

Topical collection on human factors and safety

Dominique Mignot¹

Published online: 1 August 2017

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The *Global Status Report on Road Safety 2015* published by WHO [1, 2] indicates that 1.2 million fatalities are related to road accidents annually. The road safety challenge remains a very important issue at the worldwide level, and especially for the low and middle income countries. It is also a real challenge for the European countries. Although a reduction in road fatalities is noted in Europe, with a reduction from 10.3 fatalities per 100,000 inhabitants in 2010 to 9.3 in 2013, the decrease in the number of fatalities knew a stop in recent years for several European countries such as France and Germany.

At the European level, the total societal costs of road crashes vary between 0.4% and 4.1% of the Gross Domestic Product, while the total societal costs related to serious injuries amount to between 0.04% in Ireland and 2.7% in Poland of the GDP [3].

Some previous research [4, 5] show accident causes are multifactorial, so that there is not only one cause for an accident. Alcohol, speeding and fatigue are among the most important safety factors of road accidents. For example, driving while impaired by alcohol is associated with 28% of fatal crashes [6]. At the European level, about 22% of road deaths are alcohol-related [7].

The recent Malta declaration on road safety by Transport Ministers of the Member States of the EU (March 2017) recommended to member states to “*put in place enforcement plans and zero tolerance for speeding, distraction and alcohol offences*” [8]. This clearly demonstrates that the role of human factors remains a crucial issue for road accidents.

This topical collection on Human factors and safety is based on a selection of papers presented to TRA 2014 meeting hold in Paris, which were delivered through four different sessions: Human behavior, factors, perception and visibility; Driver, driving simulation and naturalistic driving; Human factors in Safety and security; ADAS/automatic driving. Papers have been selected and submitted for publication. Four papers have been accepted for this topical collection.

This topical collection aims to show how it is possible to reduce road accidents and their consequences for people involved and for society with a human factors perspective. They focus on the question of alcohol linked to cultural patterns, the question of speeding related to scene comprehension, the importance of naturalistic driving for having a better knowledge of practices, and the role of management and education to prevent and reduce impact of suicides and trespasses for railway accidents.

The purpose of the paper authored by Gabriella Kosztolanyi-Ivan, Csaba Koren and Attila Borsos is to evaluate road scenes and particularly if characteristics of built-up, non built-up nature and the complexity of scenes could be linked to the speeding choice made by the driver and could explain some unsafe situations. Of course, speeding is a well-known factor of risk, but the originality of this paper is the proved link existing between built environmental characteristics and the speeding choice of the road user. That question is not completely new. Indeed, authors refer to Montel et al. works, based on reconstruction of accident scenes [9], which explained that drivers take into consideration some categories of roads when they decide of their driving and choose their speed. The authors aim is here to highlight the role and importance of the perception of road scenes by the road user. They use pictures of scenes (built-up scenes and non built-up ones and more ambiguous scenes), submitted to 500 subjects. They show “*that standard deviations of speeds at not clearly identified sites are considerably higher than at clear built-up*

This article is part of Topical collection on TRA 2014 human factors and safety

✉ Dominique Mignot
dominique.mignot@ifsttar.fr

¹ Department “Transport, Health, Safety”, Ifsttar, Lyon, France

or clearly non built-up sites". Authors develop then a tool (program) to recognize and digitize scenes and they show that if the program is able to recognize clear built-up sites and non built-up sites, it's less obvious concerning transition sites. They also show a consistent classification between human and program. The added value provided by this paper is by proving that speed dispersion could be used as a means for determining ambiguous scenes and thus less safe scenes.

The paper presented by Yvonne Barnard, Fabian Utesch, Nicole van Nes, Rob Eenink, Martin Baumann, based on the European project UDRIVE, describes a large scale European naturalistic Driving study aiming to provide a "*better understanding of what happens in the road in everyday traffic situation*". For authors, human behavior is, directly or indirectly, an important determinant of road crashes, and thus impact road fatalities and injuries. They propose a very fine state of the art about naturalistic driving and experiences with naturalistic driving studies. The methodology based on FESTA project, identified research questions across five thematic areas: Crash causation and risk, Everyday driving, Distraction and Inattention, Vulnerable road users, Eco-driving. Those research questions are used for defining vehicles equipments and instrumentation to be used during the data acquisition period. The main expected output of the project is the data collection potentially used by all partners and allowing different kind of analysis and scenarios, in order to improve driver behavior models and risk functions. At the time of the writing of this editorial, data collection have been completed and partners started the very first analysis.

The contribution of Christopher Schlembach, Gerald Furian, and Christian Brandstätter addresses the role of cultural practices and habits concerning drink-driving and their impacts on road accidents. The methodology of authors consists in defining a "traffic safety culture", as the shared values, actions, and behaviors that demonstrate a commitment to safety over competing goals and demand. They applied this framework using the European SARTRE4 database (Social Attitudes to Road Traffic Risk in Europe) focusing on car drivers. The approach mobilizes cognitive, emotional and moral dimensions. For each of these three dimensions, authors propose an operational definition in order to apply them to the country cases. The authors show, except for the case of Serbia, that for all countries, 90% and more of the population agree that *drinking and driving increases the risk of accident with another road user*, showing that main part of the population is conscious of the problem. They show also that the *probability to be stopped and fined by the police* is not neutral on perception and attitude towards alcohol. The link between cultural patterns and road accidents is then made. It may bring new ideas concerning road safety campaigns adapted to each country.

The paper authored by Grigore M. Havârneanu, Marie-Hélène Bonneau, and Jacques Colliard highlights the question of railway suicides, which amount to two thirds of all

railway fatalities. They present the main results of the European RESTRAIL project (REduction of Suicides and Trespasses on RAILway property). If recent works have focused on public transport safety, for example COST action 1103 [10], few studies deal with suicide. The authors provide a very stimulating state of the art on railway suicides and trespassing accidents, identifying international databases and studies in Europe and in United States, particularly related to possible countermeasures. If one challenge for society is the reduction of the number of suicides, the challenge for Railway stakeholders is also to limit the consequences of suicides on railway traffic and particularly on traffic disruption time. Based on an initial set of 83 measures, 38 families of measures were identified and evaluated by experts of the railway safety and security sector. For the authors, the method has demonstrated the capacity to support the selection of most cost-effective measures. The project addressed the procedural aspects of communication chain, enabled the development of a functional information reference source for all stakeholders and proposed technical specification and prototype for the situation management system. Several field pilot tests in different countries show that an evaluation of these measures was possible. Among some results, authors highlight the role of a good training for employees concerning suicides, the need of a well-focused communication among participants, or the importance of a mid-platform fencing (on rail platforms) as an anti-suicide measure or anti-trespass measures.

The whole of the papers gathered with this topical collection on Human factors and Safety cannot bring an exhaustive overview of the question, but provide a true contribution to the understanding of this issue. The papers clearly show that even if some factors are well-known (impaired driving, speeding, etc.) those factors continue to constitute a real challenge for the public decision maker. That was confirmed by the recent Malta declaration.

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