (5). Alpha reliabilities for this scale were .69 for volunteer drivers and .71 for remunerated drivers.

2.2.3 Inattention: Inattention items were assessed with three items specifically developed for this study. An example item was “In a typical week when driving for work purposes how often do you drive while thinking about how to get to your destination,” All items were measured on a 5-point Likert scale, ranging from Rarely or Never (1) to Very Often (5). Alpha reliabilities for this subscale were .78 for volunteer drivers and .89 for remunerated drivers.

2.2.4 Tiredness while driving: Tiredness while driving items were assessed with three items specifically developed for this study. The items were “In a typical week when driving for work purposes how often do you drive while tired,” All items were measured on a 5-point Likert scale, ranging from Rarely or Never (1) to Very Often (5). Alpha reliabilities for this subscale were .79 for volunteer drivers and .72 for remunerated drivers.

2.2.5 Control variables: An item was included in the general driving section related to kilometres driven per week. A space was provided for the participants to indicate how many kilometres they drove per week. Type of vehicle driven when volunteering was measured on a categorical scale, with the categories including your organizations vehicle, own vehicle, and other.

3. Results

Table 1 provides descriptive information and correlations between the study variables. Differences in driving behavior between remunerated and volunteer work-related drivers were tested with univariate and a multivariate analysis of variance models. Kilometres driven per week and type of vehicle driven while driving for work purposes was used as co-variables in both models. In regards to hypothesis one, the four driving behaviors examined in this study were combined to form a composite variable. In turn, a univariate analysis of variance model was utilized to examine whether volunteers reported safer driving behavior to remunerated drivers. The results showed a significant difference between the two groups, $F(1, 246) = 12.35, p < .05, \eta = .05$ with volunteers ($M = 1.42$) reporting safer driving behavior to remunerated drivers ($M = 1.83$). These results suggest that hypothesis one was supported.

To examine the differences in driving behavior between the two groups, a multivariate analysis of variance model was utilized. First, the results showed a significant main effect for group, $F(4, 242) = 6.19, p < .05, \eta = .09$. Further examination revealed significant differences in inattention, $F(1, 245) = 23.49, p < .001, \eta = .09$ and tiredness while driving, $F(1, 245) = 6.04, p < .05, \eta = .02$. Examination of the mean values found that volunteers reported lower inattention ($M = 1.86$) and tiredness while driving ($M = 1.27$) compared with remunerated work-related drivers self reported inattention ($M = 2.82$) and tiredness while driving ($M = 1.65$). Thus, Hypothesis four and five were supported¹.

¹ Given the large variability in kilometres driven in the remunerated and volunteer driver samples, a supplementary analysis was conducted to verify the results found in this study through adjusting the remunerated data file so that the kilometres driven per week could be similar to that of the volunteer sample. This task was conducted by matching the kilometres

No significant difference was found for either speeding, $F(1, 245) = .15, p = .ns$, between volunteers ($M = 1.35$) and remunerated work-related drivers ($M = 1.55$) or rule violation, $F(1, 245) = .69, p = ns$, between volunteers ($M = 1.19$) and remunerated work-related drivers ($M = 1.30$). As such, Hypothesis two and three were not supported as volunteers did not report significantly lower driving speeds and rule violations compared with remunerated work-related drivers.

Table 1 here

4. Discussion

The aim of this paper was to examine the differences in driving behavior between remunerated and volunteer work-related drivers. In the introduction, we argued that the driving context is different for remunerated and volunteer drivers. Specifically, we argued that remunerated drivers are influenced by an organizational context which predicates ambiguity in the roles and responsibilities of the work-related driver. Based on this argument, we argued that volunteers would report safer driving practices, owing to the social context and their prosocial role identity. Support was found for this proposition.

In support of the hypothesis, we found that volunteer drivers reported safer driving behavior than remunerated drivers. Further examination of the driving behaviors revealed that volunteer drivers reported less inattention and tiredness while driving compared with a sample of remunerated work-related drivers. It is argued that

driven per week to the volunteer sample and deleting those cases in the remunerated sample where the kilometres driven per week exceeding 400. In this sample, remunerated drivers ($n=59$) drove an average of 78 kilometres per week ($SD = 67.81$; Range = 5 to 400 km/week). The volunteer sample remained the same. The analysis found the same results as in the original sample where significant differences were found between remunerated and volunteer drivers for inattention $F(1, 114) = 23.84, p = <.01$, and tiredness while driving inattention $F(1, 114) = 6.73, p = <.05$. Furthermore, volunteers reported less inattention ($M = 1.86$) and driving while tired ($M = 1.27$) than remunerated work-related drivers ($M = 2.70$ and $M = 1.49$, respectively).

as the driving task of the volunteer driver is their primary work role, these individuals are less likely to be influenced by the organizational context where the role of the driver is ambiguous and not well recognised within the OHS system. Rather, the prosocial identity formed through the role of volunteering is more likely to have a positive influence on safe driving practices.

Contrary to the hypotheses, we found no significant differences in reported speeding and rule violation between remunerated and volunteer work-related drivers. These findings were surprising as research has found that drivers of employer owned cars and those driving a car for work-related purposes are presumed to be among the groups who are more likely to engage in speeding (Stradling, 2000). This finding supports other research that suggests that speeding and rule violation can be influenced by other factors, such as personal dispositions, rather than the organizational context (Wills, Watson, & Biggs, 2009).

5. Practical applications

No study to date has compared driving behaviors between remunerated and volunteer work-related drivers. This study addressed this issue and integrated existing organizational and social psychology literature to describe the contexts which shape and constrain work-related driving practices. The results of the current study offer some practical suggestions for future research in this setting and the safety management of work-related drivers.

This study offers a number of practical implications for the safety management of work-related drivers. The results suggested that the identity of the work-related driver should be integrated within a broader social system of the organizational context. In order to do this, organizations firstly need to formalize the role requirements for the work-related driving task. In particular, organizations need

to safety manage the role of the work-related driver by identifying safe driving practices as a key component of those who drive for work purposes. In achieving this task, individuals are more likely to identify with their responsibility as a safe driver. Second, work-related driving safety needs to be prioritized within the organization as a whole. Specifically, the driving task needs to be better integrated within the OHS system and throughout all levels of the organization. In support, research has found that the value given to safety at multiple levels within an organization to be influential on achieving a reduction in work-related driving crashes (Newnam et al., 2008).

6. Limitations

Despite its practical applications, this study has a number of limitations. First, this paper used self-report behavioral measures which are open to socially desirable responding. However, this is less likely to be an issue as self-report measures of crashes have been found to be strongly correlated with independent observations (Lusk, Ronis, & Baer, 1995). Furthermore, self-report driving questionnaires have been found to be associated with minimal social desirability bias (Lajunen & Summala, 2003). Regardless of this issue, future research should attempt to gain objective measures of behavioral data to ensure the accuracy of results.

Second, this study was unable to calculate a response rate in the volunteer sample and, as such, it is uncertain how representative these results are of all volunteer work-related drivers. This limitation presents two concerns. First, some of the non-significant results could have been attributed to the small sample size. Second, it is possible that those volunteers who responded had generally safer driving practices than those who did not respond. As such, it would be desirable to replicate this study with a larger group of volunteer drivers. To further strengthen this argument, research could also attempt to collect objective measures of work-related

driving behaviors, through utilizing possibilities such as in-vehicle telemetry devices such intelligent speed adaptation and eye-tracking devices (i.e., attentional behaviors), or, utilizing distal measures such as driving infractions (e.g. being stopped for speeding, running lights, illegal left-turns, etc.).

7. Conclusion

This paper investigated the differences in driving behavior between remunerated and volunteer work-related drivers. As predicted, the results found that remunerated drivers reported higher levels of inattention and tiredness while driving compared with volunteers. These results suggest that the organizational context of high uncertainty and low interdependence is negatively influencing the priority given to safe driving practices within the role of the remunerated work-related driver. As such, organizations need to address this issue by formalizing safe driving within the role of the work-related driver and prioritizing safety in the work vehicle within the organization as a whole.

8. References

- Arboleda, A., Morrow, P. C., Crum, M. R., Shelley, M. C. (2003). Management practices as antecedents of safety culture within the trucking industry: similarities and differences by hierarchical level. *Journal of Safety Research*, 34, 189-197.
- Arnold, P. K., Hartley, L. R. (2001). Policies and practices of transport companies that promote or hinder the management of driver fatigue. *Transportation Research Part F: Traffic Psychology & Behaviour*, 4, 1-17.

- Australian Bureau of Statistics. (2006). Voluntary work, Australia. Report 441.0. July 2007.
- Bureau of Statistics (2004). *BLS statistics of worker safety and health*. United States Department of Labor. <http://www.bls.gov/>.
- Campbell, J. P., McCloy, R. A., Oppler, S. H., & Sager, C. R. (1993). A theory of performance. In J. Schmitt & W. C. Borman Associates (Eds.), *Personnel selection in organizational* (pp. 35-69). San Francisco, CA: Jossey-Bass.
- Chapman, R., Roberts, K., & Underwood, G. (2000). A study of the accidents and behaviour of company car drivers. In G. B. Grayson (Ed.), *Behavioural research in road safety X*. Crowthorne: Transport Research Laboratory.
- Collingwood, V. (1997). Promoting the safe driving policy in NSW fleets of twenty or more vehicles. In *Staysafe 36: Drivers as workers, vehicles as workplaces: Issues in fleet management*. (Report No. 9/51). Ninth report of the Joint Standing Committee on Road Safety of the 51st Parliament, Sydney, Australia.
- Cummings, T., & Blumberg, M. (1987). Advanced manufacturing technology and work design. In T. Wall, C. Clegg, & N. Kemp (Eds.). *The human side of advanced manufacturing technology*: 37–60. Chichester, U.K: Wiley.
- Davey, J., Wishart, D., Freeman, J., & Watson, B. (2007). An application of the driver behavior questionnaire in an Australian organizational fleet setting. *Transportation Research Part F*, 10, 11-21.
- Dimmer, A. R., & Parker, D. (1999). *The accident, attitudes and behaviour of company car drivers (Report No. 317)*. Crowthorne: Transport Research Laboratory.

- Downs, C. G., Keigan, M., Maycock, G., & Grayson, G. B. (1999). *The safety of fleet car drivers: A review (TRL Report 390)*. Crowthorne: Transport Research Laboratory.
- Finkelstein, M. A. (2006). Dispositional predictors of organizational citizenship behavior: Motives, motive fulfillment, and role identity. *Social Behavior and Personality, 34*(6), 603-616.
- Finkelstein, M. A., Penner, L. A., Brannick, M. T. (2005). Motive, Role identity, and prosocial personality as predictors of volunteer activity. *Social Behavior and Personality: An International Journal, 33*(4), 403-418.
- Griffin, M. A., Neal, A., & Parker, S. K. (2007). A new model of work role performance: Positive behavior in uncertain and interdependent contexts. *Academy of Management, 50*(2), 327-347.
- Grube, J. A., Piliavin, J. A. (2000). Role identity, organizational experiences and volunteer performance. *Personality and Social Psychology Bulletin, 26*(9), 1108-1119.
- Haworth, N., Tingvall, V., & Kowadlo, N. (2000). *Review of best practice fleet safety initiatives in the corporate and/or business environment (Report No. 166)*. Melbourne: Monash University Accident Research Centre.
- Ilggen, D. R., & Hollenbeck, J. R. (1991). The structure of work: Job design and roles. In M. D. Dunnette & L.M. Hough (Eds.), *Handbook of industrial and organisational psychology* (2nd ed.): 165–207. Palo Alto, CA: Consulting Psychology Press.
- Lajunen, T., & Summala, H. (2003). Can we trust self-reports of driving? Effects of impression management on driver behavior questionnaire responses. *Transportation Research Part F, 6*, 97-107.

- Lusk, S., Ronis, D., & Baer, L. (1995). A comparison of multiple indicators: Observations, supervisor report, and self-report measures of worker's hearing protection use. *Evaluation and the Health Professions, 18*(1), 51-63.
- Lynn, P., & Lockwood, C. R. (1998). *The accident liability of company car drivers (TRL Report 317)*. Crowthorne: Transport Research Laboratory.
- McGregor-Lowndes, M. (2003a). Volunteer protection in Queensland, *The Queensland Lawyer, 24*(2), 81-96.
- McGregor-Lowndes, M. (2003b). Australian volunteer protection provisions, *Australian Journal on Volunteering, 8*(2), 42-53.
- McGregor-Lowndes, M., & Nguyen, L. (2005). Volunteers and the new tort law reform, *Torts Law Journal, 13*(1) 41-61.
- McGregor-Lowndes, M., & Edwards, S. (2004). Volunteer immunity and local government, *Local Government Law Journal, (9)*, 53-72
- Murray, W. (2007). Guidance on fleet driver incentive programs for crash avoidance. *Incentives*.
- Morrow, P. C., & Crum, M. R. (2004). Antecedents of fatigue, close calls, and crashes among commercial motor-vehicle drivers. *Journal of Safety Research, 5*, 59-69.
- Murray, W., Newnam, S., Watson, B., Schonfeld, C., & Davey, J. (2003). *Evaluating and improving fleet safety in Australia*. Australian Transport Safety Bureau.
- National Council of Social Services (NCOSS). (2004). Important update on car insurance for paid workers and volunteers, Sydney.
- NCOSS. (2004). Important update on car insurance for paid workers and volunteers, Sydney.

- Neal, A., & Griffin, M. A. (2006). A study of the lagged relationships among safety climate, safety motivation, safety behavior, and accidents at the individual and group levels. *Journal of Applied Psychology, 91*(4), 946-953.
- Newnam, S., Griffin, M. A. & Mason, C. M. (2008). Safety in work vehicles: A multi-level study linking safety values and individual predictors to work-related driving crashes. *Journal of Applied Psychology, 93*(3), 632-644.
- Newnam, S. A., Newton, C. J., & McGregor-Lowndes, M. (2009). Predicting the safety performance of volunteers: Does motivation for volunteering influence driving behavior? *Safety Science, 47*, 1090-1096.
- Newnam, S., Watson, B., Murray, W. (2002). *A comparison of the factors influencing work-related drivers in a work and personal vehicle*. In the Proceedings of the Road Safety Policy, Education and Policing Conference, Adelaide, Australia.
- Penner, L. A. (2002). Dispositional and organizational influences on sustained volunteerism: An interactionist perspective. *Journal of Social Issues, 58*, 447-467.
- Piliavin, J. A., & Callero, P. L. (1991). *Giving blood: The development of an altruistic identity*. Baltimore, MD: Johns Hopkins Press.
- Reason, J., Manstead, A., Stradling, S., Baxter, J., & Campbell, K. (1990). Errors and violations: a real distinction? *Ergonomics, 33*, 1315–1332.
- Stradling, S. G. (2000). *Driving as part of your work may damage your health*. Crowthorne: Transport Research Laboratory.
- Sullman, M. J. M., Meadows, M. L., & Pajo, K. B. (2002). Aberrant driving behaviours amongst New Zealand truck drivers. *Transportation Research Part F: Traffic Psychology and Behaviour, 5*, 217-232.

- Wills, A., Watson, B., Biggs, H. (2009). A exploratory investigation into safety climate and work-related driving. *Work: A journal of prevention, assessment and rehabilitation*, 32(1), 81-94.
- Wills, A. R., Watson, B., & Biggs, H. C. (2004). The relative influence of fleet safety climate on work-related driver safety. *In the Proceedings of the Australasian Road Safety Research, Education and Policing Conference*, Perth, Australia.
- Zohar, D. (2000). A group-level model of safety climate: Testing the effects of group climate on microaccidents in manufacturing jobs. *Journal of Applied Psychology*, 85(4), 587-596.

Table 1. Means, standard deviations, and correlations between study variables

Scale	M	SD	1	2	3	4	5	6	7
1. Speeding	1.35-1.55	.53-.77	*	.61**	.62**	.61**	.85**	.09	.03
2. Rule violation	1.19-1.30	.36-.54	.31**	*	.54**	.74**	.84**	-.08	.05
3. Inattention	1.85-2.82	.65-.97	.34**	.27**	*	.58**	.85**	.17	-.14
4. Tiredness	1.27-1.65	.31-.72	.31**	.29**	.53**	*	.84**	.14	.02
5. Behavior	1.42-1.83	.35-.57	.67**	.56**	.83**	.74**	*	.12	-.03
6. Kilometres	57-344	69-306	.25*	.09	.17*	.19*	.25*	*	-.01
7. Type of vehicle	1.86-1.73	.60-.78	-.17*	-.08	-.18*	-.14	-.22*	-.29**	*

NB: Volunteer sample correlations are listed above the diagonal and first in the mean and standard deviation columns. The behavior scale is a composite measure of speeding, rule violation, inattention and tiredness while driving

** Correlation is significant at the 0.01 level * Correlation is significant at the 0.05 level