Designing Products Against Crime

Paul Ekblom

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SYNONYMS

Designing out crime, design out crime, hot products

Overview

Crime, unlike mercy, doesn't fall like a gentle rain evenly covering the land – it gathers in pools. Risk of crime is concentrated in particular places (Eck et al., 2007), on particular victims (Farrell and Pease, 2008) and on particular products, the focus of this chapter. This concentration has two kinds of implication. On the one hand it gives strong clues about the causation of criminal events, whether concerning the targets or tools of those crimes or the insecurity of their immediate situation; on the other, it guides the kind of situational crime prevention (SCP) strategy that can be adopted. That strategy can be developed either in reaction to an established pattern of risk, or in anticipation, but in either case the underlying rationale is the same. If you – as policy-maker, police officer, designer, manufacturer or consumer – can identify the targets and tools at elevated risk of featuring in crime, then you can respectively concentrate your preventive policies and practices, direct your costly operational resources, design and incorporate elevated security performance in particular products, and choose the make and model of product you buy according to security ratings, as happens, say, with the UK car theft index (Laycock, 2004).

There is much practice and research into how the design of the built environment increases, or decreases, the risk of crime. But this chapter covers products, essentially two- or three-dimensional objects that have been designed and manufactured in some way, and which may be portable (e.g. laptops), mobile (e.g. cars), movable (e.g. home cinema TV sets), incorporated (e.g. a tamper-evident lid for a medicine container) or installed (e.g. a cash machine).

Classes of items at elevated risk of crime have been dubbed 'hot products' (Clarke, 1999), revisited below. Products may be hot by virtue of their intrinsic material value (such as jewellery or bronze statuary), their manufactured-in value (such as a mobile phone) or some combination. In either case, this 'reward' value (using rational choice perspective terms – Cornish and Clarke, 1986) is often accompanied by some kind of opportunity, enabling the product to be taken with relatively little effort or risk to the offender. Of course, risk and effort may partly reside in the nature of the environment in which the products are typically found, such as whether guardians of targets (Cohen and Felson, 1979) or other kinds of crime preventer (Ekblom, 2011) are present, capable and motivated. But much of that opportunity may reside in the rewarding and/or vulnerable design of the product itself; and

even if the design is not obviously 'culpable' (e.g. an easy-to-steal car or a provocative poster) design solutions may be the most reliable and/or cost-effective remedy.

The first section of this chapter begins by defining key terms such as risk and risk factors. It then reviews how the latter feature in situational crime prevention notably via the phenomenon of hot products; the underlying causes of elevated risk; the risk life-cycle of products. The second part covers the response to elevated risk, notably via intervention through design, covering both content and process; anticipation of future risks; and evidence of effectiveness. As said, the focus is on two-and three-dimensional manufactured products excluding buildings and landscapes although some such products can be considered enclosures (such as handbags or vehicles) with 'access control' resemblances to buildings (you can break into a building or car, or slip or slash open a handbag or purse, to reach the contents you wish to steal). (The architectural approach known as Crime Prevention Through Environmental Design (CPTED – e.g. Armitage, [ref to chapter in this volume]) has developed its own terminological traditions – not always clear ones – and concepts and theory need integrating with SCP.) The important role of businesses in creating or reducing crime opportunities in manufactured products, and the difficulties of influencing their 'design decision-making' to give some weight to security, is covered only briefly; more is in Ekblom (2012a) and Hardie and Hobbs (2005). The creativity of criminals themselves is well-addressed in Cropley et al. (2010). The role of government in incentivising and otherwise leading on design is discussed in Clarke and Newman (2005) and was exemplified in the UK Home Office's Design and Technology Alliance (see www.designcouncil.org.uk/our-work/challenges/security/design-out-crime/ for useful case studies).

Fundamentals of Risk and risk factors

Definitions

The term 'risk' is used loosely in SCP, normally covering probability alone, and implicitly the risk of *harm to offender*. But risk can be decomposed into possibility (the nature of the undesired events), probability and harm (Ekblom, 2012b), and prevention can address each. Eliminating the *possibility* includes, say, replacement of tempered beer glasses with toughened or plastic ones so they cannot be misused as weapons (see e.g. www.designcouncil.org.uk/our-work/challenges/Security/Design-out-crime/Alcohol-related-crime/). Reducing the *probability* includes providing clips at tables in bars to combat theft of customers' bags (Ekblom et al., 2012 and see www.designcouncil.org.uk/our-work/challenges/Security/Design-out-crime/Case-studies1/Stop-Thief-Chair-and-Grippa-Clips/). Reducing the *harm* includes designing an easy-to-use back-up system for numbers stored on mobile phones (the numbers on stolen phones would otherwise be lost). Crime prevention approaches have until recently underemphasized harm reduction, focusing instead on 'cutting the numbers of incidents'. Harm is both something for designers to avoid, reduce or mitigate, and a consideration in setting priorities within the design process. Harm can be further divided: With a stolen purse harm could befall the user (if assaulted during a snatch), the product (the bag handle ripped), contents taken or damaged (e.g. phone) and a whole new range of recipients through 'propagated' offences (e.g. identity theft from bank cards, or burglary using stolen keys).

'Risk factors' is a concept derived from health (e.g. risk factors for heart disease). It is one of the few concepts used right across the crime prevention field. Coverage ranges from risk (and protective) factors for offending (such as poor parenting) through to criminogenic properties and features of places (e.g. the Burgess scale (Armitage, 2006)) covering the immediate environment of houses such as whether they are sited on a corner plot), through to products (e.g. their value-to-weight ratio – Cohen and Felson, 1979).

Risk factor approaches in Situational Crime Prevention

The risk factor approach to products and crime was pioneered, like much else, by Cohen and Felson (1979) and Clarke (1999). Cohen and Felson generated the first of many acronyms, in the shape of VIVA. Value, Inertia (ie weight), Visibility and Access are a set of risk factors empirically backed by, among other things, correlating the decreasing weight of particular products (like TV sets) in the Sears catalogue with increasing crime risk. Clarke extended the analysis in a report using target-of-crime data from, for example, the British Crime Survey, to generate the more widely-used CRAVED acronym:

- **C**oncealable
- **R**emovable
- **A**vailable
- **V**aluable
- **E**njoyable
- **D**isposable

CRAVED focuses more clearly on how the properties of particular classes of product connect to criminal opportunity from the offender's perspective, both as rewarding ends in themselves (Valuable, Enjoyable) and as means to achieving those ends via reduced risk and effort (Concealable, Removable, Available, Disposable). Examples of hot products include mobile/cell phones and cash.

Other risk-factor acronyms have since emerged to demonstrate the versatility of this approach including AT CUT PRICES (Gill and Clarke, 2012). This characterises fast-moving consumer goods like batteries:

- **A**ffordable
- **T**ransportable
- **C**oncealable
- **U**ntraceable
- **T**radeable
- **P**rofitable
- **R**eputable
- **I**mperishable
- **C**onsumable

- **E**valuable
- **S**hiftable

A complementary 'protective factors' approach was developed by Whitehead et al. (2008) who summarised the crime-resisting properties to design into mobile/cell phones. IN SAFE HANDS describes phones with these characteristics:

- **I**dentifiable – by owner, e.g. through marking
- **N**eutral – anti-theft design features should not adversely affect user's experience or elevate risk of other crimes
- **S**een – to be protected – deterrence
- **A**ttached – mechanical/electronic links to its owner
- **F**indable – lost/stolen product can be tracked and found
- **E**xecutable – can be deactivated if lost/stolen
- **H**idden – e.g. about the person, and used covertly
- **A**utomatic – security built-in/automated
- **N**ecessary – to be the owner, to be able to use product, e.g. via mechanical keys, codes, biometrics
- **D**etectable – make it obvious product is being/has been stolen, e.g. via alarm
- **S**ecure – protection itself should not be easily removable or hackable

Most of these factors describe the causal mechanisms whereby risk is reduced. Neutral and Automatic relate to avoiding interference with other design requirements for the user, and Secure describes self-protection of the security function. The latter connects with Ekblom's (2012b) distinction between a security feature on a product being 'in function' (i.e. delivering the protection as intended) and 'as object' (being a target of an attack intended to disable the security, steal the product for its valuable material or vandalise it).

The risk factors approach, or at least how it is realised in practice, can be criticised. For example, Concealable has a very different role depending on *when* in the theft '*script*' (Cornish, 1994) the concealment occurs (Ekblom and Sidebottom, 2008): when the thief is seeking a target (concealed in owner's pocket) versus when the thief is making off with target (concealed in thief's pocket). This has significant practical implications, introducing a design conflict between making the product concealable for users but not for thieves. Resolutions may involve active discrimination, for example with computers which 'report themselves' to owners or recovery companies such as Immobilise when separated from their registered place of use; or cash-in-transit boxes which churn out smoke when stolen.

Risk factor lists are also somewhat ad-hoc. To make the approach more systematic, and to augment the capacity for exploring empirical risk patterns and generating new lists, an abstraction can help. Ekblom (e.g. 2008) devised the Misdeeds and Security framework to characterise very generic crime risks (and corresponding prevention opportunities) originally for assessing the criminogenic/criminocclusive impact of innovations in science and technology. The misdeeds are broad ways whereby products can feature in crime: a camera phone, say, can be

- **M**isappropriated or stolen
- **M**istreated or deliberately damaged
- **M**ishandled, e.g. smuggled
- **M**isbegotten or counterfeited
- **M**isused as a tool for crime, e.g. in anonymous drug deals
- **M**isbehaved with, e.g. cyber-bullying

Even broader is to treat the product as a *target* of crime (the first 4) or *contributor* to crime (the last 2). The contributor concept connects with the 'crime facilitators' – tools or weapons – of SCP (e.g. Clarke and Eck, 2003) and 'resources for offending' in the Conjunction of Criminal Opportunity framework (Ekblom, 2011)). A product could, of course, alternatively act as a *resource for crime preventers* as discussed below.

Underlying causes of risk

Risk factors are *correlates* of heightened possibility, probability and harm attending particular products. What causal mechanisms underlie them? This is important for connecting the nature and design of products with underlying *theory*. Theory confers the capacity to generate variety in candidate modifications and innovations which are a priori plausible rather than 'shots in the dark'.

Sometimes elevated risk comes predominantly from *exposure* factors – some products tend to be left unattended (e.g. cars) or worn or used in risky environments (bling jewellery in clubs, mobile/cell phones on late-night streets). More localised exposure factors include being close to markets for stolen goods (Harris et al., 2003); being in locations where drug addicts steal to fuel their habit; or being the subject of aggressive and incautious sales techniques that leave valuable items accessible on the retailer's shelves.

Otherwise, predominant causes centre on products themselves. *Value* is obviously important here – even if a satnav is concealed in a compartment in a car, offenders may seek it out. Value of course can change, as with steep fluctuations in commodity prices (Sidebottom et al ref). Other motivating causes engendered by products include acting as *precipitators* in the crime situation (Wortley, 2008). These include *prompts* (drawing attention to a stealable object, such as a flashy new bike) and *provocations* (e.g. a coin-operated drink dispenser that swallows money and doesn't deliver).

In yet more cases, some sort of inherent *vulnerability* attends the product. The term vulnerability has been used variously but Ekblom and Sidebottom (2008), attempting to define a consistent suite of product security concepts, suggest it be confined to covering all criminogenic properties (those enhancing probability of crime) of products *except* the motivation they engender. These normally relate to being seen and taken by the offender. In the case of harm, the product can be inherently *susceptible* to the actions of the offender – easily damaged, tampered with etc.

These causes often reinforce one another. For example, properties that make phones inherently attractive to offenders, such as small size and portability, also make for ease of theft. Perhaps the most generic cause of elevated risk of mass-produced products is what

might be called their *promiscuity* – they can be bought by anybody, sold on by anybody, used by anybody and virtually identical copies may be found throughout the community.

Vulnerability and susceptibility are not absolutes but depend on the resources the offender can bring to bear in taking, damaging or manipulating the target product. These include other, misused products (e.g. portable cutting tools), and strength and dexterity (e.g. breaking anchorages and picking locks). Reflecting this understanding, insurance specifications for secure products like vehicles nowadays are stated as *performance criteria* (e.g. 'resist attack by currently-available tools for minimum 5 minutes') rather than technical construction (e.g. 'lock must be made of manganese steel').

The risk life cycle of products

Felson (1997) observed that, besides a life cycle of legitimate use, products have a criminal one too:

1. Product does not exist
2. Product exists, but few consumers know how to use it
3. Product spreads, gains interest, worth stealing
4. Product everywhere, no longer worth stealing

This should produce an 'inverted U-curve' over time, of accelerating then decelerating risk. However, the 'criminal nirvana' of saturation rarely occurs in reality. Both fashion, and marketing/manufacturing tricks to get people to buy the latest model (not to mention true obsolescence and product unreliability) continue to drive both legitimate consumption and theft long after everyone possesses their first mobile phone.

Fundamentals of the response to elevated risk

There are several broad strategies for responding to elevated risk of crime associated with particular products. The products can be:

- Safe – kept in a guarded or locked environment, like bullion
- Secured after-sale – protected by a dedicated security device (e.g. a 'crooklock' linking steering wheel and brake pedal of unattended cars)
- Secured in production – incorporating specialized security components like anti-counterfeiting stickers
- Security adapted – where design features explicitly reduce vulnerability (like anti-pick locks) or lower value (like the folding Puma bike whose diagonal down-tube is replaced by a tensioned steel cable, which unlocks at one end to wrap round the bike stand, and which if cut, renders it unrideable and unsaleable – see www.designagainstcrime.com/projects/puma-bike/)
- Inherently secure – by virtue of weight or bulk, e.g. home cinema TV sets are currently awkward to carry off (but future technologies may see roll-up versions)

Applying the Misdeeds and Security framework cited above (fuller treatment is in Ekblom, 2008), products can be:

- Secured against Misappropriation – e.g. vehicles with built-in immobilisers
- Safeguarded against Mistreatment – e.g. street signs that avoid couching regulations in provocative, confrontational terms
- Scam-proofed against Mishandling and Misbegetting – e.g. fold-over airline baggage labels concealing holidaymakers' addresses from burglars' touts; or anti-copying functions within DVDs
- Shielded against Misuse and 'Sivilised' against Misbehaviour – e.g. 'once-only' syringes, waste bins that reveal their contents – including hidden bombs (Lulham et al., 2012 and see www.designcouncil.org.uk/our-work/challenges/Security/Design-out-crime/Case-studies1/An-anti-terrorist-rubbish-bin/) or metro station seating shaped to discourage rough sleeping

Design and the design process

Links with situational crime prevention

Product design connects closely with, and applies, many of the 25 techniques of situational prevention (see www.popcenter.org/25techniques/). It can even extend this list, for example with the concept of 'target softening' – with, say the lock whose bolt can swivel in its housing, causing hacksaw blades to slip.

More theoretically, product design engages with the risk, effort and reward (as encountered or perceived by the offender) of the Rational Choice perspective (Cornish and Clarke, 1986). The Karrysafe handbag (www.designagainstcrime.com/projects/karrysafe/) has a Velcro fastening which increases the risk of the owner hearing or feeling the thief's action. An anchor cable for securing laptop to table-leg increases the effort and resources (a cutter is needed to release it). Ink tags clipped to expensive clothing spoil the reward when shoplifters try to remove them.

SCP also seeks to manipulate Wortley's (2008) *crime precipitators*, which add emotional/motivational/perceptual influences to the opportunity to act out the emotion or realize the criminal goal thus awakened. A frustrating door entry system can provoke damage from 'machine rage'; a stylish new mobile phone can prompt thoughts of theft.

Even if the design is not obviously 'culpable' for a product's elevated crime risk, design solutions may be the most reliable and/or cost-effective remedy, for several reasons:

- Design potentially removes the burden of effort from guardian of target products: with central locking, for example, car owners no longer must remember to lock all the individual doors of their vehicle
- Mass production potentially enables incorporation of security into a huge proportion of product classes and individual items, covering many individual crime situations

- Such mass coverage can supply the 'herd immunity' needed for impact – when the proportion of a particular kind of items protected is high enough for thieves to give up on the whole category

Designers can confer criminocclusive or harm-reducing properties on their products by intervening in the materials (e.g. resistant to damage), structural features (e.g. concealable) or functionality of a product (incorporating security or securing functions). Even the products' packaging can be recruited for security (Segato, 2012). Criticisms of the design approach centre on 'paranoid products' (Gamman and Thorpe 2007) where the security focus is excessive, fear-arousing, ugly or inconvenient. But these apply to *poor* designs and clunky 'engineering' solutions. Done properly, design can resolve a range of contradictions or 'troublesome tradeoffs' (Ekblom 2008; 2012a,b) for example between security and aesthetics, cost, convenience and social inclusion (e.g. locks usable by elderly/disabled people).

The important thing is that designers capture all these requirements in the design *process*, which should begin with a penetrating analysis of the diverse stakeholders' interests. This should provide the basis for an effort to maximise the meeting of the often-contradictory requirements – not by seeking compromises but by applying ingenuity and creativity in a process of iterative development and testing (see Ekblom, 2012c). The end result should be simultaneously user friendly whilst abuser-unfriendly (Ekblom, 1997). Further accounts of the design against crime process are in Thorpe et al. (2009) and www.designagainstcrime.com/methodology-resources/design-methodology/#users-abusers; and on the UK Design Council website. See the 'Double-Diamond' model of design at www.designcouncil.org.uk, the guide to designing out crime at www.designcouncil.org.uk/our-work/challenges/Security/Design-out-crime/Design-out-crime-guide/.

To support a more efficient, and potentially more effective, design effort several preconditions must be established:

- First, designers require a 'think thief' (or 'think terrorism') mindset (Ekblom, 1997), which may not come naturally if they assume all those who will encounter their product are legitimate users and honest, well-behaved citizens
- Second, they need the simultaneous guidance and constraint offered by theoretical principles, so they reliably come up with plausible ideas as a starting point (though we should preserve the 'wonky thinking' and importation of 'foreign' ideas that generate true novelty)
- Third, they need 'design freedom' to innovate, which is best served by performance-based requirements (as described) and tested theoretical principles rather than detailed technical specifications or specific exemplars of products that have successfully resisted crime – though particular security features can be innovatively recombined and tweaked to adapt to new products or new contexts of use
- Finally, developing a clear design rationale (Ekblom 2012c) is important both to sharpen thinking and communicate with other designers and clients. One such rationale is the Security Function Framework (Ekblom 2012a). This systematically describes products in terms of:

    1. *Purpose* (what are they for?)

2. *Security niche* (how do they fit with the 'ecology of security' – are they e.g. security products, securing products like 'Stop Thief' chairs for cafes with notches to securely hang bags behind one's knees (see www.designcouncil.org.uk/our-work/challenges/Security/Design-out-crime/Case-studies1/Stop-Thief-Chair-and-Grippa-Clips/), or inherently secure products?)
3. *Mechanism* (how do they work in cause-effect/theoretical terms?)
4. *Technicality* (how are they constructed and how do they operate?)

Retrospective descriptions of products using this framework include the Grippa clip for securing customers' bags to bar tables (Ekblom et al., 2012); Meyer and Ekblom (2011) use it to provide a prospective specification for an explosion-resistant railway carriage.

Some of the above preconditions may arguably militate against individualistic deployment by talented designers of sheer intuitive genius. But their establishment enables society to build a broader design against crime capacity, one that enables more of the 'field of emerging products' to be covered on a more routine basis. We thus raise the overall ground level of design fitness rather than achieving a few spectacular, but isolated, peaks.

Anticipating risk through design

Every new product design is a bet on the future, whether concerning market success or undesired side-effects like crime. Continual arrival on the market of new, naively insecure products generates what Pease (2001) calls *crime harvests,* followed by hasty retrospective efforts to cope with the crime and clumsily patch the damage by remedial design. The classic example has been with mobile/cell phones. While older 'phone cloning' leaks are now plugged with the switch from analogue to digital systems, arguably the early vulnerabilities enabled the establishment of a crime market, with a persistent corpus of criminal expertise, criminal service providers, and criminal networks.

Advances in technology also produce a steady stream of new resources for crime, like cordless drills, or pocketable 12V batteries (which can be misused to energise car door locks). Previously secure items become vulnerable overnight. In fact, adaptive, entrepreneurial offenders and a changing technological backdrop set the scene for arms races between offenders and preventers, especially designers. The classic case is the evolution of the safe. The pace of the race is boosted by dissemination through the Internet – there are, for example, many lock-picking forums. Such arms races are described in Ekblom (1997, 2005). The basic strategy for handling them is 1) to develop ways to anticipate offender moves and countermoves, and 2) to build designers' capacity (and manufacturers' will) to out-innovate the offenders and more generally to design variety and upgradeability into products.

The risk factor approach naturally primes anticipation. An ambitious attempt to develop a theft-proofing approach for personal electronic products was the EU-funded Project MARC (Armitage, 2012). The basic plan was to devise a system for 1) determining the anticipated risk of theft attending some new product exemplar and then 2) incorporating, at the design stage, a commensurate level of security (obviously, products judged to be potentially at

elevated risk of theft from their own properties and/or context of use should be given correspondingly higher security specifications). An attempt was made to try this out with a sample of existing mobile personal electronic products, rated by diverse experts, but various difficulties arose. For one thing, it was judged a security checklist approach would impose an artificial ceiling on the exercise of ingenuity and skill in crime preventive design. This could lead designers to design-down to the level of security required by the checklist and militate against innovation. The security checklist also understates the degree to which security is specific to product type, which rather removes the justification for standardization. Nevertheless, this first serious attempt at crime proofing of products is unlikely to be the end of the story. The original lead researcher, in a recent reprise (Armitage, 2012), makes a strong case, with practical suggestions, for taking a modified approach forward.

Horizon-scanning and foresight approaches (Department of Trade and Industry, 2000) acknowledge the need to entertain diverse possibilities when making products robust to the future: specific predictions will likely be wrong. One such case was the TV set-top box, designed to allow analogue TV sets to receive digital signals. This seemed a likely hot product, until the service providers changed their marketing strategies from selling the boxes at cost, to heavily subidising the price and recouping revenue from the additional service. Given such uncertainties designers could cope by incorporating into their products some flexibility and upgradeability of the security function.

Mobilizing design of products against crime

Designs are often intended to work with human crime preventers. The Grippa clip (Ekblom et al., 2012) for example requires bar customers to fasten their bag to it. Others work against unintentional crime promoters. The M-shaped 'CaMden' bike stand designed by Adam Thorpe et al. (2009) on the basis of extensive research into locking behaviour and secure parking configurations) nudges cyclists to lock their bike securely (both wheels and the frame) rather than relying on a single lock in the middle of the crossbar, which leaves the wheels removable and the frame liable to misuse as a tool for its own theft – serving as a lever to snap the lock.

Mobilisation of preventers is challenging. Ekblom (2012d) describes how various mobilisation failures among bar customers, bar staff, management and senior company executives of one company left the Grippa clips unused (though not so in other companies' venues).

Governments could play various roles in modifying criminogenic products (Clarke and Newman, 2005). Policy justifications for governments to mobilise companies centre on 'polluter pays' principles where a company that generates crime opportunities that fall as 'externalities' on other victims or taxpayers is required to modify their products or to compensate in some other way (e.g. Newman, 2012; Roman and Farrell, 2002). Mobilisation can be motivated through incentives including tax breaks, regulations and 'naming and shaming' of criminogenic designs. A useful review was undertaken by the UK Home Office (2006). An example of incentivisation of vehicle manufacturers to improve security through awakening market demand is the UK Home Office's Car Theft Index (Laycock, 2004). This encourages buyers to take theft rates of particular makes and models into account when choosing which to purchase. (Learmount, 2005, makes the wider case for demand-led influence in a review of the field.) Similar pressures from insurance companies have also been effective (Hardie and Hobbs, 2005).

Does design against crime work?

Assessment and feedback from workshop tests, field trials, user and service engineer experience and ultimately sales, profitability and market leadership are inherent to the iterative process of directed improvement that is product design (Thorpe et al., 2009). In impact evaluation and cost-effectiveness terms normally applied to crime prevention, however, there is unfortunately little hard evidence that relates to product design as opposed to 'target-hardening' and other situational approaches in general. Such evidence as exists is often characterized by weak research designs; formally evaluated products were summarized in Clarke and Newman (2005, Table 4) and few such studies have emerged since.

One reason is that prototypes are expensive to produce and test in sufficient quantities to support an impact evaluation of sufficient statistical power (Bowers et al., 2009). Another is the timescale for 1) developing a product then evaluating it within a typical research funder's timeframe.

Circumstantial, correlational evidence points to the contribution of vehicle security technology towards the substantial and sustained reduction of theft of cars in the UK in recent years, following implementation of a European Directive on compulsory factory-fitting of immobilisers from 1998 (Sallybanks and Brown, 1999; Webb, 2005). British Crime Survey figures (Home Office, 2007, Table 2.01) show theft of vehicles reduced by 65% from 1995 to 2006-7 following the design of improved security into the vehicle. None of the case studies commissioned by the Design Council for the Home Office have been formally evaluated.

Other evidence is more anecdotal but almost entirely self-evident (Clarke and Newman, 2005). An example is the fabric curtain between certain London Underground train carriages, retrospectively fitted to stop boys riding the couplings. A glance reveals nowhere left to stand. But self-evidence cannot be taken for granted; and gives no information on comparative cost-effectiveness.

A recent study (Sidebottom et al., 2009) of attempts to reduce bike theft by installing advisory stickers on the bike stands has yielded reliable intermediate outcome evidence, important where behavioral change of people acting as crime preventers or promoters (Ekblom, 2011) is sought. The stickers were designed after systematic observation of bike-locking behavior and analysis of perpetrator techniques. The simple advice – lock both wheels and frame to the stand – yielded significant and substantial reduction (from 62% to 48% of observations) in the proportion of bikes locked insecurely (available funding did not, however, cover evaluation of impact on theft.)

Conclusions and future research

The practice of systematically designing products against crime, and the research into that practice, have barely left their infancy. Concepts and frameworks are beginning to emerge (and will need further integration with one another and with other crime-oriented disciplines like SCP or schools of practice like CPTED). They have only superficially tapped the wealth of knowledge and experience that is the field of design.

The emerging domain faces a significant challenge in motivating designers, producers and consumers to press for, and to use, secure designs. And any knowledge that does accumulate must be considered a 'wasting asset', vulnerable to becoming out of date with social and technical change and adaptive offenders. Finding ways to incentivize designers and their clients, and developing and building innovative capacity among designers, is the only way to keep ahead in the long run.

We still lack a sufficient range of rich and rigorous case studies to build on. In particular, the effort to find hard evidence of the cost-effectiveness of product design against crime must continue. Only then will design against crime fare better in obtaining sustained funding and attention from government. The evidence may also help convince consumers to favour products so designed, and manufacturers to routinely include security in their requirements capture.

Related entries

Armitage [CPTED]

Brantingham and Brantingham [Crime Pattern Theory?]

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