



The influence of a bicycle commuter's appearance on drivers' overtaking proximities: An on-road test of bicyclist stereotypes, high-visibility clothing and safety aids in the United Kingdom

Ian Walker^{a,*}, Ian Garrard^b, Felicity Jowitt^b

^a Department of Psychology, University of Bath, United Kingdom

^b Brunel Institute for Bioengineering, Brunel University, United Kingdom

ARTICLE INFO

Article history:

Received 19 June 2013

Received in revised form 6 November 2013

Accepted 14 November 2013

Keywords:

Bicyclists
Bicycling
Overtaking
Proximity
Stereotypes
Experience
High-visibility

ABSTRACT

This study looked at whether drivers overtaking a bicyclist changed the proximities of their passes in response to the level of experience and skill signalled by the bicyclist's appearance. Seven outfits were tested, ranging from a stereotypical sport rider's outfit, portraying high experience and skill, to a vest with 'novice cyclist' printed on the back, portraying low experience. A high-visibility bicycling jacket was also used, as were two commercially available safety vests, one featuring a prominent mention of the word 'police' and a warning that the rider was video-recording their journey, and one modelled after a police officer's jacket but with a letter changed so it read 'POLITE'. An ultrasonic distance sensor recorded the space left by vehicles passing the bicyclist on a regular commuting route. 5690 data points fulfilled the criteria for the study and were included in the analyses. The only outfit associated with a significant change in mean passing proximities was the police/video-recording jacket. Contrary to predictions, drivers treated the sports outfit and the 'novice cyclist' outfit equivalently, suggesting they do not adjust overtaking proximity as a function of a rider's perceived experience. Notably, whilst some outfits seemed to discourage motorists from passing within 1 m of the rider, approximately 1–2% of overtakes came within 50 cm no matter what outfit was worn. This suggests there is little riders can do, by altering their appearance, to prevent the very closest overtakes; it is suggested that infrastructural, educational or legal measures are more promising for preventing drivers from passing extremely close to bicyclists.

© 2013 Elsevier Ltd. All rights reserved.

1. Introduction

Bicycling is a generally safe activity, providing increases in fitness and life expectancy thanks to the regular integrated exercise it provides (Andersen et al., 2000; British Medical Association, 1992; Tuxworth et al., 1986; World Health Organization, 2013). However, avoidable collisions do occur when bicyclists must mix with motorists on the road. Although the most likely type of collision to befall a bicyclist involves being hit by a motorist who is turning their vehicle into or out of a junction (Stone and Broughton, 2003), collisions where bicyclists are struck by an overtaking motorist are disproportionately dangerous to riders – probably because, unlike at junctions, vehicles are often travelling at higher speeds (McCarthy and Gilbert, 1996; Pai, 2011; Stone and Broughton, 2003; Transport for London, 2005). In addition, even when overtaking drivers do not collide with riders, close-passing motor vehicles can

create a subjective experience of being unsafe that is a disincentive to travel by bicycle (Guthrie et al., 2001; Parkin et al., 2007). Given these two issues, the topic of what affects the space left by passing drivers, and what bicyclists, drivers or policy-makers might do about this, is an important field of study.

Walker (2007) used an ultrasonic distance sensor to measure the space left by motorists as they overtook a bicycle in two United Kingdom cities. That study showed effects of the bicyclist's lateral road position, helmet wearing and gender on the space left by passing drivers – drivers left less space when the bicyclist rode towards the centre of the lane or was wearing a helmet, and left more space when he wore a long wig so that he appeared to be a woman (an effect later replicated with real women by Florida Department of Transportation, 2011, and Chuang et al., 2013, in the United States and Taiwan respectively). Walker's study also showed that longer vehicles – buses and heavy goods vehicles – tended to get closer on average when passing the bicycle, a finding replicated by Parkin and Meyers (2010). Given this last finding, it is notable that Pai (2011) recently found long vehicles were particularly associated with bicycle overtaking collisions in United Kingdom police accident records,

* Corresponding author.

E-mail address: i.walker@bath.ac.uk (I. Walker).

as did Kim et al. (2007) with American data, suggesting indirectly that closer proximities measured on the road (Parkin and Meyers, 2010; Walker, 2007) might indeed translate into real collisions (Pai, 2011). Chuang et al.'s (2013) finding of decreased rider stability during a lengthy overtake even hints at one possible mechanism for this. Since Walker's study, there has been a certain amount of interest in the subject of how bicycle helmets affect bicyclists' and non-bicyclists' perceptions of risk (Curnow, 2008; Fyhri et al., 2012; Pucher and Buehler, 2008) and how close drivers will pass bicyclists on the road (Chapman and Noyce, 2012; Chuang et al., 2013; Love et al., 2012; Parkin and Meyers, 2010) – an issue which has even been expanded to drivers passing horse riders (Chapman and Musselwhite, 2011).

To explain the closer passing proximities seen when wearing a helmet, Walker (2007) referred to a study of bicyclist stereotypes from Basford et al. (2002), which found people often took helmets to be a sign of a bicyclist's experience and control. Quotes from their qualitative study included "Pictures of cyclists wearing helmets were generally considered to be more serious and sensible on the road than those without" (p. 9), "it was felt that people who had arranged appropriate and/or specialist cycling equipment and clothing were more likely to have also the experience and/or training to employ correct cycling behaviour" (p. 9) and "The 'proper kit' [for a responsible cyclist] was deemed to include wearing a helmet" (p. 9). Based on these claims, Walker hypothesized that motorists in his study might have taken the helmet as a sign of experience, control or skill, and accordingly felt able to pass closer when the rider was helmeted. It is this notion of perceived rider ability, as judged from a rider's appearance, that is explored further here.

This question of how drivers might use a bicyclist's appearance to judge their abilities fits nicely with two recent studies of stereotypes, which both suggest that many people recognize only a few broad and visually distinctive categories of rider. Gatersleben and Haddad (2010) gave participants a large set of attributes about bicyclists and asked them to rate the attributes for how characteristic they were of the typical bicyclist they encountered on the road. The attributes referred to bicyclists' appearances or behaviour ('wears Lycra', 'abides by the rules of the road'), motivations ('bicycles to keep fit'), demographics ('is male', 'is young') and personalities ('worries a lot'). Factor analysis of these responses, to examine which attributes were rated similarly by participants, revealed four fairly clear (Chronbach $\alpha = .72-.83$) stereotypes of bicyclists:

- (1) a 'responsible' bicyclist type, defined primarily by their courtesy to others, strong adherence to the rules of the road and traffic signals, and their use of lights and helmets;
- (2) a 'lifestyle' bicyclist type, who wears a helmet and Lycra, who belongs to a bicycling club and who rides an expensive bicycle for the adrenaline rush and to keep fit;
- (3) a 'commuter' bicyclist type who is probably a well-educated man cycling for utilitarian purposes whatever the weather; and
- (4) a 'hippy-go-lucky' bicyclist type who is likely to be a sociable woman who uses a bicycle with a basket on the front for shopping.

These are clearly broad stereotypes, but as Gatersleben and Haddad's methodology seems sound, they likely reflect some reality of bicyclist types understood or recognized by road users in the United Kingdom – they are likely, in other words, to represent shared mental models, prototypes, or stereotypes of bicyclists. (Although given the factor structure for their 'responsible' bicyclist shows no significant loadings for motivational or demographic items, and therefore says nothing about who these people are or why they cycle, it is tempting to suggest that this reflects an idealized meek cyclist who will stay out of people's way more than a class of people actually encountered in real settings!)

The idea that people understand broad stereotypes of bicyclists is further supported by Musselwhite et al.'s (2010) qualitative study of road safety discussions. Musselwhite et al.'s participants described three classes of bicyclist – professionals (such as couriers), commuters and leisure riders – although discussions about these classes showed some nuances: it was recognized, for example, that amongst the commuters there will be a difference between those who cycle all year round and 'fair-weather' bicyclists who might have less riding experience. Musselwhite et al. cited an earlier sociological study by Jensen (1999) which similarly grouped bicyclists into three categories, although this time based on their reasons for bicycling rather than other people's perceptions: users of the heart, users of convenience and users of necessity. As Musselwhite et al. note, it might be possible to map Jensen's groups onto the kind of stereotypes being described here, which is an interesting exercise as it reveals the extent to which there might be concordance between bicyclists' motives and the motives recognized by observers. Jensen's 'users of the heart' map very clearly onto Musselwhite's leisure riders and Gatersleben and Haddad's 'lifestyle' type – these are the people passionate about bicycling and who do it for pleasure in a serious manner; and her 'users of convenience' map onto Musselwhite's and Gatersleben and Haddad's 'commuter' categories quite clearly. However, Jensen's final category – 'users of necessity', which involves people bicycling because they lack alternatives – are not really seen in either Musselwhite et al.'s or Gatersleben and Haddad's studies. This potentially reveals an interesting mismatch between the reasons people really cycle and the reasons attributed to them by observers.

In summary, then, the literature shows that some shared ideas might exist about bicyclist stereotypes. Given that Walker (2007) previously showed that the simple visible cue of wearing a helmet, which is a component of some of these stereotypes, was associated with changes in motorists' passing behaviour – and given studies such as Davies (2009), which showed the influence of stereotypes on people's judgements in other traffic situations – the present study explored a range of bicyclist outfits with the aim of more clearly signalling different 'types' of rider. The intention was to see whether, as Walker (2007) predicted, this might affect the space left by passing drivers, with less space afforded to a bicyclist whose outfit made them look more experienced or skilled. The underlying framework is one in which stereotypes are used as fast short-cuts to behavioural selection (McGarty et al., 2002), with drivers rapidly recognizing the bicyclist as belonging to one of relatively few categories, making inferences about their level of experience and likely behaviour based on this, and adjusting their overtaking manoeuvre accordingly. This is not to say motorists' perceptions will necessarily be *accurate* or their responses *appropriate* – in reality it is unlikely a rider's level of experience or control could ever be gauged accurately from their appearance, nor that all riders fall neatly into a small number of types – but rather is simply to suggest that overtaking behaviour will be modified to some extent based on the rider's appearance in a way that is consistent with shared beliefs.

2. Method

2.1. Design

The study involved, for consistency, a single male bicyclist riding the same route over several months wearing various outfits, as illustrated in Fig. 1, with instruments recording the proximities of each passing vehicle. As Fig. 1 shows, the clearest manipulation of the rider's apparent experience is between the RACER outfit (intended to represent the Type 2/leisure rider identified by Gatersleben and Haddad, 2010, and Musselwhite et al., 2010) and the NOVICE outfit, which explicitly told other road users that the

Download English Version:

<https://daneshyari.com/en/article/572392>

Download Persian Version:

<https://daneshyari.com/article/572392>

[Daneshyari.com](https://daneshyari.com)