

# Crime, science and evaluation

Gloria Laycock describes what established scientific method brings to the developing field of crime science.

This short article is written from the perspective of a crime scientist. Crime science, as Ken Pease discussed in a recent CJM article, aspires to join up the various sciences in the quest to reduce crime, disorder and terrorism to the lowest possible levels in ways which meet current ethical expectations. It also aspires to become a new discipline with post-graduate courses and a relevant research programme. It is, in other words, in for the long-haul. Ken likes to stick his neck out, and has argued that all sciences have a potential contribution to make to crime management. It is a strong statement and obviously difficult to prove. As one of the sceptics I now ask our students what, if anything, astronomy may have to offer to crime reduction. They often surprise themselves by being able to list things such as the phases of the moon and its effect on behaviour. My current favourite example is from the Institute of Astronomy at Cambridge where, with funding from the EPSRC, they are investigating whether the techniques used

Let us now look at some of the established sciences and see what we might learn from them in the furtherance of crime control. Starting with medical science we find randomised controlled trials as the purported gold standard and indeed there are some research questions that can best be answered using such designs. When RCTs are not possible, perhaps for ethical or other pragmatic reasons, then quasi-experimental methods can be used. Of course many of these techniques have their origins in attempts to develop better crops in the Midwestern United States. There is nothing wrong with a bit of plagiarism in an appropriate context.

From experimental physics we see the challenge of measurement and note that the act of measuring the location or existence of an atom or sub-atomic particle can change its location or even its nature. This has some resonance in criminology where attempts to measure crime and disorder have plagued researchers from the start. It also illustrates the costs involved in accurate measurement at that level. The

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to improve images from space can also be used to improve CCTV images. This is obviously relevant when atmospheric interference is the cause of distortions.

If we accept Ken's basic point, what might we learn from the other established sciences in relation to evaluation, research methods and statistics? At this stage in the development of crime science the answer should be quite a lot. It would be premature to dismiss any approach without thinking through the implications and that exercise encourages us to go back to basics and ask what the 'bottom lines' are in relation to good experimental methods.

We can begin by suggesting that good science tries to establish testable hypotheses based on plausible theories. In that way we can move toward a truly knowledge-based approach to crime management. One in which 'evidence-led' actually means something (Tilley and Laycock, 2000). Its experiments seek, through the use of appropriate experimental design, to control for bias and chance. In this way it is possible to be a little more confident in the conclusions that may be drawn.

amount of money spent on the measurement of crime is but a drop in the ocean when compared with the measurement costs in some hard sciences. On that, it is encouraging to see that the National Statistical Office has commissioned a review of the uses to which crime statistics are currently put with a view to improving or making them better fit for purpose.

Chemists show the importance of classification, as do zoologists and botanists. What can we learn from them about how to go about the task of classifying criminal behaviour? At present this is almost certainly driven by the administrative needs of the Home Office and the legal requirement to report 'crime statistics' to Parliament. But the case has yet to be made whether the present classifications are the most useful for crime prevention purposes or even for routine policing. Why, for example, would we include attempted burglary in the same statistic as successful burglary? In a rational world we would want to reduce both but in the shorter term we might settle for a reduction in successful burglary and an increase in attempts. This might indicate that preventive measures were beginning

to work. And the classification of 'violence' leads to extraordinary reporting at regular intervals with claims that violent crime is going through the roof. The subtleties of changes in crime recording, which have led to the inclusion of common assault in the same category as murder and rape, do not assist the proper or meaningful representation by the media of the extent of violent crime.

The statistical techniques used in epidemiology are now being used by crime scientists to study the movement of domestic burglary (Johnson *et al*, 2004) and are generating important insights into the ways in which burglary moves in both space and time. Johnson *et al* have shown for example, that hotspots are not simply clusters in space but are also clusters in time.

Returning to astronomy, what can we learn from the ways in which astronomers go about their business? Not for them the luxury of experimental control or randomised trials. And in some ways the challenges of astronomy have striking similarities to our own attempts to understand the world about us with its melange of interacting variables and our complete inability to understand or control the vast majority of them. How do astronomers cope with this? There are probably a whole range of responses but one is through ever more careful and painstakingly detailed measurement. Another is through the development of brilliant and predictive theory which can then be tested. Perhaps we need to do more of this. What it would imply is a greater investment in replication and a much clearer articulation of the mechanisms through which any intervention was supposed to exert its effect in a given context (Pawson and Tilley, 1997). With some very rare exceptions, investment in replication is seen as a waste of money. What's the point if we know the answer? This is to lose sight of one of the most fundamental of scientific tenets, indeed it is the gold standard of science – independent replication of research results.

There have been some examples of this in the crime field. Perhaps most famously is the attempted replication of the Sherman *et al* demonstration that mandatory arrest for domestic violence reduces further attacks. These results were not replicated when further studies were funded across three US cities (Sherman, 1992). What became clear from these studies was that the mechanism through which the effect was to have been mediated had not been thought through. Basically, if the offender was employed then arrest was more likely to reduce further attacks but if there was a history of violence and unemployment then this was far less likely. Indeed it could increase attacks.

In the UK the Kirkholt experiment reduced domestic burglary over three years by 75 per cent. This was done by protecting known victims (Forrester *et al*, 1988). Attempts at replication met with varying success but this was almost certainly because the would-be replicators had not really understood the mechanism that had applied in the Kirkholt

context. Specifically they had not understood that what worked on Kirkholt might need to be modified to their different context. The essential point was that the victims had to be protected by whatever means appropriate and this might be different for different victims. It was not simply a case of doing what was done on Kirkholt (Farrell, 2005).

So where does this leave crime science in the debate about randomised controlled trials versus scientific realism? For me (and other crime scientists might disagree – disagreement leads to scientific debate and progress so nothing wrong with that!), it is horses for courses. I can imagine an evaluation where we were primarily concerned about the internal validity of a result and a randomised controlled trial might be judged the best available methodology. In this case I would certainly press for an articulation of the mechanism through which it is expected to exert its effect (and this does not seem to have been done with any consistency in the work on restorative justice for example). If we are to build up a knowledge base of what works where and how then I would look at what scientific realism has to offer in its approach. And, again for me, the answer is a lot. But for the future, and in particular for what crime scientists might ultimately include in their tool chest, we have a work in progress, and we are looking to learn from the established sciences in developing our tools.

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## References

- Farrell, G. (2005) 'Progress and Prospects in the Prevention of Repeat Victimisation' in N. Tilley (ed) *Handbook of Crime Prevention and Community Safety*. Devon: Willan.
- Forrester, D., Chatterton, M. and Pease K. (1988) *The Kirkholt Burglary Prevention Project Rochdale*, Crime Prevention Unit Paper 13. London: Home Office.
- Johnson, S. D., Bowers, K. J. and Pease K. (2004) 'Predicting the Future or Summarising the Past? Crime Mapping as Anticipation', in M. Smith and N. J. Tilley (eds) *Launching Crime Science*. Devon: Willan Publishing.
- Pawson R. and Tilley, N. (1997) *Realistic Evaluation*. London: Sage.
- Sherman, L. (1992) *Policing Domestic Violence*. New York: Free Press.
- Tilley, N. and Laycock, G. (2000) 'Joining up Research, Policy and Practice about Crime', *Policy Studies*, Vol 21, No 3.