Accident Analysis and Prevention 58 (2013) 206–217

Contents lists available at ScienceDirect

Accident Analysis and Prevention

journal homepage: www.elsevier.com/locate/aap

Naturalistic study of rider's behaviour in initial training in France: Evidence of limitations in the educational content

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ARTICLE INFO

Article history:
Received 30 September 2011
Received in revised form 19 April 2012
Accepted 28 September 2012

Keywords:
Training
Motorcycling
Naturalistic study
Self-confrontation interview
Road Safety
Ergonomics

ABSTRACT

This paper analyses motorcycle educational content in a number of French motorcycle schools on the basis of a naturalistic study of riders' and trainers' behaviour. The aim is to specify the situations delivered in motorcycle schools and to study the rider's activity in these situations. The methodology includes ethnographic observation within the motorcycle schools and the longitudinal monitoring of 14 trainee motorcyclists during their initial training. The training situations were described by the combination of audio–visual recordings and interviews data (i.e. concomitant or interruptive verbalization, and self-confrontation data). The results permit to (1) compare the "real" and "official" durations of track and on-road training, (2) characterize the real training situations, (3) describe the preferred forms of instruction, and (4) conduct an in-depth analysis of the situations used during training in traffic. The discussion show, in first, the poverty of the training situations which are based on the repetition of the exercises in the test, and, in second, disparities between the riding situations encountered during training and the demands made by riding in natural traffic. The usefulness and the applications of this type of approach – based on the integration of the rider's point of view notably by self-confrontation interview – for understanding real riding behaviours and how such approaches could supplement vehicle-based data are discussed in a large conclusion.

1. Introduction

The risks associated with motorcycling are a major public health issue in Europe (CARE, 2007). In France, motorcycles account for 1% of motorized traffic but 40% of injured road users and almost 20% of fatalities (ONISR, 2009). These figures are worrying, particularly in the case of novice riders (those who have held a licence for less than 2 years): one in five crash-involved motorcycles in France has been registered for under 1 year (ONISR, 2009). An improvement of the initial training of motorcyclists is thus clearly of potential value both with regard to research and public policies. This is why a large research programme is now conducted in France on this issue. This programme is divided into three stages: (1) the characterization of the educational content of initial training based on a naturalistic study of riders' and trainers' behaviour in several motorcycle schools, (2) the study of the real activity of novices just after licensing, (3) the identification of guidelines in order to improve the training and licensing system, and make novice riders safer. The study presented in this paper relates to the first stage. It attempts to answer the following questions: what is really taught in initial training at motorcycle schools? What are the behaviours of riders in training situations? To what extent do the situations which are proposed during training match real riding situations?

1.1. Motorcycle training in the scientific literature

Studies involving motorcycle training can be divided into three types: (a) studies that test the effectiveness of post-test training, (b) studies that describe the educational content of training, (c) studies that attempt to identify new educational content for motorcycle training.

Most research into motorcycle training[1] tests the effectiveness of the curriculum on the basis of accident data. The results tend to show that trained and untrained motorcyclists have the same risk of being involved in an accident (Mortimer, 1984; Simpson and Mayhew, 1990; Christie, 2001; Mayhew et al., 2002; Elliot et al., 2003). Some research has attempted to demonstrate the

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[1] For a complete review see Haworth and Mulvihill (2005).

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http://dx.doi.org/10.1016/j.aap.2012.09.036

effectiveness of training on risk level (McDavid et al., 1989; Billheimer, 1998). However, in most cases, only serious injuries are included in the accident data. This is why, according to Haworth and Mulvihill (2005), research should focus more on the behaviours of motorcyclists and how these change once they have obtained their licence.

For a considerable number of authors (Chesham et al., 1993; Reeder et al., 1996; Haworth et al., 2000; IRT, 2007; Liu et al., 2009), the relative ineffectiveness of curricula is due to their training contents. Haworth et al. (2000) have shown that in the Australian state of Victoria three times more time in the training programme was given over to teaching the handling of the motorcycle than hazard perception skills. Haworth and Mulvihill (2005) have shown that most curricula focus on teaching control of the vehicle with a view to preparing for the final examination, to the detriment of skills such as the anticipation, detection and evaluation of risks. In addition, other researchers have shown that current contents favour the development of "overconfidence" (Crick and McKenna, 1991; Elliot et al., 2003). Rowden and Watson (2008) have also shown the existence of overconfidence among motorcyclists who, at the end of their initial training, have a tendency to expose themselves to risky situations in the misguided belief that they have the skills to cope with them.

The modernization of motorcycle training and licensing has recently become a topic of concern in Europe. Every country is considering a radical modification of its current training and licensing notably through scientific studies. For example, in Norway, the authorities have used accident data on novice riders and the *Goals for Driver Education* (GDE) matrix (Peräaho et al., 2003) in order to completely overhaul their training system. The GDE matrix determines driving education levels on the basis of a hierarchical car driving model (Keskinen, 1996), adapted to training by Siegrist (1999). The article of Lund (2006) details the new Norwegian motorcycle licensing system, organized around three main ideas: encouraging trainee self-evaluation, creating a balance between the teaching of cognitive and motor skills and, last, developing hazard perception rather than teaching emergency skills.

To sum up, the studies described above raise the issue of the effectiveness of training systems with regard to road safety. Following a curriculum and passing the test do not guarantee good safety. This situation seems partly linked to training systems. Many researchers have highlighted the lack of scientific work on training systems (Baldi et al., 2005; IRT, 2007; Rowden et al., 2007; Savolainen and Mannering, 2007), that is to say the knowledge and know-how that are really taught and the training situations which call on them, as well as how accurately they match the driving situations encountered once the rider has a licence (Hébrard, 1986; Marsenach and Mérand, 2003).

1.2. Conceptual framework

This study refers to the "French cognitive ergonomics approach" (Ombredane and Faverge, 1955; Theureau, 2003) which is at the crossroads between several disciplines (cognitive anthropology, psychology and microsociology). The aim is to explore the links between context, cognition and action in the real world environment. Instead of reducing riding to a task made up of a number of variables, the aim is to analyze it as a total entity. This approach has already been applied in a number of studies and is helpful when attempting to understand teaching and learning activities (Vion et al., 2000; Sève and Leblanc, 2003). One first postulate of this approach is that every activity is situated because it is closely linked to the context (Lave and Wenger, 1991). In our study, each participant interacts at every moment of the training session with his or her social environment (riders, instructors, etc.) and physical environment (motorcycle, infrastructure, etc.). These interactions lead to behaviour that is specific to the time in question. It is therefore essential to analyze activities in the real world, i.e. taking account of social, cultural and technical conditions (Theureau, 2003). At a methodological level, this implies that the study must take place in "natural" riding settings. In spite of the widespread availability of low cost advanced methods of vehicle instrumentation and recording technologies, the number of on-road studies of motorcyclist behaviour is still limited. It can be noted that at European level in the pilot study conducted in the framework of the 2BESAFE project (2009–2011) several instrumented powered two-wheelers were used in four countries in the European Union in a measurement campaign conducted in natural traffic conditions.

The second postulate is that the point of view of the actors with regard to their activity is essential to study what has meaning for them (Bannon, 1991). It is the participant who is in the best position to describe the difficulties he encounters (Grize, 1995). The naturalistic riding studies, based only on the recording of the riders' actions and the dynamics of the vehicle are laden with huge amount of data. For example, these data do not allow to automatically detect the potential risky situations because almost all of them are anticipated by the rider. For us, it is thus necessary to record not only the actions of the riders but also his point of view. This approach suggests to collect and to combine subjective data (about the rider's experience) and objective data (on the rider's actions). While the production of objective data is of value, the idea that lies behind this approach is that we can only successfully describe the activity of the participants if we link these objective data with the rider's subjective opinions. In other words, external data must be filtered through the participant's point of view. This can be possible because the rider acquires significant experience during training which can be "reactivated" and may provide useful research material (Theureau, 2003).

The third postulate concerns the sample of population. The decision to study the riding activity in such a systematic and detailed manner and the complexity of the data collection procedure meant the recruitment of a relative reduced sample. It is postulated that activity and difficulties faced by studied riders can be, in part, the same as other riders in similar situations (Leblanc et al., 2008). We believe that a number of experiences of the participants are shared by others. In addition, the benefit of studying more individuals in a superficial manner rather than a single individual in depth depends on the context of the study (Clot, 1999). If the aim is to carry out a very detailed investigation of the subjective experience of an actor in a given situation, then an individual may be a valid object of study. This kind of study that focuses on the details of individual experience can bring out some results which are difficult to detect with more quantitative approaches. The consideration of a small number of participants permits to determine some perspectives of research that can systematically analyzed with a larger population. There is a complementarity between these two approaches. But it is clear that increasing the number of subjects would help to achieve validation and wider applicability.

1.3. The official training curriculum and the motorcycle riding test in France

Across the EU, initial rider training programmes vary enormously from Member State to Member State: from virtually nonexistent to extensive, compulsory to voluntary, and cheap to expensive. The cost of training ranges from 400 to 3600 Euros (IRT, 2007). Elsewhere in the world, there are major differences in training contents and the riding tests that validate them, and variations even exist within the same country, e.g. the United States and Australia (Haworth and Mulvihill, 2005).

In France, almost all the candidates who take the motorcycle riding test have undergone an initial training in a motorcycle school.