

What is the Effect of Public Lighting on Public Safety?

Paul Marchant

p.marchant@leedsmet.ac.uk

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- In the UK some councils are reducing their costs by reducing lighting.
- The Institution of Lighting Professionals (ILP) www.theilp.org.uk has produced a list of 70+ Councils in England & Wales considering:
Dimming; Part Night; Full Switch Off
- Lighting Industry seems worried.
- Produced a document **‘Save Money and Keep the Lights ON ‘**

- It claims:
- 1. It reduces street crime and the fear of crime – lighting can help Authorities meet their requirements under the Crime and Disorder Act
- 2. It reduces the number and severity of night-time road accidents - by up to 30%
- ('up to' is rather suspect)
- Note: The UK Highways Agency has revised its lighting benefit figure down considerably. It does switch-offs & may not replace existing lights.

- The ILP says “....recently completed PFI re-lighting scheme in Wakefield.....Has helped reduce vehicle crime by 62% between 2004 and 2008”
- I say “How much has it helped?”!
- From Home Office figures, I make the drop from March 2004 to March 2008 = 54%.
- But then Knowsley (Merseyside) fell 70% March 2006 to March 2010 before their PFI scheme started!

- The ILP seems to have reported selectively...Why was Wakefield picked? There are other PFI areas.
- There are 2 lessons!
- 1 Car crime is dropping everywhere.
- 2 Marketeers pick their figures.

Science versus Public Relations

- Science: Get as close as possible to truths about the world. (A balanced process)
- Public Relations: Promote a position in the most favourable way. (A selective process)

Beyer & Ker

- Their Cochrane Collaboration Review ‘Street lighting for preventing road traffic injuries’ gives a positive result for lighting.
- However I am unconvinced...many flaws exist in the work as I say in my two separate criticisms; published Sept 2010 along with their original review & their responses to me.
- (Cochrane www.cochrane.org is a good open system)

I call for reliable studies ...

As some issues are:

- Publication bias...a real problem for policy trials of routine interventions.
- Lack of randomisation.
- Ill-determined variance.
- Regression towards the mean.

(There are enough problems with well done medical trials!)

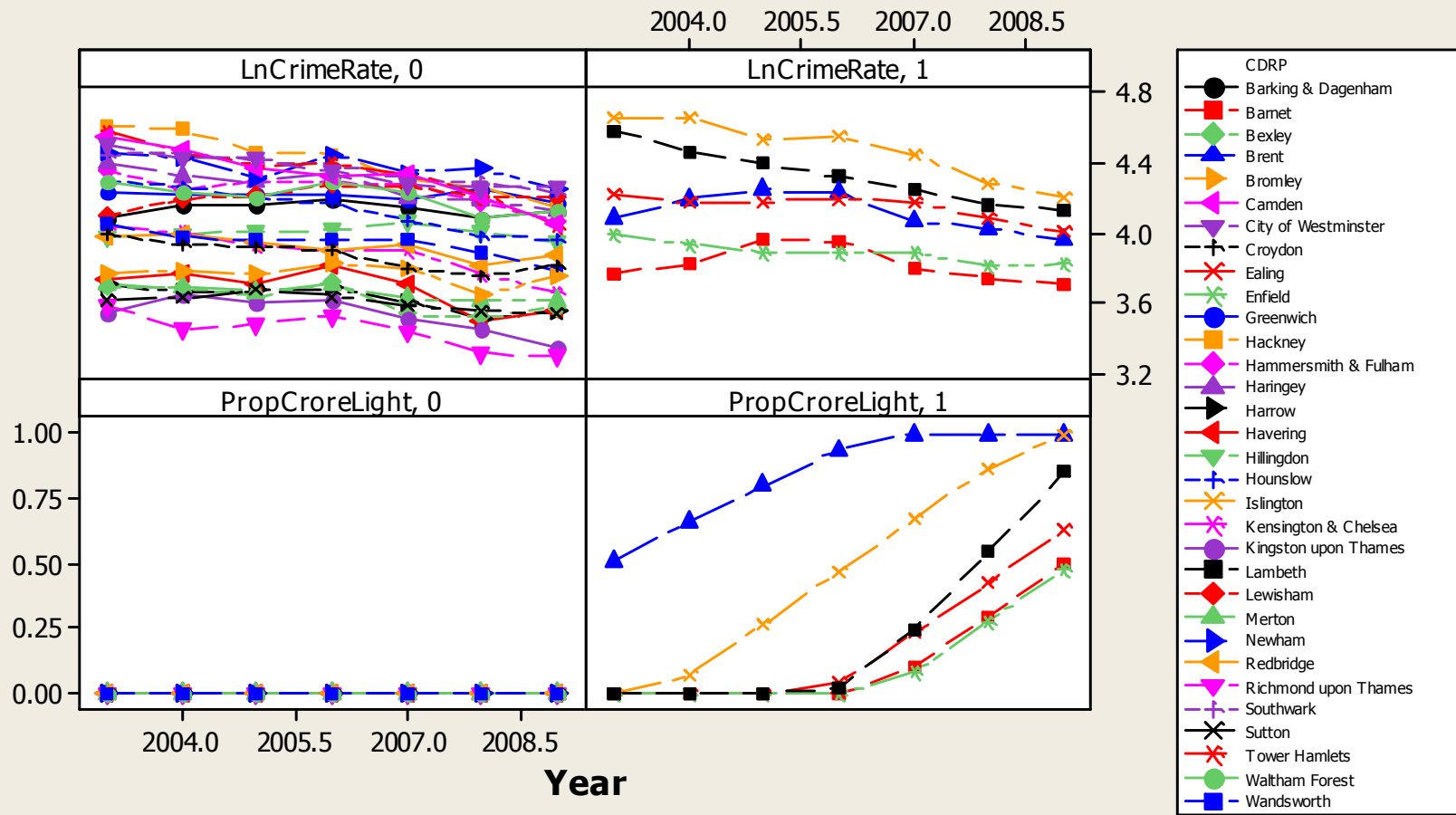
Regression Towards the Mean

- The tendency for extreme outcomes to become more average.
- Discovered by Francis Galton on heights of parents and their adult children. He found tall parents have tall children BUT on average not as tall as themselves, i.e. children tend to be more average.
- Marchant, PR, Contributor to the *International Encyclopaedia of Social Sciences*, 2nd Edition: [The entry on 'Regression towards the Mean'](#). Published by Thomson Gale, 2008
- Baxter, PD & Marchant PR (2010) ["The cross product ratio in the bivariate log normal distribution and gamma distribution, with an application to non-randomised trials"](#), *Journal of Applied Statistics*, Volume 37, issue 4, pp 529-536.
- NOTE There may be a spurious detrimental effect from switch offs (as these only happen in 'safe' areas) just as there can be a spurious beneficial effect from brightening in 'unsafe' areas.

PFI lighting in London:
Impact on 'Total' crime 2003-2009

- Total crime is what tends to be measured in crime experiments.
- 32 London boroughs, of which 6 got new PFI lights starting at different times and implemented over different periods.

LnCrimeRate & Proportion Of Core Light vs Year



Panel variable: New Lights

The natural log of the crime rate for the years and the proportion of the Core Lighting Programme completed in each local authority. The proportion of the Core Lighting Programme completed is of course zero for those not having a Lighting Programme as seen in the lower left hand panel.

A statistical model

(see ww.radstats.org.uk/no104/Marchant2_104.pdf)

- Says what can be seen with the eyes... No evidence of crime reduction benefit of lighting.
- It estimates the range (95% confidence interval) for the expected effect of a fully implemented programme of new street lighting to span from a 13% reduction to an 11% rise in crime.
- **The lower limit is well below the 20% reduction claim made for new street lighting.**

Future

- Update this to 2011 with 9 years rather than 7
- Also include better population estimates.
- However more precision will be obtained using better 'fine-grained' data.
- Aim to work at street light 'level' & have a time series for each, recording whether an adverse event (e.g. traffic accident) has occurred nearby & whether an old or new light was in place.

- Also need to take account of underlying temporal trends.
- The process will give an odds ratio for an event with new lights versus an event with old lights.
- This is expected to have a much smaller confidence interval than anything done previously and be close to being unbiased for the large geographical area involved.

- Some publications can be seen at:

- <http://praxis.leedsmet.ac.uk/praxis/Publications/publicationsmarchant.htm>