



# Breaking the habit: Does fracturing your wrist change your travel and driver behaviour?



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## ARTICLE INFO

### Article history:

Received 12 March 2014

Received in revised form 12 January 2016

Accepted 19 January 2016

### Keywords:

Habit

Driver behaviour

Travel behaviour

Behaviour change

Injury

## ABSTRACT

When someone breaks their wrist it presents a disruption to everyday routine. Some of this is as a result of having to change travel patterns. This paper investigates the changes people make to their travel behaviour in the light of an unexpected change in their situation caused by fracturing their wrist and wearing a forearm plaster cast. One hundred and eleven participants, approached as they were having their plaster cast removed, completed a questionnaire addressing travel behaviour change, driver safety and information provision covering their time in a plaster cast (typically an average of 5–6 weeks). Eighteen percent of participants drove during the time they had a forearm plaster cast on. All reported they felt safe in doing so and that wearing the plaster cast did not compromise safety, though it was uncomfortable and compensatory behaviours took place. Risk and affective scales did not predict whether participants drove in a cast, suggesting that practical and utilitarian, rather than psychosocial, reasons were the motivation for driving in a plaster cast. Eighty-two percent found other ways of travelling without using their car. Participant's use of buses and trains, walking and taking lifts were all increased and overall, across all modes of transport, participants travelled fewer miles but made more journeys. There was a reduction in cycling, especially for those who drove in a cast, suggesting cyclists who broke their wrist changed to driving while their arm was in a cast. Information provision did not affect whether someone drove or not. Implications for providing travel information to help people avoid car use while their forearm is in a cast and maintaining behaviour change afterwards are discussed.

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## 1. Introduction

### 1.1. Premise

Major life events, including gaining or losing a driving licence, moving home, and starting a new job have been demonstrated to be associated with travel behaviour change (Klöckner & Matthies, 2004), and in particular mode switch due to weakened habits (Van der Waerden, Timmermans, & Borgers, 2003). Williams, Chatterton, and Parkhurst (2013) suggest it is not just major life events but smaller disruptive elements that can effect travel behaviour change. The literature suggests that temporary events can change people's travel behaviour, such as road works and closures (Fujii & Gärling, 2003; Gärling & Axhausen, 2003), adverse weather (see Cools, Moons, Creemers, & Wets, 2010), natural disasters (Graham, 2009), the Olympic Games being held (Parkes, Marsden, & Jopsen, 2012) and protests that stop vehicles proceeding, such as the 2000 United Kingdom (UK) fuel price protests (Lyons & Chatterjee, 2002). Such changes to the flow or disruptions provide a specific opportunity to target and promote travel behaviour change (Jones & Sloman, 2003; Marsden & Docherty, 2013). This paper will examine how having a wrist in plaster that may hamper driving following a fracture is a temporary disruptive event that may lead to travel behaviour change.

### 1.2. Driving with the wrist or hand in plaster

Having the wrist or hand in plaster has the potential to disrupt habitual travel behaviour and can create a short-term cessation in driver behaviour. Previous studies suggest that between 9% and 50% of people continue to drive with their arm or wrist in a cast. Edwards, Oliver, and Hatrick (2009) in a postal survey carried out in the UK found 9% of 144 respondents admitted to driving a car or riding a motorbike with their wrist or arm in a cast. Kennedy, Roche, Lenehan, and Curtin (2006) found a slightly higher percentage, with 15% of 118 surveyed patients in Ireland with upper or lower limb casts continued to drive with their arm or wrist in plaster. Kalamaras, Rando, and Pitchford (2006) found 50% of Australian patients drove their vehicle after having their arm or wrist placed in a plaster cast. Interestingly in Edwards et al.'s (2009) study three of the 13 patients who were driving ceased on advice given during the project suggesting that they had not received advice prior to making their return to driving decision. Another patient stopped driving when his insurance company told him he was not insured. The east coast Australian study by Kalamaras et al. (2006) found that two-thirds of the male participants who broke their wrist drove in a cast, compared to only one-third of females. The difference in the prevalence of drivers between the Edwards et al. (2009) and Kalamaras et al. (2006) studies may be due to the relative geographies and the social norms in the two countries with regards to the role of driving. There is little understanding of the motivations people have for driving or not driving while their arm or wrist is in plaster and how far psycho-social factors, such as affect or risk taking, may explain some of the differences. The affective side of driving has recently received more attention, with the notion that driving has socio-emotional aspects and is more than just about getting from A to B. Research suggests this might be explained by risk (e.g. Musselwhite, 2006) and may also be present in the affect shown towards the vehicle or the act of driving itself (e.g. Ellaway, Macintyre, Hiscock, & Kearns, 2003). How far these constructs determine whether someone finds it difficult to give-up driving, even temporarily, is useful to investigate.

Another factor that might affect whether someone drives in a plaster cast is information provision. However, research across a variety of countries suggests that health practitioners are reluctant to give advice to patients, largely due to the ambiguity in guidelines about returning to driving e.g. in the UK (Edwards et al., 2009; Nunez & Giddins, 2004; Von Arx et al., 2004); USA (Chen & Jupiter, 2007; Chong et al., 2010); Australia (Kalamaras et al., 2006); Netherlands (Haverkamp, Rossen, Maas, & Olsman, 2005); and Ireland (Kennedy et al., 2006).

For those that continue to drive, previous research suggests that driving behaviour is made worse by the wearing of a plaster cast. It is unclear to what extent having an arm in a cast affects driver performance. Several studies indicate that the presence of a forearm cast on healthy volunteers does affect driving performance (Blair et al., 2002; Chong et al., 2010; Gregory et al., 2009; Kalamaras et al., 2006). Gregory et al. (2009) found that forearm immobilisation led to more cautious driving under normal conditions in terms of driving more slowly and adjusting speed and lateral position less frequently. This may be due to drivers perceiving the cast as an additional applied risk to their normal driving behaviour and their taking compensatory action (Adams, 2012; Wilde, 1998). All of these studies used low numbers of healthy volunteers on test tracks. No study to date has assessed self-reported safety of people who have actually broken their arm and are driving with their arm in plaster. This is important as pain, muscle de-conditioning, secondary stiffness and anxiety may impact on driving behaviour. These factors may be compounded by other co-morbidities, the side effects of treatments and the combined effects of ageing, such as slowed motor function, altered proprioception, weakness, decreased endurance and visual and hearing disturbances.

### 1.3. Objective

This paper investigates the prevalence of driving with a wrist in a plaster in a sample of people with broken wrists in the United Kingdom and examines differences in background, risk and affect between those who drove and those who did not. It examines changes in travel behaviour during the period of having the wrist in plaster and whether provision of information

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