

From threat to debt... or, there is mechanism in my madness

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Final version 13 April 2017 Uncorrected proof.

Ekblom, P. (2018). 'From threat to debt... or, there is mechanism in my madness'. In G. Farrell and A. Sidebottom (Eds) *Realist Evaluation for Crime Science: Essays in Honour of Nick Tilley*. Milton Park: Taylor and Francis. 58-75.

Abstract

This chapter documents the enormously significant influence Nick Tilley and his Scientific Realist approach has had on my own thinking since first encountering the man and his ideas in 1991. In particular, the notion of causal mechanism enabled me to devise a rich analytic classification/mechanism map of crime causation and intervention (Conjunction of Criminal Opportunity). In the What Works field, mechanism led to a focus on replication and the management of knowledge for practice (culminating in the 5Is process model for prevention). In Design Against Crime, mechanism articulated how the designs are meant to reduce offending. Mechanism offers a helpful discourse to encourage engineers and hard scientists to engage with Crime Science. And complementing the 'cardboard cutout criminal' of Rational Choice and Routine Activities, the development of ideas on offender resources and cognition drew heavily on mechanism. All these issues reflect a tension between complexity and simplicity in Crime Science yet to be resolved. But the mechanism concept could not have worked its magic without a key contextual ingredient – Nick Tilley's engaging and constructive personality.

Keywords: Crime Science, Crime Prevention, Causal Mechanism, What Works, Replication, Design, Conjunction of Criminal Opportunity, 5Is.

It was in 1991 that my lunch was interrupted. The Context was a cafeteria in Hartlepool, NE England, at a UK Safer Cities (SC) Programme conference. The embodied Mechanism of the interruption was the arrival of a bespectacled man with a grey moustache who asked if he could join me. The ultimate Outcome was a permanent and radical change in how I viewed, articulated and conducted crime prevention research. Quite a Configuration, and quite an achievement on his part.

The stranger introduced himself as Nick Tilley, from Nottingham, who was interested in studying the workings of SC. My task at the time, on behalf of the then Research and Statistics Directorate (RSD) of the UK Home Office, was to undertake process and impact evaluation of SC. This was a not insignificant burden, which was challenging (among other reasons) due to the extreme variety of the action purported to be preventive, and the need to develop a way of characterising the diverse nature of that action in order to compare like-with-like.

Tilley's interest in evaluation, and his subsequent engagement by the then Police Research Group of the Home Office (PRG) to undertake assessments of individual preventive schemes implemented within SC, seemed initially a little threatening: there were tensions between PRG and RSD and the arrival of a different source of expertise offering a radically different approach threatened to undermine my position and the evaluation strategy I was developing (Ekblom 1992). However, one of my other tasks in RSD was to liaise between the two groupings and so I became official translator of the Scientific Realist (SR) approach to social research and evaluation which Tilley and his colleague Ray Pawson were developing.

Initially sceptical and not a little defensive, what I learned about SR soon convinced me Tilley and Pawson were onto something both conceptually fundamental and practically useful. In fact, I'd go so far as to say that the Mechanism concept, and to some extent also its SR companions of Context and Outcome, for me came to take on the form of what philosopher Daniel Dennett (1995) has described, with reference to the Darwinian concept of evolution, as a 'universal acid'. This mythical solvent, according to Dennett, eats through every traditional concept and leaves in its wake a revolutionised world-view. In what follows, I show how the idea of causal mechanism ate into my own thinking – and transformed it. Much of what I have subsequently produced could simply not have been achieved without the embedding of the mechanism perspective in my mind – nor, too, without personal contributions from Tilley himself, both intellectual and as friend and colleague, at key moments of development.

Thus it was that an initial outcome of threat transformed into an ultimate outcome of debt. But it is a *constructive* debt, one that continues to yield dividends as Nick Tilley's influence still significantly shapes my thinking and will keep on doing so. By way of paying interest on that debt, I hope I have taken the 'mechanism meme' and Tilley's wider thinking to domains and people they might otherwise not have reached.

The significance of mechanism

How does one compare like-with-like when confronted with several hundred preventive schemes that range from driving crime prevention publicity buses round a city, to target-hardening houses against burglars, to all-female taxi services, to crime prevention puppet shows for educating schoolchildren, to early intervention on those at risk of offending? Racked brains and massively-scribbled-on concertina sheets of old-fashioned computer printout paper were leading nowhere. Then, I seized on the SR concept of Mechanism: *how was each scheme intended to work, in terms of cause and effect?* I had been trying to integrate a range of perspectives on the causation of crime – causation which the preventive action was intended to block, weaken or divert. *Mechanism* enabled me to articulate causation sufficiently well to start asking the right questions. My starting-point was Cohen and Felson's (1979) Routine Activities perspective of likely offender, suitable target and absence of capable guardians. So, *how* was the offender 'likely', *how* was the target suitable, and *how* might the guardians have been capable? Then, I realised that the other situational approaches (e.g. Rational Choice – Cornish and Clarke 1986) could be treated likewise and indeed brought into the same frame. The offender perspective was, and is, deliberately neglected by situational prevention theorists but the Safer Cities schemes covered both situational and offender-oriented action. Pursuing what was meant by 'likely' enabled these to be covered too.

Maps for mechanisms

Thus was born the integrated framework originally called 'proximal circumstances' (Ekblom 1994; see also Ekblom 2011a), and subsequently renamed the Conjunction of Criminal Opportunity (CCO). The term 'proximal', rather scorned as jargon at the time, referred to the immediate causes of

offender-in-situation just before the crime event. It has since become the natural focus of crime science. Proximal contrasted with 'distal', i.e. remote causes e.g. influences in an offender's childhood or the market price for copper metal: these could only ultimately have their effect on criminal events via mechanisms that connected them, perhaps via a long causal chain, to the immediate components of the crime situation, or how these components were brought together (e.g. by routine activities or offender foraging). Trying, on those computer paper sheets, to sketch out these ideas (sometimes with Nick's help) led to realisations that:

- Here was a map of all the immediate causal components of criminal events, one moreover which brought all the familiar perspectives of situational prevention into a 'one-stop-shop' using a consistent language and with no overlaps.
- There were some additional components needed to complete the picture (one such being offender resources, returned to below). After a trial 'learning' process on the Safer Cities schemes a total of 11 distinguishable categories evolved (on the situational side, target, enclosure, wider environment, people playing crime preventer and crime promoter roles; on the offender side, predisposition, resources to avoid offending, motivational/emotional readiness to offend, resources to commit crime, perception and decision, and presence).
- The map of *causes* of crime could also be used as a basis for a counterpart analysis of preventive *interventions* seeking to manipulate those causes to reduce the risk of criminal events; crime prevention as a whole then became definable as 'intervention in the causal mechanisms of criminal events to reduce their risk'.
- With these interventions, *Context*, rather loosely-defined in SR, could be mapped out in terms of the remaining un-manipulated components in a kind of 'figure : ground' relationship.

By the last, I meant that typically, many or all of the 11 components were present and contributing to the causation of the criminal events in question, but only some were actively manipulated by the preventive action – the others provided the immediate causal background... or context. Other kinds of context are identified below.

The (eventual) 25 Techniques of situational prevention (www.popcenter.org/25techniques/) was organised originally around the Rational Choice decision agenda of increasing risk, increasing effort and decreasing reward (to which reducing provocations and removing excuses were later added in somewhat ad-hoc fashion). These are mechanisms too but rather more generic and abstracted ones than those in CCO, which arguably enable a subtler, more analytic approach at the cost of a little more complexity.

Mechanisms in fact can be described at any level of abstraction/generality. In CCO texts (e.g. Ekblom 2010, 2011a) I attempt to draw a distinction between a) broad generic *principles* (such as securing the target enclosure or reducing the resources for offending) based around each of the 11 components of CCO; and b) very detailed, situation-specific *mechanisms* which I see as reflecting the dynamic causal interaction *between* these components (e.g. when an intervention such as restricting access to keys denies the offender the resources to overcome the security of the enclosure).

Happily, the traffic of ideas with Nick Tilley was not entirely one-way. He saw Proximal Circumstances as potentially a rigorous way of classifying conjectured intervention mechanisms (Tilley 1993b footnote 1). And his interruptions were becoming a habit, albeit a welcome one: I was once poring over a Home Office file in my office when he burst in, saying he was running a working group on police training discussing conceptual frameworks for the Crime & Disorder Act 1998, and could I come and present mine to them, *now!*

Attempting to develop Proximal Circumstances as an all-inclusive and integrative ‘mechanism map’ of the immediate causation of criminal events, revealed some components missing or understated in the prior situational prevention literature. One of these was the offender’s *resources* for committing crime. ‘Likely’ under Routine Activities included offender capability, but this was under-emphasised (and indeed many subsequent writers refer simply to ‘motivated’ offenders). Similarly, ‘crime facilitators’ were mentioned in the 25 Techniques for situational prevention in a limited way, only covering tools and weapons: missing were skills, know-how, contacts – in fact a range of psychological and social factors. I discovered that Nick Tilley had been thinking along similar lines and we combined forces to produce ‘Going equipped – the resourceful offender’ (Ekblom and Tilley 2000) which happily continues to inspire research including in cybercrime (Chon 2015). Several further things flowed from the thinking behind that article. At a general level there was the principle that *for gaps you need maps* – i.e. to identify what is missing you have to systematise what you know. Conceptually, there was the realisation that *opportunity*, customarily considered part of the situation, actually requires resources to shape and define it: an open window three floors up is only an opportunity for someone with agility, courage and perhaps a ladder and someone to hold it (see Ekblom 2017). Finally, from the resourceful offender I was later led (Ekblom 2007) to explore a range of non-materialistic/non-rational mechanisms including the remorseful, righteous, revengeful, reactive and ready offender: these enriched the ‘cardboard cutout’ model of the offender adopted in situational prevention and offered ways to fine-tune its interventions.

A second missing component identified in the mechanism map comprised people who *increased* the risk of crime, while not (necessarily) committing any criminal act themselves – they could be innocent (a passer-by who happens to block the view of a CCTV camera at a critical moment), careless (leaving their car unlocked), reckless (selling spray-cans to teenagers) or deliberate (e.g. criminal fences). These eventually became called *crime promoters*. This, combined with a sociological input from Tilley’s thinking (e.g. 1992:3) with an emphasis on *roles* has led me to explore the relationship between people/organisations’ *crime* roles (offender, preventer, promoter, victim) and *civil* roles (e.g. user, security guard, landlord, passer-by, designer – see Ekblom 2014). This arguably gives a far subtler and more flexible understanding of who practitioners and policymakers have to influence and how in the complex field of responsibility surrounding a given crime problem, than the Problem Analysis Triangle (www.popcenter.org/about/?p=triangle) with its ‘victim/target, offender, place’ and the rigid, limited roles of ‘handlers, place managers and guardians’ that (together with their ‘supercontrollers’) control or protect these.

Mechanism-based definitions

Developing proximal circumstances, subsequently CCO, as a clear, consistent and integrated suite led me to recognise the need to develop an appropriate *suite* of definitions-in-depth, a theme I have pursued ever since (and which again owes much to Nick Tilley’s own, supporting, interest in the academic and practical utility of clear concepts which was, I often felt, swimming against the tide in both the Home Office and among practitioners). At one level this involved making distinctions such as that between target and target enclosure. At another, I was moved to define more fundamental terms. Thus, back in 1994 I was already defining crime prevention as ‘intervention in mechanisms that cause criminal events’ to reduce the risk of their occurrence (p194). Incidentally, this also pinned down what is meant by intervention which was (and unfortunately still is) loosely (ab)used to cover any kind of action. A publicity campaign is not, strictly, an intervention as so defined. It is the means to involve people in implementing the intervention. The intervention itself is, say, the points at which the recipients of the campaign install good quality locks on their back doors (detering/discouraging offenders) and then actually operate the locks they have installed

(discouraging and defeating offenders who were not put off on seeing the locks). (One could allow for an additional direct deterring/discouraging intervention acting via the *perception* that the campaign meant, say, 'something has been done to tighten security in this area', but this is a long way from the crude 'it was the publicity campaign wot done it'.)

The need to distinguish between mechanisms loosely referred to as deterrence (even by academics who should know better) was first picked up by Felson (1995) in his distinction between deterrence, which related to perceived risk to the offender, and *discouragement*, which related to increased effort relative to reward. Much later, in a project aimed at controlling hostile reconnaissance by terrorists and others (Ekblom and Hirschfield 2014), an original 'deter and detect' distinction in the security literature was found to be seriously wanting, and we progressively added more 'Ds' as we studied the preventive approaches encountered. By the time these reached 11, we were beginning to wonder how exactly to characterise them collectively – what *kind* of action were they? The answer emerged that these were *mechanisms by which interventions influenced offenders*, by some combination of psychological (e.g. disconcert – to startle or disrupt criminal action), practical (e.g. defeat by opaque barrier) and personal (e.g. detain). This SR articulation was a major step forward in clarifying, and then communicating, the concepts for use in a toolkit for security managers, of varying levels of experience, enabling them to cope with developing action plans in complex and diverse contexts ranging from chemical plants to sports stadia.

One of the early publications Tilley produced in the HO Crime Prevention Unit 'brownie' series was on CCTV in car parks (Tilley 1993a). Here, he listed a range of conjectured mechanisms by which CCTV installed in a public car park might be expected to reduce car theft. This would generate hypotheses to explain any outcome pattern. These ranged from straightforward deterrence, to non-obvious ones such as influencing users' choices of where to park (security-alert users could preferentially select sites where CCTV was installed in the belief it would reduce crime, but it was not necessarily the cameras but their own additional protective behaviour which actually served to cut the theft). The mechanisms numbered nine in all.

Not only did this impress me with the flexibility and subtlety the mechanism discourse offered, I was taken with the relationship between practical intervention actions (installing the cameras) and the understanding of how they worked. This led me to formalise the distinction between intervention *principles* (as distilled generic mechanisms centring on one or other of the 11 components of CCO) and intervention *methods* (as the practical realisation of principles). A given method could work via several principles; likewise, a given principle could be realised via several methods. This many-to-many relationship became important in my practical attempts (through a relational database – Ekblom and Pease 1995) to classify the preventive action of Safer Cities and subsequently. It also resurfaced in the hostile reconnaissance toolkit referred to above in which we offered users the choice of 'thinking security' by starting with either a menu of principles (the 11Ds) or a list of methods (surveillance, access control, escort etc.) according to their preference and cognitive style. The issue has unfortunately not been fully addressed in the 25 Techniques listing where a given method (e.g. 'improved street lighting') is shown simply in a one-to-one relationship with a single principle (e.g. 'increase the risks'). A moment's thought on the relationship between the principles of the 'rational choice agenda' (risk, effort, reward) reveals the further issue that these principles are 'interchangeable currency' (Ekblom and Hirschfield 2014) – to reduce risk, the offender can accept a reduced reward, say, by carrying off smaller, more easily-concealed loot; or increase the effort by more carefully seeking the shadows to counter the upgraded lighting. This means that the mechanism a practitioner or researcher *thinks* is operating in a given situational method, may not be the one that actually does function; moreover, the adaptive nature of offenders (Ekblom 1997,

2016) suggests that perturbing the situation in one way may lead to a response in another direction. It is as if the 'universal acid' of mechanisms has eaten through all but the surface of the 25 Techniques table, but its creators and users don't know it yet – like those Tom and Jerry cartoons where Tom walks off a cliff-edge but doesn't fall until he looks down and glimpses the void beneath his feet.

Relative to the 25 Techniques classification of methods, and the Problem Analysis Triangle roughly derived from Routine Activities approach, the added flexibility, subtlety, inclusivity of CCO and its more analytic perspective was not to everyone's taste. I have elsewhere argued the case for providing practitioners (and academics) with a *slightly* more complex conceptual schema to better equip them to handle the *hugely* more complex reality of crime prevention (e.g. Ekblom 2011a). But the entire logic of my approach follows directly and fundamentally from the understanding of the significance of mechanism as elaborated by Nick Tilley and his colleague Ray Pawson (e.g. Pawson and Tilley 1997)

Replication and evaluation: the significance of process knowledge

Nick Tilley and I share an interest not just in evaluation, but the knowledge that is produced by evaluations, and how it is used.

By 1990 I had begun to think quite hard on methodological issues in evaluation (Ekblom 1990, 1992) but largely within a conventional frame of comparing action/control areas in before/after phases, without much consideration of conjecturing, and seeking evidence for, underlying mechanisms. This began to change. As Nick Tilley became embedded within the HO PRG the evaluation of the Safer Cities programme became subject to an informal division of labour between him, responsible for evaluating a sample of individual schemes or themes (the term 'project' referred to the team in a single city which implemented a number of schemes) and myself, responsible for assessing the performance of the programme as a whole. As said, I started out sceptical and a bit threatened by Nick's SR approach, but the universal mechanism acid began to erode resistance and eventually to captivate. This was aided by a process of 'counter-attitudinal statement' writing in which I was asked to summarise the SR approach for my Research and Statistics colleagues. Such statements were a well-known influence technique in cognitive dissonance theory (Festinger 1957) in which apparently freely-written expositions against one's initial position served to change one's opinion. I should have been alert to this as my own PhD thesis was on that theory!

Whatever the case, I found myself warming to the SR ideas. By 1995 Ken Pease and I (Ekblom and Pease 1995) gave considerable space in our *Crime and Justice* review of crime prevention evaluation, to the SR approach. (As an amusing byline, one of the anonymous reviewers of our chapter referred to SR as a 'postmodern' approach which rather perplexed us and Nick too, whom we consulted. His rejoinder was typical, analysing and demolishing the postmodernist interpretation on the basis of an articulate sociological understanding of the concept, which left us, the authors, gasping in admiration.) We had been especially impressed when Nick had produced *After Kirkholt* (1993b), a study of attempted replications, by Safer Cities project teams, of Ken's renowned Kirkholt burglary prevention study (Forrester et al. 1988).

The original Kirkholt work was an action research project endeavouring to reduce domestic burglary in a heavily-hit local authority housing estate in northwest England. Ken Pease and colleagues undertook an assortment of surveys, observations and interviews combined with crime pattern analysis and revealed a range of interesting patterns (including the first inkling of the repeat victimisation phenomenon). This information was then used, in the context of multiagency

collaboration, to design and implement several key interventions. These included swapping of existing coin-operated gas and electricity meters (a target for burglary as well as suspected 'own goals' by the residents when short of cash) and the concept of 'cocoon neighbourhood watch' (mobilising the immediate neighbours of a burgled household rather than a wider and diffuse geographical grouping). Situational interventions were followed by various offender-oriented ones including approaches to helping people control debt. An impact evaluation showed that the Kirkholt project reduced burglary significantly and substantially – by some 65%, with no sign of displacement – and made quite a stir. A year or two later, Safer Cities team leaders were in post and casting urgently around for schemes to implement in their own territories. They were under pressure to devise and implement something fast, as the funding for action was annualised (if it was not spent by the following March, it would turn into a pumpkin – more formally, be clawed back by Treasury). Understandably, many of them chose to replicate Kirkholt. Tilley's study looked at some 14 attempted replications, 3 well-evaluated ones in depth. He found that they were pretty much all miserable failures in terms of burglary reduction. Why was this?

The problem was, that the replications were too-literal copies. The hard-pressed practitioners had copied the *end-products* of the Kirkholt project, not the intelligent problem-identifying and problem-solving *process*, and in so doing they had failed either to determine the appropriate mechanisms of intervention or if they had somehow got this right, to set up the right practical circumstances for those mechanisms to be triggered in the new context.

These insights unfortunately cut no ice with the then HO minister for crime prevention, an exceptionally ignorant holder of that office, who queried why on earth we needed to spend money evaluating replications. But they cut a lot of ice with me. They led me to think about evaluation from a functional perspective: why do we evaluate, at the practice level? The answer is fourfold: 1) to help practitioners facing some kind of crime problem to formulate more clearly what it is; 2) to then help them select intervention methods appropriate to that problem and its context, from the corpus of existing evaluated practice knowledge of what works; 3) if they find such methods, to replicate them, intelligently reflecting underlying mechanisms and customised to context; 4) if they find none, to use the knowledge of mechanisms (perhaps abstracted as principles, as in CCO) to help generate theoretically plausible innovations; and 5) monitor the interventions (replicated or novel) to ensure the desired mechanisms have been triggered (or indeed discover and document new ones, and new contextual factors).

Intelligent replication is a challenge. Realising one or more mechanisms (or abstracted principles) through practical methods is, as noted, a tricky business given the complexities of context and human motivation, emotion and behaviour. Exploring this Tilley-inspired line of thinking led me into the field of cultural evolution, the concept of *memes* (Dawkins 1976; Aunger 2000) as units of replication of ideas (the cognitive counterpart of genes) and the design-related principle of *copy the process, not the product* (Blackmore 1999). Nick Tilley also began to highlight the importance of *know-how* (know what is to be done) as a necessary accompaniment to *know what works*; and *tacit* knowledge (Polanyi 1958; Tilley 2006) as important in replication.

All these strands started to come together as the Home Office began commissioning guidance for practitioners following the Crime and Disorder Act 1998 and the National Crime Reduction Programme. As a contribution to this, and as an organisational descendant of Nick's previously-described eruption into my room at the Home Office, I produced a version of CCO for the UK Crime Reduction Centre website accompanied by the outline of a process model (<http://webarchive.nationalarchives.gov.uk/20100413151441/http://crimereduction.homeoffice.gov.uk/learningzone/cco.htm>). This was taken further when Nick – again – invited me to contribute a

chapter to a *Crime Prevention Studies* volume he was editing on evaluation. (This subsequently became two volumes (13 and 14), partly my fault I suspect due to the length of my chapter which he tolerantly included in its entirety! I should take this opportunity to salute the hard work Nick has put in, in compiling many excellent edited collections.) My chapter, *From the source to the mainstream is uphill* (Ekblom 2002), was a detailed exploration of the challenge of replication in programmes such as Safer Cities, and I remain indebted to him for both the chance to publish and some of the key ideas around which the chapter was constructed.

In that chapter I developed a classification of kinds of knowledge we can have about crime: know crime (its nature and definition), know about crime (its patterns, causes, participants), know what works to prevent it (by what mechanism, in what context – of course), know who to involve (in implementation), know when to implement (relative to other local action), know why (symbolic issues e.g. fairness, justice, which could derail the action), and finally bringing it all together in practice, know-how. Know-how in particular connected with replication, process evaluation and the need to extract and articulate a great deal of practical knowledge in order to share experience and convert preventive principles and methods into a successful reality of new action on the ground. An early consequence of publication was an invitation by the Danish National Crime Prevention Council to advise them on how to formalise member-state contributions of crime prevention case studies presented at the first of an annual series of ‘What Works’ conferences organised by the EU Crime Prevention Network. Thus was 5Is born (Ekblom 2011a and <http://5isframework.wordpress.com>).

Crime prevention did, of course, have an existing process model – SARA (Scanning, Analysis, Response, Assessment) in Problem-Oriented Policing (e.g. Clarke and Eck 2003). But I had come to see it as rather limiting. Broadly put, there was not enough practical detail captured to support practitioners through selection and replication of action, or innovation; more generally, to cope with the messy complexity of real-world preventive action.

The process model, originally loosely built around CCO, became Intelligence, Intervention, Implementation, Involvement and Impact.

- Intelligence covered the Scanning and Analysis stages of SARA.
- Intervention, Implementation and Involvement covered three different aspects of Response which had struck me as too generalised and amorphous to be useful. Intervention referred to the dual perspectives of mechanism-focused principles and practical methods; Implementation the practical tasks of making the interventions happen; and Involvement the people and organisational side of action – thus, involving people in implementing interventions. For example, mobilising householders to fit, window-locks, then use them.
- Impact covered process and impact evaluation, i.e. Assessment.

Each of these top-level headings was progressively subdivided into further subheads. This enabled the often tacit knowledge of practitioners to be prompted and articulated during interviews. It helped place the material obtained on the right places on the knowledge tree, which had a dual benefit. It put like with like, enabling synthesis and contrast (for example ‘in this context Neighbourhood Watch is appropriate, whereas in that context an alternative way of mobilising people is more easily achieved’) and also aiding retrieval (see Bullock and Ekblom 2010).

The SR approach rightly emphasises the importance of *context* in successfully triggering preventive mechanisms. But the term conceals enormous diversity, and if it is to be useful to practitioners and researchers in a systematic way, it needs an additional layer of structure. Essentially, each of the 5Is can define a particular domain of context. I have already mentioned how the *causal* context can

cover the full range of causal influences on criminal events (which can be filed under Intelligence), and the 'mechanism map' into which Interventions are injected. But we can consider the analytically-distinct *context of implementation*, or *context of involvement*. And likewise each of these processes/tasks will work via distinctive mechanisms of their own (for example, there will be particular mechanisms triggered in the course of Involvement>Mobilisation>Motivation>naming and shaming).

An in-depth study of 'Involvement failure' (Ekblom et al. 2012) identified many ways in which the design, installation and deployment of 'Grippa clips', affixed to the underside of bar-room tables to enable customers to protect their bags against theft, came up against people- and organisation-related obstacles. The upshot was, that what all stakeholders agreed was a good physical design, simply failed to be used in one chain of pubs because the management gave insufficient support, the bar staff didn't like it and the customers chose not to use it. The importance of documenting and *learning from failures* was yet another theme highlighted by Tilley (e.g. 2006). Acceptance by practitioners was slow (a column I edited in the UK Home Office's *Crime Prevention News*, headed 'Brave souls required', that invited police to discuss failures, had to fold after several months' nil entries) but now we see the UK Society for Evidence Based Policing holding a conference entitled 'Creating a culture of curiosity: why failure is a good thing'.

Nick Tilley has in recent years become a major star in the firmament of the 'simplifying tendency' of the management of practice knowledge, championing the conventional SARA approach to Problem-Oriented Policing (indeed, the *Tilley Awards*) symbolise this) and in the 'EMMIE' framework for what works in crime prevention (Johnson et al. 2015: **Effect** – the impact on crime (i.e. Outcome in original SR terms), **Mechanism** – how it works, **Moderators** – where it works best (i.e. Context in original SR terms), **Implementation** – how to do it, **Economic assessment** – what it costs). Simplification, or rather, *oversimplification*, is a direction that I have, frankly speaking, resisted. This is on the grounds that real-world crime prevention practice is very messy and complicated and that a moderate increase in the complexity of the frameworks we supply to crime prevention practitioners – *appropriate complexity* – can better enable them to get to grips with this in their working lives (Ekblom 2006, 2011a chapters 4 and 5). Without doubt SARA is far more popular than 5Is, as revealed by Sidebottom and Tilley (2011) although revealing comments from their interviewees such as "Getting over the initial hurdle is difficult but worth the 'frown time'" (p234) were reported. It's also fair to say that 5Is has had only a fraction of the resources devoted to disseminating, supporting and training in SARA. Yet whatever the differences, all the above features of the 5Is approach to the management of practice knowledge – clear definitions, articulating tacit experience, focus on sometimes quite subtle mechanisms, generative nature of theory, intelligent replication process, diverse kinds of context and interest in instructive failures – owe an enormous amount to Nick Tilley's writings, or at least my interpretation of them. An interesting unresolved issue. More generally, the 'crisis of replicability' in social science and beyond (e.g. Stroebe and Strack 2014; see also www.nature.com/news/reproducibility-1.17552) means that replication is a live issue – one that Tilley (and Pawson) hopefully will continue to contribute to.

Designs against crime – how do they work?

I often describe myself as a 'crime scientist fallen among designers', having worked closely with them for around a decade and considered the role of design of products and places in crime for long before that. Designers cherish 'design freedom', creativity and spontaneity, and from a crime preventive perspective (among many others) these characteristics are to be nurtured. This is because, in a context of rapidly-changing technology, business models etc. we have to out-innovate

adaptive offenders (Ekblom and Pease 2014; Ekblom 1997, 2017) in order to keep up; and designers have a strategic role in this. Yet designs must avoid being narrowly-conceived around security (so-called vulnerability-led designs': Gamman and Thorpe 2007) and creatively balance security requirements with a range of others covering, say, aesthetics, convenience, inclusivity and carbon footprint. And they must always work within a field of constraints and enablers: for example the laws of physics determine what they can safely build, and (as with the Grippa clip failure described above) human factors immensely complicate the functioning of physically and tactically straightforward designs intended to reduce crime. This paradoxical relationship between creativity and constraint was brought home both during the Grippa project and in earlier involvement in judging a range of student design awards in an annual competition held by the UK Royal Society of Arts (Ekblom 2012a). Judges were confronted with up to 80 sets of posters setting out a huge diversity of designs for, say, 'spiky-bum anti-theft bicycle seats', rings with a sliding platinum housing to conceal the diamonds when visiting risky locations, rucksacks given false openings with unwashed underwear apparently hanging out, and a range of more sober, yet not necessarily more effective, entries. Before we rated these, we had to discern what they were trying to achieve and how. This was often very challenging. In fact, it led me to develop the *Security Function Framework* (Ekblom 2012b) as a means of articulating the design. This covers purpose (who/what is it for, especially but not exclusively for reducing the risk of particular crimes?); niche (how does it relate to other security arrangements e.g. the Grippa clip is a dedicated *security product*, but the Stop-Thief chair (www.stophiefchair.com/) is a *securing product*, because its main purpose is not crime reduction but somewhere to sit; mechanism (how does it work?); and technicality (how is it constructed and how does it operate?). As ever, an articulation of mechanism in relation to crime science theory is the most fundamental element missing from many designs, but arguably the most necessary. However, not all designers are sold on such a rigorous approach (cf. Lulham et al. 2012) although out of the same stable (Dorst 2015) comes advocacy of design as a disciplined process; and to add to this we also have leading design writer Donald Norman (2010) advocating his own form of appropriate complexity. Whatever the case, the security function framework, heavily dependent on the mechanism discourse, is proving itself capable of getting to grips with designs as diverse as the chairs and clips described, explosion-resistant railway carriages (Meyer and Ekblom 2011) and the design of government districts (Meyer et al. 2015).

Rationality, cognition, neuroscience and more

Mechanisms are now starting to permeate crime science from other domains. Significant among these is the cognitive/neuroscience of decision-making. The Rational Choice perspective (Clarke 2012) is a major pillar of situational crime prevention. From the angle of causation of crime, one can argue that risk, effort and reward are more a kind of universal economics 'foraging agenda' for criminals (and others), than a mechanism per se. Mechanisms come in when we consider how the realisation of the agenda is mediated, by psychological/ neurological processes of perception, decision-making and action. Crime science researchers have finally begun to take a serious interest in these underlying processes (e.g. Bernasco et al. 2017; Bouhana, 2013) and we now have to address mechanisms covering, say, thinking fast and slow (Kahneman 2011); or the connections between prefrontal lobes (decisions) and the amygdala (e.g. fear) in the offender's brain.

Something has to happen *between* decisions, and this something, goal-directed action, is equally mechanism-mediated. A case in point is the operation of the *executive function* in ensuring the offender follows a cognitive script for offending (Cornish 1994); when the script ceases to offer guidance, turns to improvisation to maintain the strategic course; and either adheres to decisions made or changes course impulsively or deliberately (Ekblom and Gill 2016). Executive function is a

major focus of generic cognitive/neurological research (e.g. Diamond 2013) covering processes of inhibition, goal-directedness, attention and adaptability besides being a mechanism of central interest in some theories of crime causation (e.g. Wikström's (2014) Situational Action Theory). It is covered (admittedly rather loosely) under CCO's 'resources to avoid offending', and 'resources for offending' depending on whether the focus is on the executive function *stopping* someone from committing crime (e.g. impulse control) or *facilitating* it (e.g. cool nerves during hostile reconnaissance). These executive mechanisms have yet to command much attention in mainstream situational prevention. But understanding them should benefit situational interventions that boost the former (e.g. removing temptations) or interfere with the latter (e.g. disconcerting offenders by reactive security lighting).

An interesting challenge for future crime scientists is how to articulate the diverse mechanisms underlying everything from human perception, reaction, decision, behaviour and learning, and to identify which are relevant for the causation of crime and for its prevention. It is also necessary to map the behavioural, cognitive, neurological, social and ecological discourses onto one another. Attention to *ontology* – the formal naming and definition of the types, properties, and interrelationships of the entities that fundamentally exist for a particular domain of discourse – is something that can usefully be emulated from the computer scientists coming among us, as is the explicit treatment of discourses more generally (Ekblom 2012a). The discourse approach can help give a very clear rationale to action in which mechanisms feature strongly: for example, reduce burglary (goal discourse) *by* installing and operating window locks (practical method) which act *by* blocking opportunity (generic situational discourse) *by* deterring and discouraging offenders (broad mechanisms) *by* taking extra time, requiring extra resources and/or generating extra noise which could alert preventers (specific mechanisms). How much more Scientific Realist could one get?

On the preventive side, increasing the risk and effort and reducing reward are often cited as key mechanisms to characterise and organise interventions. These are, however, limited in subtlety and range. Wortley (2017) adds a wider set of motivational/emotional mechanisms under situational *crime precipitation* one of which – provocation – has been incorporated ad hoc into the 25 Techniques of situational prevention. The 11Ds, mentioned above, characterised yet more mechanisms. Increasing risk and effort and reducing reward do have the benefit of robustness and simplicity (and as such were adopted for EMMIE), but it's not clear whether they faithfully describe the underlying preventive mechanisms, for one simple reason: these quantities are interchangeable currency. If, say, some place manager increases an offender's risk from shoplifting by installing CCTV, the perception of that heightened risk could directly deter the offender; on the other hand, the offender if sufficiently motivated could decide to devote more effort by wearing a disguise or taking longer to steal.

This live, dynamic and subtle nature of mechanisms, and their basis in interactions between the components of the crime situation, makes them fascinating and challenging to research as well as practically tricky to implement in a reliable and robust way. Intriguingly, the critique of simple additive models of action research and corresponding evaluation designs is where Pawson and Tilley's (1997) *Realistic Evaluation* volume caused such a stir and not a little controversy. The authors argued that mere presence or absence of a neighbourhood watch scheme should not be treated as a simple add-on variable tipping the balance in favour of security, but should instead be considered as a perturbation of a complex system activating a range of possible mechanisms in interaction with the context. However, when conveying evaluation findings to practitioners, we face a challenging trade-off between subtlety and simplicity in deciding how and to what extent to advise them on interventions, implementation factors and contextual moderators.

Following the mechanism perspective, particularly when paired with system thinking and user-centred design led me towards the science of complexity, complex adaptive systems and subtlety (e.g. Eklom 2011a; see also Chapman 2004, Kurtz and Snowden 2003); this is a direction which Ray Pawson seems to have taken in, say, *Evidence Based Policy* (2006) but not so the 'Practical Tilley' of Problem-Oriented Policing and EMMIE. This is an interesting tension that crime science has yet to resolve. Medical science seems to have coped with the equivalent issue, for we see both advanced medical science articles and texts, and practice guides ranging from advanced surgery down to family first aid books, but all informed by the same leading-edge research, and the same underlying scientific concepts and frameworks. Engineering science is now not so user-oriented: lift the bonnet of a stalled car and you will be greeted with signs galore saying 'no user-serviceable parts'. The answer for crime science would seem to be a multi-pronged attack:

- 1) Simplify the model of causation as far as possible *but no further* (to paraphrase Einstein)¹
- 2) Train practitioners to handle the appropriate complexity that remains by getting a more sophisticated general schema of causation and intervention into their heads, so the specific, detailed guidance on particular interventions, problems or contexts has suitable, and sufficient, mental machinery to ingest and engage with it
- 3) Invest in (co-)designing high quality interactive guidance material that *makes sense* to practitioners coming to it at different levels of sophistication (novice, experienced, expert etc.), and that is designed to *minimise the cognitive load* on the user e.g. by presenting limited screen views defined by successive user choices rather than the entire conceptual space all at once in, say, a single diagram
- 4) Change the *police culture* – it never ceases to amaze me how police officers individually and collectively are prepared to ingest and apply an enormous and complex body of doctrine and law (defining crimes, empowering/constraining police procedures, setting out rules of evidence etc.) yet shy away from some elementary social research material, as reported among many others by Bullock and Tilley (2003) and Bullock et al. (2006)
- 5) And if 4) fails, seriously consider trying to shift the responsibility for more sophisticated preventive work to *alternative occupational groups* less hostile to analytic approaches of the kind involving 'the triggering of mechanisms in contexts'.

Conclusions

Space precludes me from tracing out yet more contributions to my thinking from Nick Tilley – to briefly mention just one, his frequent recourse to Popper and the evolution of ideas was one strand that nourished my evolutionary approach to crime (e.g. Eklom 1997, 2002, 2016).

While much of the penetration of crime science by the SR approach can be attributed to Tilley (and his collaborator Pawson), there have also been direct feeds from the mainstream of Scientific Realism among the engineers, neuroscientists, chemists and others who are steadily joining the crime science interdiscipline. (A puzzle and a disappointment is the more recent, but equally enthusiastic, adoption of the mechanism discourse, and the interest in practice knowledge of P-O Wikström (e.g. 2007, 20014), yet without any cross-reference to SR à la Tilley.) But one could with much justification say that Nick Tilley has laid the pathway for the ready acceptance of causal mechanisms and the rest of the package among those crime science researchers who, like me, began their careers taking a conventional social science perspective. And similarly, he has supplied a reassuringly familiar discourse for those entering the field from hard science and engineering backgrounds. All this is especially intriguing since his core discipline is sociology, which, it must be said, has not fitted well with the academic culture of psychologists (myself included) who have been

at the heart of developing situational prevention. This speaks of the power of mechanism as 'universal acid' in dissolving and re-forming my own thinking and that of many colleagues. But it also speaks volumes about the personal characteristics of Nick Tilley himself – engaging, open-minded, simultaneously rigorous, analytic and constructive, and adventurous.

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Note

¹ The quotation from Einstein is 'Everything should be made as simple as possible, but not simpler'. This is on dozens of quotation websites but none gives original source.