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## Expectations of efficacy, social influence and age as predictors of helmet-use in a sample of Spanish adolescents

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### ABSTRACT

Despite the proven effectiveness of helmets in avoiding or reducing the severity of brain injuries and the law requiring their compulsory use, both by drivers and passengers of motorcycles, approximately 20% of Spanish adolescent motorcycle users do not wear them. This study analysed the pattern of motorcycle and helmet-use in a sample of Spanish adolescents (age range 14–17;  $n = 874$ ) and the relationship this safety measure has with belief in its effectiveness and its use by friends and relatives. Overall more males than females ride motorcycles and this difference increased with age. Motorcycle drivers and passengers who always wear helmets consider them to be more effective than those who do not use a helmet all of the time. The best predictors of helmet-use among motorcycle drivers were their beliefs regarding the helmet-use of their friends and relatives. In the case of passengers, knowing that their friends always wear them and age were the best predictors of helmet-use. Programmes and campaigns promoting helmet-use must take into account the modelling effect of close referents or other role models in order to increase their effectiveness.

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### 1. Introduction

In 2003, 17.9% of all fatal traffic accidents in the European Union involved moped and motorcycle, with Spain ranking third among the constituent countries in terms of the total number of fatal accidents involving these types of vehicles with 758 deaths (Bos et al., 2005). Despite the fact that mortality on Spanish roads has decreased in recent years, the number of fatalities in traffic accidents involving two-wheeled vehicles (the term motorcycle is used to encompass all powered two-wheeled vehicles) has not fallen. In 2006 there were 467 deaths, while in 2007 the number rose to 528 (Directorate General of Traffic, 2008) and in 2008 the number of deaths fell to 390 (Directorate General of Traffic, 2009). However, the proportion of motorcycle fatalities is not evenly distributed among the different age groups, with the 15-to-24 year-old age group accounting for 34.2% of all motorcycle-related fatalities in Spain (Bos et al., 2005), and a substantial number of serious injuries. Traumatic brain injuries and facial trauma are the most frequent injuries suffered by victims of motorcycle accidents, and represent 50% of all deaths from traumatic injuries (Moore, Mattox, & Feliciano, 2004). As is the case with victims of traffic accidents in general (Twisk, 2007), males are over-represented in the statistics. In 2006, 98% of the motorcycling deaths on Spanish roads in the 15–20 year age group were male (Directorate General of Traffic, 2007). Furthermore, in

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the first half of 2008 79.3% of those killed on Catalan roads (Catalonia, Spain) were also male (119 victims), with 20.6% being female (31 victims) (Catalan Traffic Service, 2008).

Since 1982, adolescents in Spain have been able to obtain a licence that authorises them to drive a motorcycle (a two-wheeled vehicle whose engine capacity does not exceed 50 cc) at 14 years of age. However, in recent years there has been much debate about whether to increase the age at which young people can drive motorcycles. Two arguments seem to justify an increase in the age for obtaining a motorcycle licence: the high accident rate for these types of vehicles recorded in 2004 and the adaptation of Spanish regulations to the European Directive. However, motoring associations and the automotive industry in general have criticised this proposed increase in age, which they consider unwarranted according to the accident statistics (Pàmies, 2005). Other research, however, highlights the increase in the accident rate involving motorcycles following the modification of the law in 1982, which allowed motorcycles to be ridden by 14 year olds (16 years old before this law) (Villalbí & Pérez, 2006). After years of debate, a law was recently passed that raises the minimum age for driving motorcycles to 15, although this law will not take effect until 2010. Furthermore, from this date motorcycle drivers will not be able to carry passengers until they are aged 18 (BOE, 2008). From a preventative point of view, is this legislative change warranted? Perhaps not, as previous research has shown that among adolescent motorcycle drivers, age is neither associated with a higher accident rate nor with greater helmet-use by motorcycle drivers or passengers (Plieggi, Bianco, Nobile, & Angelillo, 2006).

The results of numerous studies show the effectiveness of helmets in avoiding or reducing the severity of injuries in the advent of a motorcycle accident (Hundley et al., 2004; Keng, 2005; La Torre, 2003; León & Hernández, 2004; Liu, Ivers, Norton, Blows, & Lo, 2004). Despite the proven effectiveness of helmets in avoiding or reducing the severity of brain injuries and the legislation requiring their use by both drivers and passengers of motorcycles in Spain since 1992, research has found 29% of those killed in motorcycle accidents in 2007 were not wearing a helmet at the time of the accident (Spanish Interior Ministry, 2007).

Previous research has identified a number of variables which are related to adopting preventive behaviours when driving, including; social influence (Bianco, Trani, Santoro, & Angelillo, 2005; State of Hawaii Department of Transportation, 2004; Canada Safety Council, 2002), belief in the effectiveness of the behaviour (Gras, Cunill, Sullman, Planes, & Font-Mayolas, 2007) and the immediate consequences of its use (Block, 2001; Chliaoutakis, Gnardellis, Drakou, Darviri, & Sboukis, 2000; Cunill, Gras, Planes, Oliveras, & Sullman, 2004; Cunill, Gras, Sullman, & Planes, 2005).

These variables are included in the social cognitive theory of Bandura and Walters (1963), which has been used as a predictive model of risk and prevention behaviours among vehicle drivers. According to the social cognitive theory, much of social learning results from observations of real actions carried out by others as well as the consequences involved. Bandura (1986) stresses that, in acquiring a skill, the model constitutes a learning rule. In accordance with this model, social approval of behaviour may change risky behaviour, especially among young people and adolescents. helmet-use by adolescents, when travelling by motorcycle, is closely related to the beliefs of friends and relatives regarding the use of this safety measure (Bianco et al., 2005). Similar results have also been found in the Spanish population in relation to other preventive behaviours, such as seat belt use (Cunill et al., 2004; Gras et al., 2007). Bandura's (1990) model also considers the expectation of a positive consequence of the behaviour as another variable that predicts it being adopted. Therefore, the belief that using a helmet is an effective behaviour for reducing injuries or avoiding being killed in a motorcycle accident should be a predictor variable of the use of this safety measure (Fuentes, 2005; Gras et al., 2007).

### 1.1. Goals of the study

The aims of this study were to: (1) investigate the pattern of motorcycle and helmet-use by adolescents and to analyse differences by gender and age; (2) evaluate boys' and girls' beliefs about the effectiveness of a helmet for avoiding serious injuries and death from motorcycle accidents, and its relation to self-reported use among motorcycle drivers and passengers; (3) study the relationship between self-reported helmet-use and beliefs about the pattern of helmet-use by friends and relatives among adolescents who travel by motorcycle as drivers and as passengers; and (4) identify which of these variables distinguish between helmet-users and non-users.

## 2. Method

### 2.1. Sample

The participants were 874 secondary education students from all of the public secondary schools in the city of Girona (Spain), which represented 76.6% of the total student enrolment at the schools. The sample contained 409 males (46.8%) and 465 females (53.2%) whose ages ranged from 14 to 17 (Mean = 15.08; SD = 0.82), with 95.5% being 16 or younger. The average age of the males was 15.09 (SD = 0.81) and 15.08 (SD = 0.84) for females.

### 2.2. Material

Data were collected using an instrument designed for this purpose, which measured; demographic details (gender and age), motorcycle and helmet-use among motorcycle users, along with efficacy expectations and beliefs concerning helmet-use by the participants' friends and relatives.

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