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CRIME VICTIMIZATION IN THE EIGHTIES

Changes in Area and Regional Inequality

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Analysis of British Crime Survey data confirmed that area differences in crime incidence are attributable to both differences in victim prevalence (number of victims per respondent) and differences in the concentration of victimization (number of victimizations per victim). The paper extends the analysis to changes in victimization over time, comparing the 1982 and 1988 British Crime Surveys. It was found that property crime had become more unequally distributed across parliamentary constituencies, the change being attributable more to changes in concentration than to victim prevalence. The pattern was much less marked for personal crime. Changes in crime incidence varied greatly by region, though there was evidence of redistribution of victimization between Northern and Southern regions. The analysis not only illustrates the importance of diaggregating crime trends into indices of prevalence and concentration but also points to the possible relationship between sub-national crime trends and processes of economic and social regionalization.

Three central and related facts have been identified about the distribution of crime. The first is that a small proportion of offenders commits a large proportion of crime. The second is that a small proportion of victims suffers a large proportion of crime committed (Ellingworth *et al.* 1995, this issue). The third is that a small number of areas hosts an unequal amount of crime events. For some of these areas the reasons are fairly straightforward—for example, city centres, entertainment, shopping, and industrial districts all have high rates of crime relative to their resident populations by virtue of containing more opportunities or occasions for criminal incidents—for example, stores and warehouses with goods for theft, and bars with rowdy drinkers (Brantingham and Brantingham 1984). Yet, the residents of some residential areas are also victimized disproportionately relative to those living in other areas. For example, the 12 per cent of households living in the types of high crime-risk area in England and Wales identified in the 1984 British Crime Survey suffered 37 per cent of all the burglaries, 33 per cent of all the personal thefts and robberies, and 23 per cent of all the thefts from motor vehicles estimated by the survey to have occurred nationally (Hope and Hough 1988).

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The observation of area inequality in crime is ambiguous in meaning in a way that the first two inequalities are not. This is because differences in area crime *incidence* rates (i.e. the number of crimes per head of population) may be a function of the area *prevalence* rate (i.e. the proportion of victims amongst the population) and/or the area *crime concentration* rate (i.e. the number of victimizations per victim). Clarifying the basis of area differences in these terms is not merely a trivial statistical exercise: to take two implausible extremes, if area differences turned out to be a function exclusively of victim prevalence, crime control activity would need to be spread throughout the communities suffering much crime, since people who had not yet been victimized in those areas none the less would be at substantial risk of falling victim. At the opposite extreme, if area differences were to be purely a function of the number of victimizations per victim, crime control should concentrate upon the victimized population, since they are the only group at heightened risk in high crime areas.

If more probable intermediate positions hold true, a strong case still exists for disentangling these indicators since together they afford a means for assessing the optimization of a crime prevention policy aimed at victims. That is, comparison of the respective performance of these indicators may assist in assessing the gains in effectiveness or efficiency from reducing the number of 'new cases' entering the population (i.e. by controlling prevalence) relative to reducing the rate of occurrence for the current 'at risk' victimized population (i.e. by controlling crime concentration). Moreover, if inequalities in crime risk amongst areas and individuals are regarded as warranting public concern, then conceptual clarification of the basis of these inequalities is necessary as a condition for their explanation and amelioration.

The decomposition of area differences in crime incidence into the components of victim prevalence and crime concentration[1] seems like a fundamental exercise in criminology. However, we know of no exercise to do this before the work of Trickett *et al.* (1992) on British Crime Survey (hereinafter BCS) data. In short, that work showed that area contrasts were a function of both prevalence and concentration differences. How surprised the reader is by the pattern will depend upon preconceptions about high crime areas. For the present writers, the inequality in area prevalence was notable. The 10 per cent of areas suffering greatest crime incidence were contrasted with the 10 per cent of areas suffering least crime incidence. In such a comparison there was an elevenfold difference in the prevalence of crimes against the person, and a fourfold difference in property crime. Notwithstanding the substantial contribution which differences in prevalence made to area differences in crime incidence, the point of greatest interest was the very large extent to which area variation in incidence rates reflected substantial differences between areas in the distribution of crime concentration amongst the residents of high victim prevalence areas. Considering property crime in the highest decile, half of the BCS interviewees had not been victimized at all. The other half had been victimized an average of four times each. There was plenty of crime to go around in these areas—everybody could have been victimized twice. The literature on crime victimization is consistent in showing the importance of repeat victimization (for a review see Farrell 1992). The pattern suggests that there is sub-

[1] There has been a change in terminology from the Trickett *et al.* (1992) paper. This is to substitute the term 'concentration' for the previously favoured 'vulnerability' on the grounds of its greater transparency of meaning.

stantial scope for crime control policies based upon the prevention of repeat victimization—a strategy suggested by one of the present authors elsewhere (Farrell and Pease 1993).

Since the analysis cited above already showed a marked inequality in the distribution of victimization at the beginning of the 1980s, it seemed an important preliminary for understanding the impact of social change, and for framing appropriate crime control policies, to establish whether growing inequalities in other spheres during the decade were mirrored also in a growth of inequality in the sphere of criminal victimization. The period 1982 to 1988 is of special interest because it covers a period during which Conservative governments began a project of restructuring the British economy, with an emphasis on governmental deregulation and the promotion of free market economic activity, consistent with neo-liberal political values. Over much of the century preceding the 1980s, British society had become generally less unequal in the distribution of income, wealth, and opportunity. 'But in the 1980s this long term trend to greater equality apparently came to a halt, and was perhaps even reversed. In relation to both wealth . . . and income . . . the gap between top and bottom has been widening' (Millar 1991: 23). Similar evidence of increasing inequality over the 1980s has been adduced in relation to employment and health (Walker and Walker 1987) and in terms of the effects of taxation (Hills 1988).

The purpose of this paper is to extend the analysis of BCS data carried out in Trickett *et al.* (1992). The finding that individual-level inequality in victimization (i.e. concentration) is related to area differences calls for analysis of change at the area level over time. The previous paper explored differences in victimization rates between the parliamentary constituencies identified in the BCS. Additionally, significant differences in victimization incidence and prevalence rates between BCS constituencies were found to be correlated with differences in their social, economic, and demographic characteristics (Osborn *et al.* 1992). The constituency is thus one level where change over time might be explored.

A second level of aggregation at which it may be possible to study change in the BCS is that of the Standard Regions of England and Wales. In the post-war period, these regions have served nationally as a means of conceptualizing and organizing economic development (Champion and Townsend 1991). Smith (1986) found substantial regional differences in the 1982 BCS which appeared 'neither an artefact of official statistics nor a simple reflection of different degrees of urbanization' (p.59). Moreover, an independent regional effect has been identified, net of other characteristics, on variation in victimization rates both between constituencies (Osborn *et al.* 1992) and between individuals (Trickett *et al.* 1995; Osborn *et al.* 1995). Since this suggests the possibility that the particular characteristics of regions themselves might have an impact on victimization in addition to the characteristics of individuals or smaller areas contained within them, further exploration of differential regional change may serve, at least, to call attention to the possible role of crime as an externality to regional development, or as an index of the selective impact of economic change (Smith 1986).

Thus, this paper investigates whether previously observed differences in property and personal crime victimization had changed over the 1980s at both the constituency and regional levels of England and Wales. In its preliminaries, it shows that a non-optional design of the earlier study did not seriously distort its results.

Data and Method

The British Crime Surveys

Data on victimization in England and Wales during the 1980s are available from three of the sweeps of the British Crime Survey (BCS), each conducted early in the years of 1982, 1984, and 1988 and referring to victimization recalled by respondents over the previous 12 months. This paper reports comparisons between the first and last of these. Crime trends derived from the BCS have come to play an increasingly important role in public and political debate in Britain. Unfortunately, however, comparison over time between different sweeps is not straightforward, especially if sub-total or disaggregated trends are considered.

The BCS has a complex, stratified sample design. Both the 1982 and 1988 sweeps used the annual electoral register as a sampling frame with the parliamentary constituency as the primary strata.[2] In each sweep, the number of inner city constituencies were selected disproportionately, relative to non-inner city constituencies.[3] In 1982, so-defined inner city constituencies were selected, proportionate to size, at three times the proportion of the national total their electorate would justify; in 1988, a larger number of constituencies were defined as inner city, using a different definition, and were oversampled proportionate to size by a factor of 1.5. The achieved sample in 1982 was 10,905, distributed between 239 constituencies; in 1984, the achieved sample was 11,741, distributed between 300 constituencies. Twenty per cent of sampled constituencies in the 1982 BCS were designated as inner city, with 26 per cent in 1988.

Below constituency level, addresses where interviews with individual respondents were to be obtained were spatially clustered within two areas—the electoral ward and, within that, the polling district. However, the method of selecting the sub-constituency clusters differed between the two sweeps. For this reason, and in view of the relatively small achieved average sample sizes for constituencies,[4] the parliamentary constituency was selected as the smallest spatial unit for the present analysis. Nevertheless, since respondents were not sampled randomly within constituencies, there remains the possibility that analysis at this level obscures smaller-area differences below constituency level, or aggregates dissimilar clusters together.[5]

Calculation of aggregate victimization rates

In order to correct for biases in representativeness introduced by the sample design, weighting factors were used in the analysis as recommended by the BCS sample designers (see Wood 1983; NOP/SCPR 1989). Thus constituency and regional victimization rates were calculated using the appropriate inner city weighting factor

[2] A difficulty with extending area comparisons to later BCS sweeps is that the 1992 and subsequent sweeps have used the Postcode Address File (PAF) as a sampling frame in preference to the electoral register, utilizing the hierarchical postcode geography as sampling strata.

[3] Technical details of the surveys are contained in Woods (1983), NOP (1985), and NOP/Social and Community Planning and Research (1989).

[4] In the 1982 BCS the average sample size per constituency was 45; in the 1988 BCS, the average sample size was 39.

[5] For evidence of the possibility of a clustering effect on victimization rates below ward level in the 1984 BCS see Trickett *et al.* forthcoming.

applied to the individual-level data noted above.[6] Additionally, a weight was applied in respect of the 1988 data to correct for the over-sampling of ethnic minority respondents in that year. *Property crime* in this analysis comprises victimizations directly against the dwelling and against personal property in and around it. It is made up of: burglary, attempted burglary, break-in with damage, theft from inside and outside the property (excluding theft of milk bottles) and criminal damage to the property. Counts of incidents are taken from the 'screener' questions (as are those of personal crimes, below).[7] The recommended household weight was used when examining property crime to correct for households with high numbers of electors having a greater probability of being selected. The weight is the reciprocal of the number of electors in the household. As some of the analysis relates to geographical changes, and there is the problem that a small minority of respondents had moved house during the reference period, only victimizations relative to the current property are therefore taken into account.

Crimes against the person (hereinafter referred to as *personal crimes*) are those in which the victim comes into physical or threatening verbal contact with the perpetrator. For the current analysis it comprises: assault, sexual assault, threat, theft, and attempted theft from the person. The adult weight has been applied for analysis of personal crime. This corrects for differences between the household composition reflected in the electoral register and the actual number of adults in a household.

Weighting and sample composition effects

All comparisons between the two samples are between point estimates calculated from the survey data with varying degrees of error. There are difficulties, however, in applying appropriate tests of statistical significance to take such error into account in the comparison of differences between the sweeps. While the above paragraphs have described the necessity of using weights to correct for disproportionate stratification in sample selection, the use of weighted data—and the complex sample design which the weights represent—violates the assumptions of simple random sampling underlying most significance tests, whether parametric or non-parametric.[8] This makes it unwise to test the significance of observed individual-level change between the two sweeps. Inevitably, then, comparisons of individual-level change between the two sweeps must remain descriptive. Nevertheless, it may be defensible to test the significance of differences in the distributions of constituency-level victimization rates between the sweeps; though a non-parametric test is preferred which is sensitive to the range of possible ways in which the two distributions might vary.[9]

However, weighting of individual responses does not entirely compensate for differences in the sample composition of constituencies in each sweep. For instance, while

[6] For details see Wood (1983) and NOP/SCPR (1989).

[7] The screener questions record the counts of all crimes initially reported by respondents.

[8] In addition, there now exists some doubt as to the nature of the underlying distribution of victimization in cross-sectional data (discussed in Osborn *et al.* 1995) which would caution against the use of parametric tests based on common distributions.

[9] For example, in central tendency, dispersion, skewness, etc. The preferred test used here is the Mann–Whitney Wilcoxon (2-tailed) test for independent samples.

the inner city weight corrects for the over-representation of inner city residents in the national sample, it does not compensate for the over-selection of inner-city constituencies themselves. In as much as the definition of 'inner city' differed between the two sweeps, it cannot be ruled out that differences observed between the sweeps might be due, to some extent, to differing selections of constituencies. Similarly, since the initial stratification in the design was by constituency, it cannot be ruled out that regional differences might be due to the allocation of constituencies to regions, which may vary between sweeps. Paradoxically, the relationship between individual-level and area-level victimization rates which has been identified in previous research (Trickett *et al.* 1992), means that the calculation of aggregate regional crime rates might be susceptible to changing constituency compositions in the regional samples.

The chief substantive implication of these possibilities is that differences in the regional and constituency distributions of victimization between the two sweeps might be due, to some extent, to *compositional* change—i.e. changes in the sample composition of constituencies—rather than to *contextual* change—that is, change in the national distribution of area crime rates between the two years. While the general issue of conceptualizing aggregate change in terms of composition of context is a common one[10] this possibility does create difficulty in assessing the reliability of some of the comparisons made below. Nevertheless, were compositional bias to have an effect on the calculation of area victimization rates aggregated from individual responses it would still point up the relevance of the earlier paper—that inequality in the distribution of victimization between areas is correlated with inequality in the distribution of victimization between individuals.

Results

Preliminary analyses

Previous work established the contribution of differences in concentration—the number of victimizations per victim—in determining area differences in crime incidence (Trickett *et al.* 1992). To do this, deciles were established by ranking areas by total crime incidence, i.e. aggregating property and personal crime (but excluding motor vehicle crime). In so far as area differences in property crime diverge from area differences in personal crime, the contrast between worst and best deciles for each crime type, considered individually, will be less extreme than it would be by proceeding in the way that Trickett *et al.* did. This will be particularly true of personal crimes, whose total incidence is much less than that of property crime. Area differences in property crime will thus swamp such differences in personal crime when calculating deciles by the incidence of the combined categories. Instead of proceeding in this way, deciles were established in the present study on the basis of the incidence of each crime type separately, appropriately weighted.

This analysis showed strikingly similar patterns for both property and personal crime, for all three sweeps of the BCS during the 1980s, to that established by Trickett

[10] For a discussion of compositional and contextual change see Sampson (1987).

et al. (1992); high crime areas were characterized by higher levels of both crime concentration and victimization prevalence. The only notable difference related to concentration of victimization in the worst decile for personal crime, where the value was much higher. This was not unexpected as the level of property crime much outweighed that of personal crime. Thus the previous analysis would have shown a lower figure if the units of primary analysis with the highest levels of personal crime concentration did not exactly match those with the highest levels of property crime concentration. The precise figures from these analyses are available from the first author on request.

Having established that the pattern of results identified by Trickett *et al.* (1992) was not the result of a flawed research design (indeed the importance of the concentration of personal crime was revealed as an even more central determinant of area differences in the incidence of personal crime), we can go on to apply the same basic approach to the determination of changes over time in the inequality of crime victimization.

Changes in the distribution of area crime rates

Changes in inequality between the sweeps can be considered in a number of ways. In the first approach described below, the national picture is examined. The question addressed here is whether areas (constituencies) have become more or less disparate in the three measures of their crime experience—incidence, prevalence, and concentration. In the second approach, the question is addressed of whether individual regions of the country have changed their level of crime victimization. In considering changes in the inequality of victimization, only the 1982 and 1988 BCS sweeps are considered, the unit of analysis being the constituency. This gives a more detailed picture than the division into crime deciles favoured in the earlier paper and provides for more accurate measurement of inequality. The Gini coefficient was the preferred measure of inequality (see Cowell 1977). Gini coefficients for incidence, prevalence, and concentration were calculated to establish if changes in inequality in the distribution of constituency crime rates had occurred. The figures for the Gini coefficients were obtained by a programme written by the first author based upon the formula suggested by Cowell (1977). It will be recalled that the Gini coefficient lies between zero and unity; zero in the present context would indicate a state where the index of victimization under consideration is spread evenly across the constituencies surveyed. Unity would indicate a state of affairs in which victimization is maximally concentrated. It should be borne in mind that with incidence being a product of prevalence and concentration, the measures are not independent.

A slight problem occurred in respect of the calculation of the Gini coefficient for concentration, in that there were some constituency units in the BCS samples where there were no victims at all and in this case the calculation of concentration would involve division by zero. Where this has occurred, the result has been taken as undefined in the strict mathematical sense, and the constituencies involved have been omitted from the Gini coefficient calculations for concentration.

Table 1 shows the Gini coefficients for both property and personal crime. Broadly, it can be said that for property crime there was an increased inequality in the distribution of victimization rates between areas during the 1980s. This seems to have been mainly a function of an increasing concentration of victimization amongst victims,

with a smaller change in area differences attributable to changes in victim prevalence. It would appear that the distribution of property crime between areas during the 1980s experienced a 'double concentration'—a smaller number of areas during the 1980s suffered an increasing proportion of property crime victimization not only because they contained more victims than other areas but also because victims in those areas were becoming much more frequently victimized than were the residents of other areas.

In other words, by 1988 the residents of some areas were taking a greater share of the national level of victimization—via an increasing inequality in prevalence—and within those areas the burden of this increase was being suffered by a small number of households—via an increased inequality in concentration. These findings would appear to support one of the implications of Trickett *et al.* (1992)—that changes in prevalence rates may have a non-linear relationship to changes in concentration rates. In this case, increased inequality in the distribution of prevalence rates produced a greater incremental inequality in the distribution of victimization concentration rates.

In contrast, change in the distribution of personal crime victimization between areas during the 1980s was much less marked. Yet even so, a 'single concentration' effect seems to have occurred. Over the period, the distribution of victims did not change, but victims living in some areas became more frequently victimized relative to those living elsewhere. This had the probable consequence of increasing the equality of the distribution of personal victimization rates for the majority of areas. In this case, a marginally greater equality in area victimization (incidence) rates seems to have occurred because the national 'share' of personal victimization became more unequally concentrated on victims in certain areas without any change in the distribution of victims between areas.

Thus for both offence groupings, the middle period of the 1980s appears to show a redistribution of victimization between areas of England and Wales. In both cases, victims in a smaller number of areas were being victimized more frequently—with a greater degree of 'multiple' victimization—than had been the case previously. As shown below, this redistribution occurred irrespective of the level of the national trend in crime.

TABLE 1 *Gini Coefficients and Percentage Change 1982–88*

	1982	1988	% change
Property crime			
Incidence	0.4269	0.5325	+15.0
Prevalence	0.3326	0.3606	+8.4
Concentration	0.2731	0.3365	+23.2
Personal crime			
Incidence	0.5963	0.5831	−4.8
Prevalence	0.3986	0.4024	0.0
Concentration	0.4298	0.4499	+4.3

Regional changes in property and personal victimization

Table 2 gives the regional figures for the incidence, prevalence and concentration of property crime, for both 1982 and 1988.[11] To be clear what the entries in this table mean, looking at the two corresponding to the North West region, this shows 0.4616 property crimes per respondent in 1982,[12] and 0.4750 property crimes per respondent in 1988. There were 0.1812 victims per respondent in 1982 and 0.2188 victims per respondent in 1988. The number of victimizations per victim was 2.5483 in 1982 and 2.1714 in 1988. Of course these figures exclude cross-type repeats. For instance, someone suffering two property crimes may also suffer two personal crimes, but only the property crimes would be counted for this analysis.

While the national figures show a modest rise in the incidence of property crime, primarily contributed by an increase in prevalence, individual regional patterns are strikingly different. The national increase in the incidence of property crime was greatest in the West Midlands (32.39 per cent) and Northern (44.37 per cent) regions of England. In more southerly regions of England, the South East and East Midlands exhibited increases, whereas the South West, Greater London and East Anglia enjoyed a decrease. The largest downwards change was for Greater London (28.13 per cent) followed by East Anglia (21.92 per cent). Regions also differed in the pattern of change occurring. The change in property crime incidence in three of the 10 regions appeared primarily to do with changes in prevalence (North, North West, and Wales), while changes in three regions (West Midlands, East Anglia, and the South East) appeared to be driven mainly by changes in concentration rates. Simultaneous changes in prevalence and concentration occurred in the remaining three regions (Wales, East Anglia, and Greater London) but only in Greater London was the direction of change in both rates the same.

TABLE 2 *Property Crime: Regional Incidence, Prevalence, and Concentration Rates for 1982 and 1988 and Percentage Changes*

Region	Incidence			Prevalence			Concentration		
	1982	1988	Δ%	1982	1988	Δ%	1982	1988	Δ%
North	0.3435	0.4959	44.37	0.1592	0.2131	33.86	2.1583	2.3269	7.81
N. West	0.4616	0.4750	2.90	0.1812	0.2188	20.75	2.5483	2.1714	−14.79
Yorks	0.4297	0.4569	6.33	0.1747	0.1835	5.04	2.4590	2.4898	1.25
Wales	0.3147	0.3408	8.29	0.1366	0.1644	20.35	2.3036	2.0737	−9.98
W. Mids	0.2766	0.3662	32.39	0.1416	0.1603	13.21	1.9527	2.2851	17.02
E. Mids	0.3357	0.3836	14.27	0.1518	0.1664	9.62	2.2108	2.3047	4.25
E. Angl.	0.1688	0.1318	−21.92	0.0907	0.0982	8.27	1.8617	1.3421	−27.91
S. West	0.1724	0.1608	−6.73	0.1073	0.1035	−3.54	1.6075	1.5532	−3.38
S. East	0.2068	0.2193	6.04	0.1078	0.1082	0.37	1.9180	2.0265	5.66
G. London	0.3992	0.2869	−28.13	0.1859	0.1499	−19.37	2.1477	1.9130	−10.93
National	0.3170	0.3346	5.55	0.1457	0.1565	7.41	2.1762	2.1376	−1.77

[11] Unlike the Standard Regional classification, the area within the boundary of the former Greater London Council area is treated separately from the remainder of the South East region. The proportion of the sample in each region differed by no more than 2 percentage points between each sweep.

[12] Figures for regional victimization rates differ from those reported in Smith (1986). The basis for calculating rates in the latter is not made clear.

Table 3 below gives the regional figures for personal crime incidence, prevalence, and vulnerability, for 1982 and 1988. Despite a national decline of 10.17 per cent in the incidence rate, regional changes in personal crime incidence show even more dramatically different patterns. All but one of the regions in the south had substantial reductions in incidence, whereas the rest of the country, except Yorkshire, showed considerable increases; the largest occurring in the North (148.11 per cent), West Midlands (75.52 per cent) and the East Midlands (56.92 per cent). For concentration, the pattern was broadly similar. Again, as with property crime, regions differed markedly in their respective patterns of change over the period. Unlike property crime, a change in prevalence appeared solely responsible for change in the crime rate in only one region (Yorkshire and Humberside); changes in the remaining regions appeared to be driven mainly by changes in concentration. Concentration appeared solely responsible for incidence rate change in three regions (West Midlands, East Midlands, and Greater London). Of the other six regions, in only two (the North and the North West) was the direction of change for both prevalence and concentration in the same direction. Nevertheless, in the remaining four (Wales, East Anglia, South West, and South East) the greater degree of change in concentration determined the magnitude and direction of change in the incidence rate.

Thus, modest changes in national crime rates during the 1980s would appear to have masked quite substantial regional changes in both numbers of victims and the amount of victimization. For property crime, regional prevalence rates of change varied by up to a third either way; while rates of change in concentration varied from + 17 per cent to − 28 per cent. For personal crime, change in regional prevalence rates varied from an increase of over a half to a decline of 17 per cent; while change in regional concentration rates varied from an increase of 89 per cent to a decline of 57 per cent. Given the relatively large sample sizes for each region, the magnitude of these changes would seem to be beyond that which might have been produced simply by sampling error.

Explanation of such widely varying regional patterns is challenging but beyond the scope of the present analysis (see Discussion below). Nevertheless, one evident pattern

TABLE 3 *Personal Crime: Regional Incidence, Prevalence, and Concentration Rates for 1982 and 1988 and Percentage Changes*

Region	Incidence			Prevalence			Concentration		
	1982	1988	Δ%	1982	1988	Δ%	1982	1988	Δ%
North	0.1324	0.3285	148.11	0.0655	0.1017	55.27	2.0204	3.2293	59.83
N. West	0.1942	0.2250	15.86	0.0840	0.0896	6.67	2.3124	2.5126	8.66
Yorks	0.1809	0.1524	−15.75	0.0805	0.0686	−14.78	2.2476	2.2203	−1.21
Wales	0.1250	0.1295	3.60	0.0576	0.0476	−17.36	2.1717	2.7209	25.29
W. Mids	0.1352	0.2373	75.52	0.0818	0.0761	−6.97	1.6528	3.1194	88.73
E. Mids	0.1806	0.2834	56.92	0.0761	0.0809	6.31	2.3736	3.5029	47.58
E. Angl.	0.1800	0.0859	−52.28	0.0632	0.0704	11.39	2.8496	1.2196	−57.20
S. West	0.3107	0.1696	−45.41	0.0553	0.0660	19.35	5.6214	2.5682	−54.31
S. East	0.2282	0.1458	−36.11	0.0594	0.0650	9.43	3.8426	2.2426	−41.64
G. London	0.4040	0.2513	−37.80	0.1142	0.1092	−4.38	3.5363	2.3005	−34.95
National	0.2231	0.2004	−10.17	0.0756	0.0780	3.17	2.9512	2.5708	−12.89

from the present data would seem to be a redistribution of crime occurring between the 'Northern' and the 'Southern' regions of England and Wales. During the 1980s, the 'North-South Divide' became increasingly apparent in British economic development (Lewis and Townsend 1989) and though obviously masking considerable intraregional disparity, nevertheless served as an expression of macroeconomic and demographic trends, particularly 'Northern' de-industrialization and consequent economic and population drift to the South (Champion and Townsend 1991).[13]

Table 4 suggests that the North to South drift in the economy was accompanied by a South to North drift in the distribution of crime victimization.[14] It shows change between 1982 and 1988 in the Northern and Southern regions' respective 'share' of victims and incidents of both property and personal crime. The figures in parentheses express these shares proportionate to the two areas' respective share of the BCS sample in each sweep. For property crime it is apparent that the gap between North and South widened over the 1980s increasing the North's disproportionate share. Thus, by 1988 the North appeared to have one-and-a-half times the South's share of property crime victims and twice its share of incidents. For personal crime, an interesting but different story unfolds. The share of victims remains 'equitable', in that the relative share of victims remains unchanged at one. However, the substantial difference between the North and South shares reversed between 1982 and 1988. It would seem that the economically poorer fortunes of the Northern regions during the 1980s were accompanied by an increasing concentration of criminal victimization amongst their populations, for both property and personal crimes.

TABLE 4 *Northern vs Southern Standard Regions: 'Share' of Crime Victims and Incidents (Relative to Share of Population)*

	% of Victims		% of Incidents	
	1982	1988	1982	1988
Property crime				
North	49.64	57.73	53.66	63.69
	(1.11)	(1.21)	(1.20)	(1.33)
South	50.36	42.27	46.34	36.31
	(0.91)	(0.81)	(0.84)	(0.69)
Personal crime				
North	44.88	47.72	32.04	50.95
	(1.01)	(1.00)	(0.72)	(1.07)
South	55.12	52.28	67.97	49.05
	(0.99)	(1.00)	(1.22)	(0.94)

Northern Regions: North, North West, Yorkshire and Humberside, Wales and the West Midlands.
Southern Regions: East Midlands, East Anglia, South West, South East, and Greater London.

[13] For instance Tables 2 and 3 suggest that for property crime victimization, this 'redistribution' seems to have resulted from a marked decline in Greater London's share, with rises for the North, North West and West Midlands regions; for personal crime, all Southern regions had reduced shares (particularly Greater London and the South East), with increased shares for all Northern regions except Wales and Yorkshire.

[14] The North-South division between regions is the same as that employed by Champion and Townsend (1991), viz.: Northern regions include—North, North West, Yorkshire and Humberside, Wales, and West Midlands. Southern regions include—East Midlands, East Anglia, South West, and South East and Greater London.

Nevertheless, within each region change in victimization (incidence) rates was produced by different combinations of change in prevalence and concentration. Moreover, in only two Northern (North, North West) and two Southern (East Midlands and East Anglia) regions was the direction of change the same for both prevalence and concentration measures in both offence groupings. Thus national trends in crime over the 1980s would seem to have masked a considerable state of 'crime-flux' sub-nationally (see Hope 1995, this issue) possibly reflecting both regional and sub-regional trends in various spheres of the economy and society.

Regional changes in constituency victimization rates

Tables 2 and 3 have shown the percentage changes for the three different measures of crime over the period in question, using data from the individual level to obtain the regional statistics for incidence prevalence and concentration; but are these changes statistically significant? The difficulty here was that some form of hypothesis test comparing, say, one region across the two time periods required data broken down within that region into relevant data points consistent with the definitions of incidence, prevalence, and concentration. Incidence, prevalence, and concentration are not valid definitions at the individual level; therefore, to be able to perform a hypothesis test required that a common data point across the two sweeps be established for which they had valid meanings. These data points could then be used to establish regional figures amenable to some form of hypothesis test.

Because of the different sampling strategies of the two BCS sweeps for 1982 and 1988 noted above, the data point common for the two sweeps was that of the constituency. Incidence, prevalence, and concentration measures were thus calculated for all constituencies, and these used for the purposes of hypothesis tests for each of the regions across time.

An appropriate two sample hypothesis technique consistent with the data and the underlying assumptions of the distribution of victimization had to be established. In any region, the sample of constituencies could be assumed to be small—for example, the Northern regional sample had 11 constituencies in 1982 and 19 constituencies in 1988. However, the nature of the underlying distribution of victimization is not known (see Osborn *et al.* 1995) and preliminary analysis evidenced heterogeneity of variance amongst constituencies in victimization rates. With these factors, a t-test for two independent samples was not appropriate, as the required assumptions of normality and homogeneity of variance could not be met (see Freund and Walpole 1987: 418–21). The obvious alternative test was the Mann–Whitney Wilcoxon two-sample test, for which the data fulfilled the necessary assumptions. The test is not only sensitive to changes in location, but also to changes in the distribution (see Conover 1980, Siegel and Castellan 1988). The null and alternative hypotheses are thus:

H_o: $F(x_{82})\ \text{Region}_{(i)} = G(x_{88})\ \text{Region}_{(i)}$ for all x
H_a: $F(x_{82})\ \text{Region}_{(i)} \neq G(x_{88})\ \text{Region}_{(i)}$ for any x

where x = incidence, prevalence, or concentration. Details of the results of the tests, as evidenced by the p-values, are given in Tables 5 and 6.

Tables 5 and 6 report aggregated constituency victimization rates in each region, while Tables 2 and 3 (discussed above) report aggregated individual victimization

TABLE 5 *Property Crime: Mean Constituency Rates for Each Region (i.e. Analagous to the M-W Tests)*

Region	Incidence				Prevalence				Concentration			
	1982	1988	Δ%	M-W	1982	1988	Δ%	M-W	1982	1988	Δ%	M-W
North	0.3443	0.4970	44	0.4514	0.1602	0.2160	35	0.0674	2 2269	2 1142	−5	0.3116
N. West	0.4507	0.5278	17	0.7184	0.1918	0.2135	11	0.3784	2.0948	2.0443	−2	0.1714
Yorks	0.4384	0.4649	6	0.9278	0.1825	0.1834	0	0.8626	2.2678	2.3583	4	0.8303
Wales	0.2840	0.3351	18	0.3690	0.1330	0.1691	27	0.4472	1.7390	1.8097	4	0.9609
W. Mids	0.3266	0.3467	6	0.5876	0.1649	0.1539	−7	0.9303	2.1025	2.2057	5	0.4718
E. Mids	0.3446	0.3788	10	0.8257	0.1564	0.1751	12	0.5473	2.1320	2.2302	5	0.9150
E. Angl.	0.1652	0.1348	−18	0.6834	0.0887	0.1014	14	0.6834	2.0619	1.5082	−27	0.1215
S. West	0.1687	0.1451	−14	0.3479	0.1055	0.0919	−13	0.3770	1.4468	1.4361	−1	0.5021
S. East	0.2131	0.2248	5	0.1103	0.1082	0.1086	0	0.6173	1.8679	1.8030	−3	0.0070
G. London	0.4039	0.2693	−33	0.0186	0.1939	0.1480	−24	0.0268	1.9652	1.9493	−1	0.0983
National	0.3334	0.3344	0	0.1340	0.1566	0.1545	−1	0.8121	1.9873	1.9774	−1	0.0038

M-W = > p-value for 2-tailed Mann–Whitney test.

TABLE 6 *Mean Constituency Rates for Each Region (i.e. Analagous to the M-W Tests)*

Region	Incidence				Prevalence				Concentration			
	1982	1988	Δ%	M-W	1982	1988	Δ%	M-W	1982	1988	Δ%	M-W
North	0.1389	0.3373	143	0.0297	0.0652	0.1057	62	0.0612	1.9539	4.1187	111	0.4722
N. West	0.2351	0.2251	−4	0.9717	0.0902	0.0911	1	0.7675	2 7942	2.1755	−22	0.5765
Yorks	0.1850	0.1410	−24	0.9278	0.0791	0.0664	−16	0.7231	1.9620	2.3907	22	0.7098
Wales	0.1277	0.1366	7	0.4718	0.0581	0.0487	−16	0.4166	2.2330	2.7466	23	0.5688
W. Mids	0.1550	0.2789	80	0.7661	0.0862	0.0780	−10	0.4311	1.6896	3.6939	119	0.3637
E. Mids	0 1835	0 3551	94	0.6918	0.0759	0.0806	6	0.7136	2.2595	3.0149	33	0.2007
E. Angl.	0.1812	0.0853	−53	0 3649	0.0651	0.0712	9	1 0000	2.4551	1.1267	−54	0.0168
S. West	0.2831	0 1713	−39	0.7930	0.0545	0.0676	24	0.6686	3.1965	2.4905	−22	0.9345
S. East	0.2278	0.1443	−37	0.9817	0.0606	0.0648	7	0.8318	3.1403	2.1997	−30	0.8162
G. London	0.3455	0.2475	−28	0.1997	0.1320	0.1145	−13	0.3096	2.6547	2.1200	−20	0.8910
National	0.2334	0.2132	−9	0.8479	0.0849	0.0811	−4	0.6034	2.5597	2.5863	1	0.9238

M-W = > p-value for 2-tailed Mann–Whitney test.

rates. The rates presented in Tables 5 and 6 are produced by appropriately weighting individual responses, grouping respondents by their constituency, calculating the required statistic for each constituency, and, finally, taking the average of the constituency rates for each region. If there was no 'constituency effect', the regional rates in the two sets of tables would be similar, net of rounding errors; to the extent that the rates differ, they reflect two kinds of compositional effect. First, the differences reflect unequal constituency samples sizes—in effect this analysis gives equal weight to each constituency rate, irrespective of the number of respondents sampled from each constituency who were used to produce it.[15] Secondly, differences in the rates reflect the effect of the differential clustering of victims and victimization in particular con-

[15] It was decided not to re-weight constituency rates to correct for different sample sizes both because constituencies themselves vary somewhat in population size and because of the potential for obfuscation in adding a further factor to an already complicated weighting procedure.

stituencies which, of course, was established in the previous analysis (Trickett *et al.* 1992). As can be seen from a comparison of the two sets of tables, possible compositional effects of these kinds may have occurred for some regions more than others. Thus, the estimation of victimization rates at different levels of aggregation would seem to be sensitive to compositional configurations of these kinds, which may arise either as artefacts of sample construction or as genuine differences in context. Indeed, given the correlation between the distribution of area and individual victimization rates (Trickett *et al.* 1992), the effect of area aggregation on the calculation of victimization rates from the BCS would seem to be inevitable.

Notwithstanding aggregation effects, Tables 5 and 6 still show marked regional differences in the level and type of change over the 1980s. Initial exploratory non-parametric one-way analyses of variance were conducted for each type of rate within each year to confirm the existence of a 'regional effect'.[16] In both years, highly significant regional differences in constituency rates were found in incidence and prevalence rates for both property crime and personal crime. However, while there was no significant regional effect on constituency property crime concentration rates in 1982, the regional effect had increased considerably in magnitude by 1988. In contrast, there was no significant regional effect in either year on the regional distribution of constituency personal crime concentration rates. This finding suggests that the growth of inequality in the distribution of constituency concentration rates reported in Table 1 reflects, in part at least, evolving regional differences. In contrast, there were no significant regional differences in either year for personal crime nor, as Table 1 shows, was there anything like as marked an increase in the distribution of area concentration rates.

Finally, the significance tests reported in Tables 5 and 6 confirm the picture of North–South regional polarization reported in Table 4. Such tests, of course, take into account not only the magnitude of change in the distribution in each region but also the number of constituencies in the regional samples. Thus, despite some quite marked changes, regional polarization in property crime at the constituency level is most marked in the contrast between the North and London and the South East. Greater London constituencies saw a significant reduction in average incidence rates ($p. < 0.02$) produced by reductions in both prevalence ($p. < 0.03$) and concentration ($p. < 0.1$). Similarly, the South East also saw a reduction in area concentration rates ($p. < 0.007$). In contrast, constituencies in the North region saw a significant increase in prevalence rates ($p. < 0.07$). As suggested by Table 1, less marked regional changes were found for area personal crime rates—prevalence rates increased for constituencies in the North region ($p. < 0.06$), while concentration rates declined for constituencies in East Anglia ($p. < 0.02$).

Discussion

Together with other recent publications from the same group (e.g. Trickett *et al.* 1992; Farrell and Pease 1993; Pease 1993; Hope 1995, this issue) the underlying theme of the research reported here is the crucial importance of considering both victim prevalence and victimization concentration as complementary measures yielding the composite

[16] The non-parametric Kruskal–Wallis test was used.

measure of crime incidence. Trickett *et al.* (1992) showed that area differences were attributable to differences in concentration, as well as to differences in victim prevalence. These findings were replicated in this paper, after removal of a design imperfection from the method used in the earlier study. The next stage was to decompose changes in crime incidence between 1982 and 1988 into prevalence and concentration changes.

The central justification for the paper seems well established, namely that victim concentration—that it, the rate of victimization and the resulting proportion of repeat victims—cannot be denied a central role in understanding either the distribution of crime incidence at one time, or changes over time in that distribution. In England and Wales between 1982 and 1988, both property and, to a lesser extent, personal crime became more uneven in their distribution across constituencies. Particularly for property crime, this was attributable to an increasing inequality in victim concentration. It seems constituencies diverged during the 1980s primarily in the number of victimizations their victims sustained, rather than the number of victims among their citizens.

The present analysis has shown very marked and divergent regional trends in prevalence and concentration rates during the 1980s and suggested that increasing inequality between constituencies in property crime concentration rates may in part have reflected an evolving pattern of regionalization. Changes generally differed greatly by region, most dramatically for personal crime—regions in the South (especially London and the South East) had declining crime risks during the 1980s, principally because of reductions in victim concentration. The converse is true elsewhere, with increases in incidence being fuelled primarily by increases in victim concentration. For property crime, Northern regions generally saw increases in both prevalence and concentration, though the contribution of either varied between regions.

These strong patterns confirm the importance of regional analysis and—in view of a possible growing disparity between North and South identified here—the importance of economic and demographic regionalization processes for explaining crime rate change. It is beyond the scope of the present paper to speculate about the meaning of these differential regional trends but they are clearly suggestive of a relationship between macro-level economic and social trends and micro-level criminal activity. Uneven spatial development has been a principal characteristic of change in the British economy since the 1960s with significant consequences for the structure of British society (Lash and Urry 1987, 1994). It is possible that the acceleration of these processes during the 1980s (Champion and Townsend 1991) has altered the spatial distribution of the criminal victimization of individuals and households within England and Wales.

It is tempting to see the differing distributional patterns identified for property and personal crime as a corollary to the differential relationships between these crime types and changes in the growth of personal economic consumption identified in the British economy. In this research, a declining rate of growth in personal consumption in the post-war period was accompanied by an increasing rate of growth in property crime; conversely, increasing growth in consumption appeared to produce increasing growth in personal crime (Field 1990). From the present analysis, it is possible that, irrespective of the national rate of change in crime during the 1980s, an aggregate drift in economic fortunes from Northern to Southern regions was accompanied by a shift in the distribution of victimization from South to North, alongside increasing inequality in the concentration of victimization between local communities. While the con-

centration of personal crime victimization was most marked for individuals, change in inequality in the distribution of property crime was marked between areas.

The measure of crime concentration employed here expresses not only the proportion of 'multiple' victims but also the frequency or rate at which the victim population is being victimized over a particular recall period. In effect, the constituency level analysis suggests that for property crime not only were more households in some communities being victimized than in other places but also that those victims were being victimized much more frequently. In other words, the *intensity* of victimization from property crime had increased markedly in some areas. To the degree to which this change is related to change in the economic fortunes of particular places, the findings presented here call not only for more detailed spatio-temporal analysis—at different levels of aggregation of the concentration of victimization—but also for a specification of the possible explanatory linkages between the growth of criminal victimization, its distribution amongst individuals and areas, and its relationship to the dynamics of economy and society.

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