

CONCEPTUAL PROGRESS IN UNDERSTANDING FEAR OF CRIME IN RAILWAY STATIONS

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Abstract: Previous research demonstrates there are discrepancies between actual crime and perceived beliefs about crime. The likelihood of threatening incidents and the potential impact of a given incidents are the focus of the present study of how psychological and environmental cues influence people's fear of crime in railway stations. Having established the salience of individuals' construct evaluations of the likelihood and impact of being the victim of crime based upon travellers' experiences and observations, the analysis demonstrated that conceptualisations of impact and likelihood are multifaceted, i.e. different types of threats influence evaluations including psychological threats as a result of the actions of others, physical threats initiated by others and threats posed by the railway station environment itself. The implications of these findings are discussed for the design and management of railway station environments.

Key-words: railway stations, fear of crime, risk, threat.

O progresso conceptual na compreensão do medo do crime nas estações ferroviárias (Resumo): As investigações anteriores mostram que existem discordâncias entre as taxas do crime reais e as percepções e as crenças sobre o crime. A probabilidade de ocorrência de incidentes ameaçadores e o seu impacto potencial são o alvo deste estudo que trata da maneira como as características psicológicas e ambientais podem influenciar o medo do crime nos utentes das estações ferroviárias. Partindo da saliência das avaliações individuais dos passageiros acerca da probabilidade e do impacto de serem vítimas do crime (baseadas nas suas experiências e observações), a análise dos dados mostrou que as conceptualizações acerca do impacto e da probabilidade são multifacetadas. Os diferentes tipos de ameaça influenciam as avaliações, incluindo quer as ameaças psicológicas e físicas resultantes de acções de outrem, quer as provenientes do próprio ambiente da estação ferroviária. As implicações destes resultados para o planeamento e a gestão dos espaços das estações ferroviárias são discutidas.

Palavras-chave: estações ferroviárias, medo do crime, risco, ameaça.

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The public's experience of the public transport environment is often transient and temporary in nature, a setting that is given negligible consideration and taken for granted, except as a means to an end. The planning, design and management of the railway station speaks to the users of stations – the passengers, the staff, the shoppers, the homeless, the pickpockets, and those just passing the time of day – as to what activities are encouraged, permitted and tolerated, and who is in control; it tells them whether the station is cared for and respected or whether it has been abandoned and is neglectful of those who use it. If the latter is the dominant experience, it is likely that passenger confidence will be adversely affected, a fear of crime instilled thereby creating a downward spiral of decline.

Perring (1995) highlights that, unlike other public spaces, individuals may perceive little control over their surroundings in stations, and thus the physical attributes of the environment may serve to have a crucial effect upon passengers' perceptions of safety and security. The consequence of this lack of control could be a decline in the number of passengers using public transport services. Fear of crime in railway stations has been shown to affect passengers' desire to use the railway system. Passenger surveys in the U.K. and abroad consistently reveal that, despite low levels of reported and recorded crime, passengers have real fears for their personal safety whilst using public transport. There is evidence that these fears influence their decisions to travel and, in particular, their use of public transport. (Crime Concern & Transport and Travel Research, 1997).

The UK Government's Department of the Environment, Transport and the Regions demonstrated that perceived threats to personal safety are decisive factors in deterring people from using public transport (DETR, 1998). Moreover, the findings indicated that measures on behalf of the station management to improve personal security would result in an increased use of services. The respondents ranked good lighting, visible presence of staff and CCTV surveillance as being the most effective measures in railway stations. (DETR, 1998). From this we can infer that issues such as the railway station environment and information and services provided by the railway authorities are critical in defining perceptions of risks associated with travelling by train.

Crime tends to be concentrated in particular places; it does not occur randomly across the city or even in the railway station. This suggests that there is something about particular places rather than simply the specific activities which occur there which may account for this (Forrester, Frenz, O'Connell & Pease, 1990; Polvi, Looman, Humphries & Pease, 1990; Sherman, Schmidt & Velke, 1992). Research undertaken on the London Underground has found that passengers tend to perceive the environment as a whole rather than identifying individual elements (Perring, 1995). Conse-

quently small crime prevention measures may not have any impact if the overall environment emits threatening signals; the design and structure of the station environment is a significant predictor of fear of crime.

Brantingham and Brantingham (1991) suggested that in order to comprehend the nature of criminal events it is imperative that research highlights the role of space and place in determining the time, location and character of crimes. As conceptualised by Barker (1968) behaviour settings are areas of the physical environment that over time have become associated with persistent patterns of individual and collective behaviour. Stokols and Novaco (1981) placed this conceptualisation within the context of transport, presenting airports, bus stations and commuter trains as examples of travel-related settings.

Brantingham *et al.* (1991) stated that the mode of travel has a strong influence on the type, location and timing of crimes, with routine exposures to risks being considerably higher for users of public transport systems than for people travelling in private automobiles. UK Government research findings indicate that users of public transport feel most vulnerable and unsafe when waiting for services, and that 22% of respondents would be more willing to use public transport if security measures were implemented (DETR, 1998). The 1998/9 British Transport Police Annual Report stated that although levels of crime on British railways were declining, there have been failures in translating these findings into increased passenger confidence. Moreover, specific incidents are known to have had a profound effect upon perceptions of safety in using public transport networks; the resultant social costs are particularly significant, since people who perceive greater risks react by using alternative modes of transport on a routine basis.

Rhodes and Conly (1991), using the concept of *spatial attractiveness* and distinguishing between public and private territories (Altman, 1975), suggest that public areas such as shopping centres, commercial quarters and presumably railway stations rank highly in spatial attractiveness. These places are considered to be attractive crime targets and will be a magnet for outsiders including prospective criminals who will almost certainly formulate detailed mental maps on which they will select possible victims – vulnerable people in vulnerable places – to perpetrate their actions.

Four types of crime on public transport at the micro-level have been identified: incivilities and crimes against passengers, attacks on staff, fare evasion and vandalism. In the case of incivilities and crime against passengers, Shellow, Romuladi and Bartel's (1974) analyses of police reports indicated that during an 18-month study period, 75% of all crime on rapid transit systems occurred on station premises, predominantly on the elevated platforms. They stated that incidences of robbery accounted for most of the

crimes and occurred after peak hours when passengers were most isolated. Assault was most likely to occur at congested times. Kenney's (1987) study of crime and fear on New York's subways found that distinctive and predictable patterns in crime were reported, with the majority (43%) of crimes against passengers occurring on either station platforms or stairways – these representing the most dangerous areas in the station.

In the psychological research literature there are discrepancies between *actual* crime and *perceived* beliefs about crime. Considerable research has indicated that fear of crime and actual victimisation rates differ. Individuals may fear crime even if they have had no actual experience of being the victim of crime. Brantingham and Brantingham (1991) suggested that places which develop a reputation for crime become 'ecologically labelled'. Ecological labels attract certain types of people to certain urban settings, whereas others are repelled. Such labels or reputations may be likened to stigmatisation in which a stigma is attached to a particular area, thus affecting associated individual expectations and beliefs. Perceptions can ultimately be embedded in firmly rooted belief systems that play a part in contributing further to attitude formation. Ecological labels are however often inconsistent with actual conditions. This is an important issue that should be recognised when interpreting research. In drawing on an example provided by the Brantinghams (1991), fear of crime in a neighbourhood seems to be linked to ecological labels rather than actual crime rates.

Brantingham and Brantingham (1997) proposed a general model in which they characterised fear of crime as a fear of being attacked, suffering some physical harm, or suffering an intrusion of privacy or dignity. These fears are amplified through a sense of personal physical vulnerability, an increased sense of being isolated from "known" others, and perceived lack of control over the situation. Ferraro's (1995) theoretical work suggests that fear of crime is independent of actual victimisation. He further distinguishes conceptually between fear as an emotive response with regard to others and risk which is held to be a cognitive judgement centred on oneself. Perceived risk may invoke a fear response and behavioural *sequelae* such as avoidant or precautionary actions.

There is limited research directly related to fear of crime on public transport with the exception of that undertaken by Carr and Spring (1993) who studied public transport safety in Victoria, Australia. They presented a framework of the conditions that contribute to perceptions of fear as being the unclean conditions of station; the intimidating effect of graffiti; exposure to rowdy or offensive groups; and the role of the media in amplifying fear. Carr and Spring (1993) proposed that these contributory factors create a cycle-like mechanism. Their framework is quite similar to Glazer's (1979)

ideas, in that initial fear leads to a reduction in the number of people travelling, which serves to reduce the effect of safety in numbers, which in turn reduces actual levels of safety, creating further fear. Another theme in research is that people fear harassment and crime whilst waiting for trains; this has been referred to as 'the waiting environment'. Research carried out for the DETR (1998) shows that passengers on public transport are particularly concerned when waiting at stations.

Factors related to general environmental quality such as poor lighting, crumbling structures, dirtiness, rubbish, vandalism and graffiti in subways and railway stations have a cumulative effect in creating unfavourable assessment of the place thereby increasing perceptions of fear and risk. This accords with Perring's (1995) views, that the design and structure of the London Underground environment significantly predicted fear of crime, because passengers viewed the environment as a whole entity. This suggests that the nature of the physical environment is more likely to exacerbate perceptions of fear, rather than individual components of crimes and incivilities.

In comparison with other sources of transport, railway stations have distinctive features of environmental design that can inhibit perceptions of security. Railway stations have the potential to be particularly threatening since many were designed when the visibility and ability to monitor movement were not seen as a priority and essential to the safety and security of passengers. Consequently, the station design with pillars, building structures, subways, enclosed routes and poor sightlines creates hiding places and a potentially intimidating environment.

Perceptions of Railway Stations: A Theoretical Context

It is clear from much of the literature cited above that fear of crime and perceived risks are essential components in defining attitudes and perceptions towards the railway station environment. Definitions of 'fear of crime' are inconsistent, however, and the concept is consequently difficult to measure empirically (e.g., Ferraro, 1995). For the purposes of the present study, therefore, it was seen to be important to identify and classify *how* psychological and environmental cues influence people's evaluations of uncertainty and risk. In the field of risk perception, Pidgeon and Beattie (1998) have recognised that risk can be characterised according to many different generic categories. They defined risk in terms of uncertainties attached to the state of the world. In this sense, risk is interpreted as being "the probability of an undesired state or harm". In the context of the present

study, this concept is interpreted to denote the *likelihood* of a threatening incident occurring, involving a crime or incivility. Pidgeon and Beattie also recognised that risk can also be defined as “the magnitude of the negative consequence that might flow from an action, decision, or possible state of the world”. Here, they stated that the extent of risk depends upon the maximum size of anticipated detriment. In the present study, risk is interpreted to represent the *impact* of a given incident. Pidgeon and Beattie (1998) added that the notions of probability and consequence (or likelihood and impact) could be combined to represent a “weighted combination”, a technique that is described as being “the most common definition used in formal quantitative risk assessments”. (Pidgeon and Beattie, 1998).

Our final theoretical consideration is drawn from the work of Gibson (1979) on ‘affordances’. This is a theory of perception which conceives the environment as offering opportunities through its physical structure. Environmental affordances are the opportunities afforded or provided by the environment to enable certain behaviours. They are the resources within the environment that can be used by the individual to achieve their goals. Thus an affordance of a railway station might be a tunnel allowing the person to transfer from an overground train to the subway. The same affordance can be used by the graffiti artist whereby the walls in an unsupervised tunnel offer a canvass for their spray can. A crowded concourse where passengers are required to stand and gaze up at a train departure indicator board affords information for passengers, but also provides a distraction which thieves can capitalise upon. Clearly then there is something about places in general and railway stations in particular and the person-environmental relationship which is critical to both the incidence and the prevention of criminal activity.

The research reported in the present paper has been undertaken as part of the International Union of Railways Man-Machine Interface project (Uzzell, Brown and Breakwell, 2000). The aim of one element of the project was to examine what factors give rise to feelings of insecurity, crime and vandalism in the station. This was investigated by examining the perceptions and attitudes of station users towards the station itself and the organisations that manage the station. The research focused on three international stations, London Waterloo, La Gare de Lyons (Paris) and Roma Termini. Data for Waterloo only are presented in the current paper.

Study one

The starting point for the research was to identify the factors which need to be taken into account when considering the relationships between crime, fear of crime, the different station users and the station environments

themselves. Our first study sought to ascertain the concerns of people who travel to Waterloo Station either regularly or irregularly.

Sample

Our sample consisted of 116 participants who were familiar with travelling at Waterloo Mainline Station. The sample was opportunistic in nature, comprising staff and students affiliated to the University of Surrey, and justified on the grounds that provided a reasonable balance of respondents of age and gender were interviewed these were as likely to be rail travellers and have the same concerns as any other group. Waterloo is the mainline terminus for rail travel from Guildford, the University town for Surrey.

Measure

A questionnaire was developed in the UK. Relevant factors were derived from the research literature and through consideration of *Crime Prevention Through Environmental Design* (CPTED). Over 100 items and issues were identified in the following categories: satisfaction with service; information; social support; station facilities; on trains; illegitimate activity; fear of crime; platform entrance and routes; lighting and maintenance; security devices; personal security; theoretical frameworks; demographics. Furthermore comments and advice from discussions held with representatives of Railtrack, SNCF (Société Nationale des Chemins de fer Français) and ISFORT (Istituto Superiore di Formazione e Ricerca per i Trasporti) as to the nature and prevalence of crime and insecurities in the three countries were incorporated into the questionnaire.

The participants were required to indicate how concerned they felt with regards to the 26 items reflecting various kinds of situations they might face as a railway traveller, using a four-point Likert-type scale ranging from *very concerned* (4) to *not at all concerned* (1). Since the questionnaires were not administered in a railway station setting, the respondents were asked to contemplate and evaluate their past experiences of travelling at Waterloo Mainline Station.

Results

The findings replicated the kind of concerns the other research studies have found (Table 1).

Table 1 – Travellers’ Concerns at Waterloo Station*

Variable	Mean
No one being able to help if you were in danger	3,25
Having adequate up-to-the-minute information	3,13
Travelling at night	3,10
Having information about connecting transport services	2,94
Being pick-pocketed	2,93
Police not being in control of the station	2,77
Witnessing a suicide	2,75
Station staff not being in control	2,63
Being approached by beggars in the station	2,63
Travelling alone	2,60
Crowding on the platforms	2,59
Groups of youths in the station	2,55
Having luggage stolen	2,55
The state of the area just outside the station	2,55
Drug-users in the station	2,49
Having difficulty purchasing your ticket	2,49
Being trapped in case of fire in the station	2,44
Walking to/from the station	2,38
Being attacked	2,35
Homeless people’s presence in the station	2,32
Walking in the corridors	2,30
Vandalism and graffiti in the station	2,26
Being pushed/falling onto the tracks	2,17
Terrorist attacks	2,07
Changing modes of transport at the station	1,99
Getting lost in the station	1,89

Note: * The higher the score the greater the concern.

It is clear from these results that there is a high degree of variability in levels of concern with the more benign aspects of travel safety assuming most significance. Not surprisingly, safety situations which are rare such as terrorist attacks are of low concern. But how do these items relate to each other? Can we detect any underlying pattern in these concerns in terms of their salience for the public? Using factor analysis with the Varimax rotation procedure we identified four distinct factors or dimensions of concern about Waterloo Station (Table 2).

Table 2 presents the results of the factor analysis of travellers' concerns about Waterloo Station. Four factors were extracted with Eigenvalues greater than 1, accounting for 57.4% of the variance. The results indicate that salient loadings on Factor 1 belong to items associated with concerns about being a *victim* in the railway station. Each item pertains to instances of physical threats to passengers' safety, over which the individual lacks control. Thus the locus of control is external and lies with the railway station as the behavioural setting.

Factor 2 has high loadings from items relating to concepts of *time and space* associated with railway stations, i.e., they revolve around the temporal aspects of train travel and potential threats posed by the physical environment: walking to the station; the state of the area outside the station; walking in the corridors; changing modes of transport in the station and walking from the station. The theme also incorporates aspects such as time of day and travelling alone, adding to the notion of the sequential stages of a typical journey.

Items in Factor 3 denote the salience of *information and services* and demonstrate the importance of adequate information needed to complete a typical journey. The variable "staff station not in control" was interpreted as being of particular relevance since it relates to instances in which station staff are unable to provide ample travel information to passengers, as well as occasions where station staff are not easily visible to passengers for guidance and instructive purposes.

Factor 4 is a dimension relating to the concept of *security* in the railway station, where threats are posed by the behaviour of others and the physical environment. Again, as with Factor 1 the individual feels out of control. The inclusion of "police not being in control" highlights the importance of authoritative regulation in the railway station, while "no-one being able to help if in danger" draws attention to the need for social support as a means of creating an impression of security.

Table 2 – Details of the Factor Analysis on the concern items.

Attitude	Item	Factor			
		Victim	Time/ space	Info/ service	Security
Factor 1	VICTIM				
a.	being attacked	0,77	0,29	7,92	0,12
d.	being trapped in case of fire	0,74	4,24	0,14	0,19
b.	being pick-pocketed	0,69	0,18	0,11	-0,13
c.	terrorist attacks	0,67	0,2	7,1	0,27
I.	being pushed/falling onto the tracks	0,59	0,17	0,27	0,18
k.	drug-users in the station	0,57	0,18	0,45	0,22
e.	having luggage stolen	0,56	0,13	-3,19	0,11
q.	getting lost in the station	0,41	0,12	0,2	0,37
Factor 2	TIME and SPACE				
g.	travelling at night	0,15	0,86	0,18	0,1
h.	travelling alone	0,26	0,83	0,15	4,7
f.	walking to/from the station	0,26	0,79	7,9	5,1
t.	walking in the corridors	0,23	0,67	8,3	0,35
y.	state of the area outside the station	-2,6	0,6	-2,5	0,52
z.	changing modes of transport	0,21	0,53	0,16	0,37
Factor 3	INFORMATION and SERVICES				
p.	having adequate information	5,02	-5,21	0,79	1,06
r.	having information about connecting services	0,22	8,61	0,74	0,13
o.	having difficulty purchasing your ticket	-2,2	0,15	0,72	1,3
s.	station staff not being in control	0,37	9,9	0,66	0,35
m.	groups of youths in the station	0,14	0,33	0,44	0,38
j.	crowding on the platforms	0,27	0,36	0,4	0,26
Factor 4	SECURITY				
n.	homeless people's presence	5,6	0,14	0,2	0,75
w.	witnessing a suicide	0,49	-2,3	4,43	0,64
x.	police not being in control	0,5	0,19	0,17	0,57
u.	vandalism and graffiti in the station	0,11	0,22	3,5	0,56
l.	being approached by beggars in the station	0,15	0,14	0,49	0,51
v.	no-one being able to help if in danger	0,36	0,2	0,4	0,43
Factor	Eigenvalue	% of Variance	Cumulative %		
1	9,325	17,0	17,0		
2	2,158	14,7	31,6		
3	1,951	13,0	44,6		
4	1,484	12,8	57,4		

However, identifying peoples concerns and the structure of their concerns only provides a partial or 'headline' perspective on environmental concerns. There are two critical issues underlying concern.

- i) the likelihood of being the victim of a crime or insecurity – how likely is the passenger to experience the situation?
- ii) the impact of that crime or insecurity upon the individual – how pleasant or unpleasant they would find the situation?

Study two

The rationale behind the second study was to identify the conceptual system which people employ when thinking about crime and threats to safety in railway stations. The multiple sorting procedure allows "a flexible exploration of conceptual systems either at the individual or group level" (Canter, Brown and Groat, 1985). In order to understand human behaviour it is imperative to understand the ways in which people form categories and construct systems of classifications. It is therefore of importance to explore the nature and organisation of concepts elicited from people, specific to the issues being explored. The key question to be answered were how likely rail travellers thought they would be to experience the crime or insecurity situation.

Sample

The second study required a small group of people (i.e., potential rail travellers) and 14 respondents were selected on the criteria that they were familiar with travelling at Waterloo Mainline Station.

Measure

The aim of this stage of the research was to establish the salience of individuals' construct evaluations of the likelihood and impact of being the victim of a particular crime in a railway station setting, based upon their own experiences and observations.

Multiple sorting tasks were employed in order to explore which attributes of personal safety and security commuters pay attention to in railway stations, and to audit what the problems are and their relative degree of seriousness. The stimulus material was the 26 questionnaire items which were printed individually onto cards.

Initially the participants were asked to assign the cards to categories of their own choice (i.e., a free sort); they were informed that any number of cards could be assigned to different categories and were told there was no right or wrong answer. After the sort the participants were asked to

explain the rationales behind their choices of categorical themes and to elaborate on why they perceived the elements to have common features.

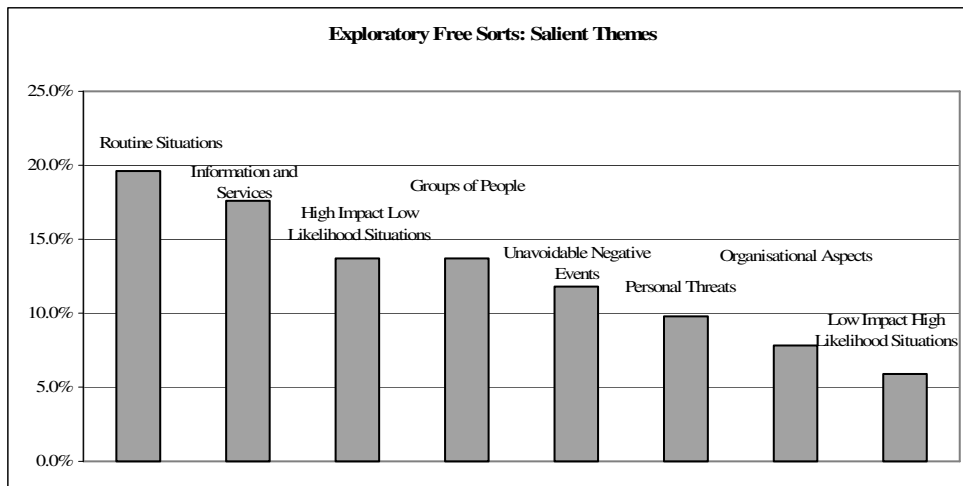
The exploratory sort allowed the participants to become familiar with the items, in order for them to progress to the second stage. A second structured sorting constituted two elements, requiring the participants to sort the cards according to stipulated categories these being oriented around the concepts of *likelihood* and *impact*. The participants were required to place the items into three groups; in terms of how likely they thought they would be to encounter a crime or incivility (high, medium or low chance of occurrence); and how they would rate the impact of an incident occurring (high, medium and low impact). The potential impact could have been physical, emotional or both; respondents were not asked to specify. The data generated by the sorts were thematically analysed and also subjected to multidimensional scaling.

Results of the free sort

Analysis of the exploratory free sorts involved the procedure of content analysis, involving the development of a classification of salient issues that were elicited from the sorts. This provided the basis for a suitable coding framework for the content analysis process. Evaluations of the intragroup results indicated that the participants assessed the items in terms of eight themes.

Figure 1 represents the percentage of participants who classified the cards into the eight different categorical themes, in descending order. The content analysis revealed that the majority of the respondents deemed *routine situations associated with stations* followed by *information and services* as the most salient. Although the information extracted from the exploratory card sorts implies little statistical relevance or significance, the qualitative information elicited from the respondents allows insight into the processes that individuals use to formulate categories and construct systems of classifications for the items. On this basis it may be plausible to infer that individuals view the railway station environment according to specific conceptual systems and components. The themes highlighted above indicate that collectively, the respondents estimated issues oriented around the concepts of *information and services* and *routine situations associated with stations* as being more prominent than concepts associated with potential threats to safety. In addition, *high impact/low likelihood situations* were deemed as being more significant than *low impact/high likelihood situations* revealing that the respondents approximated the relative degree of distress caused by potential incidents (impact) as being higher than the probability of being the victim of a crime or incivility (*likelihood*).

Figure 1 – The dominant themes found in the exploratory free sorts.



Results of the Structured Card Sorts: Associations between Likelihood and Impact

The card sorts revealed that the participants evaluated the items as being distinct from one another when they were asked to rate how likely an incident would be to occur to them and how they would rate the impact. Figure 2 provides a classification of the association. The items on the left of the quadrant were derived from the mean scores for *the impact of an incident occurring*, while the items on the top were derived from the mean scores for *the likelihood of an event occurring*. The items in the quadrant are ordered from the highest to the lowest mean value of *impact*.

The responses can be divided into four categories.

- 1) High Impact / High Likelihood situations are clearly seen as the most serious. If one has limited resources for tackling crime and insecurity, this might suggest priorities for their deployment.
- 2) High Impact/Low Likelihood situations are associated with undesirable and unavoidable negative events together with a lack of social and organisational assistance.
- 3) Low Impact/High Likelihood situations are associated with the routine nature of rail travel
- 4) Low Impact/Low Likelihood situations

Figure 2 –Likelihood and Impact of Experiencing Threatening Situations

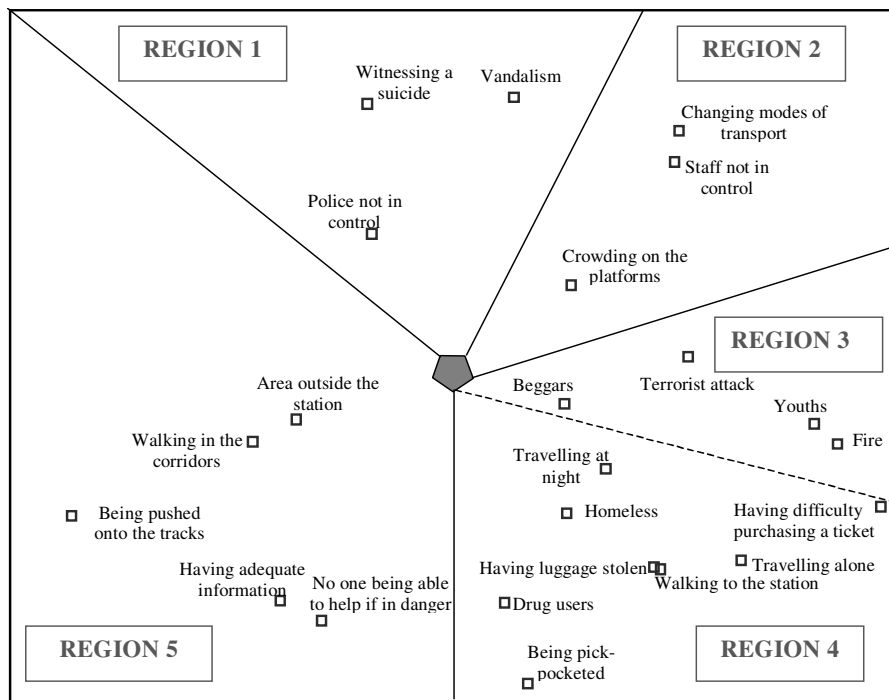
		Likelihood	
		High	Low
Impact	High	Being pick-pocketed Being approached by beggars in the station	Witnessing a suicide No one being able to help if in danger Having luggage stolen Being trapped in case of fire in the station Police not being in control of the station Being pushed/falling onto the tracks Terrorist attack Station staff not being in control Drug-users in the station
	Low	Travelling at night Crowding on the platforms Vandalism and graffiti in the station Travelling alone Homeless people's presence in the station Walking in the corridors Walking to/from the station Groups of youths in the station The state of the area outside the station Having adequate up-to-the-minute information Changing modes of transport in the station	Having difficulty purchasing your ticket

Closer inspection of the items in the quadrant revealed that the participants perceived personal threats to their own safety (*being pick-pocketed; being approached by beggars in the station*) as being of both high impact and high likelihood, suggesting that they perceived the events to be of greatest seriousness, whilst the only low impact/low likelihood item (*having difficulty purchasing a ticket*) is associated with a routine situation associated with railway stations, and was equated with least seriousness. ‘Vandalism’ and ‘groups of youths’ which in some other situations might be seen as a trigger for anxiety by the public fall into the category of low impact/high likelihood, along with more commonplace issues, perhaps suggesting that this is an inevitable feature and routine consequence of travelling and using railway stations. The high impact/low likelihood items are associated with undesirable and unavoidable negative events that may occur, together with items associated with a lack of social and organisational assistance.

In order to examine the general pattern of relationships between impact and likelihood a non-metric multidimensional scaling using Guttman

Smallest Space Analysis (SSA) was performed. This involved calculating Pearson correlations between impact and likelihood and inputting the correspondences to the SSA programme. The SSA procedure estimates the overall Pearson correlation coefficients between the scores and spatially represents them as linear distances such that the more highly correlated two items are, the closer they will be together in space. Interpretation of the multi-dimensional space is undertaken by the identification of meaningful clusters of items. This analysis produced five regions:

Figure 3 – Pattern of Relationships between Likelihood and Impact



- Region 1** – Psychological threats posed by the behaviour of others, over which the individual bystander has no control.
- Region 2** – Threats posted by unreliable services (routines of train travel).
- Region 3** – Unavoidable threats posed by train travel.
- Region 4** – Physical threats posed to the individual (e.g., personal threats to safety; threat of being physically assailed).
- Region 5** – Threats posed by the physical environment.

Figure 3 shows the output that was generated from the SSA analysis. In simple terms the items appear as a radial pattern, suggesting a qualitative sequence rather than a straightforward quantitative linear progression. The coefficient of alienation in the three-dimensional solution was 0,21, which indicates an acceptable fit between the pattern of correlations and their representation in the multi dimensional space. The configuration shows five groups of items are distinctly visible.

The regions indicate an underlying conceptual pattern whereby fear of crime is associated with a range of complex factors, varying from threats related to the physical environment, lack of control over the behaviour of others, perceptions of personal exposure to risks and threats associated with the inherent nature of travel in railway stations. The findings represented in this plot suggest that the respondents did not base the impact and likelihood of being the victim of crime simply upon their perception of the railway station environment. Rather, their fear of crime is associated with complex factors ranging from threats related to the physical environment, a lack of control over the behaviour of others, perceptions of personal exposure to risks and threats associated with the inherent nature of travel in railway stations.

Conclusions

In exploring perceptions of different types of crimes and incivilities at railway stations, the analyses reported here involved two distinct types of conceptual frameworks, and correspondingly, two types of data. The questionnaire revealed information about respondents' levels of concern while in the railway station. This in itself is inadequate. While this gives an important measure of the relative importance of different types of threat, it is more useful to distinguish threat in terms of both likelihood and impact. The 2 x 2 matrix clearly serves to demonstrate that distinguishing between the estimated probability of an incident and the ensuing consequence of the event has significant implications for the planning, design and management of railway station environments as well as the allocation of resources to achieve a safe environment and the reduction in the fear of crime. Thus low likelihood/high impact events like suicide by jumping in front of a train seem to be accepted as rare inevitabilities which the station management can do relatively little about. High impact and high frequency events such as being approached by beggars or pickpockets are where resources might best be prioritised (e.g., the provision of CCTV cameras; increased staff or police presence in 'hot spots'; improving station design in order to afford

better self-protection by passengers as well as reducing the affordance for criminal activity).

The factor analysis showed respondents' general ratings and degree of concern associated with the different situations. These findings indicated that ratings of concern exhibited an orderly configuration, with the resultant themes being: *victim, time and space, information and services* and *security*. These represent potential targets for intervention. If greater visibility of staff satisfies the increased sense of security, the affordances concept would suggest that if these staff were knowledgeable about the station and journey times, this would offer a multiple affordance resource in also satisfying service and information needs.

The evaluation individuals make of the world does not comprise distinct and unrelated judgements. The card sort results served to highlight the intricate nature of perceived risks. The impact/likelihood matrix served as a classification system of crime and security, while the SSA technique allowed a multi-dimensional analysis of the representations formed by respondents' evaluations of impact and likelihood of the various situations. That the multi-dimensional space was plotted in a radial sequence served to draw attention to respondents' conceptualisations of impact and likelihood as being multifaceted. The SSA regions indicate that different types of threats influence evaluations including psychological threats as a result of the actions of others, the failure of services, the unavoidable threats posed by train travel, physical threats initiated by others and threats posed by the railway station environment itself.

The priority for the responsible agencies is to reduce the incidence of crime and insecurity situations. Action in respect of fear of crime is more problematic. Clearly the railway authorities do not wish the public to be over anxious about their susceptibility to criminal activity while in railway stations. On the other hand, a reasonable fear of crime commensurate with the actual levels of risk does serve to protect the public from incautious behaviour. It puts passengers on their guard and alerts them to potentially threatening situations.

Clearly some design interventions can be subtly effective. For example, there has been a growth in attempts to 'design out' crime such as through the installation of blue fluorescent tubes in station lavatories in order to make it more difficult for intravenous drug users to find a vein to inject heroin or other narcotic drugs. These responses are valid and have an important role to play but they are not the whole story. Changing environmental features in order to affect the affordances of people/environment relationships may change behaviour in one place at one particular time, but the formula may not work in another place at another time. Neither does this account for displacement effects or adaptations by criminals to new

types of illicit activities. Fear of crime measures relate to the whole station. The present paper demonstrates that this is inappropriate as crime occurs in particular places, at particular times and in particular situations. Part of the strategy to raise the public's awareness of risk and taking more responsibility for their own actions might be to encourage and enable them to discriminate more effectively between places and times where they are more likely to be at risk. Certain places and times afford greater opportunities for criminal activity and one action might be to alert the public to this.

While it may seem that fear of crime is an entirely psychological construct in which fear may bear little or no relationship to the actual likelihood or impact of crime, it is clear that perceptions of risk and safety are grounded in people's experience of the environment and the rapidly changing micro-situations and settings they experience as they move through public spaces. This makes a powerful case for the mapping of the psychological regions of risk perception onto the physical regions or spaces of the railway station environment.

References

- Barker, R. G. (1968). *Ecological psychology: Concepts and methods for studying the environment of human behavior*. Stanford, CA: Stanford University Press.
- Brantingham, P. J., & Brantingham, P. L. (1991). *Environmental Criminology*. Prospect Heights, Illinois: Waveland Press, Inc.
- Brantingham, P. J., & Brantingham, P. L. (1997). Understanding and controlling crime and fear of crime: Conflicts and trade-offs in crime prevention planning. In Steven P. Lab (Ed.), *Crime Prevention at a Crossroads* (pp. 43-60). Cincinnati, OH: Anderson.
- Canter, D., Brown, J., & Groat, L. (1985). A Multiple Sorting Procedure for Studying Conceptual Systems. In M. Brenner, J. Brown & D. Canter (Eds.). *The Research Interview: Uses and Approaches* (pp. 79-113). London: Academic Press.
- Carr, K., & Spring, G. (1993). Public transport safety: A community right and a communal responsibility. In R. V. Clarke (Ed.), *Crime Prevention Studies* (vol. 1, pp. 147-155). Monsey, NY: Criminal Justice Press.
- Crime Concern and Transport & Travel Research (1997). *Perceptions of Safety from Crime on Public Transport*. London: Crime Concern & Transport & Travel Research.
- Department of the Environment, Transport, and the Regions (DETR) (1998a) *Secure Stations Scheme: Manage and design to cut out crime*. London: HMSO
- Ferraro, K. F. (1996). Women's fear of victimization: Shadow of sexual assault. *Social Forces*, 75 (2), 667-690.

- Forrester, D. H., Frenz S., O'Connell, M., & Pease, K. (1988). *The Kirkholt Burglary Prevention Project: Phase II*. Crime Prevention Unit Paper n.º 23. London: Home Office.
- Gibson, J. J. (1979). *The Ecological Approach to Visual Perception*. Boston: Houghton Mifflin.
- Glazer, N. (1979). On Subway Graffiti in New York. *The Public Interest*, 54-57, 3-11.
- Kenney, D. J. (1986). Crime on the subways: Measuring the effectiveness of the Guardian Angels. *Justice Quarterly*, 3 (4), 481-496.
- Kenney, D. J. (1987). *Crime, Fear, and the New York City Subways: The Role of Citizen Action*. London: Praeger.
- Perring, T. (1995). *Fear of crime in the London Underground: Closed circuit television and the physical environment*. Unpublished MSc Environmental Psychology dissertation, University of Surrey.
- Pidgeon, N. F., & Beattie, J. (1998). The Psychology of Risk and Uncertainty. In P. Calow (Ed.), *Handbook of environmental risk assessment and management* (pp. 289-318). Oxford: Blackwell.
- Polvi, N., Looman, T., Humphries, C., & Pease, K. (1990). Repeat break-and-enter victimizations: Time-course and crime prevention opportunity. *Journal of Police Science and Administration*, 17, 8-11.
- Shellow, R., Romualdi, J. P., & Bartel, E. W. (1974). Crime in rapid transit Systems: An analysis and a recommended security and surveillance system. *Transportation and Research Record*, 487, 1-12.
- Sherman, L. W., Gottfredson, D., MacKenzie, D., Eck, J. Reuter, P., & Bushway, S. (1998). *Preventing crime: What works, what doesn't, what's promising: A report to the United States Congress*. Washington, DC: National Institute of Justice.
- Stokols, D., & Novaco, R. W. (1981). Transportation and well being: An ecological perspective. In I. Altman (Ed), *Transportation and Behaviour* (pp. 85-130). London: Plenum Press.
- Uzzell, D, Brown, J, & Breakwell, G. (2000). *Public Perceptions and Attitudes Towards Crime, Safety and Security in Three International Railway Stations: Waterloo, La Gare de Lyon and Roma Termini*, Report to the International Union of Railways, Paris.