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Monitoring speed before and during a speed publicity campaign

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ABSTRACT

Driving speeds were monitored during a period of 16 weeks encompassing different stages of an anti-speeding campaign in the Netherlands. This campaign targeted speed limit violations in built-up areas. The observation periods differed in terms of intensity and media used for the campaign. Small road-side radars, mounted in light poles, were used and registered the speeds on 20 locations in built-up areas. Speeds of over 10 million vehicles were measured. Ten locations had a posted speed limit of 50 km/h; the other ten had a posted speed limit of 30 km/h. Posters were placed at half of each group of locations to remind drivers of the speed limit. The average speed on the 50 km/h roads was 46.2 km/h, and 36.1 km/h on the 30 km/h roads. The average proportions of vehicles exceeding the speed limit were 33.3% and 70.1% respectively. For the 30 km/h roads, the data shows differences in speed and speeding behaviour between the six distinguished observation periods, but overall these differences cannot be logically linked to the contents of the phases and, hence, cannot be explained as an effect of the campaign. The only exception was an effect of local speed limit reminders on the 30 km/h roads. This effect, however, was temporary and had disappeared within a week.

1. Introduction

Excess and inappropriate speed is one of the main contributors to road crashes and road injuries. It is often reported that approximately one third of the fatal crashes is related to excess or inappropriate speed (see OECD/ECMT, 2006). Speed not only influences the risk of a crash, it also largely determines the injury severity if a crash occurs (e.g. Aarts and Van Schagen, 2006; Elvik, 2009, 2013). The latter is particularly true when cars collide with pedestrians (Rosén et al., 2011), since these road users are not protected by an 'iron cage', seatbelt or airbag. The same applies to cyclists.

Most countries use a speed management policy to reduce the negative safety effects of speed while maintaining its positive feature, i.e. the efficient transport of persons and goods. Speed management can be defined as an effort to realize safe driving speeds in different road and traffic conditions, ideally consisting of an integrated set of measures, including network planning, safe and credible speed limits, adequate road design including physical speed reducers like speed humps or roundabouts, and, finally, police enforcement. This is all to be supported by education and information (see for example OECD/ECMT, 2006; Van Schagen and Feypell, 2011).

In the spring of 2010, the Dutch government, as part of its speed management policy, launched a national publicity campaign with the message to respect the speed limits in built-up areas. The current study was set-up to evaluate its effect in terms of driving speeds. Before we elaborate on the aim and design of the Dutch speed campaign and its evaluation we will briefly look at previous findings of speed campaign effectiveness.

1.1. Effectiveness of speed publicity campaigns

International experiences as gained in the European CAST-project (Campaigns and Awareness-raising Strategies in Traffic Safety) show that the realisation of a sustainable behavioural change by just using publicity is very difficult (Delhomme et al., 2009). This may be even more so when the publicity campaign targets speed behaviour. Compared to for example drink-driving, speeding has been found to be fairly resistant to change by publicity campaigns. In a meta-analysis of road safety campaign effects, Phillips et al. (2011) found that drink-driving campaigns were generally linked to substantially larger effects than speeding campaigns. They reported an average crash reduction of 18% for drink-driving campaigns, and a non-significant crash reduction of 4% for speed campaigns. The meta-analysis included a wide variety of publicity campaigns, including mass media campaigns and more

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local campaigns as well as campaigns in combination with police enforcement activities and 'stand-alone' publicity campaigns.

Most of the evaluated campaigns involve publicity in combination with enforcement. Research shows that this combination can have positive effects on speed and/or crashes, effects that are larger than those of enforcement without publicity (Delaney et al., 2003; Erke et al., 2008; Tay, 2005). Research also shows that speed enforcement combined with local publicity is more effective than police enforcement combined with national publicity (Erke et al., 2008). Similarly, but in a broader context, Delhomme et al. (2009) report evidence that road safety campaigns at local or city level are more effective than campaigns at the national level.

Evaluations of stand-alone speed publicity campaigns are scarce. This was one of the conclusions of Phillips and Torquato (2009) who looked at websites of 45 speed publicity campaigns in different countries. Based on the information on the websites, they found that 20% of these 45 campaigns had been evaluated, all in terms of indirect measures like recall, knowledge, attitudes, behaviour intentions or self-reported behaviour; none had been evaluated in terms of observed behaviour or crashes.

Generally, the evidence resulting from evaluations of stand-alone campaigns is not very convincing. An example of an evaluation based on indirect measures is the evaluation of the German 'Runter vom Gas!' ('Down with speed') campaign, targeting young car drivers and motorcyclists. In 2009 the campaign reached a general campaign awareness of 68% amongst the population, and 24% of the population could recall the campaign slogan. Despite high levels of acceptance and agreement among citizens and the campaign generally being judged to be credible and professional, the attitudes towards driving speed did not change (Klimmt and Maurer, 2012).

Another example of an evaluation based on indirect measures is the evaluation of the Foolsspeed campaign in Scotland. Based on the Theory of Planned Behaviour (Ajzen, 1985) the campaign addressed attitudes and beliefs, subjective norms and perceived behavioural control in relation to speed and speeding as the key determinants of behavioural intention and subsequent actual speed behaviour. In order to evaluate the campaign's effects, Stead et al. (2002) conducted four surveys over a four year period (1998–2001), monitoring drivers' attitudes, intentions and self-reported speeding behaviour in 30 mph zones. It was found that over time, the campaign influenced attitudes and beliefs (related to hazard perception) in an anti-speeding direction, but the campaign had no discernible influence on subjective norm, perceived behaviour control, or behavioural intentions to speed.

As indicated earlier, very few speed campaigns were evaluated in terms of actual speed behaviour. One exception is the evaluation of a four year Norwegian national campaign (2009–2012). The campaign focused on 80 km/h roads, using the slogan "Driving a little faster than the speed limit is more dangerous than you think". The campaign materials consisted of television spots, road signs, and press bulletins, and pointed at the dangers of even moderate speeding on 80 km/h roads. The evaluation (Phillips and Sagberg, 2013) showed a decrease in self-reported speeding from 38% to 26% and an average real speed reduction of 1 km/h. Since it was a national campaign, an adequate control group was lacking. Therefore the authors could not exclude the possibility that the effects on speeds were caused by other factors than the campaign.

Another exception is a Dutch study that evaluated the effects of a local campaign to reduce speeding in urban areas, consisting of a mix of local publicity, social media, enforcement and two different types of reward strategies (Duivenvoorden et al., 2013). Actual speeds were measured and since it was a local campaign, the study could apply a before-after/experimental-control research design. The results showed no effect on average speed nor on the frequency of speeding. According to the researchers this was mainly due to lack of conspicuity of the campaign.

1.2. The Dutch speed publicity campaign

In the Netherlands, the two main urban speed limits are 30 km/h (in residential and shopping areas) and 50 km/h (on main urban roads). According to the Dutch road crash statistics, during the period 2007–2009, 86% of the registered pedestrian fatalities and serious injuries, and 79% of the registered cyclist fatalities and serious injuries occurred in built-up areas. In spring 2010, the Dutch government, as part of its speed management policy, therefore launched a national publicity campaign with the message to respect the speed limits. The campaign was set up and implemented in cooperation with the police and regional road safety organisations. It focussed on a reduction of the number of minor violations of the speed limit (defined as a driving speed less than 10–15 km/h over the speed limit) in built-up areas, pointing at the vulnerability of pedestrians and cyclists, and appealing to the car driver's responsibility. Both in words and images, the campaign stressed the link between driving in urban areas, the presence of vulnerable road users, and the related risks.

The campaign (see for more details http://www.nederlandveilig.nl/houjeaandesnelheidslimiet/) focussed on attitude and behaviour change. It consisted of regular radio spots (two versions) and television spots (three versions), billboards alongside motorways ("Respect the speed limit, also later in the built-up area"), posters alongside (some) urban roads and in bus shelters, advertisements in journals, as well as a dedicated website with background information and an online game related to 30 and 50 speed limits. The roadside posters showed children and elderly as pedestrian or cyclist (see Fig. 1) and contained elements for 'priming'. Priming is a psychological technique that aims to activate specific mental constructs by presenting people with sensory input (words or images) that is closely associated with those constructs (Bargh and Chartrand, 1999; Dijksterhuis and Bargh, 2001). The roadside posters in this campaign aimed to activate constructs of social interaction and responsibility, which was expected to result in better compliance with the speed limit and more careful driving. Priming is increasingly used in road traffic aiming to elicit the desired behaviour more or less automatically. In a review on road safety campaigns, Hoekstra and Wegman (2011) judge priming as a promising new campaign approach because it does not require people to actively process the campaign messages.

According to an evaluation of the Dutch government, the television spots reached 92% and the radio spots 83% of the target group at least once. This resulted in an average contact frequency per person in the target group of 6.3 and 9.3 respectively (Van den Berg et al., 2011). The introduction of the campaign was supported by a press release, resulting in free publicity in newspapers and on the internet. In this period several traffic-related television programmes paid attention to speed and speeding, mainly from a police enforcement point of view. Since the first launch in spring 2010, the campaign has been deployed several times.

In the present study, driving speeds were registered before and during the first campaign on a number of 30 km/h and 50 km/h urban roads. Data was analysed to obtain an overall picture of the speed behaviour at 30 and 50 km/h roads as well as of the possible effects of the campaign on actual driving speeds. The campaign lasted for several weeks with different levels of intensity, as specified in Section 2, Method. If the campaign had an effect, one would expect lower speeds and fewer speed limit violations during the campaign than before the campaign and larger effects during the more intense campaign periods.

Furthermore, local campaigning activities have been found to have a larger effect than general, nationwide publicity (e.g. Erke

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