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**Abstract**

This paper explores the perceptions of various crucial stakeholders in urban Britain, relating to the criminogenic capacity of a range of characteristic housing designs. Crime Prevention Through Environmental Design (CPTED) is an increasingly popular crime reduction strategy, based primarily upon Newman's 'Defensible Space' theory (1973). However, this theory remains largely untested, and findings have been contradictory. CPTED responses are often based upon recorded crime statistics and this research challenges the use of such data in isolation. Firstly, such data is empirically flawed and persistently misrepresents the reality of crime, and secondly, the recorded crime statistics are inappropriate for geographical comparisons at the micro-scale.

This culturally-specific investigation seeks to explore the perceptions of three crucial user groups. The perceptions of town planners, police officers and convicted burglars are investigated with regard to various characteristic housing designs in Cardiff, Wales, to discover whether a commonality or plurality of perspectives exists. The ways in which different user groups perceive housing design can provide a framework for modifying future designs and may also have implications for housing allocation policies, policing and the layout of cities.

## **Background and Rationale**

A recent government report has estimated an increase of 4.1 million households in England for the period 1991-2016 (DETR, 1999a). The increase projected for Wales is some 156,000 households between 1998 and 2021 (National Assembly for Wales, 2001). Opinion is divided regarding *where* such developments should be constructed. However, until recently, discussion has tended to ignore consideration of the actual design of these proposed residential developments. Carmona (1999) has reported on three contemporary documents on residential design; *Kerb Appeal: The External Appearance and Site Layout of New Houses* (Popular Housing Forum, 1998), *Housing Layouts – Lifting the Quality* (Planning Officers Society, Housebuilders Federation and the DETR, 1998) and *Places, Streets and Movement. A Companion Guide to Design Bulletin 32: Residential Roads and Footpaths* (DETR, 1998), claiming “the flurry of recent activity witnessed by the funding (part-funding) of the three publications ... suggests a willingness by central government once again to engage in residential design concerns” (Carmona, p54).

Lord Roger’s report entitled ‘Towards an Urban Renaissance’ (DETR, 1999b) has recommended a national campaign in order to improve design “... new urban developments, on brownfield or greenfield land, must be designed to much higher standards if they are to attract people back into our towns and cities” (DETR, 1999b).

Significantly, these publications have provided little in the way of a detailed discussion into addressing the ubiquitous problem of crime, although that is not to understate their undoubted value and significance. Testament in part, to the inadequacies of past design ‘crusades’, the Social Exclusion Unit’s report ‘Bringing Britain Together: A National Strategy for Neighbourhood Renewal’ (1998), has identified over 3,000 ‘problem’ housing estates, some being highly criminogenic. The history of urban housing design has tended to indicate that certain designs are persistently more criminogenic than others. However, the means to evaluate new-build housing designs in terms of potential criminality has only recently been highlighted (Cozens *et al.*, 1999a, 1999b).

## **Crime and Environment**

The study of crime and the environment has its origins in the nineteenth century studies of ‘dangerous places’ (Guerry, 1833; Quetelet, 1835; Fletcher, 1849; Mayhew, 1862). Later, urban sociologists at the ‘Chicago School’ mapped the location of offenders (Park *et al.*, 1926; Shaw and McKay, 1942) although the study of the location of offences (Schmid, 1960a; Schmid, 1960b) received scant attention (Brantingham and Brantingham, 1975) until victimisation studies in the 1960s and 1970s adjusted the focus. The work of such as Lynch (1960), Jacobs (1961), Angel (1968) and Jeffery (1969) popularised the idea that urban design could influence criminality. Further studies focused upon the ‘geography’ of crime (e.g. Pyle, 1974; Harries, 1974), and the academic discipline of ‘environmental criminology’ gradually took shape. However, it was not until Newman’s ‘Defensible Space’ (1973) that crime and design were seemingly empirically linked.

The multi-dimensional causes of crime are acknowledged within these ideas, and the enduring impact of social conditions upon crime is recognised explicitly by Newman (1973, p13) “the root causes of inner city and ghetto crime lie deep in the social fabric of our nation” and by other environmental criminologists. Indeed, the design and redesign of the physical environment is one crime prevention technique that potentially works most effectively as part of a multi-disciplinary and multi-agency approach.

## Defensible Space

Newman (1973) noted the spiralling crime problems of the inner cities in the 1960s and the failure of policy responses to resolve this increasingly urgent situation. He argued that 'defensible space' "is about an alternative, about a means for restructuring the residential environments of our cities so they can again become liveable and controlled not by police, but by a community of people sharing a common terrain" (Newman, p2). This alternative implicates the design of the built environment as an important causative factor with regard to criminality, and he claims that design can hinder or assist the criminal in the selection of both the crime site and the criminal act.

'Defensible space', for Newman "...is a surrogate term for the range of mechanisms - real and symbolic barriers, strongly defined areas of influence, and improved opportunities for surveillance - that combine to bring an environment under the control of its residents" (Newman, p3).

There are four elements of 'defensible space' (Newman, p50) which act individually and in concert to assist in the creation of a safer urban environment:

- the capacity of the physical environment to create *perceived* zones of territorial influence;
- the capacity of physical design to provide surveillance opportunities for residents and their agents;
- the capacity of design to influence the *perception* of a project's uniqueness, isolation, and stigma; and
- the influence of geographical juxtaposition with 'safe zones' on the security of adjacent areas.

To summarise Newman's study, two social housing projects in New York were compared and analysed using recorded crime statistics. The high-rise blocks of the Van Dyke project experienced recorded crime rates as much as 50% higher than the low-level development of Brownsville. The influence of the design of the buildings was then implicated as a causative factor to explain the differing rates found in the two housing projects. The physical form of the urban environment, according to Newman, actively assisted the criminal in the victimisation of society. The four elements of 'defensible space', mentioned above, can translate the latent territoriality and sense of community of inhabitants, into a responsibility to secure and maintain a safe, productive and well-maintained neighbourhood. This theory attracted considerable attention for a variety of reasons, not least because it was the first to implicate design factors in the explanation of crime. Furthermore, Defensible Space (1973) was also apparently supported by the data Newman collected as well as offering practical and operational guidelines to achieve reductions in urban crime. After initial popular support, followed by widespread criticism and much delay, 'defensible space' re-emerged in the guise of CPTED in the U.S.A as a 'new' crime prevention strategy.

The similarities between CPTED and 'defensible space' are numerous. Indeed, Moffat (1983, p3), recognised the theoretical foundations of CPTED claiming that "defensible space is at the root of the concept". Significantly, Jeffery (1999) who originally coined the phrase CPTED (Crowe, 2000) recently claimed contemporary CPTED measures were predominantly "based upon Newman's concepts and not mine" (Jeffery, 1999, p1).

Taylor *et al.*, (1980), discuss the evolution of 'defensible space' into 'Second Generation Defensible Space' which refined, updated and modified Newman's ideas, by incorporating the necessity for local resident / community support, involvement and management assistance in

this regard. Social ‘defensible space’ is also a dimension, indicating that improvements to such as neighbourhood image, social interaction / control and informing the community of the potential of crime prevention issues can all offer pay-offs and strengthen ‘defensible space’ initiatives.

Further research has prompted Saville (1998) to claim that CPTED is now “a more comprehensive, ecological approach for reducing crime” (Saville, 1998), referring to it as ‘Second Generation CPTED’. The use of risk assessment, a consideration for displacement and the inclusion of “social changes to maintain the impact of design modifications” (Saville, p8) are important developments. In addition, it incorporates an understanding and consideration for ‘Tipping Point Theory’ (Saville, 1996). This theory asserts that in common with natural ecosystems, all neighbourhoods have a finite carrying capacity. When this threshold is exceeded, fundamental changes may take place. Clearly this would involve obvious consequences in the ways in which such parts of the city are perceived, labelled, managed and used.

More recently, Crowe (2000) has commented that “CPTED, in its modern form, was developed as an extension of ‘defensible space’ concepts to retail, commercial, industrial, institutional and low-density residential environments” (Crowe, p5).

### **A Resurgence of Ideas**

The ‘Secured by Design’ (SBD) initiative is a UK police initiative launched in 1993, which designates and certifies new housing developments with the SBD logo if certain minimum security design criteria are satisfied. The Building Research Establishment (BRE) has recently validated this initiative, and a similar programme is in operation in the Netherlands. Indeed, the emerging discipline of crime prevention through environmental design (CPTED) has noticeably grown in popularity and is finding support from organisations as diverse as the Home Office, the Royal Institution of Chartered Surveyors (RICS), the Association of Chief Police Officers (ACPO) and the Royal Town Planning Institute (RTPI). Moreover, the amalgamation and standardisation of elements of urban planning to ‘design out crime’ is now underway. British Standards (BS8220, ‘Guide to the Security of Buildings Part 1 – Dwellings’) and European Standards (CEN/TC325, ‘Prevention of Crime by Urban Planning and Building Design’), are both in the process of final detailed deliberation.

In America, Canada, Australia, Japan and the Netherlands, CPTED is increasingly being operationalised as a crime prevention strategy for retail, commercial and residential development, in addition to organised social events, such as music festivals and public functions. Significantly, CPTED was also adopted for the Sydney Olympic Games in 2000, in the planning of venues, accommodation and transportation (Crowe, 2000).

Crucially, this paper argues that SBD in Britain and other CPTED initiatives world-wide are based upon Oscar Newman’s theory of ‘Defensible Space’ (1973). It is argued that these ideas have not been rigorously tested within the British city and have so far, produced conflicting and inconclusive results. It is therefore opined that a thorough re-examination of this theoretical perspective, which nonetheless offers practical applications, is both prudent and necessary.

‘Defensible space’, in the guise of CPTED in America, Canada, Australia, the Netherlands, Japan and SBD in Britain, is becoming viewed as contemporary, innovative and useful. “Today the pendulum seems to be swinging back to an increasing recognition that, in the right places, physical design does have a role to play in crime reduction” (Cisneros, 1995, p1).

Indeed, Cisneros asserts that Newman’s work has stimulated a “surge of new research and experimentation” (Cisneros, p3), referring in particular to the establishment of the

'International Crime Prevention Through Environmental Design Association' (ICA) in the U.S.A. In the U.K, the 'Design Out Crime Association' (DOCA) has been inaugurated along with branches in the Netherlands, France, Italy, Japan, Switzerland and Sweden, whilst the Asia/Pacific chapter was more recently founded in May 2000.

The flexibility of Newman's thinking is, perhaps, reinforced by the fact that the US Fire Administration is utilising 'defensible space' to combat bush-fires employing strategic property and landscape maintenance. Crowe (2000) also notes similarities regarding the nature and interpretation of positive and negative environmental cues between CPTED and the contemporary space/design concept of 'feng shui' (Crowe, pp107-109).

One dramatic development for those who design and manage the urban fabric is the relatively recent increase in, and the changing character of, premises liability lawsuits in the USA. Kennedy (1993) claims that, increasingly, third parties are being sued for premises liability, especially if criminal acts can be partially attributed to poor or inadequate design features. Landlords, employers and others are therefore being held liable for failing to take reasonable security measures to prevent criminal acts that jeopardise guests and tenants (Kennedy, 1993, Atlas, 1994a, 1994b; National Institute of Justice, 1996; Hanson, 1998). CPTED experts are also being called as professional witnesses in such cases. Some lawyers have suggested that such a trend may soon migrate to Britain (Infield, 2000) and elsewhere, and would have obvious and far-reaching consequences upon the planning system, criminal justice agencies and landlords and residents alike. It is noteworthy that some American city administrations have already included CPTED as an integral part of their legal and planning process (Crowe, 2000).

### **Rethinking Defensible Space**

Recently, 'Defensible Space' has received widespread criticism (see Adams, 1973; Hillier, 1973; Kaplan, 1973; Bottoms, 1974; Repetto, 1976; Mawby, 1977; Phelan, 1977; Hunter, 1978; Mayhew, 1979; Booth, 1981; Merry 1981; Poyner, 1983, Bennett and Wright, 1984; Smith, 1987; MacDonald and Gifford, 1989) from a variety of perspectives. These have been discussed elsewhere (Cozens *et al*, 2001) and do not form the focus of discussion of this paper.

Crucially, however, research that has attempted to evaluate Newman's ideas using recorded crime statistics (largely undertaken by criminologists) has so far produced contradictory findings (Cozens *et al*, 2001).

Research in the field of environmental psychology has investigated perceptions of territorial markers and some have supported Newman (MacDonald and Gifford, 1989; Shaw and Gifford, 1994), while others have produced more inconclusive findings (Bennett and Wright, 1984; Perkins *et al*, 1993). Studies of surveillance opportunities have generally underpinned Newman (Brown and Altman, 1983; Brown and Bentley, 1993), although such analysis has not been specifically conducted in relation to the British context. Furthermore, Newman's third concept of 'image' remains largely under-investigated.

Newman's 'Defensible Space' theory involved four elements and the concentration by modern practitioners of 'defensible space' and CPTED, exclusively on the first two concepts of territoriality and surveillance, may deprive the theory of crucial perspectives which may serve to strengthen its utility and its integrity.

Newman's third concept was the capacity of the built environment to influence perceptions regarding the image and stigma of a particular housing project. Such stigmatised neighbourhoods and communities clearly exist worldwide and the influential 'Broken Windows' theory of Wilson and Kelling (1982) has contributed significantly in the USA and

further afield to our understanding of the importance of urban management issues in this regard. Such neighbourhoods nonetheless persist.

One crucial aspect of CPTED is the use of local and national recorded police crime statistics to map criminality and allocate resources to CPTED and other crime prevention initiatives. It is therefore essential that accurate crime data are collected, with some researchers calling for more precise, site-specific data (Repetto, 1974). GIS mapping of recorded crime statistics and socio-economic and demographic information has developed considerably in recent years and promises much for the future. Such data, however, does not adequately reflect the actuality of crime at the localised neighbourhood level. Furthermore, fear of crime has emerged in recent years as being as important an issue as crime itself, and the use of recorded crime statistics as the sole underpinning of research and policy has obvious limitations.

Crime statistics used to guide the implementation of CPTED initiatives are also open to criticism in themselves. The reportability and recordability of incidents of crime may well result in persistent under-estimations, and the 'dark figure' of crime (Scott, 1990; Maguire, 1997) may clearly be substantial. Recent changes in procedures for counting and classifying crime have resulted in a 14% increase in recorded crime rates in the U.K (Home Office, 2000, p26). Areal differences in police force resources, management and operational priorities can also further reduce the effectiveness and usefulness of geographical comparisons of recorded crime statistics (Farrington and Dowds, 1985).

The development of the victim survey in America the 1960's encouraged such trends elsewhere. The British Crime Survey (BCS), initiated in 1982, has attempted to provide a more meaningful measure for crime, and consistently reports substantially more incidents of criminality than the Home Office statistics (Mirrlees-Black *et al.*, 1998). However, since the BCS is based upon a sample population, the utility of this data is restricted and may prove inadequate for guiding CPTED initiatives. Furthermore, a location experiencing high levels of fear of crime may not receive appropriate police attention, when, according to recorded crime statistics, incidents of crime are relatively low. Indeed, Brantingham *et al.*, (1977) employed both recorded crime statistics and mental maps of the fear of crime and found mismatches to be a common occurrence. Vrij and Winkel (1991) analysed unsafe locations and observed that "many places perceived as unsafe were never examined because in reality they are not unsafe" (Vrij and Winkel, p204). Indeed, Harries (2000) states that "...the 'fear surface' ... in a city is an intriguing mystery" (Harries, p27). Vrij and Winkel (1991) conclude that "research that defines unsafe locations primarily on the basis of crime statistics is therefore incomplete" (Vrij and Winkel, p214). The growth of research into fear of crime has been significant (Hale, 1996) although for Harries (2000) "fear is not usually accorded the attention it deserves" (Harries, p28).

### **British Housing Designs – Perceiving Defensible Space.**

Newman's theory clearly provides the foundations to CPTED initiatives worldwide and is arguably both a theoretically plausible and practical approach to crime reduction. Its strengths are well-known, and this paper has probed some of the shortcomings, thereby raising important issues. Two of the most crucial weaknesses are central to this paper. Firstly, the continued utilisation of recorded crime statistics upon which CPTED initiatives are based. This has been criticised above and indicates that measuring the fear of crime may provide a more sophisticated way forward. The relevance of this approach is further supported by the fact that there is often a mismatch between 'fear of crime' maps and recorded crime statistics. Secondly, it is argued that an important and crucial phrase in Newman's theory is the reference to the

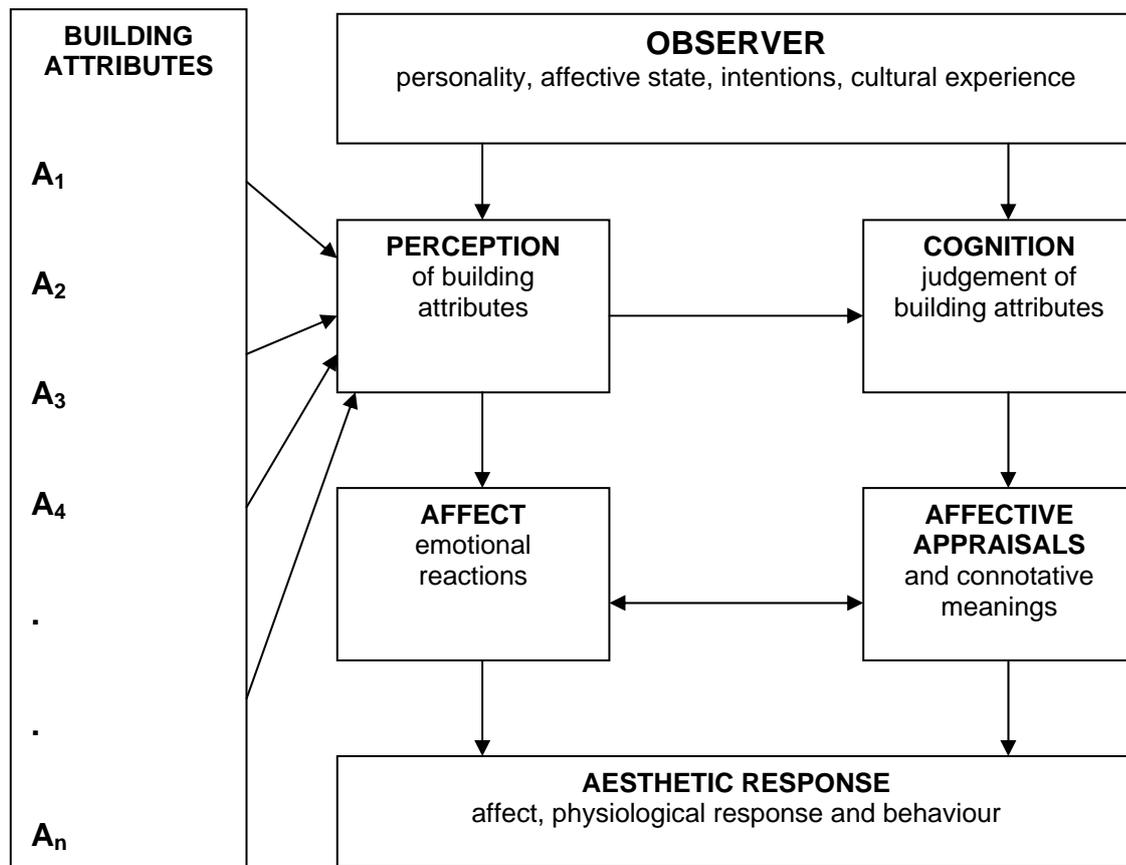
direct and implied notion of ‘perceptions’, which have been largely ignored by subsequent researchers (Ham-Rowbottom *et al*, 1999).

Newman (1973) stated that the physical environment has the capacity “to create *perceived* zones of territorial influence” and “to influence the *perception* of project’s uniqueness, isolation and stigma” (Newman, p50). In terms of opportunities for surveillance, these may in part depend on whether the potential offender perceives that someone is actually watching. Additionally, Newman argues the psychological intricacies of his theory: “Defensible space is a model for residential environments which inhibits crime by creating the *physical expression* of a social fabric that defends itself” (Newman, p3). Crucially, such perceptions will also be subject to temporal variation as the urban fabric adjusts to changing socio-demographic and economic conditions and to urban social movements (e.g the migration of more affluent groups to the suburbs). Indeed, the image of residential areas is certain to change in response to such events – underlying the necessity to create environments that are ‘capable of being defended’.

It is therefore argued that any effective evaluation of the theory must involve an investigation into the perceptions of the users of urban residential space. Various studies which have investigated crime and housing have utilised recorded crime statistics (Poyner, 1983; Stollard, 1991; Poyner and Webb, 1991) and other diverse measures (Coleman, 1985) as indicators of crime (e.g. urination, excrement and graffiti), and found support for Newman’s ideas. However, notwithstanding the undoubted contribution of this research, utilising such indicators clearly fails to incorporate the perceptual dimension into ‘defensible space’ theory.

The discipline of environmental aesthetics provides a useful model to explain users’ perceptions in terms of their aesthetic responses to buildings (see Figure 1). Nasar (1994, p381) argues that this response “results from an ongoing interaction between active humans and their environment”, where the preferences of individuals is based upon a range of perceived qualities. These include ‘openness’, ‘complexity’, ‘order’, ‘pleasantness’, ‘excitement’ ‘interest’ ‘naturalness’, ‘upkeep’, ‘intensity of use’ and ‘style’.

**Figure 1. A Probabilistic Model of Aesthetic Response**



(Arrows indicate probabilistic relationship) Source: From Nasar (1994, p381).

Significantly, in terms of environmental preferences, commonalities (Hershberger, 1969; Nasar, 1988; Wohwill, 1976) and contrasts (Groat, 1982; Devlin, 1990; Downing, 1992; Purcell and Nasar, 1992; Stamps and Nasar, 1997) have been found to exist between urban professionals and lay persons. Crucially, ‘safety’ is a central component within preference and therefore, what is perceived to be a ‘safe’ design by professionals might not necessarily be decoded as such by other groups. Indeed, as Figure 1 demonstrates, how the environment is perceived can affect behavioural responses of those who use such space – which has important implications for both crime and the fear of crime.

This paper presents findings from research which seeks to provide a critical evaluation of ‘Defensible Space’ theory, by focusing on the different perceptions of crime which are associated with the micro-level analysis of characteristic housing designs in modern Britain. This is a necessary limitation placed upon the research methodology and other studies would be appropriate to probe the perceptions of ‘defensible space’ in terms of street configurations / communities (meso-level) or indeed, how such component parts interact at the macro-level of the city. Newman’s fourth concept of ‘geographical juxtaposition’ remains beyond the scope of this investigation although the contribution of the wider urban environment is a topic worthy of study in its own right. However, focusing upon specific design types with contrasting levels of maintenance is arguably a worthwhile and potentially useful starting point for investigating perceptions of crime associated with characteristic British housing designs.

Newman decoded the residential component of the built environment in the USA from the perspective of an architect and planner, as a precursor to formalising his theory of 'Defensible Space'. The perceptions of those who might be said to 'abuse' space, namely criminals, offers an intriguing perspective in this regard, since it is *they* who must ultimately decode its subliminal and symbolic messages, for the theory to have any meaning, foundation or utility. Furthermore, investigating how planning professionals perceive British housing designs is equally essential, since it is they who are primarily responsible for urban configuration, design and management. The contribution of the police to the maintenance of law and order is another crucial perspective that is sought. Analysing the perceptions of the police is particularly relevant considering that it has been found that their perceptions will influence their routine behaviour, deployment of resources and definition of priorities (McGahan, 1984). Recent research in the field of environmental psychology also suggests that environmental preferences are linked to notions of safety and will vary within user groups (Hubbard, 1996). It is argued, therefore, that probing the opinions of these crucial user groups is an important and profitable approach, and one that is necessarily culturally-specific.

These three user groups were selected as they are crucial stakeholders on the urban stage and their opinions and perceptions have significant implications for the design-affects-crime debate. In terms of their existing knowledge of 'defensible space', the police officers in this study were selected to deliberately exclude any architectural liaison officers (ALOs) or crime prevention design advisors (CPDAs). The planners had only acquired a limited understanding of the concept, primarily as part of their continuing professional development. Predictably, the burglars had no formal knowledge or training in 'defensible space' whatsoever. Crucially, Robinson (1999) argues that CPTED is myopic in its assumption that 'defensible space' is decoded consistently by all user groups. This exploratory investigation seeks to probe the perceptions of these key stakeholders within the context of the UK. Probing the insights of such user groups in different cultures may well produce contrasting findings relating to both the perception of 'defensible space' and the associations made in relation to the range of housing designs. However, it is argued that such an approach will provide a framework for understanding the complex relationship that exists between housing design, crime and the fear of crime.

### **The Research Design**

Five housing designs, characteristic to the British city, were selected and photographed with the guidance of a town planner / chartered surveyor, and presented to respondents in the form of slide projections (see Figure 2). The length of time allocated for responses was standardised and the environmental stimuli was controlled in terms of both lighting conditions and setting (the presence of people within the photos was avoided). Two contrasting versions of each design were selected (where possible); whereby one was well maintained (A) and the other was poorly maintained (B). A series of qualitative and quantitative questions were delivered to explore the subjects' perceptions of 'defensible space', crime and deviancy.

The concepts of territoriality, surveillance and image were probed and three of the user groups interviewed in the project are discussed in this paper, namely, burglars, planning professionals and police officers. These groups are of crucial relevance, not only for understanding crime in the British city, but also in devising policies, which would contribute to tackling this problem.

## The Qualitative Investigation

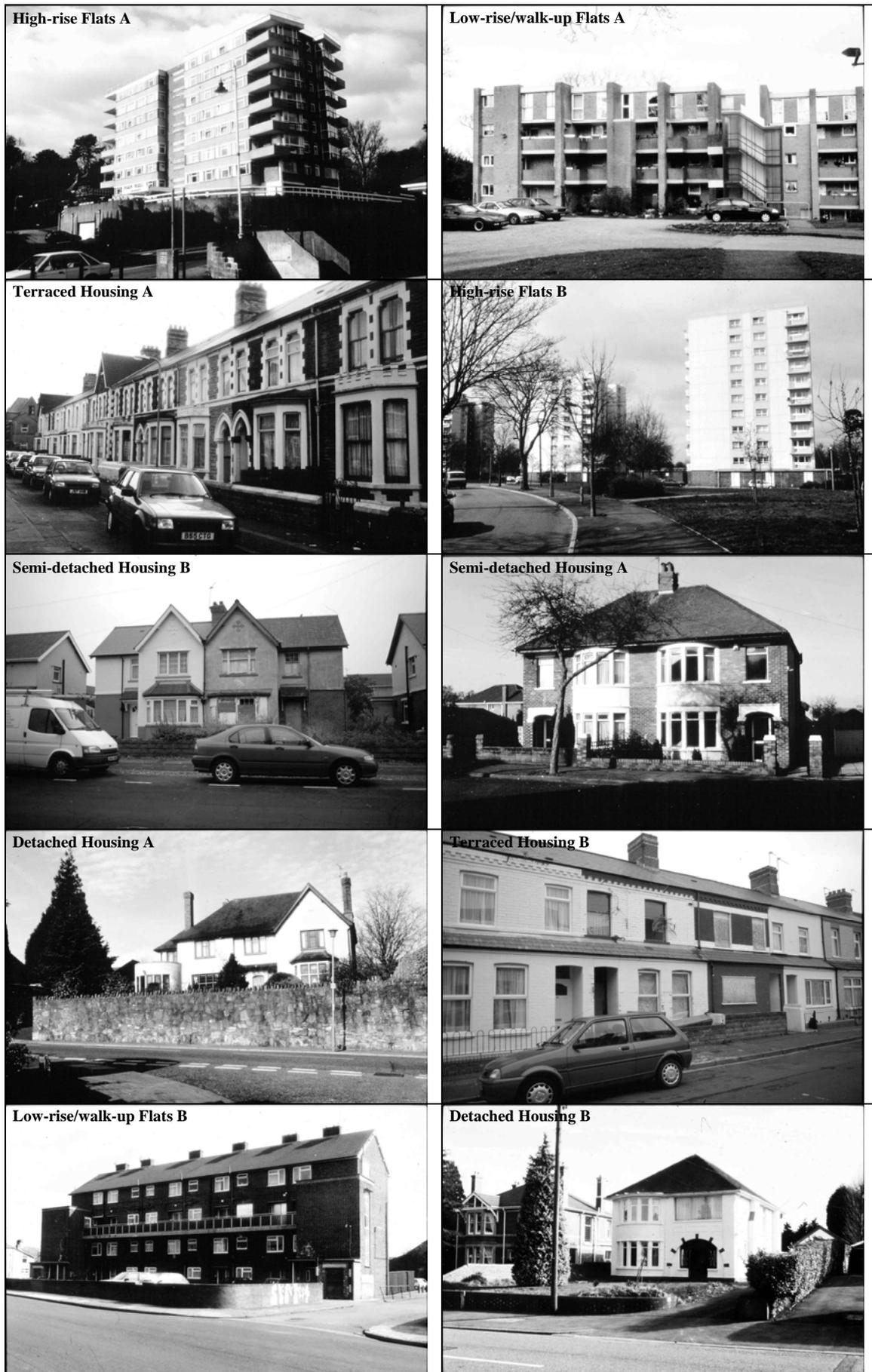
The qualitative investigation employed five open-ended questions. These probed the socially acceptable and unacceptable behaviour that was 'expected', emotional / affective responses to the designs, suggested improvements to design and socio-economic associations. Table 1 presents the results as a hierarchy, as perceived by the respective user groups.

**Table 1. Burglars, Planners and Police Decode Housing Designs**

	Burglars	Planners	Police
<b>Positive Imagery</b>	Detached A Semi-detached A Detached B Terraced A Low-rise A	Detached A Semi-detached A Detached B Terraced A	Detached A Semi-detached A Detached B Terraced A
<b>Neutral Imagery</b>		Low-rise A High-rise B	Low-rise A High-rise B Terraced B
<b>Negative Imagery</b>	Low-rise B High-rise A High-rise B Terraced B Semi-detached B	High-rise A Low-rise B Terraced B Semi-detached B	Low-rise B Semi-detached B High-Rise A

It is evident that broad agreement exists regarding the perceptions of all three user groups concerning seven of the images presented. Four designs, namely; 'Semi-detached Housing A', 'Detached Housing A', 'Detached Housing B' and 'Terraced Housing A' were all perceived as possessing a positive image. This is represented by a high preference to reside in such property, low levels of perceived crime/deviancy and fear of crime, residents in employment and minimal suggested design changes.

**Figure 2. Images of Characteristic British Housing Designs**



Conversely, three designs ('Low-rise/walk-up Flats B', 'High-rise Flats A', and 'Semi-detached Housing B') were perceived in considerably more negative terms. This is represented by low preference for residing in such properties, expectations of high levels of crime/deviancy and fear of crime, residents being unemployed and numerous suggested design changes.

For the three remaining designs ('Low-rise/walk-up Flats A', 'High-rise Flats B' and 'Terraced Housing B'), there was little agreement from the user groups. As previously discussed, the police officers perceived 'Terraced Housing B' in a marginally more positive way than the other two groups. The heightened visibility and surveillance offered by the linear layout of this design may partially explain this anomaly. It is argued that the recently renovated appearance of 'High-rise Flats B' and the 'private' demeanour of 'Low-rise/walk-up Flats A' may have elevated these designs out of the negative category 'A' into the neutral zone for both the police officers and the planning professionals.

Furthermore, the designs with visible 'signs of decay', 'Semi-detached Housing B', 'Low-rise/walk-up Flats B' and 'Terraced Housing B', were mainly perceived in highly negative terms, illustrating the vital contribution of property management and maintenance upon the decoding of housing designs and supporting Wilson and Kelling's 'Broken Windows' hypothesis (1982).

Undoubtedly, it is evident that Newman's theory is strongly supported by the qualitative insights and that multiple dwelling units (MDU's) are considered to be more criminogenic and fear-inducing than single dwelling units (SDU's) by all three groups analysed in this study. Well-maintained designs were also repeatedly associated with less crime/deviancy, fear of crime and were positively regarded in terms of the perceived employment status of residents. Conversely, poorly-maintained designs were viewed in negative terms, as areas associated with high levels of crime/deviancy and fear of crime in addition to possessing high levels of perceived social problems.

Significantly, perhaps, both police officers and planners expressed some concern at the high exterior wall present in 'Detached Housing A' and the reduced opportunities for surveillance and social interaction that this design element generated. In addition, from the analysis of the three designs with visible 'signs of decay', it is evident that all groups perceived the paired design typologies (A and B) consistently according to their maintenance and general state of disrepair.

In this current period of extensive house-building in Britain, it is noteworthy to find the 'Terraced Housing A' design in the 'positive' category for all three groups, particularly since such a design may warrant consideration as a relatively inexpensive and high-density design option for Britain. The quantitative analysis further probes these themes and specifically, the 'defensible space' perceptions, and criminal associations attached to each housing design.

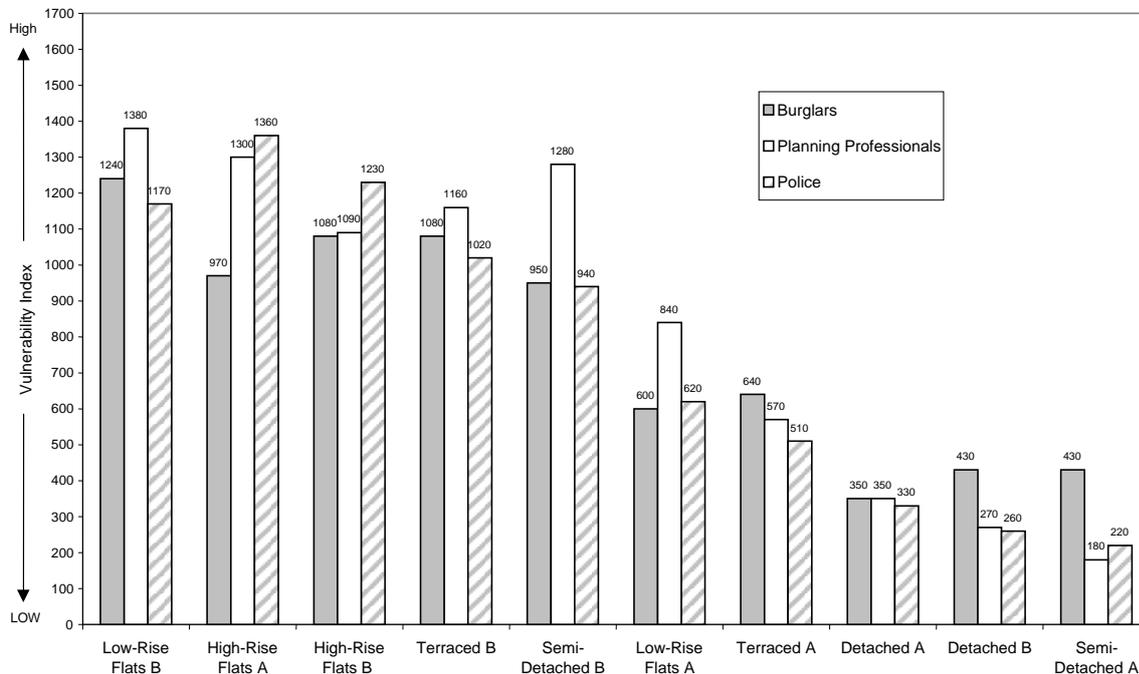
### **Quantitative Data Analysis – A 'Hierarchy of Design Vulnerability'**

Ten convicted burglars, ten planning professionals and ten police officers were asked seventeen questions designed to probe 'defensible space, crime/deviancy and the fear of crime, in addition to their housing preference. The responses were scored and aggregated to produce. A 'Hierarchy of Design Vulnerability' (Figure 3) for the ten housing designs.

Analysis of the quantitative responses produces broad agreement with the qualitative findings in that all the groups perceived five of the designs to be particularly vulnerable to crime and deviancy. These were 'High-rise Flats A', 'Low-rise/walk-up Flats B', 'High-rise Flats B', 'Terraced Housing B', and 'Semi-detached Housing B'. The five remaining designs were perceived to be significantly less vulnerable and include 'Low-rise/walk-up Flats A' and

‘Terraced Housing A’ and the ‘safest’ designs of ‘Detached Housing A’, ‘Semi-detached Housing A’ and ‘Detached Housing B’. Figure 4 clearly reveals this pattern.

**Figure 3 A Hierarchy of Design Vulnerability for All Groups**



(The 10 respondents in each group were asked 17 questions, which were expressed as a % and aggregated)

An inter-group comparison reveals that in general, the ‘Hierarchy of Design Vulnerability’ for each group is broadly similar. The MDUs and the designs with clearly visible ‘signs of decay’ (‘Low-rise/walk-up Flats B’, ‘Terraced Housing B’ and ‘Semi-detached Housing B’) are commonly perceived as being the most vulnerable designs for all groups. Significantly, the police officers considered ‘High-rise Flats A and B’ to be the most vulnerable designs. ‘Low-rise/walk-up Flats B’ are considered as a highly vulnerable design by burglars and police officers alike.

Opinion is also evident in relation to the designs perceived as being the safest (‘Semi-detached Housing A’, ‘Detached Housing B’ and ‘Detached Housing A’), although the burglars perceived these least vulnerable designs to be noticeably more vulnerable than the other two groups. This may be explained in part by the perceived level of ‘potential rewards’ that such designs offered this ‘interested’ cohort. Furthermore, ‘Detached Housing A’ was considered to be the least vulnerable by the burglars, although some unique security issues were created by the presence of the perimeter wall.

Another significant finding is that ‘Terraced Housing A’ was considered to represent the fourth safest design, and in reinforcing the findings from the qualitative analysis, further strengthens the case for further detailed consideration of this design in the context of British house-building needs in the immediate future.

Overall, Newman’s theory is consistently supported, particularly with reference to MDUs and the designs with visible ‘signs of decay’. With the growing need in Britain for higher density urban housing designs, these findings certainly warrant detailed consideration. When each image is compared on a design-by-design basis (see Table 2), further interesting insights are revealed. Although the three hierarchies are broadly similar, the burglars appear to possess a

more restricted hierarchy where variation and range is less evident, perhaps reflecting ‘learned’ caution for all designs. The least vulnerable designs are also considered by the burglars to be significantly more vulnerable in comparison with the other two groups.

Finally, the police officers’ perceptions of the high-rise designs as substantially more vulnerable than all the other designs cannot be understated. Table 2 presents both group, and aggregated perceived vulnerability scores, for each design type.

**Table 2. Housing Design and Perceived Vulnerability**

Housing Design (max 3,400)	Burglars (max 3,400)	Planners (max 10,200)	Police	Total
High-rise Flats A and B	2050	2390	2590	7030
Low-rise/walk-up Flats A and B	1840	2220	1790	5850
Terraced Housing A and B	1720	1730	1530	4980
Semi-detached Housing A and B	1380	1460	1160	4000
Detached Housing A and B	780	620	590	1990

Note: The scores for each design type were aggregated to produce a maximum score of 3,400. A score of 10,200 therefore represents the maximum vulnerability according to ALL three sample groups.

The perceived ‘defensibility’ of each housing design clearly contributed to the shape of the ‘Hierarchy of Design Vulnerability’, once more supporting Newman’s findings. In terms of the fear of crime, police officers revealed low levels, largely, it can be reasoned, as a necessary requirement in their role of policing the urban place. They nonetheless perceived the high-rise designs to be clearly fear inducing. Burglars also exhibited low levels of fear, possibly also as a result of their ‘occupation’.

In terms of ‘expected’ crime and deviancy, the three user groups agreed that as perceived vulnerability decreased, so would incidents of crime and deviancy. Significantly, however, the burglars perceived burglary to increase at the low end of the ‘Hierarchy of Design Vulnerability’. Potential rewards on offer in both the detached properties and the well-maintained ‘Semi-detached Housing A’, is one explanation for this trend, since this group also perceived such designs to be significantly less vulnerable, and more defensible. All three groups also perceived incidents of graffiti/vandalism/dereliction and the existence of noisy troublesome teenagers to rapidly decline as designs were perceived as less vulnerable in terms of the ‘Hierarchy of Design Vulnerability’ (Figure 3).

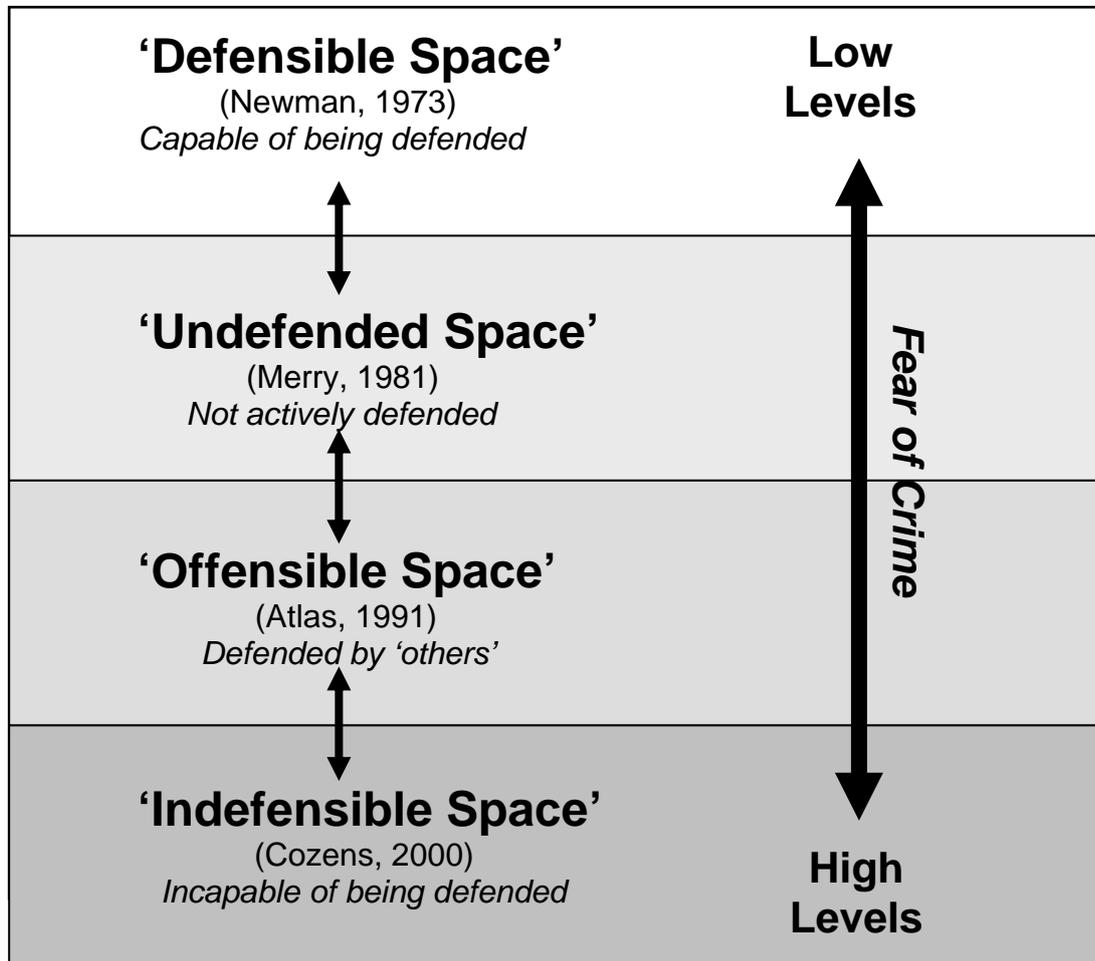
Figure 4 (below) presents ‘A Taxonomy of Defensible Space and Fear of Crime’. This model details how perception and ‘image’ can interact to permeate and define localities. The crucial social associations relating to the respective housing designs certainly reiterates the highly complex nature of the built environment. It is clear that both physical and social dimensions are complexly interwoven within the fabric of the city and of the design-affects-crime debate.

## Conclusions

The findings suggest that from an UK perspective, Newman’s theory of ‘Defensible Space (1973) is clearly relevant. MDUs are routinely considered to be highly criminogenic and fear inducing while at the same time they are perceived to possess significantly lower levels of defensibility than SDUs. In terms of the maintenance and appearance of each design, those manifesting visible ‘signs of decay’ were regarded as being notably more criminogenic, fear inducing and, significantly, less defensible than the well-maintained versions of the same

design. Indeed, the existence of an area dominated by vacant and derelict properties, of whatever design typology, is certainly ‘indefensible’, in several ways.

**Figure 4. A Taxonomy of Defensible Space and Fear of Crime**



The powerful socio-economic associations attached to specific designs clearly influenced the perceptions of burglars, planning professionals and police officers. Significantly, these perceptions may well influence the behavioural patterns of burglars and police and more importantly perhaps, those of residents, as daily users. The disintegration of informal social controls promoted by a poorly maintained physical environment (Wilson and Kelling, 1982) may well mean that ‘defensible space’ is downgraded to become ‘undefended’ (Merry, 1981), ‘offensible’ (Atlas, 1991) or even ‘indefensible’ space (Cozens, 2000).

The sentiments of Rainwater (1966) are not inappropriate in discussing the perceived influence and significance of such ‘signs of decay’ upon some residents “...the physical and social disorder of their world presents a constant temptation to give up or retaliate in kind” (Rainwater, p93).

There are obvious policy implications for planners and housing officials to purposefully and rapidly repair the physical fabric of residential areas and to use caution in their residential allocatory procedures, particularly with reference to high-rise and low-rise flats. In terms of the new-build housing projections in the UK, the requirement for higher density developments may

well be most appropriately met by a thorough consideration of the terraced design, which was favourably evaluated by all three groups in this study.

For the police, their perceptions of stigmatised neighbourhoods have been shown to affect their behavioural patterns, responses and operational procedures (McGahan, 1984) and this research suggests that it is of crucial importance to respond operationally to the objective *and* the subjective reality of crime. The continuing refinement of mental and perceptual mapping will surely make a vital contribution to this process.

In conclusion, this paper has highlighted crucial aspects of the design-affects-crime debate and provided a novel, cultural-specific and design-specific approach. The findings strongly indicates that Newman's theory, and therefore contemporary CPTED and SBD measures, are perceived to be appropriate crime prevention strategies. It is acknowledged that such findings may vary between different cultures (e.g. Britain, Continental Europe or the USA) and certainly between contrasting user groups. However, the crucial perceptual dimension to 'defensible space' arguably demands such a locationally-specific analysis. Indeed, despite the experimental nature of this study, the only obvious alternative is a continuing reliance on recorded crime statistics which will condemn urban analysts and others to decision-making based on a partial understanding of urban crime.

The highly complex socio-spatial dynamics of the built environment will be more fully understood by analysing the objective *and* the subjective 'reality' of both crime and the fear of crime. Researching retail, commercial, industrial and recreational environments in a range of different countries and cultures and studying the perceptions of other key user groups can only serve to broaden our emerging understanding of this protean and complex problem in society.

### *References*

- Adams, J. 1973. Review of Defensible Space. *Man – Environment Systems*, 10/73, Volume 3, pp267-8.
- Angel, S. 1968. *Discouraging Crime Through City Planning* (Working Paper No. 75). University of California. Berkeley, California.
- Atlas, R. 1991. The Other Side of Defensible Space. *Security Management*. March, pp63-66.
- Atlas, R. 1994a. *Secure Your Property to Avoid Liability*. [Http://www.cpted-security.com/premises.htm](http://www.cpted-security.com/premises.htm).
- Atlas, R. 1994b. Design Against Security Lawsuits. [Http://www.cpted-security.com/premises2.htm](http://www.cpted-security.com/premises2.htm).
- Bennett, T. and Wright, R. 1984. *Burglars on Burglary*. Gower, Hampshire.
- Booth, A. 1981. The Built Environment as a Crime Deterrent. A Re-examination of Defensible Space. *Criminology*, Volume 18. No. 4, pp557-570.
- Bottoms, A.E. 1974. Book Review of Defensible Space. *The British Journal of Criminology*, Volume 14, pp203-206.
- Brantingham, P.J. and Brantingham, P.L. 1975. The Spatial patterning of Burglary *Howard Journal*. Volume 14, Part 2, pp11-23.
- Brantingham, P.J., Brantingham, P.L. and Molumby, T. 1977. Perceptions of Crime in a Dreadful Enclosure. *Ohio Journal of Science*. Volume 77, Part 6, pp256-261.
- Brown, B. and Altman, B. 1983. Territoriality, Defensible Space and Residential Burglary: An Environmental Analysis. *Journal of Environmental Psychology*. Volume 3, pp203-220.
- Brown, B.B. and Bentley, D.L. 1993. Residential Burglars Judge Risk: The Role of Territoriality. *Journal of Environmental Psychology*. Volume 13, pp51-61.
- Carmona, M. 1999. Re-Inventing Residential Urban Design. *Town and Country Planning*. Volume 68, No.2, pp54-57.
- Cisneros, H. G. 1995. *Defensible Space: Deterring Crime and Building Community*. Urban Institute, Department of Housing and Urban Development. Washington.
- Coleman, A. 1985, *Utopia on Trial - Vision and Reality in Planned Housing*. Hilary Shipman Ltd.
- Cozens, P. M. 2000. *Investigating Defensible Space and the Criminogenic Capacity of Common Housing Designs in the British City* Unpublished Doctoral thesis. University of Glamorgan.

Cozens, P. M., Hillier, D. and Prescott, G. 1999a. Crime and the Design of New-Build Housing. *Town and Country Planning*. Volume 68. No. 7. July, pp231-233.

Cozens, P. M., Hillier, D. and Prescott, G. 1999b. The Sustainable and the Criminogenic. The Case for New-Build Housing Projects in Britain. *Property Management*. Volume 17. No. 3, pp252-261.

Cozens, P. M., Hillier, D. and Prescott, G. 2001. Crime and the Design of Residential Property. Exploring the Theoretical Background. *Property Management*. Volume 19. No.2 pp136-164. (Paper 1 of 2).

Crowe, T.D. (2000). *Crime Prevention Through Environmental Design: Applications of Architectural Design and Space Management Concepts*. (2<sup>nd</sup> Edition). Butterworth-Heinemann. Oxford.

DETR. 1998. *Places, Streets and Movement. A Companion Guide to Design Bulletin 32: Residential Roads and Footpaths*. HMSO. London.

DETR. 1999a. *Projection of Households in England to 2021*. HMSO. London.

DETR. 1999b. *Towards an Urban Renaissance*. Urban Task Force. Final Report. E and FN Spon, London.

Devlin, K. 1990 An Examination of Architectural Interpretation: Architects Versus Non-architects. *The Journal of Architectural and Planning Research*. Volume 7, pp235-244.

Downing, F. 1992. Images Banks: Dialogues Between the Past and Future. *Environment and Behavior*. Volume 24, pp441-470.

Farrington, D.P. and Dowds, E.A. 1985. Disentangling Criminal Behaviour and Police Reaction. In D.P Farrington and J.Gunn, (Eds.), *Reaction to Crime: The Public, The Police, Courts and Prisons*. John Wiley, Chichester.

Fletcher, J. 1849. Moral Statistics of England and Wales. *Journal of the Royal Statistical Society of London*. Volume 12, pp151-181, 189-335.

Groat, L.N. 1982. Meaning in Post-Modern Architecture: An Examination Using the Multiple Sorting Task. *Journal of Environmental Psychology*. Volume 2, pp3-22.

Guerry, A.M. 1833. *Essai sur la Statistique Morale de la France avec Cartes*. Crochard, Paris.

Hale, C. 1996. Fear of Crime: A Review of the Literature. *The International Review of Victimology* Vol. 4, pp79-150.

Ham-Rowbottom, K.A., Gifford, R. and Shaw, K.T. 1999. Defensible Space Theory and the Police: Assessing the Vulnerability of Residences to Burglary. *Journal of Environmental Psychology*. Volume 19, pp117-129.

Hanson, R.K. 1998. Liability on Franchise Premises: Footing the Bill for Crime. *Business Horizons*, July/August.

([http://www.findarticles.com/cf\\_0/m1038/n4\\_v41/21015195/print.jhtml](http://www.findarticles.com/cf_0/m1038/n4_v41/21015195/print.jhtml)).

Harries, K. (2000). Filters, Fears, and Photos. Speculations and Explorations in the Geography of Crime. In *Analyzing Crime Patterns. Frontiers of Practice*. Goldsmith, V., McGuire, P.G., Mollenkopf, J.H., and Ross, T.A. (Eds.). Sage Publications, California.

Harries, K.D. 1974. *The Geography of Crime and Justice*. New York.

Hershberger, R.G. 1969. A Study of Meaning and Architecture. In Sanoff, H. and Cohn, S. (Eds.), *EDRA 1: Proceeding of the First Annual Environmental Design Research Association Conference* (pp86-100). Raleigh, North Carolina State University.

Hillier, B. 1973. In Defence of Space. *RIBA Journal*, No. 11, November, pp539-544.

Home Office. 2000. *Criminal Statistics, England and Wales*. Government Statistical Service, London.

Hubbard, P. 1996. Conflicting Interpretations of Architecture: An Empirical Investigation. *Journal of Environmental Psychology*. Volume 16, pp75-92.

Hunter, J. 1978. Defensible Space in Practise. *Architects Journal* , No.11 October, pp675-678.

Infield, P. 2000. Personal Discussion at the Suzie Lamplugh Trust Research Institute's 'Responding to Workplace Violence' seminar, October 10<sup>th</sup>, London Voluntary Resource Centre, Hollaway, London.

Jacobs, J. 1961. *The Death and Life of Great American Cities*, Jonathon Cape, London.

Jeffery, C.R. 1969. Crime Prevention and Control through Environmental Engineering. *Criminologica*. Volume 7, pp35-58.

Jeffery, C.R. 1999. *CPTED: Past, Present and Future*. A Position paper prepared for the International CPTED Association at the 4<sup>th</sup> Annual International CPTED Association Conference. Mississauga, Ontario, Canada. September 20-22.

Kaplan, S. 1973. Book Review of Defensible Space. *Architectural Forum*, Volume 98 p8.

Kennedy, D.B. 1993. Architectural Concerns Regarding Security and Premises Liability. *Journal of Architectural and Planning Research*. Volume 10. Part 2. Summer, pp48-58.

Lynch, K. 1960. *The Image of the City*. MIT Press. Cambridge, Mass.

MacDonald, J.E, and Gifford, R, 1989. Territorial Cues and Defensible Space Theory: The Burglar's Point of View. *The Journal of Environmental Psychology*, Volume 9, pp193-205. Maguire, M, Morgan, R and Reiner,R.(eds) pp135-188, Clarendon Press.

Maguire, M. 1997. Crime Statistics, Pattern and Trends: Changing Perceptions and their Implications. In *The Oxford Handbook of Criminology*, by Maguire, M, Morgan, R. and Reiner,R.(Eds.) pp135-188, Clarendon Press.

Mawby, R.I, 1977. Defensible Space: A Theoretical and Empirical Appraisal. *Urban Studies*, Volume 14, pp169-179.

Mayhew, H. 1862. *London Labour and the Condition of the London Poor*. Griffin, Bohn, London.

Mayhew, P. 1979. Defensible Space: The Current Status of Crime Prevention Theory. *The Howard Journal*, Volume XVIII pp150-159.

McGahan, P. 1984. Police Imagery of the Urban Environment. *Canadian Police College Journal*. Volume 8, Number 2, pp107-153.

Merry, S.E. 1981. Defensible Space Undefined. *Urban Affairs Quarterly*, Vol.16, No.4, pp397-422.

Mirrlees-Black, C., Budd, T., Partridge, S. and Mayhew, P. 1998. *The 1998 British Crime Survey*. HMSO, London.

Moffat, R.E. 1983. Crime Prevention Through Environmental Design – A Management Perspective. *Canadian Journal of Criminology*. Volume 25, Part 4, pp19-31.

Nasar, J.L. 1988. Perception and Evaluation of Street Scenes. In Nasar, J.L. (Ed.) *Environmental Aesthetics: Theory, Research, and Applications*, pp275-289. Cambridge University Press. New York.

Nasar, J.L. 1994. Urban Design Aesthetics: The Evaluative Qualities of Building Exteriors. *Environment and Behavior*. Volume 26, No.3, May, pp377-401.

National Assembly for Wales. 2001. 1998-Based Population and Household Projections for Wales. Statistical Bulletin No.32. Statistical Directive.

National Institute of Justice. 1996. *Environmental Design & Premises Liability Series: NIJ Research in Brief*. <http://www.ncjrs.org/txtfiles/cptedlia.txt>

Newman, O and Franck K.A. 1980. *Factors Influencing Crime and Stability in Urban Housing Development*. US Department of Justice.

Newman, O. 1973. *Defensible Space People and Design in the Violent City*, Architectural Press. London.

Park, R.E., Burgess E.W. and McKenzie, D. 1925. *The City*. University of Chicago Press. Chicago.

Pascoe, T. 1999. *Evaluation of Secured by Design in Public Sector Housing*. Final Report. BRE. Watford.

Perkins, D.D., Wandersman, A.H., Rich, R.C. and Taylor, R.B. 1993. The Physical Environment of Street Crime: Defensible Space, Territoriality and Incivilities. *Journal of Environmental Psychology*. Volume13 (1), pp29-49.

Phelan, G. F. 1977. *Testing Academic Notions of Architectural Design for Burglary Prevention. How Burglars Perceive Cues in Suburban Apartment Complexes*. Paper presented to the annual meeting of the American Society of Criminology. November. Atlanta, Georgia.

Planning Officers Society, House Builders Federation and the DETR. 1998. *Housing Layouts – Lifting the Quality*. HBF. London.

Popular Housing Forum. 1998. *Kerb Appeal: The External Appearance and Site Layout of New Houses*. Popular Housing Forum, Winchester.

Poyner, B. 1983. *Designing Against Crime: Beyond Defensible Space*, Butterworths. London.

Poyner, B. and Webb, B. 1991. *Crime Free Housing*. Butterworth Architecture, Oxford.

Purcell, A.T., and Nasar, J.L. 1992. Experiencing Other People's Houses: A Model of Similarities and Differences in Environmental Experience. *Journal of Environmental Psychology*. Volume 12, pp199-212.

Pyle, G.F. 1974. *The Spatial Dynamics of Crime*. University of Chicago.

Quetelet, A. 1835. *Sur L'homme et le Development de ses Facultes; Essai de Physique Sociale*. Bachelier, Paris.

Rainwater, L. 1966. Fear and the House-as-Haven in the Lower Class. *Journal of the American Institute of Planners*. Volume 32 (January), pp23-31.

Repetto, T.A. 1974. *Residential Crime*. Ballinger. Boston.

Robinson, M.B. 1999. The Theoretical Development of Crime Prevention Through Environmental Design (CPTED). *Advances in Criminological Theory*. Volume 8, Volume, pp427-462.

Saville, G. 1996. Assessing Risk and Crime Potentials in Neighbourhoods. Paper presented at the 1<sup>st</sup> Annual International CPTED Association Conference. Calgary, Alberta, October 30-November 1.

Saville G. 1998. *New Tools to Eradicate Crime Places and Crime Niches*. Paper Presented at the Conference "Safer Communities; Strategic Directions in Urban Planning". In Melbourne, Australia, September 10-11.

Schmid, C.F. 1960a. Urban Crime Areas: Part I. *American Sociological Review*. Volume 25, pp224-237.

Schmid, C.F. 1960b. Urban Crime Areas: Part II. *American Sociological Review*. Volume 25, pp655-678.

Scott, J, 1990. *A Matter of Record*. Polity Press and Basil Blackwell Inc.

Shaw, C.R. and McKay, H.D. 1942 (revised 1969). *Juvenile Delinquency and Urban Areas*. University of Chicago Press. Chicago.

Shaw, K.T. and Gifford, R. 1994. Residents' and Burglars Assessment of Burglary Risk from Defensible Space Cue. *Journal of Environmental Psychology*. Volume 14, pp177-194.

Smith, S.J. 1987. Designing Against Crime? Beyond the Rhetoric of Residential Crime Prevention. *Property Management*, Volume 5 (2) pp146-150.

Social Exclusion Unit. 1998. *Bringing Britain Together: A National Strategy for Neighbourhood Renewal*. HMSO, London.

Stamps, A.E. and Nasar, J.L. 1997. Design Review and Public Preferences: Effects of Geographical Location, Public Consensus, Sensation Seeking and Architectural Styles. *Journal of Environmental Psychology*. Volume 17, pp11-32.

Stollard, P. 1991. *Crime Prevention Through Housing Design*. E And F N Spon, London.

Taylor, R.B., Gottfredson, S.D. and Brower, S. 1980. The Defensibility of Defensible Space: A Critical Review and a Synthetic Framework for Future Research. In *Understanding Crime*. Hirschi, T. and Gottfredson, M. (eds.), pp53-71. Sage, Beverly Hills. (eds)

Vrij, A. and Winkel, W. 1991. Characteristics of the Built Environment and Fear of Crime; A Research Note on Interventions in Unsafe Locations. *Deviant Behavior* Vol.12, pp203-215

Wilson, J.Q. and Kelling, G.L. 1982. The Police and Neighbourhood Safety. Broken Windows. *The Atlantic Monthly*. Volume 3, pp29-38.

Wohlwill, J.F. 1976. Environmental Aesthetics: The Environment as a Source of Effect. In Altman, I. and Wohlwill, J.F. (Eds.), *Human Behaviour and the Environment: Advances in Theory and Research.: Volume 1* (pp37-86). Plenum, New York.