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EVALUATING SITUATIONAL CRIME PREVENTION USING A YOUNG PEOPLE'S SURVEY

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The main aim of this research is to evaluate the impact of improved street lighting on crime in a local authority housing estate in Dudley, West Midlands. It is argued that high quality evaluation designs, for example, comparing experimental and control areas and including before and after measures of crime, are needed to evaluate situational crime prevention initiatives. Previously, in a design of this kind using household victimization surveys to measure crime, we demonstrated that crime decreased after the street lighting was improved. The main aim of this paper is to investigate whether the same results are obtained in a self-report survey of young people, also given in experimental and control areas before and after the improved street lighting. It is argued that self-reported delinquency is a valid and reliable measure of offending. The self-report results corroborated the victimization survey results in showing that offending decreased in the experimental area compared to the control area. Also, the young people thought that the crime problem had decreased more in the experimental area, and their fear of crime after dark also decreased more in the experimental area. However, the victimization of young people did not decrease more in the experimental area, possibly because street pestering by older people did not decrease.

Evaluating Situational Crime Prevention

At least in the 1980s and 1990s, situational crime prevention was the dominant strategy for reducing crime used by the British government, and it has also been important in Holland and Sweden (Clarke 1995). However, up to the present, there has been a relative lack of interest in situational crime prevention in the United States. Why is this?

One possible explanation is that policy makers in the United States demand a higher standard of rigour in evaluation evidence than policy makers in Great Britain before investing a large amount of money in a crime prevention strategy. For example, the most influential American report on crime prevention is *Preventing Crime: What Works, What Doesn't, What's Promising* by Sherman and his colleagues (1997). This arose from a request from the United States Congress to the Department of Justice to commission an independent, scientifically rigorous assessment of more than $4bn worth of federally sponsored crime prevention programmes. The *New York Times* called the 500-page report from the University of Maryland 'the most comprehensive study ever of crime prevention' (Butterfield 1997).

An important feature of the University of Maryland report is the use of the 'scientific methods scale' to assess the methodological quality of evaluation studies. This was also

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used in the influential Home Office report on *Reducing Offending* (Nuttall *et al.* 1998). Briefly, this is as follows:

Level 1: Correlation between a prevention programme and a measure of crime at one point in time (e.g. 'areas with CCTV have lower crime rates than areas without CCTV').
Level 2: Measures of crime before and after the programme, with no comparable control condition (e.g. 'crime decreased after CCTV was installed in an area').
Level 3: Measures of crime before and after the programme in experimental and comparable control conditions (e.g. 'crime decreased after CCTV was installed in an experimental area, but there was no decrease in crime in a comparable control area').
Level 4: Measures of crime before and after the programme in multiple experimental and control units, controlling for other variables that influence crime (e.g. 'victimization of premises under CCTV surveillance decreased compared to victimization of control premises, after controlling for features of premises that influenced their victimization').
Level 5: Random assignment of programme and control conditions to units (e.g. 'victimization of premises randomly assigned to have CCTV surveillance decreased compared to victimization of control premises').

The scientific methods scale is based on the work of Cook and Campbell (1979) in describing research designs that are most effective in eliminating threats to internal validity (i.e. alternative plausible explanations of observed effects). Experimental control (Level 5) is most convincing, but it usually requires the analysis of smaller units than areas (e.g. individuals or households). With situational prevention methods targeted on areas, the best design in practice is to have before and after measures of crime in experimental and control areas with some control of extraneous variables (Farrington 1997): Level 4 on the scientific methods scale.

Sherman and his colleagues (1997) set a minimum standard of methodological quality of Level 3. For example, their criterion of 'What Works' required at least two Level 3 evaluations with statistical significance tests showing effectiveness. Unfortunately, many British evaluations of situational crime prevention measures only reach Level 2; they demonstrate that crime decreases in an experimental area, but do not compare an experimental area with a *comparable* control area (Welsh and Farrington 2000).

One British evaluation of situational crime prevention that reached Level 4 on the scientific methods scale was carried out by Painter and Farrington (1997). They investigated the effects of improved street lighting in Dudley, West Midlands, by comparing before and after measures of crime (based on a household victimization survey), in experimental (re-lit) and control areas. They showed that crime decreased significantly in the experimental area (by 23 per cent) and did not change significantly in the control area (a 3 per cent decrease). Furthermore, they also demonstrated that these results held after controlling statistically for factors related to victimization (in particular, the age of the respondent). A similar study was later carried out in Stoke-on-Trent, with similar results (Painter and Farrington 1999b). In both cases, the monetary benefits from crime reduction exceeded the monetary costs of the improved street lighting (Painter and Farrington 1999a).

The victimization surveys in the Dudley project were accompanied by before and after self-report surveys of young people living in the experimental and control areas. Previous British evaluations of situational crime prevention have used police records and victimization surveys as measures of crime. The main aim of the present paper is to evaluate the

impact of a situational crime prevention method (improved street lighting) using self-report surveys of young people, and to compare results obtained in self-report surveys with results obtained in victimization surveys. Clearly, results replicated with outcome variables from different sources are more compelling than results based on outcome variables from only one source. (For reviews of previous research on street lighting and crime, see Painter 1996; Painter and Farrington 1997, 1999b; Pease 1999.)

Self-Report Surveys of Young People

The influential research of Short and Nye (1957) triggered the self-report revolution in the United States, with many researchers abandoning police records in favour of self-reported delinquency (SRD) measures. In Great Britain in the 1960s, pioneering research on SRD by young people was carried out by Willcock (1974), Belson (1975) and Gibson (1971).

In 1963, Willcock interviewed a representative sample of 808 males aged 15–21 from England, Wales and Scotland, and invited them to admit to 40 offences, including theft, burglary, assault, vandalism and unlawful sex. Nearly all (97 per cent) admitted at least one act. By comparing SRD and court appearances, Willcock found that the probability of detection was low in most cases (e.g. about one in 100 for shoplifting), but relatively high for burglary and taking vehicles (about one in five offences). In 1967, Belson asked 1,425 London males aged 13–16 about 44 types of stealing. Perhaps because of his elaborate method of assuring confidentiality, his admission rates were very high. For example, 70 per cent of his boys said that they had ever shoplifted.

Early British researchers were concerned not only with the prevalence and frequency of SRD but also with the validity and reliability of responding. In the Cambridge Study in Delinquent Development, a prospective longitudinal survey of 411 London boys, Gibson *et al.* (1970) showed that 91 per cent of offences found in official records were admitted in SRD, thereby demonstrating concurrent validity. Farrington (1973) carried out the first extensive evaluation of SRD questionnaires on traditional psychometric criteria such as questionnaire content, administration procedures, norms for various populations, internal consistency, retest stability, and concurrent and predictive validity. Generally, the questionnaires came out pretty well, suggesting that it was perfectly defensible to use self-reports in measuring delinquency. Furthermore, West and Farrington (1973: 162) concluded that, to a considerable extent, the predictors of SRD and convictions were similar. Evidence of the validity of SRD surveys is far greater than evidence of the validity of victimization surveys.

Later British SRD research has tended to continue the traditions of earlier research. West and Farrington (1977: 27) provided more detailed information about the probability of a conviction given a self-reported offence. Farrington (1989) reported on the prevalence of SRD at five ages (14, 18, 21, 25 and 32), on continuity of self-reported and official offending over time, and on the predictive validity of SRD. Farrington (1992) compared predictors of SRD and convictions in more detail. Riley and Shaw (1985) interviewed a nationally representative sample of 751 boys and girls aged 14–15, focusing particularly on parental supervision as a correlate of SRD. Graham and Bowling (1995) interviewed a nationally representative sample of 1,648 males and females aged 14–25,

plus a booster sample from ethnic minorities, so they were able to compare the prevalence of SRD by Whites, Blacks and Asians.

Mawby's (1980) SRD survey of 591 boys and girls aged 13–15 from one Sheffield school is noteworthy because he was the first British researcher to relate SRD to self-reported victimization of young people. He found that offenders tended disproportionally to be victims, and vice versa. This was later verified by Maung (1995) with a nationally representative sample of 1,350 boys and girls aged 12–15.

It appears that the present study represents the first attempt in Great Britain to use an SRD questionnaire completed by young people to evaluate the effects of a situational crime prevention initiative (improved street lighting). In addition, because the young people were asked not only about their offending but also about their victimization, the effects of improved street lighting can also be investigated using a victimization survey of young people.

Method

The main project

The main aim of the research was to evaluate the crime-reducing effects of improved street lighting in Dudley, West Midlands (Painter and Farrington 1997). The experimental area was selected for re-lighting by local authority engineers on the basis of need. The street lighting was in a bad state of repair and had been the subject of complaints from the Tenants' Association. The control area was near to the experimental area but was physically separated from it by a conservation area and nature reserve. The control area's lighting was equally bad, but its residents were less organized and less vociferous in complaining at the time. Both areas were about two miles from the town centre and similar on basic demographic and design features. Both were characterized by deprivation and high unemployment rates.

Both areas were local authority housing estates which had been built at approximately the same time (mid-1930s). In many ways, they were typical pre-war council estates. They had similar architectural designs (semi-detached houses and terraced rows of four, low rise dwellings with gardens front and back); a similar number of dwellings (approximately 1,200–1,300 on each estate); the same housing authority and similar housing allocation policies; and clear geographic boundaries (both were bounded by the nature reserve and by main arterial roads). The design and layout of the estates and the types of dwelling facilitated natural surveillance, which was potentially important for street lighting to be effective in preventing crime.

In a four-week period during February and March 1992 129 high pressure sodium (white) street lights were installed over 1,500 metres of roadway in the experimental area. This lighting improvement constituted a noticeable alteration of the night-time environment. The amount of useful light more than doubled. In general, however, only the main roads were re-lit, not the alleyways between the houses.

The timing of data collection was the same in both areas. The before survey was completed in February–March 1992, and the after survey was completed in February–March 1993. Both household surveys enquired about events (especially victimizations) in the previous 12 months. Thus, the before survey period covered January

1991–January 1992, and the after survey period covered February 1992–February 1993, including the street lighting installation period which began towards the end of February 1992. Care was taken to ensure that nobody in the before survey was interviewed after the lights were improved. Respondents were only asked about crimes which had occurred *on their estate* in the previous 12 months, and supplementary questions ensured that the same criminal event did not generate reports of two categories of crime.

Exactly 600 addresses were issued to interviewers in each area (essentially a 50 per cent random sample drawn from the electoral register). The type of local authority dwelling ensured that only one household lived at each address. A person aged 18 years or over was selected at random for interviewing; 431 interviews were achieved in the experimental area and 448 in the control area, in the before survey. Excluding void properties, the response rate was 77 per cent. Only the addresses interviewed in the before survey were issued to interviewers for the after survey. The number of households reinterviewed was 372 in the experimental area and 371 in the control area, a reinterviewing rate of 85 per cent. Altogether, 65 per cent of the original target sample was interviewed twice. The household face-to-face interviews took between 45 and 90 minutes depending on the extent of victimization. The interviewers were not told about the main focus of the project (on the effects of improved street lighting).

The results were as follows:

(a) On most variables the experimental and control areas seemed closely comparable in the before survey. If anything, the experimental area was slightly worse on crime.
(b) The prevalence of victimization (the percentage of households victimized) decreased in the experimental area but did not change in the control area.
(c) The incidence of victimization (the number of crimes committed) decreased more in the experimental area than in the control area.
(d) Crimes committed in the daylight decreased just as much as crimes committed after dark.
(e) The number of people (especially women) on the street after dark increased in the experimental area but not in the control area.
(f) The experimental sample noticed that the lighting had improved, became more satisfied with their estate, and had less fear of crime.

It was concluded that improved street lighting caused decreased crime, possibly because the improved street lighting led to increased community pride and informal social control of potential offenders, which inhibited them from committing crimes. Effects on potential offenders are investigated in the present paper.

The young people's survey

During the before household victimization survey, each adult respondent (age 18 or above) was asked if any young person aged between 12 and 17 lived at the address. About 20 per cent of households contained such a young person. If a young person was identified, permission to interview that young person was sought. Altogether, 205 young persons were identified with permission to interview them. However, it proved to be quite difficult to carry out these interviews, even when appointments had been made, because young people were often out. In order to boost the numbers, interviewers asked

the young people about other young people living next door, and attempted to interview them as well. Altogether, 307 young people were interviewed in the before survey in February–March 1992 (140 in the experimental area and 167 in the control area). It is not possible to specify the response rate exactly. Only one young person was interviewed from each household.

In the after survey in February–March 1993, an attempt was made to reinterview the young person seen in the before survey, or alternatively to interview another young person at the same address or next door. Altogether 170 young people were interviewed in the experimental area (104 of whom had been seen before), and 164 were interviewed in the control area (113 of whom had been seen before). Unfortunately, it is not possible to link up before interviews with after interviews to carry out longitudinal analyses. The before and after surveys have to be treated as repeated cross-sectional surveys.

Each face-to-face interview was completed *without* parents present and took about 60–90 minutes. The young people were asked first about offences and antisocial acts that they had committed and secondly about their experiences as victims of crime. In the before survey, they were given cards describing antisocial acts and sorted them into those they had ever done and those they had never done. The classic studies of self-reported delinquency mentioned earlier all used similar card sorting methods. The young people then had to read out the number on each card to the interviewer, so they never had to talk explicitly about these acts. Therefore, there was no possibility of their being overheard. The young person was told that the interviewer did not know what was on the cards and that all responses were anonymous and confidential. In the after survey, they sorted acts into those they had committed in the previous 12 months and those they had not committed. It was emphasized to the young people that they should only report incidents that had occurred on their estate. A similar card sorting procedure was used to report victimization.

The key question addressed in the present paper is whether the decreases in crime in the experimental estate detected by the household victimization survey could also be detected in a self-report survey of young people.

Results

Self-reported delinquency

The young people were given 30 antisocial acts on cards, 25 of which were classified into four scales as follows:

Violence (8 items)
- Annoyed or insulted other people in the street
- Had a fight in the street or other public place
- Been in a gang fight
- Carried a weapon to protect yourself
- Used a weapon in a fight
- Injured or hit someone in a public place
- Hit a boy
- Hit a girl

Vandalism (5 items)
- Smashed or damaged public property
- Smashed or damaged street lights
- Damaged a parked car/van/motorbike
- Set fire to dustbins or other public property
- Written graffiti in public places

Dishonesty (7 items)
- Broken into a house
- Broken into a shop
- Taken a stranger's purse or bag in a public place
- Broken into a car/van and driven it away
- Taken somebody else's bike and not returned it
- Stolen something out of a car
- Stolen something from a shop

Substance use (5 items)
- Taken illegal drugs (ecstasy, cannabis, dope, pills, etc.)
- Injected yourself with drugs
- Bought or sold illegal drugs
- Sniffed glue or other substances
- Drunk alcohol

The other five items were generally less serious, more difficult to classify, and/or less likely to be committed outside (truancy, smoking cigarettes, unlawful sex, malicious 999 call, taken money from home). For each act that was admitted, the young person was asked to say whether on the last occasion it was committed inside a private building or outside in a public place, and whether it was committed during the hours of daylight or darkness. The interviewer checked that the same act did not trigger two admissions.

Table 1 shows the results, only for acts committed outside in a public place. Each young person was scored according to the number of different acts he or she admitted. The key result is that the total SRD score of experimental youth *decreased* after the improved street lighting, compared with the SRD score of control youth: experimental from 3.43 acts before (out of 25) to 2.23 after, and control from 2.99 acts before to 2.57 after (interaction term in Poisson regression = 8.53, $p = .003$, two-tailed: see the Appendix. One-tailed tests could be used since predictions are directional.)

The decreases in SRD for experimental and control youth do not necessarily mean that they committed fewer acts per year afterwards; instead, the decreases could reflect the fact that young people were asked to report acts committed 'ever' in the before survey and 'in the last year' in the after survey. This difference does not affect the main conclusions, since the interaction term in a regression equation tests whether the experimental decrease is significantly different from the control decrease. Asking about SRD 'ever' in the before survey had the advantage of obtaining more complete information on offending before, but it had the disadvantage of making the before and after SRD scores difficult to compare.

For all four types of offences, experimental decreases were greater than control decreases. For example, violent acts decreased from 2.25 before to 1.36 after for the

TABLE 1 *Self-reported delinquency scores*

	Experimental		Control		Interaction
	Before (140)	After (170)	Before (167)	After (164)	
Outside					
Violence	2.25	1.36	2.03	1.51	.081
Vandalism	0.55	0.45	0.46	0.51	–
Dishonesty	0.14	0.13	0.10	0.16	–
Substance use	0.49	0.29	0.41	0.38	.070
Total SRD	3.43	2.23	2.99	2.57	.003
Outside in dark					
Violence	1.07	0.64	0.78	0.79	.003
Vandalism	0.32	0.31	0.29	0.31	–
Dishonesty	0.06	0.08	0.05	0.06	–
Substance use	0.42	0.25	0.37	0.30	–
Total SRD	1.88	1.28	1.49	1.46	.005
Outside in light					
Violence	1.18	0.72	1.25	0.73	–
Vandalism	0.23	0.14	0.17	0.20	.074
Dishonesty	0.08	0.05	0.04	0.10	.012
Substance use	0.06	0.04	0.04	0.09	.057
Total SRD	1.55	0.95	1.50	1.11	–

Note: Significance of difference between experimental change and control change tested by interaction term in Poisson regression equation; p values two-tailed.

experimental area, and from 2.03 before to 1.51 after for the control area (interaction term = 3.04, p = .081).

The remainder of Table 1 divides up acts into those committed outside during the hours of darkness and those committed outside in daylight. Importantly, violent acts committed outside in the dark decreased in the experimental area (from 1.07 to 0.64) but stayed constant in the control area (0.78–0.79), a highly significant difference (interaction term = 8.81, p = .003). Primarily because of the change in violence, the total SRD score for acts outside in the dark decreased in the experimental area (from 1.88 to 1.28) and stayed constant in the control area (1.49–1.46), a highly significant difference (interaction term = 7.77, p = .005).

Violent acts committed outside in the light did not decrease more in the experimental area than in the control area. However, the other three types of acts committed outside in the light all decreased in the experimental area and increased in the control area. Although the numbers were small, the results for dishonesty were statistically significant, driven largely by decreases in shoplifting and theft of vehicles in the experimental area and corresponding increases in the control area.

Further confirmation of reduced offending in the experimental area was obtained from an item that asked the young people about contact with the police in the previous year for different reasons (help/advice, reported incident, stopped/told off). The proportion of experimental youth who said that they had been stopped or told off by the police in the previous year decreased from 23 per cent before to 15 per cent after, while the corresponding proportion of control youth increased from 10 per cent before to 18 per cent after (interaction term in logistic regression = 7.29, p = .007).

Victimization of young people

The young people were asked about 14 types of victimization. Excluding being bullied at school, the other 13 were classified into two scales as follows:

Criminal (6 items)
- Insulted or threatened in the street
- Hit by people of your own age
- Hit by adult
- Assaulted in the street
- Had item deliberately damaged
- Had property or money stolen

Pestered (7 items)
- Pestered by drunks
- Followed on foot by stranger
- Followed by stranger in a car
- Man asked you to get into car
- Man tried to touch you
- Man wanted you to touch him
- Man exposed himself to you

The items on the 'Pestered' scale usually specified that the young person was frightened, e.g. 'Have you ever been followed on foot by a stranger in a way which frightened or upset you?'

A third victimization scale was derived from seven questions beginning as follows: 'During the past 12 months have you been upset, frightened, felt threatened or annoyed because any of the following things have happened to you in the streets on the estate?'

Frightened (7 items)
- Stared at
- Followed
- Shouted at/insulted
- Touched/held
- Threatened with violence
- Pushed/shoved
- Hit or attacked

These items probably overlapped to some degree with the 13 victimization items, which referred to ever in the before survey and to the last 12 months in the after survey.

As with the SRD items, the victimization items only referred to acts occurring on the young person's estate. For the first 13 victimization items, the young person was asked to say whether on the last occasion it was committed inside a private building or outside in a public place, and whether it occurred during the hours of daylight or darkness. For the last seven items (which were defined as occurring outside on the street), the young person was asked to say whether it occurred during the hours of daylight or darkness. Each young person was scored on each scale according to the number of different types of victimization suffered.

TABLE 2 *Victimization, crime, fear, and youths hanging around*

	Experimental		Control	
	Before (140)	After (170)	Before (167)	After (164)
Victimization outside				
Criminal	0.94	0.64	0.87	0.59
Pestered	0.86	0.55	0.68	0.55
Frightened	1.84	1.34	1.53	1.05
Total Victimization	3.63	2.52	3.08	2.19
Crime Problem score	2.53	1.95	2.04	1.93
Fear of Crime score	3.56	2.95	3.25	3.52
Youths hanging about				
% youths hang about after dark	79.3	90.6	71.3	92.1
% youths big problem	27.1	50.6	21.6	43.3
% you hang about with group	45.0	35.9	52.7	39.6
% allowed out after dark in winter	82.1	88.8	78.4	85.4
% allowed out until 10pm or later	60.7	73.5	50.3	60.4
% out after dark 4+ nights per week	53.6	54.1	47.3	44.5
% more crime in experimental area	27.1	27.6	68.3	63.4
% crime committed by people on estate	70.7	77.1	71.3	80.5

Note: Interaction terms non-significant except for: Fear of Crime score, LRCS=9.68, p=.002; Crime Problem score, LRCS=3.36, p=0.67.

Table 2 shows the results for the three scales and for the 20-item Total Victimization scale, for outside victimizations only. Disappointingly, there was no significant tendency for victimization to decline more in the experimental area than in the control area. Similarly, there were no significant experimental-control differences when victimization in the dark and in the light were analysed separately (not shown). The Total Victimization scale correlated significantly ($r = .44$, $p < .0001$) with the total SRD scale, but the results obtained with the two scales were different.

Crime, fear of crime and youths hanging around

The young people were asked whether certain crimes were a big problem, a bit of a problem, or not a problem on their estate. In addition, they were asked whether there was a lot, quite a bit, not much or no crime and vandalism on their estate. A Crime Problem scale was developed, based on the following seven items:

– Nuisance from drunks—big problem
– Vandalism to property and cars—big problem
– Burglary—big problem
– Being pestered or threatened on the street—big problem
– Drug use/drug dealing—big problem
– Glue sniffing—big problem
– A lot of crime and vandalism on the estate

As before, the Crime Problem score was simply the total number of these seven items endorsed.

Table 2 shows that the average Crime Problem score decreased by 23 per cent in the experimental area (from 2.53 to 1.95) but by only 5 per cent in the control area (from 2.04 to 1.93). The decrease in the experimental area was almost significantly greater than the decrease in the control area (interaction term in Poisson regression = 3.36, p = .067). These results are remarkably similar to those obtained previously for the prevalence of crime in the household victimization survey (Painter and Farrington 1997: 220): a decrease of 23 per cent in the experimental area and 3 per cent in the control area.

The young people were also asked various questions relating to fear of crime outside after dark. A Fear of Crime scale was developed, based on the following nine items:

- Do you ever feel unsafe in the streets around your home after dark? (yes)
- Do you think there are risks for young people who go out on their own on the estate after dark? (yes)
- Young people are afraid to go out after dark because of the possibility of crime against them (big problem)
- Have you ever heard or seen anything in the streets on the estate after dark which has made you feel unsafe, frightened, worried or annoyed? (Yes)
- Worry a lot about being attacked in the street
- Worry a lot about being pestered or threatened in the street
- Avoid going out after dark although you would like to
- Avoid walking past certain types of people after dark
- Stay away from certain streets after dark

(These last three questions specified: As a precaution against the possibility of crime . . .) As before, the Fear of Crime score was simply the total number of these nine items endorsed.

Table 2 shows that the average fear of crime score decreased by 17 per cent in the experimental area (from 3.56 to 2.95) but increased by 8 per cent in the control area (from 3.25 to 3.52). The change in the experimental area was significantly different from the change in the control area (interaction term in Poisson regression = 9.68, p = .002). Clearly, therefore, the young people's fear of crime after dark in the experimental area decreased significantly after the improved street lighting. There were also indications in the household victimization survey that fear of crime had decreased in the experimental area (Painter and Farrington 1997: 223).

While crime and fear of crime decreased in the experimental area, the number of youths hanging about increased in both areas. Table 2 shows that more than 90 per cent of respondents in the after survey in both areas said that groups or gangs of youth hung about on the estate after dark. Youths hanging about on the streets were perceived to be a big problem by about half of the respondents in the after survey in both areas. However, the percentage of young people who said that they regularly hung about the estate with a group of people of about their own age decreased in both areas. The majority of young people in both areas were allowed out after dark in winter, and more than half of them were allowed out until 10 pm or later. About half went out four or more nights per week after dark.

In both the before and after surveys, about two-thirds of young people on the control estate said that there was more crime on the experimental estate, whereas only about a quarter of young people on the experimental estate thought that there was more crime on their estate. The household survey of adults also revealed that those living on the

control estate thought that crime on the experimental estate was worse (Painter and Farrington 1997: 223). Very few young people thought that there was more crime on the control estate. About half of those in the experimental area and a quarter of those in the control area thought that there was about the same amount of crime on both estates, and the remainder did not know. Experimental and control young people agreed that most of the crime on their estate was committed by people living on their estate.

Perceived effects of improved street lighting

In the before survey, the young people were asked to say what effects they thought improved street lighting might have. In the after survey, the young people in the experimental area were asked to say what changes they thought there had been in the previous 12 months. Table 3 compares the before and after surveys in the experimental area. (The predicted effects of improved street lighting were similar in the experimental and control areas in the before survey.)

In the before survey, almost all the young people in the experimental area thought that the lighting was too dull (96 per cent) and needed improvement (93 per cent). Young people in the control area also thought that their lighting was too dull (86 per cent) and needed improvement (82 per cent). In the after survey, two-thirds (68 per cent) of young people in the experimental area noticed the improved lighting; all subsequent after percentages are based on these 115 young people. (Only 12 per cent of young people in the control area had noticed the improved lighting in the experimental area, reflecting the general lack of contact between young people on the two estates.) Interestingly, almost exactly the same percentage of adults in the experimental area had noticed the improved lighting according to the household victimization survey (65 per cent). The vast majority (80 per cent) of young people in the experimental area thought that their ability to recognize people after dark had improved.

There were considerable differences between predictions in the before survey and perceptions in the after survey. Whereas 71 per cent of young people in the before survey

TABLE 3 *Perceived effects of improved street lighting*

	Experimental		p
	Before (140)	After (115)	
Lighting needs improvement	92.9	–	–
Lighting too dull	95.7	17.5	.0001
Noticed improvement	–	67.6	–
Increased ability to recognize people after dark	–	80.0	–
More people use the streets at night	70.7	32.2	.0001
Increased groups of youths hanging around	30.0	32.2	NS
Increased noise from those using streets at night	22.1	20.0	NS
Decreased risks of crime to those on the street	60.0	22.6	.0001
Decreased vandalism to cars or property on the estate	60.0	17.4	.0001
Increased feelings of personal safety	83.6	44.3	.0001
Decreased fear of crime	60.7	24.3	.0001

Note: 'After' percentages based on 115 who noticed the improved lighting (67.6% of 170); p values based on chi-squared; NS = not significant.

thought that more people would use the streets at night after improved lighting, only 32 per cent in the after survey thought that the number of people using the streets at night had increased. (Most—63 per cent—thought that there had been no change in the number of people using the streets at night.) Pedestrian counts reported by Painter and Farrington (1997: 224) showed that the number of people using the streets at night in the experimental area had indeed increased by the time of the after survey. Therefore, the predictions before seemed more accurate than the perceptions after.

Neither the predictions before nor the perceptions after suggest any increase in groups of youths hanging around or in noise from those using the streets at night. Most young people predicted or perceived no change in these features as a result of improved street lighting. However, as previously shown in Table 2, there was an increase in the number of young people in the experimental area who thought that groups of youths hanging around the streets was a big problem.

In the before survey, most young people in the experimental area predicted that improved street lighting would lead to decreased risks of crime to those on the street (60 per cent) and decreased vandalism to cars or property on the estate (60 per cent). However, in the after survey, only a minority (23 and 17 per cent, respectively) perceived a change in these features. Again, most thought that there had been no change in the risks of crime and vandalism. The evidence from the household victimization survey (Painter and Farrington 1997: 219–22) and from young people's SRD shows again that the predictions before were more accurate than the perceptions after.

In the before survey, most young people in the experimental area predicted that improved street lighting would lead to increased feelings of personal safety (84 per cent) and decreased fear of crime (61 per cent). However, in the after survey, only a minority (44 and 24 per cent, respectively) perceived a change in these features. Again, most thought that there had been no change in feelings of personal safety or fear of crime. The empirical evidence presented above (Table 2) shows again that the predictions before were more accurate than the perceptions after.

Explaining the Results

Possible explanations of the results, and hypotheses about processes intervening between improved street lighting and crime, were obtained from open-ended questions that were included at various points in the interview. In addition, interviewers were asked to complete fieldwork sheets and record any additional information volunteered by the young people which was relevant to their experiences of crime and fear. Weekly debriefing sessions were held during the survey periods and on-site monitoring was undertaken through regular telephone contacts between the principal researcher, the fieldwork supervisor, local estate housing officers and the local police. The principal researcher also attended Tenants' Association meetings during the research period. This qualitative information helps in interpreting the quantitative results.

Open-ended questions included the following:

– Why do you feel safe/unsafe in your home/on the streets?
– Why do you avoid certain areas/streets?
– What are the risks for young people who go out on the estate after dark?

Typical answers were as follows:

[I] avoid any abuse from folks, grown-ups and because of the older yobs and drunks hanging around them [streets].

[Avoid] because there's always grown-ups want to start on you or something.

There are gangs of lads and sometimes gangs of girls who are older than me. A boy got beaten up by four other boys.

One street I avoid because a man there has pellet guns and catapults that he fires at us.

I avoid the off-licence, pub and local shops because the gangs hang around them and it worries me because they are troublemakers. The awful mouth you get off them, when you walk past.

Another open-ended question was:

– Apart from things you've already mentioned, have you heard or seen anything on the estate which has made you feel unsafe, worried, frightened or annoyed you?

If young persons answered 'Yes', they were asked to say what things they had heard or seen.

Typical answers were as follows:

In March I was in a phone box with my sister at the top of . . . Road [this bordered both estates]. We were followed round the corner towards the Broadway. The man who followed us had a short coat on. He opened his trousers and revealed himself. Then he ran off.

I was walking back from town and was approached by a car but it drove off.

When cars pull up behind me, I am frightened.

There was a girl who was threatened with a knife and messed about with, the other week. [mentioned several times]

There are some bullies and some that race cars and bikes. They enjoy swerving towards you.

The striking feature of the qualitative data is that it suggests that the victimization of young people was mostly perpetrated by older people. This may explain why SRD and crime decreased more in the experimental area but victimization of young people did not. Conceivably, more serious crimes committed by young offenders against older victims (especially burglary, theft, violence and vandalism) decreased after the improved street lighting, but street pestering of younger victims by older offenders did not. Another factor is that the improved street lighting in the experimental area encouraged more people to use the streets after dark and hence increased their risk of being pestered. Because the victimization items referred to ever in the before survey and to the last 12 months in the after survey, it is unclear whether victimization of young people decreased in the experimental area.

The qualitative data also help to explain discrepancies between the expected and perceived effects of improved street lighting. However, it must first be explained that, while the experimental area was re-lit, it did not cover the whole of the experimental estate. Resources were not sufficient to re-light the whole estate. The part of the experimental estate that was not re-lit was not included in the survey, but it was used by young people from both estates, because it contained the only youth club. The roads leading to the youth club were very dark, and hence young people who wanted to attend it had to balance fear against fun.

In response to open-ended questions, young people from the experimental area said that they generally felt safer but also that the incomplete lighting coverage was a problem:

I feel safe with brighter streets.

[The lighting is] better now in most parts.

Things are a lot quieter but we need still more [lighting]. It's not in the right places. We need more by the youth club.

We need more by the park and youth club area.

I think darker areas are prone to crime and attack. We need lighting by the youth club. There's a lot of trees and bushes where there is known to be a flasher.

It may be, therefore, that young people's expectations before (that there would be less crime and less fear of crime) were more optimistic than their perceptions after because the perceptions after were affected by the incomplete lighting coverage. If the whole experimental estate had been re-lit, and if the alleyways between houses had been re-lit as well as the main roads, the effects of improved street lighting should have been greater. It might be expected that there would be a dose-response relationship between improved street lighting and decreased crime.

Conclusions

It is desirable to evaluate the impact of any crime reduction initiative using multiple measures. In Dudley, the effects of improved street lighting were evaluated using a household victimization survey of adults which included measures of crime and fear of crime, using pedestrian counts, and using a young people's survey which included SRD, victimization, crime and fear of crime measures. It had also been planned to compare changes in police-recorded crimes in the experimental and control areas before and after the improved lighting, but this was unfortunately not possible, because of changes in police recording procedures and inadequacies of available data.

Our main result is that the SRD survey of young people showed that offending decreased in the experimental area compared to the control area, corroborating previous results obtained in the household victimization survey. The SRD survey showed that the biggest decreases were in violent acts after dark and in non-violent acts in daylight. In agreement with the main result, fewer experimental young people were stopped or told off by the police after the improved street lighting, they thought that the crime problem had decreased more in the experimental area, and fear of crime after dark also decreased more in the experimental area.

The most surprising result is that victimization of young people did not decrease more in the experimental area than in the control area. The qualitative data suggested that, whereas crimes by young people decreased, pestering of young people by older people did not decrease. Possibly, the improved street lighting inhibited offending by younger offenders against older victims but not offending by older offenders against younger victims.

It was interesting that young people's predicted effects of improved street lighting seemed to be more accurate than their perceived effects afterwards. In most cases, the young people perceived little change in crime and fear of crime after the improved street

lighting. The qualitative data suggested that their perceptions might have been affected by the incomplete coverage of the re-lighting.

Situational crime prevention has been an important part of the British government's crime prevention strategy but it has been criticized by some criminologists. It is argued that opportunity-reducing measures (unlike social crime prevention) neglect the fundamental causes of crime. Moreover, they are allegedly associated with the creeping privatization of public space, social exclusion, and the move towards a fortress society (Bottoms 1990). Arguably, situational crime prevention can be afforded more easily by the wealthy than by the poor, leading to fortified safe areas for the rich, social divisions and social injustice. Other criticisms of situational crime prevention are that it is characterized by 'cheap, quick and dirty' research, it is atheoretical, and it is ineffective because of displacement.

None of these criticisms applies to improved street lighting or to the present evaluation. Street lighting benefits the whole community rather than particular individuals or households. Far from creating social exclusion, improved street lighting fosters social inclusion by encouraging use of neighbourhood streets at night. Its monetary benefits outweigh its monetary costs. It is not a physical barrier to crime and has no adverse civil liberties implications. Since, arguably, improved street lighting led to increased community pride and informal social control of potential offenders, this situational measure had its effects through social processes. Improved street lighting was very popular with young people. When they were asked in the before survey to say what three things would most improve the quality of life on their estate, the most popular answers were more police, better lighting and more leisure facilities. Since young people were concerned about crime and disorder caused by truculent adults and drunken youths, they wanted more security, not less.

The design of this project (experimental-control, before-after, with statistical control of pre-existing non-comparability) reaches Level 4 on the scientific methods scale. Overall, we conclude that this design is relatively good in the context of British research on the effects of situational crime prevention. The combination of quantitative and qualitative data is useful in suggesting processes intervening between street lighting and crime, thus encouraging a theoretically based evaluation. We also conclude that, especially in the light of prior research on its validity and reliability, a self-report survey is a useful method of evaluating situational crime prevention initiatives. The SRD survey of young people and the household victimization survey of adults agreed in showing that crime decreased in the experimental estate after the improved street lighting. This provides further confirmation of our previous conclusions that improved street lighting can produce cost-effective reductions in crime.

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APPENDIX

Comparability of Groups

Since the four groups of young people (experimental-before, experimental-after, control-before, control-after) were chosen according to the same rules by interviewers who did not know the purpose of the project, they should be comparable. However, since they were not strictly random samples, it was important to investigate whether pre-existing differences between them might explain any observed results. The main hypothesis to be tested is that SRD in the experimental sample decreased compared to SRD in the control sample. This is tested according to the significance of the interaction term in a regression equation (see Farrington 1997):

$$SRD = b_o + b_1 \text{ CONEXP} + b_2 \text{ PREPOST} + b_3 \text{ CONEXP} * \text{PREPOST}$$

where, for each young person:

SRD = Self-Reported Delinquency
CONEXP = Control or Experimental
PREPOST = Before or After
CONEXP * PREPOST = Interaction Term

The particular type of regression equation depends on the nature of SRD. If SRD is dichotomous, a logistic regression equation is used; if SRD is continuous and approximately normally distributed, a least-squares multiple regression equation is used (equivalent to an analysis of variance); if SRD consists of skewed count data, a Poisson regression is used.

In regard to characteristics of the four groups of young people, the key issue is not so much whether they are equivalent but whether changes in the experimental group are significantly different from changes in the control group. Table A1 shows characteristics of the four groups that were considered unlikely to be affected by street lighting. Clearly, the four groups were closely equivalent on gender (half male, half female) and ethnicity (almost all White). Not surprisingly, since about two-thirds of the after samples had been interviewed before, the after samples were older than the before samples. However, the increases in age of the experimental samples (0.35 years) and the control samples (0.32 years) were almost identical, showing that differential changes in age could not explain any differential changes in SRD.

The young people were asked whether lack of leisure facilities on their estate was a big problem, a bit of a problem, or not a problem. Table A1 shows that just over half of all four groups said that this was a big problem. More of the experimental youth thought that unemployment was a big problem, but the change in the experimental samples was not significantly different from the change in the control samples. The same was true for three items tapping attitudes to the police, although the experimental youth tended to be more negative to the police both before and after.

Just over half of all four groups said that they worried about not doing well at school, and about one-third of all four groups said that they worried about being bullied at school (of those who were at school). The one significant difference discovered in this analysis was that the experimental samples became less worried about finding a job after school, while the control samples became more worried (in a logistic regression, the interaction term = 8.15, p = .004). However, one

TABLE A1 *Comparability of four groups*

	Experimental		Control	
	Before (140)	After (170)	Before (167)	After (164)
% Male	49.3	47.1	47.3	47.0
Mean age	14.51	14.86	14.16	14.48
% White	96.4	97.6	98.2	97.0
% Lack of leisure facilities big problem	57.9	55.3	53.9	56.7
% Unemployment big problem	62.9	56.5	48.8	46.3
% Safer on streets if more police	80.7	80.0	86.8	83.5
% Police don't understand young people	53.2	48.2	40.7	45.1
% Police treat young people unfairly	42.9	38.8	29.9	29.9
% Worry about not doing well at school	61.9	51.0	59.2	60.1
% Worry about being bullied at school	33.6	32.7	31.7	38.0
% Worry about finding job after school	71.7	64.7	58.2	74.1

Note: Interaction terms non-significant except for Worry about finding job after school: likelihood ratio chi-squared (LRCS) = 8.15, 1 df; p = .004 (two-tailed).

significant result in 12 tests did not suggest that non-comparability of the groups could artefactually create differential changes in SRD.

Nevertheless, it might perhaps be argued that SRD decreased more in the experimental area because of the intervening variable of worry about finding a job. In other words, worry about finding a job declined in the experimental area and worry about finding a job was correlated with higher SRD scores. The total SRD score outside was almost significantly higher for those who worried about finding a job than for those who did not (means = 2.90 and 2.47 respectively; t = 1.89, p = .059). However, even restricting the analysis only to those who worried about finding a job, the total SRD score decreased significantly more in the experimental area than in the control area (interaction term in Poisson regression = 11.13, p = .0009). Therefore, the intervening variable of worry about finding a job could not explain the observed results.

Also, it might perhaps be argued that fear of crime decreased more in the experimental area because of the intervening variable of worry about finding a job. The Fear of Crime score was significantly greater among those who worried about finding a job (means = 3.80 and 2.75 respectively; t = 5.26, p < .0001). However, even restricting the analysis only to those who worried about finding a job, the Fear of Crime score decreased significantly more in the experimental area than in the control area (interaction term in Poisson regression = 4.69, p = .030). Therefore, the intervening variable of worry about finding a job could not explain the observed results.

In any case, worry about finding a job could have been affected by the improved street lighting. When the experimental estate was revisited in December 1994, it had changed out of all recognition (Painter 1995: 314). The Tenants' Association, in conjunction with the Housing Department, had obtained £10m from the Department of the Environment for a programme of neighbourhood improvements. According to the Tenants' Association, improved street lighting was the catalyst that signalled that the estate could be improved and that encouraged them to bid for more money. The fact that, at the time of the after survey, the estate was improving and was expected to improve even more probably led to increased community confidence and increased optimism by young people about their future, including optimism about finding a job. The changes in the experimental estate unfortunately made it impossible to carry out a follow-up study to investigate how far the effects of improved street lighting on crime persisted over time.