

Exploring the mechanisms behind the Safety in Numbers Effect: A behavioural analysis of interactions between cyclists and car drivers in Norway and Denmark

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ABSTRACT

A considerable number of studies have indicated that the risk of injury to cyclists and pedestrians is highly non-linear. This implies, everything else being equal, that the higher the number of cyclists and pedestrians, the lower their injury risk. The non-linearity of risk injury to cyclists and pedestrians has been fairly recently introduced in transport research literature [1,2] and has become to be known as the Safety in Numbers (SIN) effect. The underlying mechanisms that cause this phenomenon, are however largely unknown. The main aim of the present study is to gain more insight in the mechanisms behind the SIN effect.

Long-term interplay as well as short-term increased experience were the main mechanisms investigated. Traffic conflicts between cars and cyclists as well as violations were studied based on video-observations. Traffic conflicts were analyzed according to the Dutch Objective Conflict Technique for Operation and Research (DOCTOR)[3]. Camera observations were conducted at two intersections: one in Aalborg (Denmark) and one in Oslo (Norway). A major difference between the two countries is the modal share of cyclists in road traffic (Norway: 4%, Denmark: 17%). The general layout for the two intersections is comparable and both are signalized. This way a long-term SIN effect could be explored, i.e. a possibly better (safer) interaction between cyclists and car drivers based on a long-term interaction experience. Also, the intersection in Oslo was observed at two different points in time: in April and June 2013. The aim of these measurements at different points of time was to explore possible short-term mechanism in SIN, since a dramatic increase of cyclists during the spring finds place in Oslo. It was hypothesized that such a short-term increase in the number of cyclists entails higher attentional levels by car-drivers towards cyclists, which increases cycling safety.

Preliminary results reveal support at least for the first hypothesis; there are more conflicts between cars and cyclists in Oslo than in Aalborg. Moreover the percentage of cyclists in Oslo going through red light is much higher than in Aalborg.

Keywords: Safety in Numbers, Cycling Safety, traffic conflict analysis, DOCTOR

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