Cycling Promotion and Cycling Safety: Is there a conflict?

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ABSTRACT

This paper looks at the phenomenon of safety in numbers and concludes that there is no conflict between cycling promotion and cycling safety even if there is debate over what that cycling promotion should be. However there are far more questions asked than answers given with regards to the specific mechanism of safety in numbers.

Keywords: safety in numbers, cycle promotion, cycling safety

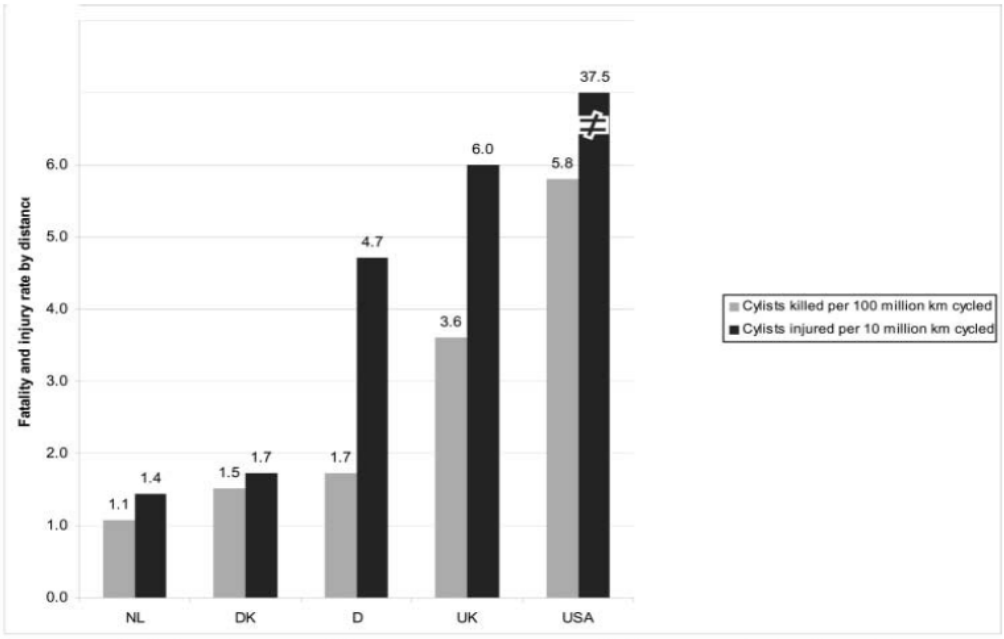
INTRODUCTION

More than half of the global population now lives in urban environments, this is putting more and more strain on our urban environments and how we travel from A to B. Many European cities, densely populated, often with aging roads are becoming increasingly congested. A car culture that has long existed in the Western world is helping to push up obesity levels and other health issues due to inactivity that are now having serious consequences for public health. The bicycle, almost unchanged for 150 years is making inroads into helping relieve many modern day malaises. Cutting across many policy levels from CO2 emissions, traffic congestion, health, urban mobility, etc. cycling has now worked its way into the thoughts of many policy decision maker in many EU countries. However will an increase in 'vulnerable road users' mean we have to sacrifice safety on the roads in order to combat the many issues that we now know cycling can effectively help to alleviate? Cyclists are not surrounded by a shell, are often seen as unstable on two wheels and in countries that have high levels of cycling, there are also high levels of cyclist casualties. The question is does promotion of the bicycle mean that we have to bite the bullet and deal with increased cycle casualties? The inclusion is no and indicates the presence of a phenomenon called 'safety in numbers' which will be explored.

CYCLING RATES

Despite the absolute number of cycling fatalities within those countries that have a high level of cycling this does not tell us the exposure figures, or take into account the number of cyclists or the trip taken. If we are to compare between transport modes as to the risks within each mode, or if we are to evaluate the risk to each individual cyclist/pedestrian/driver it is important to take the rate of fatalities per levels of exposure to that risk. Taking the exposure levels into account, the amount of fatalities per distance travelled or per number of trips, the picture becomes very different with those countries with higher levels of cycling having lower levels of risk. (figure 1)

Figure 1. Fatality rates and non-fatal injury rates in the Netherlands, Denmark, Germany, the UK and the USA (2004–2005) (1)



Sources: Danish Ministry of Transport (2007); Department for Transport (2007); German Federal Ministry of Transport (2007); Netherlands Ministry of Transport (2007); U.S. Department of Transportation (2007)

This seems strange since with an increase in exposure levels conventional wisdom would suggest that there should be an accompanying increase in risk. In other words it seems to suggest that cycling becomes safer with a higher level of cycling; promoting cycling seems to be in and of itself a mechanism for creating a safer environment for cyclists.

SAFETY IN NUMBERS

This is commonly known as the safety in numbers principle and has been around for many years. With regards to cycling the most famous study was by Jacobsen(2) He examined population level data from 68 cities in California USA, 47 towns in Denmark and 14 European countries, to compare the amount of cycling and walking and the injuries occurring in collisions with motor vehicles. He found that across all the data sets that motorists are less likely to hit bicyclists and pedestrians when there are more people bicycling or walking. An Australian study (3) showed that between 1985-86 - the mean per capita distance cycled in Western Australia was double that in New South Wales and the risk of fatality 35% less. During 1982 - 1989 in Western Australia cycling almost doubled and the number of cyclists admitted to hospital fell by 48% and reported fatal and serious injuries fell by 33%. Jensen (4) found that between 1990 and 2000, a 40% increase in bicycle-kilometres travelled corresponded to a 50% decrease in seriously injured bicyclists. In a recent intersection-level study from the US (5), the results suggest that the number of crashes per bicyclist decrease with bicycle volume

So it would seem that cycling promotion and increasing cycling numbers only has the effect of increasing safety amongst cyclists. In the Netherlands, a 45% increase in bicycling rates between 1980 and 2005, simply translated into a 50% decline in accident fatalities. In London, bicycling rates have increased by 91% since 1990, while cycling casualties actually fell by 33% from 1994 to 1998 (6). The really interesting question however becomes why (7).

The Shoal/Flock effect

What we have so far is a correlative relationship between increasing cycling numbers and increasing safety. Why does this happen? It is commonly thought that the more cyclists there are on the road then the more likely that drivers are either to be cyclists themselves and so understand that they may need room and to understand their movement. Or, that drivers become used to sharing the road with cyclists and again are more knowledgeable in how to share space with them. When the number of cyclists increases to the point where drivers begin to expect frequent conflicts with bicyclists, driver expectations and behaviour seem to change for the better. This would make sense as it would be strange if cyclists were becoming more cautious or paying much more attention to road rules when their numbers are larger. It would seem, as Jacobsen contends, more likely that motorists adjust their behaviour in the presence of people cycling. With regards to behaviour on the road, motorist's behaviour would seem to be the key factor in this change.

Infrastructure factors

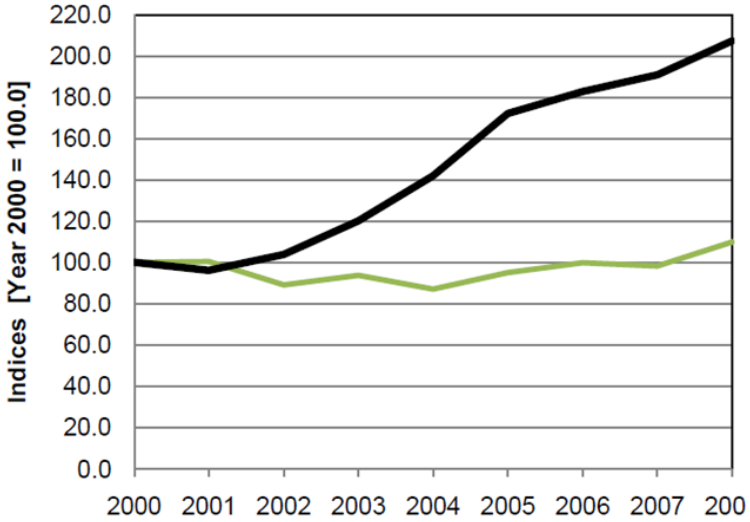
However this has not been proved or corroborated with research and as such the link between higher cycling numbers and lower risk per cyclist remains a correlation. There is the possibility that there are other factors at play. For example it is possible that it is better infrastructure being built for cyclists which leads to a virtuous circle of less perceived risk as well as less actual risk, which in turn means more people make the decision to cycle. With more cyclists, the authorities build more cycling infrastructure and so on thus bringing about the correlation between higher numbers and increased safety.

This is very much the model of the Netherlands. During the 1950's and 1960's a lack of cycling infrastructure and an increase in car use brought about a large increase in cycling fatalities. The cyclist fatality rate per billion km cycled rose by 174% from 1950 to 1978 and the average km cycled per inhabitant fell by 65%. Since the 1970's there was a great deal of investment, intellectually and financially, in improving cycling infrastructure. The result saw an 81% fall in the cyclist fatality rate from 1978 to 2006, thus encouraging a 36% increase in km cycled per inhabitant. (8) According to this, throwing numbers at the problem is not going to bring down casualties on its own, there also needs to be a dedicated change in attitude to infrastructure development.

Brief discussion

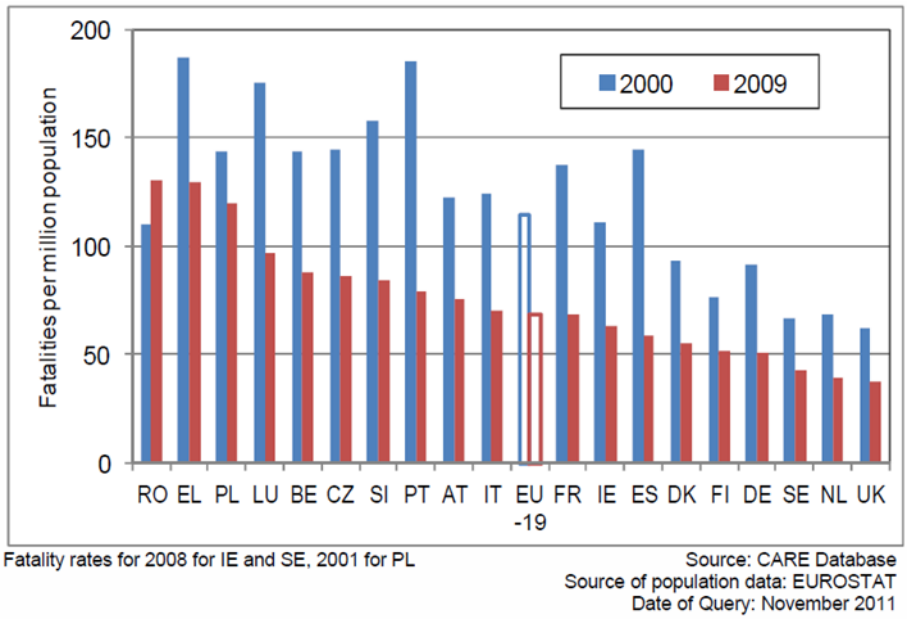
However if we look at the UK, a country not renowned for its infrastructure development, and London in particular, cycling numbers have steadily increased while casualty figures have remained relatively stable (meaning that there has been a safety in numbers effect; more cyclists but same casualty rate equals means each individual cyclist has less risk).

Figure 2. Indices of TLRN cycling flow and TLRN cyclist casualties in Greater London (9)



However that is the only thing that we can really say that has changed, there has not been a great increase in infrastructure over that time, London transport budgets for cycling have not significantly increased and infrastructure has not been built, or at least not enough to explain the increased safety. But the UK does have one of the safest road structures in Europe (see figure 3). Can we see this as infrastructural change, even it is not specifically bicycle infrastructure?

Figure 3. Fatalities per million population by country, 2000 and 2009 (10)



It is also clear that building infrastructure without cycling numbers does not mean more cycling or safer cyclists; there are a number of cycling 'ghost' lanes and paths around Europe to testify to this.

CONCLUSION AND QUESTIONS

In conclusion, and to return to the original theme, cycling promotion and cycling safety are certainly not in conflict. There is a strong positive link between cycling safety and cycling promotion. But there are many questions raised

- Is it sufficient to promote cycling numbers or is there need for a commitment to full scale infrastructure change?
- What type of cycling promotion should be undertaken to achieve higher levels of cycling?
- Is full scale infrastructure change possible within current financial environments?
- Can roads be updated to bring about the necessary 'perceived feeling of safety that will get more people cycling?
- Can we turn roads into reasonably safe cycle lanes with 30 kph zones instead of expensive infrastructure?
- Is this a cultural difference between, or even within, countries that contributes to these differences? Vehicular cycling in the UK, separate infrastructure in the Netherlands for example.

- Are there any other confounding factors that could explain this Safety in Numbers correlation? For example police enforcement of road regulations, lower speed limits, better hospitals and emergency room procedures even.

There also seems to me to be a strong subjective element to this. Key to cycle promotion and safety seems to be

- The change in behaviour of motorists when interacting with more cyclists
- To increase cycling numbers the perception of risk needs to be countered in order to encourage people to cycle

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