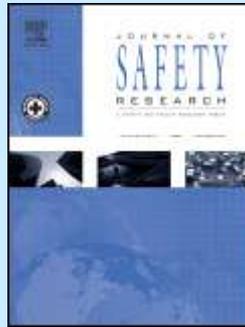


Journal of Safety Research – rok 2013, ročník 44

Číslo 4 (December 2013)



Bayliss J. Camp. *The overall program effects of California's 3-Tier Assessment System pilot on crashes and mobility among senior drivers.* Pages 1-8.

Introduction

In 2007, the California Department of Motor Vehicles (DMV) undertook a pilot study of the 3-Tier Assessment System, the purpose of which was to examine, in a large-scale real-time public agency setting, the effectiveness of this method for both reducing the crash risk of individual drivers and for extending the safe driving years of Californian drivers of all ages.

Method

The 3-Tier Assessment System consisted of tiered series of screening tools incorporated into the in-office driver's license renewal process. These screening tools identified drivers with various kinds of functional limitations (physical, visual, and cognitive/perceptual), that might impact safe driving. Paired with the screening tools were educational materials designed to improve drivers' knowledge of their own limitations, including compensating techniques. The present study is a population-based evaluation of the effects of the pilot on subsequent crash risk and mobility outcomes (including delicensure) of participating drivers age 70 and older. Pilot participants were compared with two control groups processed according to standard California DMV license renewal procedures. Because the 3-Tier Assessment System was designed to identify limitations normally associated with aging, the present analyses focus on drivers age 70 and older. However, it should be emphasized that during the 3-Tier pilot the screening tools were applied to drivers of all ages.

Results

There were two main findings. First, there were no consistent, statistically significant differences between the pilot and control groups in crash risk in the two years following screening. Second, pilot participants experienced statistically significant effects on mobility. These effects included delays in time to complete their license renewal, an increase in the number of assigned license restrictions, and an increase in the number of customers failing to renew their driving privilege.

Conclusions

Based on these findings, suggestions for further research are made.

Impact on industry

None.

- **Keywords:** Older drivers; Safety measures; Functional screening; Mobility

Meryl Lovarini, Lindy Clemson, Catherine Dean. *Sustainability of community-based fall prevention programs: A systematic review. Pages 9-17.*

Background

Fall prevention programs may be implemented but not sustained. We conducted a systematic review to identify any theories, models, frameworks, influencing factors or interventions for sustaining fall prevention programs in the community.

Methods

Peer-reviewed publications describing, investigating, or evaluating program sustainability were accessed. A narrative review was conducted to compare and synthesize study findings.

Results

Nineteen publications were included. Three conceptual frameworks were identified describing how programs may be better sustained. While ongoing financial support and the participation of older people were commonly reported influences, other factors specific to the type of program and setting were also reported. Planning, training, and collaboration between program stakeholders may facilitate sustainable programs.

Impact on industry

Organizations can use these findings when planning for sustainable programs. However more robust empirical studies are needed to confirm the value of conceptual frameworks, the critical factors and most effective interventions for sustaining community-based fall prevention programs.

- **Keywords:** Knowledge translation; Evidence-based practice; Accidental falls; Translational research

Daniel C. Smith, Kristin M. Schreiber, Andreas Saltos, Sarah B. Lichenstein, Richard Lichenstein. *Ambulatory cell phone injuries in the United States: An emerging national concern. Pages 19-23.*

Background

Over the past 15 years, the use of cell phones has increased 8-fold in the United States. Cell phone use has been shown to increase crash risks for drivers, but no systematic analyses have described injuries related to ambulatory cell phone use.

Objective

The purpose of this study is to describe and quantitate injuries and deaths among persons using cell phones while walking.

Methods

We searched the National Electronic Injury Surveillance System (NEISS) for emergency department (ED) reports of injuries related to phone use. The cases that returned were screened initially using words that would eliminate cases unlikely to be related to cell phone use and walking, possibly linked to distraction. The resulting cases were randomized and evaluated for consistency with predetermined case definitions by two authors blinded to the dates of the incidents. Cases that were disagreed upon were evaluated in a second screening by both authors for final case determination. National ED visit rates were estimated based on NEISS sampling methods. Annual variations were analyzed using linear regression with a restricted maximum likelihood approach.

Results

Our screening process identified 5,754 possible cases that occurred between 2000 and 2011, and 310 were agreed on as cases of cell-phone-induced distraction. The majority of the patients were female (68%) and 40 years of age or younger (54%). The primary mechanism of injury was a fall (72%), and most patients were treated and released from the ED (85%). No patients died from their injuries while they were in the ED. Linear modeling by year revealed a statistically significant increase in distraction injury rates over the years of study ($p < 0.001$ for trend).

Conclusions

The number of ED visits by ambulatory persons injured while being distracted by cell phone use has been increasing. More research is needed to determine the risks associated with walking and talking on a cell phone and to develop strategies for intervention.

Practical applications

Cell phone use continues to increase both at home and outdoor environments. The use of smart phones, with their more enticing features, increases the likelihood of distraction-induced injuries even more. Manufacturers should consider the addition of tools or applications on smart phones to remind users to remain alert to outside auditory stimuli that herald external hazards and to encourage them to not use these devices while engaged in other activities.

- **Keywords:** Cell phone; Pedestrian; Injury; Environmental isolation

Stephanie A. Whetsel Borzendowski, Rachel L. Rosenberg, Ashley Stafford Sewall, Richard A. Tyrrell. *Pedestrians' estimates of their own nighttime conspicuity are unaffected by severe reductions in headlight illumination.* Pages 25-30.

Introduction

At night pedestrians tend to overestimate their conspicuity to oncoming drivers, but little is known about factors affecting pedestrians' conspicuity estimates. This study examines how headlamp intensity and pedestrians' clothing influence judgments of their own conspicuity.

Method

Forty-eight undergraduate students estimated their own conspicuity on an unilluminated closed road by walking in front of a stationary vehicle to the point at which they judged that they were just recognizable to the driver. Unknown to the participants, high beam

intensity was manipulated between subjects by placing neutral density filters on the headlamps.

Results

Estimated conspicuity distances did not significantly vary with changes in headlamp intensity even when only 3% of the illumination from the headlamps was present.

Practical applications

These findings underscore the need to educate pedestrians about the visual challenges that drivers face at night and the need to minimize pedestrians' exposure to traffic flow at night.

- **Keywords:** Pedestrians; Driving; Night vision; Conspicuity; Headlamps

Arlene Walker. Outcomes associated with breach and fulfillment of the psychological contract of safety. Pages 31-37.

Introduction

The study investigated the outcomes associated with breach and fulfillment of the psychological contract of safety.

Method

The psychological contract of safety is defined as the beliefs of individuals about reciprocal employer and employee safety obligations inferred from implicit or explicit promises. When employees perceive that safety obligations promised by the employer have not been met, a breach of the psychological contract occurs, termed employer breach of obligations. The extent to which employees fulfill their safety obligations to the employer is termed employee fulfillment of obligations. Structural equation modeling was used to test a model of safety that investigated the positive and negative outcomes associated with breach and fulfillment of the psychological contract of safety. Participants were 424 health care workers recruited from two hospitals in the State of Victoria, Australia.

Results

Following slight modification of the hypothesized model, a good fitting model resulted. Being injured in the workplace was found to lower perceptions of trust in the employer and increase perceptions of employer breach of safety obligations. Trust in the employer significantly influenced perceived employer breach of safety obligations such that lowered trust resulted in higher perceptions of breach. Perceptions of employer breach significantly impacted employee fulfillment of safety obligations with high perceptions of breach resulting in low employee fulfillment of obligations. Trust and perceptions of breach significantly influenced safety attitudes, but not safety behavior. Fulfillment of employee safety obligations significantly impacted safety behavior, but not safety attitudes. Implications of these findings for safety and psychological contract research are explored. A positive emphasis on social exchange relationships in organizations will have positive outcomes for safety climate and safety behavior.

- **Keywords:** Psychological contracts; Occupational safety; Safety attitudes; Safety behavior; Structural equation modeling

Haimiao Yu, Hong Chen. *Production output pressure and coal mine fatality seasonal variations in China, 2002–2011*. Pages 39-46.

Introduction

The death rate per million tons (DRPMT) is considered as the key index to the quality of coal mine safety management. The index for 2002–2011 revealed a marked improvement in China coal mine safety management during the 10-year period. However, when seasonally adjusted, the 2002–2011 fatality data showed a strong seasonal variation trend. This was reasonably consistent for the 10 years, which suggests that it was always the weak link in Chinese coal mine safety management over that time. However, the overall annual decrease in DRPMT was not reflected by any noticeable improvement in the seasonal occurrence of fatal coal mine accidents in China.

Method

This paper focuses on this issue, first by analyzing the seasonal fluctuation of fatal accident statistics, then by investigating whether there was a parallel trend in China production output pressure. Finally an error correction model (ECM) was established to analyze the relationship between seasonal fatality rates and the pressure to increase coal production output, and revealed a close relationship between the two.

Practical applications

Firstly, the finding of this paper can help coal mine companies arrange their production planning more rationally, and decrease the fatalities' seasonal variations. Secondly, this paper is also helpful for the government to improve their regulation policies, to control the frequency of seasonal coal mine disasters.

- **Keywords:** Coal mine accident; Production output pressure index; Seasonal variations; Error correction model

Ernst Roidl, Felix Wilhelm Siebert, Michael Oehl, Rainer Höger. *Introducing a multivariate model for predicting driving performance: The role of driving anger and personal characteristics*. Pages 47-56.

Introduction

Maladaptive driving is an important source of self-inflicted accidents and this driving style could include high speeds, speeding violations, and poor lateral control of the vehicle. The literature suggests that certain groups of drivers, such as novice drivers, males, highly motivated drivers, and those who frequently experience anger in traffic, tend to exhibit more maladaptive driving patterns compared to other drivers. Remarkably, no coherent framework is currently available to describe the relationships and distinct influences of these factors.

Method

We conducted two studies with the aim of creating a multivariate model that combines the aforementioned factors, describes their relationships, and predicts driving performance more precisely. The studies employed different techniques to elicit emotion and different tracks designed to explore the driving behaviors of participants in potentially anger-provoking situations. Study 1 induced emotions with short film clips. Study 2 confronted the participants with potentially anger-inducing traffic situations during the simulated drive.

Results

In both studies, participants who experienced high levels of anger drove faster and exhibited greater longitudinal and lateral acceleration. Furthermore, multiple linear regressions and path-models revealed that highly motivated male drivers displayed the same behavior independent of their emotional state. The results indicate that anger and specific risk characteristics lead to maladaptive changes in important driving parameters and that drivers with these specific risk factors are prone to experience more anger while driving, which further worsens their driving performance. Driver trainings and anger management courses will profit from these findings because they help to improve the validity of assessments of anger related driving behavior.

- **Keywords:** Emotions; Driving anger; Driving motivation; Driving performance; Risky driving

Rosa María Morillas, Juan Carlos Rubio-Romero, Alba Fuertes. A comparative analysis of occupational health and safety risk prevention practices in Sweden and Spain. Pages 57-65.

Introduction

Scandinavian countries such as Sweden implemented the occupational health and safety (OHS) measures in the European Directive 89/391/EEC earlier than other European countries, including Spain. In fact, statistics on workplace accident rates reveal that between 2004 and 2009, there were considerably fewer accidents in Sweden than in Spain.

Method

The objective of the research described in this paper was to reduce workplace accidents and to improve OHS management in Spain by exploring the OHS practices in Sweden. For this purpose, an exploratory comparative study was conducted, which focused on the effectiveness of the EU directive in both countries. The study included a cross-sectional analysis of workplace accident rates and other contextual indicators in both national contexts. A case study of 14 Swedish and Spanish companies identified 14 differences in the preventive practices implemented. These differences were then assessed with a Delphi study to evaluate their contribution to the reduction of workplace accidents and their potential for improving health and safety management in Spain.

Results

The results showed that there was agreement concerning 12 of the 14 practices. Finally, we discuss opportunities of improvement in Spanish companies so that they can make their risk management practices more effective.

Practical Applications

The findings of this comparative study on the implementation of the European Directive 89/391/EEC in both Sweden and Spain have revealed health and safety managerial practices which, if properly implemented, could contribute to improved work conditions and accident statistics of Spanish companies. In particular, the results suggest that Spanish employers, safety managers, external prevention services, safety deputies and Labour Inspectorates should consider implementing streamlined internal preventive management, promoting the integration of prevention responsibilities to the chain of command, and preventing health and safety management from becoming a mere exchange of documents. The authors also encourage future research studies to use the

methodology presented to compare and assess the European Directive 89/391/EEC implementation in other European countries.

- **Keywords:** Occupational health and safety; Work accidents; Organization management; Sweden; Spain

Hany M. Hassan, Hesham Al-Faleh. *Exploring the risk factors associated with the size and severity of roadway crashes in Riyadh*. Pages 67-74.

Introduction

Recently, growing concern has been shifting toward the necessity of improving traffic safety in the Kingdom of Saudi Arabia (KSA). KSA has a unique traffic safety problem in that: (a) it can be classified as a developed country in terms of the magnitude and quality of the roadway networks available and its compatibility with international standards; however, (b) it can also be considered a developing country as the rate of increase in the number of road crashes is substantial compared with relevant figures of other developing countries and other countries of the Gulf region. Hence, more research efforts are still needed.

Objectives

This paper examines the nature and causes of fatal and serious traffic crashes in KSA so that solutions and/or future studies can be suggested.

Method

Data from 11,545 reported fatal and injury traffic crashes that occurred in Riyadh (the capital of KSA) during the period 2004–2011 were analyzed by alternative and complementary methods. A logistic regression model was estimated and the results revealed that crash reason (speeding), damages in public property, day of the week, crash location (non-intersection location), and point of collision (head-on) were the significant variables affecting the binary target variable (fatal and non-fatal crashes). Additionally, the structural equation modeling approach was developed to identify and quantify the impacts of significant variables influencing crash size (e.g., no. of injuries, no. of vehicles involved in the crash). Crash size is one of the important indices that measure the level of safety of transportation facilities.

Results

The results showed that road factor was the most significant factor affecting the size of the crash followed by the driver and environment factors.

Impact on Industry

Considering the results of this study, practical suggestions on how to improve traffic safety in KSA are also presented and discussed.

- **Keywords:** Crash severity; Crash size; Risk factors; Structural equation modeling; Logistic regression

Safiétou Mbaye, Dongo Rémi Kouabenan. *How perceptions of experience-based analysis influence explanations of work accidents.* Pages 75-83.

Introduction

This article looks into how perceptions of experience-based analysis (EBA) influence causal explanations of accidents given by managers and workers in the chemical industry (n = 409) and in the nuclear industry (n = 222).

Method

The approach is based on the model of naive explanations of accidents ([Kouabenan, 1999, 2006, 2009](#)), which recommends taking into account explanations of accidents spontaneously given by individuals, including laypersons, not only to better understand why accidents occur but also to design and implement the most appropriate prevention measures. The study reported here describes the impact of perceptions about EBA (perceived effectiveness, personal commitment, and the feeling of being involved in EBA practices) on managers' and workers' explanations of accidents likely to occur at the workplace.

Results

The results indicated that both managers and workers made more internal explanations than external ones when they perceived EBA positively. Moreover, the more the participants felt involved in EBA, were committed to it, and judged it effective, the more they explained accidents in terms of factors internal to the workers. Practical Applications: Recommendations are proposed for reducing defensive reactions, increasing personal commitment to EBA, and improving EBA effectiveness.

- **Keywords:** Experience-based analysis; Explanations of accidents; Perceptions of EBA; Feeling of organizational involvement; Safety management

Francisco Brahm, Marcos Singe. *Is more engaging safety training always better in reducing accidents? Evidence of self-selection from Chilean panel data.* Pages 85-92.

Introduction

The recent events in Chile involving 33 miners who were trapped and rescued in the San José mine led the government to strongly promote occupational safety and health (OSH) training. However, there is an ongoing debate regarding which type of training is the most effective in reducing accidents.

Method

The "engagement hypothesis" claims that traditional classrooms are rather ineffective and that only a strong student involvement may generate meaningful results, but the empirical evidence is inconclusive. To contribute to this debate, we claim that the selection of the training method may be contingent on the firm's OSH capabilities and commitment. Firms with fewer (greater) capabilities may optimally self-select less (more) engaging training methods.

Results

Accordingly, based on panel data from 2003 to 2009 for a representative sample of 2,787 Chilean firms, the engagement hypothesis initially appears to be supported; however, after correcting for self-selection bias, it loses most of its significance.

Impact on industry

Chilean policymakers are strongly advised to expand OSH training.

- **Keywords:** Occupational safety and health; Accident prevention; Learner engagement; Program evaluation; Safety policy

Geeta Bhat, Rebecca B. Naumann. *Travel-related behaviors, opinions, and concerns of U.S. adult drivers by race/ethnicity, 2010. Pages 93-97.*

Introduction

The U.S. population is shifting to become both older and more racially and ethnically diverse. Our current understanding of U.S. drivers' travel-related needs and concerns by race/ethnicity is limited.

Methods

Data from the 2010 HealthStyles survey, an annual, cross-sectional, national mail-panel survey of persons ages 18 years or older living in the United States, were used to calculate weighted percentages of travel-related behaviors, opinions, and concerns by race/ethnicity. Logistic regression was used to explore associations between race/ethnicity and specific travel-related concerns, while adjusting for other demographic characteristics.

Results

Adequate transportation alternatives to driving were reported by a greater percentage of persons in certain minority groups compared to whites (Hispanic: 34.7%; white: 23.4%). Concern for the availability of alternatives to driving in the future was greater among minority groups (black: 57.7%; Hispanic: 47.3%; other: 50.9%) compared to whites (37.5%). Additionally, among persons with a household income of \$25,000 +, minorities were generally more likely than whites to report concern about having alternative transportation options to driving, whereas concern was consistently high among all racial/ethnic groups for those earning less than \$25,000 annually. In each racial/ethnic group, more than 10% of persons reported not knowing how they would get around if they could no longer drive.

Conclusions

Important variations by race/ethnicity in both travel behaviors and concerns for adequate alternatives to driving were found, revealing the need for further research to better understand reasons for these differences and to identify ways to meet the transportation needs of the changing U.S. population demographics.

Impact on Industry

Further research on adequate alternatives to driving and transportation needs is needed.

- **Keywords:** Travel behaviors; Transportation; Race; Ethnicity