Attitudes and behaviour of Greek Power Two Wheelers

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Abstract
Power Two Wheel (PTW) riders comprise a vulnerable road user category as they exhibit high risk rates compared to other drivers, as well as high severity rates. This in combination with the increase of the riding population calls for effective measures towards improving PTW road safety. A prerequisite for the design of such measures is the understanding of accident causation factors, an element of which is PTW risky behaviour. The present study investigates PTW risky behaviour using verbal methods. In particular, it employs already established methodologies to identify PTW rider patterns, attitudes and risky behaviour. Within this study, the hypothesis that the riding population can be divided into two distinct groups - namely, commuters and sports riders, that exhibit different behaviour is also tested. This hypothesis does not seem to be confirmed by the findings of the study, and results indicate that a Greek sports rider may also be a commuter.

1. INTRODUCTION

PTW riders (including motorcycles and mopeds) comprise a vulnerable road user category as they exhibit high risk rates compared to other drivers (European Commission 2012, Zambon & Hasselberg, 2006), as well as higher accident severity rates (DfT, 2008, Wong et al., 2010). These indicators are further increased when riding exposure is taken into account. On the other hand, the present trend in respect to PTW usage is an increase in the riding population, which is due to several reasons including the reduced cost of purchasing and using a PTW (Chiou et al., 2009), the implementation of road pricing schemes in urban centres from which PTWs are exempted, the increase of returning riders i.e. "prior" PTW riders who have now returned to riding after a significant break and who in several cases are of greater age, and the increase of riding as a leisure activity (Jamson and Chorlton, 2009). Hence, the combination of increased motorcycle usage, increased number of novice (both young or older) riders and increased PTW leisure trips (in which high engine PTW's travelling at high speeds are used) together with the high PTW risk rates demand for the design of effective road safety measures. A prerequisite for such design is the understanding of the underlying factors behind the increased risk. These involve driver and rider behaviour and their interactions, the road environment and the vehicle component. Driving/riding behaviour depends on several rider characteristics such as age, gender and riding experience (Evans and McDonalds, 2002; Liu, Hosking and Lenné, 2009) and on behavioural aspects including personality traits, motives for riding and social representations of riders' identity (Jonah, 1997; Deery 1999; Iversen and Rundmo, 2002; Sagberg and Bjornskau, 2006).

Consequently, as driving/riding behaviour is rather complex the application of specific behavioural theories has been employed to determine risky driving/riding. These theories include the theory of reasoned action (TRA) (Fishbein and Ajzen, 1975) which was further elaborated to the design of the theory of planned behaviour (TPB) (Ajzen, 1985, 1988) or other more recently developed theories (Ulleberg and Rundmo, 2002). These theories predict an individual's intention towards a specific type of behaviour based on the individual's behavioural beliefs (attitude towards the behaviour), normative beliefs (subjective norms) and other elements. For example, in the theory of planned behaviour the parameter control beliefs (perceived behavioural control) is also added. The TPB although implemented widely in the field of risky driving (Parker *et al.*, 1992a, 1992b; Elliot, 2010; Tunnicliff *et al.*, 2011; Chorlton, *in press*) it has the disadvantage that individual's personality characteristics are not taken into account. Ulleberg and Rundmo, tested a theory involving risky driving with attitudes towards traffic safety, risk perception and personality characteristics (Ulleberg and Runmdo, 2003). Chen (2009) implemented the theory with some further elaboration to test risky behaviour of Taiwanese motorcyclists.

In addition, several studies have analysed riders risk attributes based on the hypothesis that different riding populations with distinct characteristics exhibit different riding behaviour and hence different risk. Krige (1995) has defined the categories of "Boys Wonders" who ride a motorcycle because they love the challenge to push their limits and ride fast, using high powered Japanese bikes, "Dirts" who belong to a club and use ride-off bikes, "Commuters" who ride for practical reasons rather than the love of riding, "Weekend Warriors" who are club enthusiasts and the "Outlaws" who ride Harleys and are sometimes member of an organized criminal-gang, and who correspond to the stereotypical "Bikers" image. Jamson and Chorlton (2009) defined three distinct PTW rider categories - namely, long-term riders, returning riders and new riders, who demonstrated different preferences in respect to motorcycle ownership and trip characteristics. Horswill and Helman (2003) compared PTW riders and car drivers who do not ride a PTW to establish their accident risk in respect to

distinct factors such as hazard perception, overtaking, speeding and violation attributes and sensation seeking.

This present study employs the methodology that was proposed by Chen (2009) to identify PTW rider patterns in respect to risky behaviour and test the hypothesis of the riding population being divided into two distinct groups - namely, commuters and sports riders. This is mainly presented in a "theoretical" context using a small sample size. In the next section, the experimental design including the design of the questionnaires and the field survey is presented. Section 3 presents the analysis of the study and the findings, and in the last section the results are discussed together with suggestions for future work.

2. EXPERIMENTAL DESIGN

2.1 Tools used

The experimental design was based on the development of a MOtorcyclist's PROfiling Questionnaire (MOPROQ) which consists of two parts. The first part consists of four sections concerning sociological data and in particular rider's profile and type of motorbike used, motivations for riding, riding practices including motorcycling practices in general, risky maneuvers and attitudes towards speed and accident history. The second part of MOPROQ is a replication of the questionnaire developed by Chen (2009) and involves three distinct elements. The first is personality characteristics extracted from the Sensation Seeking Scale of Zuckerman (1979), which are anxiety, anger, sensation-seeking, altruism and normlessness. The second involves safety attitudes concerned with traffic flow and the rule obedience, speeding and fun-riding, whilst the third investigates risky driving behaviours concerning speeding, self-assertiveness and rule violations. All the answers are collected in the same structure using a five point Likert-type scale ranging from 0 to 5, which depending on the question involves "disagree" or "never" and "totally agree" or "always" respectively.

2.2 Data collection

The study hypothesis was based on the division of the rider population into two rider categories with distinct characteristics in terms of riding behaviour. Those who use their PTW for everyday trips (commuters) and those who ride for fun (sports riders). PTW riders making everyday trips with similar characteristics in urban centres, and which are mainly work related were selected as commuters whereas PTW riders who ride their bikes mainly for longer trips and non-work related purposes were selected for the second category. However, there were a couple of riders who could belong in both categories. The contributing factor in this case was selected to be the membership in a motorcyclist club, in which case the study participants were classified as sports riders. Sample characteristics are illustrated in Table i.

Table i. Respondents' characteristics

	Age	Gender	Experience (years of license acquisition)	Exposure (km per year)
Commuters	33 (22-44)	13 male	13.09 (3-21)	13375 (1000-50000)
Sports Riders	44 (22-61)	16 male 2 female	24.44 (3-45)	17583 (1000-50000)
All	39	29 male 2 female	20.14	15900

The study sample is rather small, as this study serves as the preparation of a larger scale one. The sample is balanced between the two distinct rider groups, with low representation from female riders. There is also representation from young and novice riders, however no elderly riders are included in the sample. There is also a wide range of exposure values making the sample inhomogeneous in respect to this particular variable.

3. ANALYSIS

3.1 Riding motives and behaviour (MOPROQ1)

In the first questionnaire the motives for riding were examined, the answers are illustrated in Figure i.

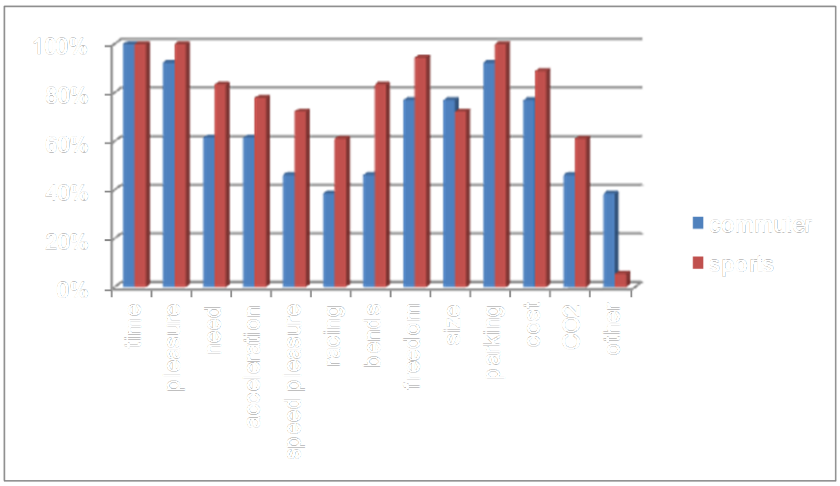

Figure i. Motives for riding

Riders were asked to tick each one of the available categories they felt applied to their motives. This contains the risk of each of the categories being selected. Interestingly enough, each of the categories is chosen less by commuters than sports riders except for the time savings category which has been selected by all respondents, and the other category which is mainly chosen by the commuters. The first phenomenon implies that sports riders will also use their PTW to make everyday trips and this is due to the traffic conditions in urban centres, traveler mentality and weather conditions in Greece which allow such use of PTW. The increased proportion of “other” answers in the commuters population points at the direction of possible existence of categories that are important for this riding group that were not considered. Although there are evident trends that confirm the hypothesis of the existence of two distinct groups concerning rider motives, the differences - mainly due to the small sample are not statistically significant with the exception of the "bends" motive (χ^2=...., p=0.02897). To identify the significant motives, riders were also asked to rank their answers. Riders’ preferences taking into account only the first three ones were similar to those identified from the selection answers.

An element of riding behaviour and in particular speeding behaviour was also identified through the investigation of riders cruising and maximum speed when riding in highways, rural and urban roads (Table ii).

Table ii. Cruising and maximum speed

	Highway	Rural roads	Urban roads
Cruising speed			
Commuters	122.50 (27.01)	78.75 (12.45)	53.85 (11.92)
Sports Riders	148.89 (23.74)	89.44 (16.26)	61.11 (11.19)
Maximum speed			
Commuters	200.83 (64.17)	137.27 (48.39)	112.92 (33.20)
Sports Riders	228.56 (30.83)	152.22 (45.83)	140.28 (37.67)

Sports riders employed in all cases higher speeds than commuters, however the differences were not statistically significant (α=0.05) except for the case of cruising speed in highways. Deviation is substantially higher when examining the maximum speed compared to cruising speed, with the exception of maximum speed for sports riders in which case the increase is not as high as in the rest examined cases. It is suggested to use the term "usual maximum speed", as it might be the case that all riders might have reached very high speeds but do not usually employ them. Further data manipulation was performed to seek whether speed behaviour was more linked to PTW cc and results are illustrated in Figure ii.

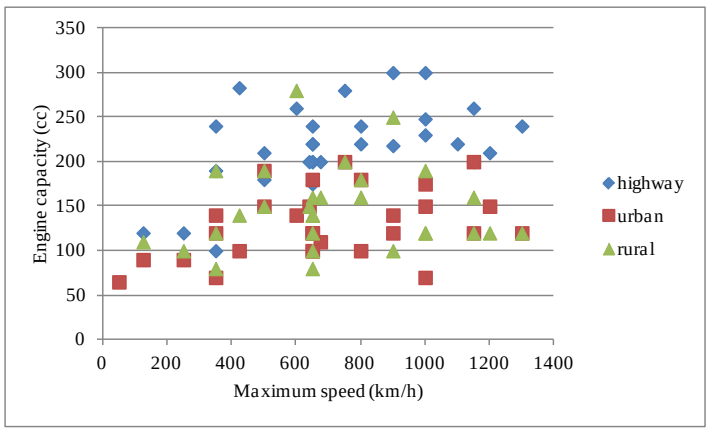

Figure ii. Maximum speed vs PTW engine capacity

Riding behaviour considering lane position was also examined (Figure iii) but no substantial differences were identified between the two riding groups. The selection categories were also grouped to identify possible patterns; however results did not reveal any such patterns.

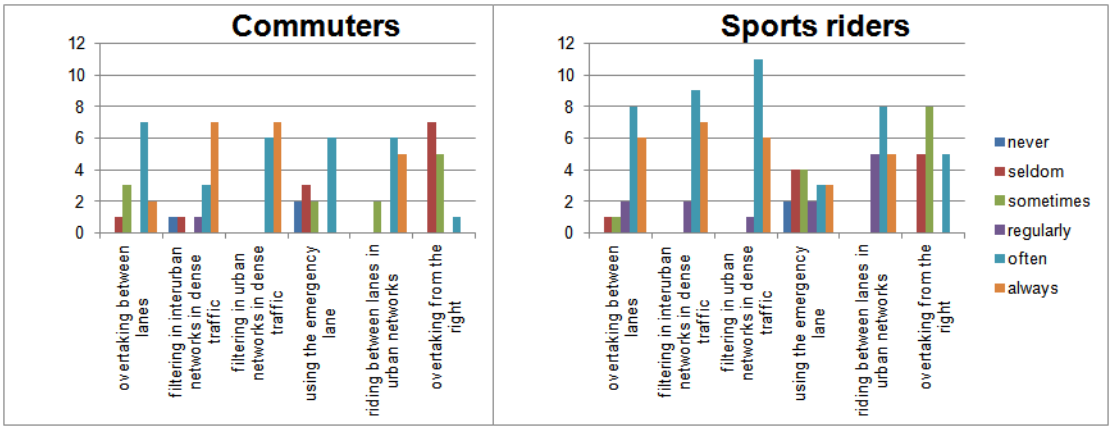

Figure iii. Riding behaviour considering lane position

Another aspect of riding behaviour was also investigated, in particular the use of other road users exclusive "lanes", considering the use of zebra crossings, cycle lanes and sidewalks. In this aspect of behaviour sports riders seemed to be less respectful to other users (1commuter and 3 sports riders used zebra crossings, 0 and 1 cycle lanes and 0 and 7 sidewalks respectively). Still, a larger sample size is required to draw accurate conclusions.

A distinct characteristic between commuters and sports riders was found to be their definition of "rider's spirit". Most commuters did not provide a definition – although they stated that they felt they have the rider's spirit. Those who did provide a definition thought of it as something linked with their vulnerability and the risk of riding. On the other hand, only a few sports riders did not provide a definition of the rider's spirit. The usual types of answers included sensation of freedom and happiness when riding and "high" rider capabilities such as anticipation, quick thinking, consciousness and so on which were linked to safe riding.

3.2 Personality characteristics, riding attitudes and behaviour (MOPROQ2)

The statistical analysis to identify the relationship between personality characteristics, riding attitudes and behaviour was factor analysis. First, Cronbach's α was estimated for several latent variables (as these were defined in Chen (2009)) to identify the internal consistency of these variables considering the ones defining them. Results are presented in Table iii.

Table iii. Cronbach's α for the latent variables of MOPRPOQ2

Personality characteristics		Attitudes		Risky behaviour	
Anxiety	0.628	Traffic flow vs rule obedience	0.903	Self-assertitiveness	0.342
Anger	0.704	Speeding	0.761	Speeding	0.751
Sensation	0.584	Fun riding	0.708	Violations	0.741
Altruism	0.579			Speeding (manipulated)	0.774
Normlessness	0.730				

Values higher than 0.700 indicate an acceptable representation. Reliability of the latent variables is high for the attitudes scale and satisfactory for the risky behaviour scale with the exception of the "self-assertitiveness" variable. It might be the case that the questions imposed to elicit this variable are not representative or that the sample used (students) in Chen's study is more well suited to these questions. In addition, the results in the personality characteristics scale imply a poor or questionable internal consistency (except for anger and normlessness); however, this is mainly attributed to the small sample size. The different elements of riders were investigated under the hypothesis that sports riders and commuters differ. Personality characteristics do not differ between groups whereas in terms of attitudes fun-riding scored higher for the sports riders group (α=0.10), rule obedience and speeding did not differ as was also indicated in MOPROQ1. Similarly, the risky behaviour elements did not differ between the two groups.

4. DISCUSSION

This study stands as a basis to design a large scale study to identify motives, characteristics, attitudes and behaviour of PTW riders. A hypothesis was made that PTW riders can be divided into two distinct groups with different characteristics and riding behaviour; however this hypothesis was not confirmed. This happens due to the fact that sports riders in Greece do not comprise an exclusive riding group, as most of these riders also use their PTW to

commute – this might not be the case in other countries where commuting by PTW is not as popular. This statement is also confirmed by the fact that although the definition of riding spirit differed between the two groups, one of the three main motives for using a PTW for almost all sports riders was that it saves time.

The methodology employed by Ulleberg and Rundmo (2003) and Chen (2009) to link rider characteristics, attitudes and behaviour after having defined latent variable through a number of observable variables can be applied to the Greek riding population following some modifications, which will consider the specificities of this population at a more suitable manner.

The next step of this research is to modify and improve these two questionnaires and perform a large scale study considering both PTW riders and passenger car drivers to identify similarities and differences and attempt to estimate risky behaviours from personality elements.

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