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Burglars' Take on Crime Prevention through Environmental Design (CPTED):

Reconsidering the Relevance from an Offender Perspective

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Abstract

Crime Prevention through Environmental Design (CPTED) represents a multi-faceted approach to crime reduction that draws upon theories from urban design, psychology and criminology. Yet there remains a lack of clarity regarding CPTED's definition and scope. CPTED has been defined by, amongst others Crowe (2000), Ekblom (2011) and Armitage (2013), and the principles upon which it is based have seen even greater discrepancy. Conscious that these principles have primarily been defined by academics and policy-makers, this research aims to rectify this imbalance. A sample of twenty-two incarcerated prolific burglars from three prisons (England), were asked to describe their response to sixteen images of residential housing. The results confirm that the design of residential housing influences burglar decision making, but that the principles of CPTED should be re-examined, with surveillance, and physical security a clear deterrent, yet management and maintenance and defensible space not considered as important in offender decision making.

Key words

Burglary, CPTED, Crime Prevention through Environmental Design, Crime Science, Situational Crime Prevention

Introduction

Crime Prevention through Environmental Design (CPTED) emerged in the 1970s and 1980s as an innovative approach to crime reduction that incorporated architecture, urban design, psychology and criminology and exemplified the multi-agency model of crime reduction that encouraged (in some countries required) relevant authorities to take responsibility for the impact of their functions on crime and disorder. Yet whilst its counterparts Environmental Criminology and later Crime Science were embracing this emphasis upon interdisciplinarity, CPTED remained the poor relation. Its intentions are faultless, its precision not so. CPTED has been defined (and redefined) by, amongst others, Crowe (2000), Ekblom (2011) and Armitage (2013) and the principles or components upon which it is based have seen even greater imprecision. This is not simply a matter of semantics, a lack of clarity in definition and scope hinders measurement and risks credibility. Crowe (2000:22) argued that: “...*the greatest impediment to the widespread use of CPTED is ignorance*”, a much greater risk is surely ambiguity. Ekblom (2011) argues that such uncontrolled vocabulary would not be accepted within the natural sciences and there is little to suggest that it has been accepted within the social sciences; this lack of imprecision being one cause of CPTED’s continued and perhaps unjustified inferiority within Crime Science. This paper has commenced with a call to arms that should in no way be interpreted as a criticism of the approach of ensuring that crime prevention is considered within the design and build of housing (as well as other buildings and spaces). On the contrary, this approach has been demonstrated to be an effective crime reduction measure - the impact of individual design features on crime evidenced in, for example, Armitage, Monchuk, and Rogerson (2011) and Johnson and Bowers (2010) and as a

combination of measures in Armitage (2000), Armitage and Monchuk (2011). Its importance has also been recognised in planning policy - in England and Wales in the 2012 *Planning Policy Framework* and the *Planning Practice Guidance*, as well as in crime reduction policy – for example the 2016 *Modern Crime Prevention Strategy*. The UK is not unique in its recognition of this importance, and a review of consideration for the impact of design on crime within international policy and regulation can be found in Armitage (2013).

Theoretical Framework

Place based crime prevention

The influence of place on crime risk is well established within the study of crime, with a wealth of research confirming that features of design play a key role in vulnerability to crime at the neighbourhood, street and individual property level. At the neighbourhood level this includes, for example, distance of a property to a transport interchange (Groff and LaVigne, 2001), distance of a property to an offender's residence (Bennett and Wright, 1984; Bernasco and Luykx, 2003; Bernasco and Nieuwbeerta, 2005; Rengert and Wasilchick, 1985; Wright and Decker, 1994) and distance of a property to a footpath/pedestrian walkway (Armitage, 2006; 2013). At the micro or property level, the presence or absence of specific design features can enhance or reduce its attractiveness to offenders (Armitage, 2006; Armitage *et al.*, 2011; Brown and Altman, 1983; Brown and Bentley, 1993; Cromwell, Olson, and Avary 1991; Johnson and Bowers, 2010; Poyner, 1983; Nee and Meenaghan, 2006; Tseloni *et al.* 2014).

Crime Prevention through Environmental Design

Research commencing in the 1960s and 1970s illustrated the role that design can play in this place-based approach to crime prevention (Angel, 1968; Jacobs, 1961; Jeffery, 1971; Newman, 1973; Wood, 1961). In the ensuing decades, the concept of CPTED became increasingly recognised as an effective approach to the management of crime (Armitage, 2000; Armitage, 2013; Poyner, 1983; Poyner and Webb, 1991). CPTED aims to reduce crime by influencing the design, build and management of the built, and sometimes natural, environment. Armitage (2013:23) defines CPTED as: “*The design, manipulation and management of the built environment to reduce crime and the fear of crime and to enhance sustainability through the process and application of measures at the micro (individual building/structure), meso (neighbourhood) and macro (national) level*”. CPTED is largely described, particularly within academia, according to a series of principles or components and these vary considerably. As an example, Poyner (1983) outlined the four principles of CPTED as *surveillance, movement control, activity support* and *motivational reinforcement*. Cozens, Saville, and Hillier (2005) extended this to the seven principles of *defensible space, access control, territoriality, surveillance, target hardening, image* and *activity support*. Montoya, Junger and Ongena (2014) in their study of CPTED in the Netherlands, referred to the six principles of *territoriality, surveillance, access control, target hardening, image/maintenance* and *activity support*. Armitage (2013) offered yet another combination of *physical security, surveillance, movement control, management and maintenance* and *defensible space*. A brief introduction to these principles is provided here. Armitage’s (2013) five principles are used as a guide, however, the reader is reminded that other definitions and principles are presented elsewhere and that a full review of these can be found in Armitage (2013, 2016).

Defensible space or *territoriality* refers to the extent to which the physical design of a neighbourhood can increase or inhibit an individual's sense of control over the space in which they reside (Newman, 1973). This is often achieved through the demarcation of private, semi-private, semi-public and public space (using design features such as a change of road colour and texture or the narrowing of the road) to ensure that it is clear who should and who should not be within a given area. Research suggests that the presence of these symbolic barriers reduces crime risk (Armitage, 2006; Brown and Altman, 1983; Montoya *et al.* 2014).

Through movement or *connectivity* refers to the extent to which a development facilitates or limits access and egress via roads and pathways. This can be achieved through the design of road type (through road versus cul-de-sac) and the positioning of footpaths linking the development to other areas. The majority of research confirms that true culs-de-sac (with no connecting footpaths) experience significantly lower levels of crime than leaky culs-de-sac (those with connecting footpaths) or through roads (Armitage, 2006; Armitage *et al.* 2011; Hillier, 2004; Johnson and Bowers, 2010).

Surveillance refers to the way that an area is designed to maximise the ability of formal (security guards, police, employees) or informal (residents, passers-by, shoppers) users of the space to observe suspicious behaviour. It also relates to the extent to which offenders, or potential offenders perceive the possibility or likelihood of being observed, even if that perception is inaccurate. This is achieved through the positioning of properties within a development - ensuring that dwelling entrances face the street, that rooms facing the street are active (such as the kitchen or living room)

and ensuring that sightlines are not obstructed by shrubbery, high walls or fences. Research supports the premise that properties with high levels of surveillance experience lower levels of victimisation (Armitage, 2006; Armitage *et al.* 2011; Van der Voordt and Van Wegen, 1990; Winchester and Jackson, 1982) and that offenders perceive properties with high levels of natural surveillance to be less vulnerable to victimisation (Armitage and Joyce, 2017; Brown and Bentley, 1993; Nee and Meenaghan, 2006).

Physical security, sometimes referred to as *target hardening*, relates to the extent to which a property and its boundaries are protected through the physical features of the building's design - such as doors, windows, locks or fences. Security measures increase the difficulty of breaking in, they increase the time it takes to enter a property and, in some cases (e.g. CCTV), they increase the likelihood of detection. Research on the effectiveness of physical security as a means of reducing crime suggests that the presence of physical security reduces burglary risk (for example, Tseloni *et al.* 2014; Vollaard and Ours, 2011) but that the protection conferred against burglary does not consistently increase with the number of devices installed (Tseloni *et al.* 2014).

Management and maintenance or *image*, brings together both Newman's (1973) concept of avoiding stigma and Wilson and Kelling's (1982) Broken Windows Theory. The former focuses upon the original design and build, and the latter upon management and maintenance following development. Newman argued that the proper use of materials and good architectural design (for example, through ensuring that social housing is not distinguishable from owner-occupied) can prevent residents

from feeling stigmatised. Wilson and Kelling's (1982) Broken Windows Theory suggests that an area with existing deterioration such as graffiti and vandalism conveys the impression that a) nobody cares so apprehension is less likely and b) the area is already untidy so one more act will go unnoticed. Low-level disorder thus having a *contagion effect* and leading to more serious and more extensive crime. Evidence to support these assertions is provided by, amongst others, Armitage (2006), Cozens, Hillier and Prescott (2001, 2002) and Taylor and Gottfredson (1987).

Award schemes, or standards such as the UK's Secured by Design (SBD) award scheme, or the Police Label Secured Housing scheme in the Netherlands set standards to ensure that each of these principles are applied – thus ensuring that housing incorporates each of these elements of CPTED in combination. Research has clearly demonstrated the crime reduction impact of such schemes (Armitage, 2000, 2006; Armitage and Monchuk, 2011; Brown, 1999; Pascoe, 1999; Teedon *et al.* 2009, 2010; Vollaard and Ours, 2011).

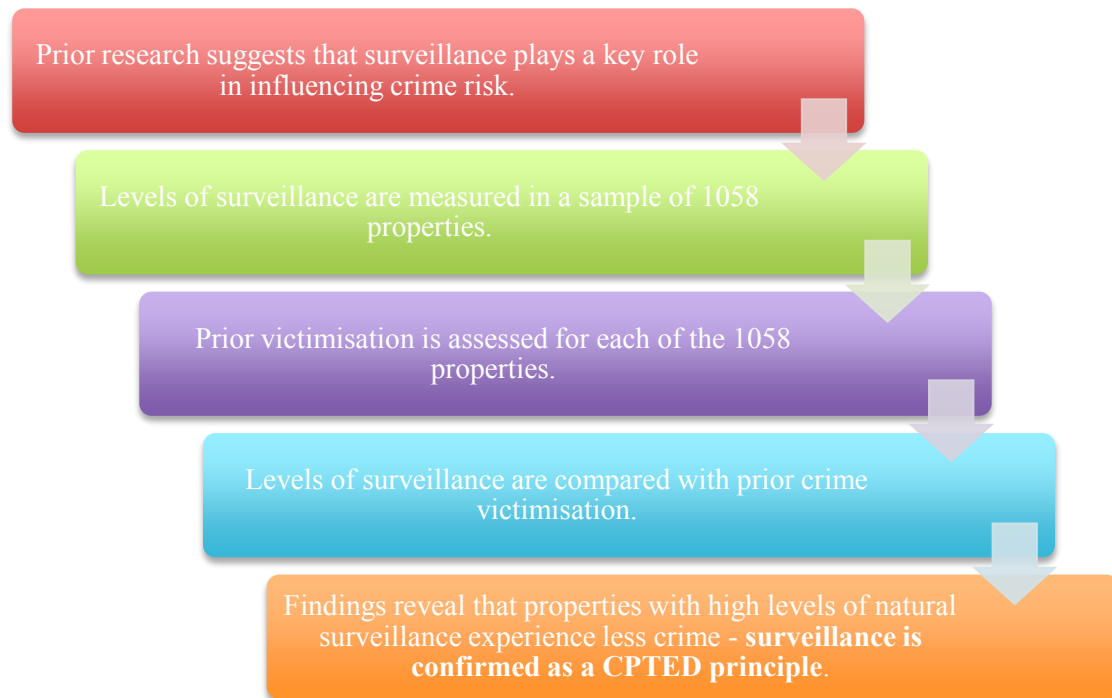
So why 'take on' CPTED?

This overview has demonstrated the effectiveness of CPTED in reducing crime and the recognition of this within policy and regulation. Its impact as a crime reduction measure is not in doubt; so why 'take on CPTED'. This research has two primary objectives. The first is to ascertain the extent to which burglars agree with the existing components or principles of CPTED – to explore burglars' take on the approach. The second is to use those findings to, where necessary, challenge the existing definition and scope of CPTED – to allow burglars to 'take on' CPTED. Both objectives have

an improvement orientation, with a view to promoting CPTED to its rightful place within existing academic debate.

The reader may be forgiven for concluding that CPTED is under-researched. Whilst there is most certainly scope for improvement, this is not the case. However, what research that has been conducted leaves a gap, that goes some way towards explaining this lack of credibility, and in turn progress and development of CPTED. This deficiency can be summarised as two key issues: 1) The majority of research exploring the role of housing design in crime risk has solely utilised police recorded crime data; 2) The majority of research exploring the role of housing design in crime risk has taken a deductive approach, and in doing so has simply tested existing hypotheses. Using Armitage (2006) as an illustration (Armitage is selected due to familiarity with the detailed methods, and because it is often easier to critique your own approach), research commenced with a review of the literature relating to the impact of housing design on burglary. Using the findings of the review, a checklist containing 33 design features – the Burgess Checklist, was developed. A sample of 1058 properties were individually assessed by two researchers (independently) and each design feature was assessed against prior victimisation (using police recorded statistics) to create a vulnerability score for each design feature. Using the CPTED principle of ‘surveillance’ as an example:

Figure One: Research design of many CPTED studies



Subsequent research modifies the methodology, uses a different data set or perhaps adds a self-reported crime element to the data, but surveillance is still being used as a starting point for exploration. These are without doubt valuable studies, but at what point did we stop to ask whether properties with pink front doors, say, experience higher or lower than expected levels of burglary, or to simply ask burglars to describe what features of design (if any) they were considering when making decisions regarding target selection? Even where studies have utilised offender narratives to ascertain perceptions of housing design, the focus has been deductive. Starting from the premise that a specific set of design principles influence crime risk, these studies have asked offenders to judge vulnerability based upon the presence or absence of design features (Cozens *et al.* 2001, 2002). The methodology has merits, but the

option for open narrative regarding vulnerability of design features is limited (if present at all).

Other limitations exist, including the need to update the principles to account for changing patterns of offending – drug use and its impact upon offender decision making, as well as improvements in security products and their impact upon *modus operandi*. As with any crime reduction measure, CPTED's success is determined to a large extent by the key organisations that implement it. A recent study of a small sample of Crime Prevention Design Advisors (CPDAs) in England and Wales (Armitage and Monchuk, 2017) found that, when assessing a set of plans for a proposed development, 90% of the sample referred to the term *surveillance*, but only 30% referred to *defensible space*, 10% to *physical security* and 10% to *management and maintenance*. None of the sample referenced the term *movement control*. This could be explained as an issue of semantics. However, when analysing the extent to which they referenced the 'concept' as opposed to the specific term, the findings remained concerning. The entire sample mentioned the concepts of *surveillance*, *movement control* and *defensible space*. Seventy per cent referenced the concept of *physical security* but only 30% referenced the concept of *management and maintenance*. With significant cuts in both police (CPDAs) and local authority (Planning Officers, Development Control) staff, reductions in training budgets and deregulation within the planning system, it is vital that there is a clearer description of CPTED – not just as a theory or concept, but also as a series of components that can be defined, implemented and measured. This paper aims to investigate the extent to which burglars' views of the crime risk associated with the design and layout of

residential housing aligns with existing CPTED theory, guidance and standards. The key research questions explored are:

- When describing the features of housing design that influence their decision making, do burglars refer to some features more regularly than others?
- When describing the features of housing design that influence their decision making, do burglars reference the same principles/concepts that are presented in CPTED literature?
- Is there consistency between burglars in their interpretation of the risk associated with the design and layout of residential housing and their subsequent decision to offend against that target?

Data and methods

The research presented within this paper was conducted between October 2014 and April 2016 in West Yorkshire, England. The sample included twenty-two incarcerated adult males convicted of burglary offences and identified by the Integrated Offender Management Team to be prolific. The extent to which a burglar was defined as ‘prolific’ was not predefined. In their study of prolific offenders in West Yorkshire, Townsley and Pease (2002) identified prolific burglars as being responsible for approximately five burglaries per month. The extent of offending prior to sentence was not a specific question within this study. Where offenders self declared offending levels (ten of the 22 offenders), this ranged from one burglary a day (offender 19) to between five and ten a day (offender 16). The offenders took part in the research voluntarily and recruitment took place post sentencing to avoid involvement for bargaining purposes. The recruitment process was time consuming – taking 18 months to recruit 22 participants.

Interviews took place within prison with one participant, one interviewer and one note taker (a note taker was required as no recording equipment was used). Interviews were semi structured, with participants asked to look at a series of sixteen images of residential housing (see Figure Two) and to describe: *“From what you can see from the photo, can you describe what would **attract** you to this property when selecting a target for burglary.”* And *“From what you can see from the photo, can you describe what would **deter** you (put you off) from selecting this property as a target for burglary.”* Participants were informed that there was no right or wrong answer and were not prompted during their response.

Figure Two: 16 Images



The images were taken in a variety of different locations across England. They included a mix of old and new properties, social and privately owned housing. There were, unavoidably, prior assumptions from the researchers involved (who selected the

images) regarding the design principles that *might* influence target selection. However, as the desire to conduct this piece of research had emerged from the concerns regarding the current relevance of CPTED principles, and the extent to which these incorporated offender narratives, it is the author's view that the images selected did not unduly lead the participants towards the discussion of existing CPTED principles.

Interviews were transcribed and thematic analysis was used to identify patterns or themes in responses. Content analysis was used to count the regularity with which those themes were discussed, and to assess the levels of consistency between offender accounts. The rationale for this study was clearly based upon the desire to explore largely undirected offender accounts, the desired outcome being a review of what is considered to be the key principles of CPTED within residential housing. As Ashton *et al.* (1998:275) highlight: "*With rich qualitative data of this kind, the choice for analysis lies between, on the one hand, developing complex coding schemes and laborious classification of responses, and on the other a more user-friendly general summary of burglar accounts*". This study was inclined towards the latter.

Risks and limitations

This, in the view of the author, is a valuable study that complements, updates and focuses existing research. It enhances existing studies on design and crime risk by adding offender accounts. Whilst the accounts of active offenders can provide details not captured through other research methods, there are undoubtedly risks and limitations with this approach. The first and most perceptible risk is false narratives from participants. There is a possibility that offenders will approach the responses

with an element of bravado – for example, *I'm not deterred by anything*, thus underplaying the deterrent effect of certain design features. Conversely, offenders may downplay their boldness – for example, *No, I wouldn't burgle them*, thus risking over-estimating the deterrent effect of certain design features. In collecting and analysing offender responses, there must be clear consideration of the offenders' motives for participating. Copes and Hochstetler (2014:20) summarise these as immediate rewards (including financial incentives, conversations with outsiders, a change of setting and curiosity), psychological benefits (including catharsis and helping others) and misunderstanding – the extent to which the participant believes that taking part will influence their sentence or relationship with prison staff. "*The motives that inmates have for participating in research ultimately affect the nature of the stories they relay and the type of information they withhold*". Whilst the participants involved in this study were not offered a financial reward, and participation was only offered post-sentencing, these elements may still have played a role in their decision to take part. The extent to which these reasons impact upon the findings is uncertain, but it is clear that conclusions should be considered alongside additional research, as opposed to being viewed in isolation or as definitive.

The second risk relates to the focus upon prolific offenders. Previous research suggests that a large proportion of burglaries committed by prolific offenders are repeats (Everson, 2000). The risk here relates to the potential to overemphasise the importance of design features that influence repeat offending.

The third risk relates to the impact of drug use on offender decision-making. Of the sample of 22 offenders, 17 described themselves as drug users – not just taking drugs,

but committing burglaries whilst under the influence of drugs. The combination was predominantly Heroin and Cocaine; however, some described taking mephedrone, alcohol, cannabis, crack, amphetamine and MDMA. The risk associated with using these participants is difficult to determine; however, it is highly likely that this will downplay the deterrence effect of specific design features: *“I would keep going until I got in”* (Offender 16) or *“You feel like you’re invincible”* (Offender 15).

An additional risk relates to the sample being selected from those burglars who have been detected and sentenced. To what extent does this sample represent unsuccessful, overconfident offenders – those making poor decisions regarding suitable targets? The risk here could be that the sample overstate the deterrent effect of certain design features: *“Ahhhh private road, I got arrested on one of those”* (Offender 5). Or that they minimise the deterrent effect of specific design features because they are by nature takers of excessive risks.

Further limitations include (but are not limited to) the focus specifically upon burglary within a UK setting. The sample are prolific burglars and the images are of residential housing. Thus, the critique of CPTED principles must be limited to its approach to burglary prevention/reduction. The sample are selected from prisons in England and the images are of residential housing in England. Again, this could potentially limit the critique of CPTED to its application to residential housing and offenders within the UK.

Findings

Twenty-two incarcerated adult male burglars were shown a series of 16 images of residential housing. The images were presented in a consistent order with no prompts from the interviewer. As interviews were largely unstructured, lasting between 45 and 90 minutes, the responses explored many issues including (but not limited to) pathways into crime, drug use, co-offending, desistance and product selection/re-sale. The focus of this paper is burglar perspectives of housing design, thus the findings presented here are limited to those themes.

Burglars' take on CPTED

Taking the five principles of *surveillance*, *movement control*, *physical security*, *management and maintenance* and *defensible space* (those principles of CPTED as defined by Armitage, 2013) the responses from the 22 participants were analysed to establish the extent to which these specific terms, or the concept of these terms were referenced. Predictably, the analysis revealed just one specific reference to a CPTED principle – this being *management and maintenance*. The specific terms: *surveillance*, *movement control*, *physical security* and *defensible space* were not referenced by the 22 participants. Examining references to the five concepts (as opposed to the specific terms) revealed more interesting findings. As can be seen in Table One, all participants referenced the concepts of *surveillance* and *physical security*. Eighty-two per cent (n=18) referenced the concept of *movement control*, 77% (n=16) the concept of *management and maintenance* and 36% (n=8) referred to the concept of *defensible space*.

Table One: Proportion of burglars referencing the five concepts of CPTED

CPTED principle	Proportion of offenders who referred to each CPTED concept (n=22)
Surveillance	100%
Physical security	100%

Movement control	82%
Management and maintenance	77%
Defensible space	36%

As can be seen in Table Two, in discussing the 16 images, the concept of *surveillance* was referred to 133 times, *physical security* 103 times, *management and maintenance* 40 times, *movement control* 39 times and the concept of *defensible space* was just referred to on 11 occasions.

Table Two: Number of references the specific principles and concepts of CPTED

CPTED principle	Number of specific references to the term	Number of references to the concept
Surveillance	0	133
Physical security	0	103
Management and maintenance	1	40
Movement control	0	39
Defensible space	0	11

The five principles of CPTED

Looking in more detail at reference to the five concepts, it is clear that the sample of 22 burglars confirmed the importance of many of the principles, yet raised some concerns regarding others.

Surveillance

Whilst none of the offenders used the specific term '*surveillance*', all referred to the concept and all considered this to be a clear deterrent in target selection. The threats or benefits associated with surveillance included: 1) Being observed by residents, neighbours or passers by – thus offenders preferred limited surveillance from others; 2) Being able to watch for potential threats or risks – thus offenders preferred enhanced surveillance of others; 3) Being able to see into a property and assess the

potential risks and rewards – thus offenders preferred enhanced surveillance of a target. Terminology used to describe the concept of *surveillance* included being ‘seen’, ‘watched’, ‘looked at’, ‘overlooked’ or ‘noticed’. Conversely, being able to: ‘hide’, ‘be concealed’, ‘view blocked’. In relation to the third threat/benefit of requiring some element of surveillance to assess risks and rewards, offenders used the terms: ‘good view of the street’, ‘keep an eye out for each other’ and ‘too much to watch for’.

Features of housing design that deterred the sample of offenders confirmed many of the existing elements of CPTED standards and guidance. Offenders regularly referred to the risks of having large windows at the front of a property, allowing residents to see them entering the street and assessing the property: “*The front windows are nice and big too, so it'd mean that I could be seen easier if I was inside*” (Offender Ten).

The same risks of being seen by residents were referenced in relation to the position of rooms within a property. Several offenders spoke of children’s bedrooms being located at the rear of properties and how this provides an additional incentive to target the rear – out of sight of neighbours and unlikely to be observed by a waking child: “*The adults have a main bedroom at the front, so if they hear something and look out the window, it'll be at the front not where the burglar is. Kids bedrooms are usually at the back*” (Offender Eight).

Offenders were deterred by housing developments where surrounding properties faced onto the street, allowing neighbours to observe them entering and exiting a development and property: “*I'd keep away. Would want nothing to do with that. They*

could be gawping out the windows - you only need one of them on that street”
(Offender 16).

Another design feature that acted as a clear deterrence, based upon the principle of enhanced surveillance, was the road layout of a true cul-de-sac. A cul-de-sac has one vehicular entry/exit point only, however, some culs-de-sac are ‘leaky’, with pedestrian walkways allowing entry and exit on foot. A true cul-de-sac would have no connecting footpaths, with entry in a vehicle or on foot via one point only. Offenders expressed the view that this housing design risks observation from neighbouring properties as the offender has to enter the development, commit their offence, and leave the development via the same road.

“I wouldn't target houses on a cul-de-sac because you feel trapped and it's difficult if someone challenges you. They might say what are you doing and you say you are lost and then you have to walk back out the way you came in as they are looking at you” (Offender Five).

Offenders were also deterred by low or open property boundaries – those that allowed neighbours and passers by to see them as they entered/exited a property: *“Open fences would put me off”* (Participant 12), and: *“I'd feel more exposed if the walls and fences were lower”* (Offender 15).

Features of housing design, specific to the concept of surveillance, that did not deter the sample of 22 offenders included visible displays indicating the presence of

Neighbourhood Watch, and high/solid property boundaries. In relation to high fences/hedges, offenders expressed the view that these allow them to conduct a burglary without the risk of being observed by neighbours or passers by: *“I like solid fences like these as no-one can see you. Once you are over these fences you are safe - in a comfort zone”* (Offender 12).

The idea of neighbours watching them was a clear deterrent, but all offenders stated that they did not equate Neighbourhood Watch with this risk – thus the presence of a sign does not convince them that they are being observed: *“It’s like the signs are up there but there is no action”* (Offender 5).

Physical security

The concept of physical security was referred to by all 22 of the offenders. Offenders were able to identify the quality of door locks from the photographs and focused upon the extent to which they believed the door lock could be snapped or mole gripped.

“That would be easy. The lock on that door looks like an old one.

The newer ones have thicker handles around them and are harder

to get through. I’d use mole grips and a screwdriver. Gold casing around

the handle will come off straight away and it’d take me around

a minute to get in” (Offender Eight).

Reference to other security measures was less consistent. With the exception of one brand of police monitored burglar alarm, these were seen as ineffective as a burglary deterrent. Offenders regularly discussed methods for disabling alarms. These included

spraying expanding polyurethane foam into the external alarm box the night before the burglary – the alarm would be activated but the sound would not be heard: *“I would buy foam sealant from DIY stores. Some took 24 hours to set, some quicker. I’d seal them up during the night and go back and do the houses the day after. The alarms still go off but you can’t hear them”* (Offender Nine). Another method of deactivating the alarm involved taking the internal alarm box off the wall once inside the property, with several participants stating that, for the majority of brands, this would deactivate the alarm: *“Good alarms like *** don’t stop when you pull them off the wall. The cheap ones do”* (Offender 13). The majority of participants expressed the view that in most instances the alarm is not activated. However, where it is, neighbours and passers by rarely respond.

The responses regarding security gates were less consistent. Some participants viewed these as a deterrent: *“It looks secure. The gates are a good idea. I’d like to live somewhere like that to be honest”* (Offender 19). Whilst for others, they conveyed the impression that the properties had something worth taking. Or worse still, put the offender burglar at ease: *“The fence wouldn’t deter me. In actual fact it would put me at ease as I could hear the fence rattle if someone came in”* (Offender Three).

The presence of security grilles was viewed, by all participants who noted them, as an attractor. Participants saw them as a challenge, and suggested that the presence of excessive security must mean that the residents have something to protect – in this case the perception was that the residents were protecting a cannabis grow: *“That security grille makes me think there’s something worth taking”* (Offender 21), and: *“It*

looks like a cannabis farm to me - it would definitely attract some interest from burglars” (Offender Eight).

Movement control

The concept of *movement control* – limiting access into, through and out of a housing development, was referred to by 18 of the 22 offenders. Explanations given by the offenders related to three potential benefits/threats, these were that through movement: 1) Enables the offender to ‘root’ for a suitable target; 2) Allows the offender to enter a development, commit an offence and exit the development without retracing their steps – thus enhancing risk of observation; 3) Allows the offender to evade the police – footpaths benefiting those with enhanced knowledge of the area and those on foot; 4) Provides the offender with a legitimate reason to be in an area.

The terminology used by offenders to describe this principle included: ‘*get away*’, ‘*get in and out*’, ‘*way out*’, ‘*can go either way*’, and ‘*escape*’. Conversely, limited through movement was described as being ‘*trapped*’ and ‘*boxed in*’. When describing the legitimacy that through movement allows, offenders used the terms: ‘*allowed to be there*’, ‘*can walk up and down*’, ‘*no-one can question you*’. The terms ‘*like a maze*’, ‘*hiding places*’ and ‘*police can’t get there*’ were used to reference the advantage that footpaths provide for those on foot and for those with knowledge of the area.

In terms of the design and layout of residential housing, limiting the presence of footpaths within a development acted to deter offenders. It was clear that participants

looked for footpaths as a means of accessing and exiting a development without the need to retrace their steps, to root for a suitable target and to provide a legitimacy should they be challenged. Offender Six describes that legitimacy: *“The houses are on a public footpath, no one would give me a second glance if I walked up and down. Even if a tramp walked up and down they wouldn't look out of place. It's a footpath, no-one can question you”* (Offender Six).

Offenders described how footpaths prevent the need to exit a development the way that they entered, reducing the likelihood of observation and subsequent identification: *“If it's a cul-de-sac then it's usually one way in and one way out. You would be stupid to do a cul-de-sac”* (Offender 8).

Footpaths were also described as a means of escape, a way to plan ahead exactly how you will enter, move through and exit a development: *“The appeal of a footpath is that you know how you are getting in and how you escape”* (Offender 3).

Offenders also described how footpaths provide an advantage for those with knowledge of the area and those on foot, leaving the police with a distinct disadvantage in relation to the offender: *“Burglars like footpaths, it makes it easy as the police can't get there easily”* (Offender 17).

Offenders spoke of the risks associated with true culs-de-sac and the possibilities of being trapped should the police attend the scene: *“If I was in there and the police came I would be boxed in and wouldn't have an excuse for being in there. I couldn't say 'I'm just walking home Officer’”* (Offender Ten).

Management and maintenance

The concept of *management and maintenance* was referred to by 16 of the 22 offenders. Terminology used included: *'overflowing bins'*, *'grass isn't cut'*, *'old'*, *'knackered'*, *'not tended'*, *'neat and tidy'*, *'smells of old people'*, *'being renovated'*, *'mess'*, *'scruffy'*, *'untidy'* and *'rubbish'*. Unlike the previous three principles, the direction of influence upon crime risk was not straightforward. Three key interpretations emerged from the 22 interviews, these were: 1) A property with low levels of management and maintenance is attractive because an abundance of rubbish means the residents will have lots of things to steal. *"They've got four bins. Why do they need so many? It tells me they spend a lot of money on food, so they've got money. Rubbish comes from one thing – buying stuff!"* (Offender 9). 2) A property with low levels of management and maintenance is attractive because a lack of care equates to less care regarding security: *"They're sloppy, which means they might have left their keys in the door, or might have left the door open"* (Offender 16). Conversely, a well maintained property is likely to have residents that care about security and are vigilant regarding strangers: *"It's manicured so someone takes time to look after it and they're probably looking out for people like me coming along"* (Offender 16). 3) A property with low levels of management and maintenance is unattractive because if the residents cannot take care of their garden they will have very little worth stealing: *"The grass isn't cut, the fence is old, it doesn't look worthwhile"* (Offender 13). If they look after the garden, they will look after the house – thus a tidy garden equates to goods worth stealing: *"If they take care of their garden they've got something worth stealing"* (Offender 17). *"I would actively look for places like this. If they have a neat garden you know they have something to steal."*

You know they look after themselves and the house” (Offender Three). Responses were evenly split between the perception that maintenance equates to an attractive versus an unattractive target.

Defensible space

Whilst the concept of defensible space was demonstrated in several of the images, only eight of the 22 offenders made reference to it. Terminology used by the offenders to describe this principle included: *‘everyone knows each other’*, *‘you’re an outsider’*, *‘they’d recognise you’*, *‘I would feel awkward’*, *‘own little community’*, *‘keep an eye out for each other’*. While there was little doubt that the perception of a small development, where residents were likely to know each other deterred the offenders, some of the design features associated with creating defensible space appeared to attract the offenders. Image 13 (see Figure 2) showed a small cul-de-sac with all properties facing the street, a narrowing of the road and a change in road colour and texture at the entrance to the estate. The word ‘private’ was also painted in large white letters on the road at the entrance to the estate.

Several participants were deterred by, what they described as: *“like walking into their own little community”* (Offender 14). This largely related to the perception that the residents would know each other and that a stranger would not only look out of place, but would likely to be challenged by residents – confirming the concept of defensible space as a deterrent: *“Everyone that lives there will be focused on the entrance and what goes on. They’ll all know each other and keep an eye out for each other - give the key to the coal man that sort of thing”* (Offender 18).

However, the more frequent response was that the narrowed road entrance, the 'private' signage and the change in road colour and texture, suggested exclusivity and wealth, making this development an attractive target: *"The private road sign and the change in road colour and texture give me the impression that it is an exclusive area - they have more money and that would attract not deter me"* (Offender Three).

The vast majority of responses equated the word 'private' with wealth – suggesting that 'private' means privately owned and, therefore, not social housing: *"Private Road suggests that it's not council housing so they won't be on benefits"* (Offender Three), and: *"Private Road means they've got money, they're middle to high class people - working people and I'd be attracted straight away. I'd think private road they've got coin"* (Offender Nine).

Table Three summarises these findings, outlining the key effective, ambiguous and counterproductive CPTED related strategies and these are discussed later in the paper in relation to the requirement for further research. It should be noted that these are simply those strategies highlighted within the interviews and are not an exhaustive evaluation of CPTED measures.

Table Three: CPTED principles and issues of operationalisation

CPTED principle	Rank (number of references)	Effective Strategies	Ambiguous Strategies	Counter-productive Strategies
Surveillance	1 st (133)	<p>Large windows at the front of properties.</p> <p>Adult bedrooms at the rear of the property.</p> <p>Surrounding properties facing the street.</p> <p>True cul-de-sac.</p> <p>Low/open property boundaries.</p>	The presence of Neighbourhood Watch	<p>Children's bedroom at the rear of the property.</p> <p>High/solid property boundaries.</p>
Physical security	2 nd (103)	<p>ADT burglar alarm.</p> <p>Anti-snap lock.</p>	<p>Burglar alarms (other than ADT).</p> <p>Security gates.</p>	Security grilles/bars.
Management and maintenance	3 rd (40)		<p>Removing litter/rubbish.</p> <p>Looked after/tidy garden.</p>	
Movement control	4 th (39)	<p>True cul-de-sac.</p> <p>Removing presence of footpaths and/or alleyways.</p>		<p>Footpaths/alleyways.</p> <p>Leaky cul-de-sac.</p>
Defensible space	5 th (11)	<p>Houses facing onto the street.</p> <p>True cul-de-sac.</p>		Use of 'private' signs or 'private' painted on street.

		Limited number of properties.		
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Can CPTED be universally applied?

Whilst the findings from interviews with 22 offenders confirmed the importance of design in influencing target selection, there are doubts about the direction and strength of influence. Before summarising, it is worth discussing the extent to which offenders concurred, and as a consequence, the extent to which a CPTED standard can be universally applied. Table Four displays the responses from each of the 22 participants to the 16 images. Analysis shows that, for nine of the 16 images, there was a statistically significant difference between the proportion of ‘yes’ and ‘no’ responses. To clarify, for seven of these images, offenders were more likely to agree with one another that they would offend against the property. For two of the images, offenders were more likely to agree with one another that they would not offend against the property. For the remaining images, there was no statistically significant agreement that ‘yes’ they would offend against that property or ‘no’ they would not. The image with the lowest number of ‘yes’ responses was image 16 with one yes response (5% of the sample). The image with the highest ‘yes’ responses was image four with 20 (91%). The mean number of yes responses was 14 (62%), median 15 (68%).

Table Four: Extent of agreement between the offender sample

Image number	Number of yes responses	Proportion of yes responses	P Value	Statistically significant ¹
1	6	27%	0.050	✓
2	18	82%	0.004	✓
3	17	78%	0.017	✓
4	20	91%	0.004	✓
5	18	82%	0.017	✓
6	19	86%	0.001	✓
7	15	68%	0.134	-
8	10	45%	0.832	-
9	17	77%	0.017	✓
10	2	9%	0.000	✓
11	15	68%	0.134	-
12	12	55%	0.832	-
13	14	64%	0.236	-
14	15	68%	0.134	-
15	19	86%	0.001	✓
16	1	5%	0.000	✓

¹ P<0.05 One sample binomial test – two tailed.

Discussion and further research

This paper has explored the importance of the impact of housing design on burglary risk from the perspective of 22 burglars within UK prisons. The findings confirmed the importance of design on offender decision-making, but emphasised the need to re-assess the existing CPTED principles and their means of implementation. Consideration should be given to the combination and weighting of each principle; the findings suggest that *surveillance* clearly plays a major role in influencing decision-making, *defensible space* not so. Does the implementation of five principles afford five times the protection of one? Increasing the sample size to establish the extent to which this finding continues to be supported would strengthen any case for re-assessing CPTED's concepts.

Specific interpretation of CPTED principles should also be reconsidered, with a focus upon those ambiguous strategies highlighted in Table Three. High rear fences are advised at the rear of properties in vulnerable locations (Secured by Design New Homes, 2016), yet offenders clearly state the appeal of such measures. 'Private' signs are used as a territorial marker, yet offenders are attracted by what they see as connotations of wealth and exclusivity, and existing justifications for the consideration of *management and maintenance* showed very little alignment with offender perceptions. Further research needs to focus upon those strategies that are actively encouraged within CPTED (or mandatory within award schemes such as SBD) – such as the use high rear fences where properties are bounded by footpaths. The concept of management and maintenance must be further explored, and whilst its protection remains ambiguous, it is the author's view that it should not be considered a principle of concept of CPTED. Other ambiguous strategies, including the use of

burglar alarms and private signs, should be further explored, but with less urgency given their status as beneficial as opposed to required.

The bold and somewhat controversial findings within this paper could be further strengthened by several improvements to the methodology. These include increasing the sample size, interviewing offenders who have not been apprehended, increasing the number of participants who were not drug users at the time of the offence and including a number of less prolific offenders. Replicating the methodology within other countries would ascertain the extent to which these critiques are relevant elsewhere – does CPTED require refinement in the UK or within other contexts and cultures? Finally, the focus upon residential burglary has limited the recommended refinements to one crime type. Further research should explore offender perspectives of design in relation to additional crime types including (but not limited to) retail crime, violent crime and vehicle crime outside of the residential setting.

Conclusion

CPTED is a well-established crime reduction measure. Evidence exists to suggest that individual features of housing design impact upon crime risk (Armitage, 2006; Armitage *et al*, 2011; Johnson and Bowers; 2010; Winchester and Jackson, 1982) and that combinations of these design features can be grouped together to produce effective interventions such as the UK's Secured by Design and Police Label Secure Housing in the Netherlands (Armitage, 2000; Armitage and Monchuk, 2011; Vollaard and Ours, 2011). Progress has been made in encouraging, or even requiring, consideration for crime prevention within planning policy, guidance and legislation and physical security standards are now embedded in Building Regulations in

Scotland, England and Wales and the Netherlands. However, progress has not been entirely favourable and austerity and deregulation (particularly in England and Wales) has seen dramatic reductions in police numbers, police training budgets and the ability to influence building design through planning policy and guidance. With numbers of police Designing out Crime Officers (DOCOs) in England and Wales falling from 347 in 2009 to just 125 in November 2014 (with further cuts following), and Local Authority Planning Officers seeing similar cuts, it is essential that CPTED and its requirements are not only clearly defined, but that we are certain that each element or component is fundamental in impacting upon crime risk. This paper highlights the need not only to redefine the principles of CPTED, but to reconsider the refine these definitions. There is little doubt that a lack of clarity has impacted upon CPTED's academic credibility within the field of Environmental Criminology and Crime Science, and this is both disappointing and unjust. Perhaps in studying CPTED we need to be cruel to be kind, and take CPTED to pieces before we can rebuild it.

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