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CRIME, GENDER AND SOCIETY IN INDIA: Some Clues from Homicide Data

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1. INTRODUCTION

Violence is something of a blind spot in development studies. Protection from violence may be thought of as one of the "capabilities" that make life valuable: most people would rather avoid being mugged, beaten, wounded, or tortured, and it is also nice to live without *fear* of these traumatic experiences. Violence also affects the quality of life in indirect ways, as when armed conflicts disrupt economic development or trigger a famine. If development is about improving the quality of life, the issue of violence should be a major concern of the discipline. Yet, it tends to receive little attention outside specialised circles.

There is another reason why protection from violence is a "capability" of special interest: it does not necessarily improve as income levels rise. Many other basic capabilities, such as nutrition, longevity, and literacy, do tend to be positively correlated with income, so that we can expect them to improve with economic growth even in the absence of direct intervention. Protection from violence, however, is not a convenient by-product of economic growth, and indeed there are spectacular cases of violence *rising* against a background of rapid improvement in per-capita income and other development indicators. Dealing with violence in the society is, therefore, intrinsically a matter of public action. The latter, in turn, calls for careful investigation of the causes of violence.

One possible reason why violence has remained out of focus in development studies is the paucity of relevant data. War-torn zones are not the best site for a household survey, and even data on civilian violence in developing countries are seldom available in a convenient and reliable form. The Indian government, however, publishes a good deal of information on homicides; this paper is a preliminary attempt to analyse these data.

Our main concern is to explore the links between homicide rates at the district level and various socio-economic variables such as poverty, urbanization, literacy rates, and the demographic and social composition of the population. Regression analysis points to a robust negative correlation

between homicide rates and the *female-male ratio* in the population. This particular pattern receives special attention in this paper.

2. DATA AND ISSUES

Crime in India, an annual publication of the Government of India (Ministry of Home Affairs), presents district-wise data on a range of "crimes" such as homicides, rapes, thefts, etc. These statistics are compiled from police records. One suspects a good deal of under-reporting for most of these crimes, but homicide data are likely to be fairly accurate. Accordingly, we restrict our attention to homicides.[1] The terms "homicide" and "murder" will be used interchangeably, even though some homicides are not, strictly speaking, murders.

Earlier statistical analyses of Indian crime data are few and far between. An important contribution is Baldev Raj Nayar's *Violence and Crime in India* (Nayar, 1975).[2] The author focuses on temporal and regional patterns in crime rates, and how these might be explained. Unfortunately, his statistical analysis of the determinants of "murder and kidnapping" (pp. 121-2) produced little result, partly because it was based on 18 observations only (one for each state). Interestingly, "police strength" had a *positive* coefficient in this regression, but this finding has to be taken with a pinch of salt, given the possible endogeneity of this "independent variable".

In the concluding pages of his book, Nayar pointed out that "district level data may provide more satisfactory results in respect of the social and economic correlates of violence and other crime" (p.128), but no-one seems to have pursued this useful hint. Philip Oldenburg (1992), however,

[1] The *Crime in India* data suggest a poor correlation between different types of crime. For instance, the ranking of Indian states by level of crime varies a great deal depending on which crime one is looking at (see e.g. Bhatnagar, 1990, pp. 60-61). One interesting exception is Kerala, which has low levels of crime across the board.

[2] See also Rao (1981, 1988a, 1988b), Bhatnagar (1990), Subramanian (1992), for related discussions of crime in India.

noticed an interesting pattern based on district-level data for Uttar Pradesh: there is a negative correlation between the incidence of murders and the female-male ratio in the population. As we shall see, this pattern also applies in India as a whole (even after controlling for a wide range of other variables), though probably for reasons different from those suggested by Oldenburg.

Aside from extending Nayar and Oldenburg's earlier work, our analysis investigates two further issues. First, we examine the possible link between crime rates and various indicators of "modernisation", such as urbanization, literacy, and the level of poverty. One common assumption in this respect is that modernisation is associated with higher crime rates. This conjecture receives little support from empirical studies of crime in Europe and north America (Rogers, 1989), but it is worth reexamining in the Indian context.[3] Second, we scrutinize the relation between crime rates and the social composition of the population.

3. REGRESSION VARIABLES

Little material is available to construct a plausible "model" of crime in India, and we shall not attempt to do so. Instead, our starting point is the "statistical approach" to regression analysis (Deaton, 1997:63), where the regression function is simply interpreted as a conditional expectation: in this case, the expectation of the homicide rate conditional on various socio-economic variables of interest.

The variables considered in this analysis are listed in Table 1, together with the sample means. The unit of analysis is the district, and the reference year is 1981. The relevant data are available for 332 districts, accounting for 92 per cent of India's total population.

[3] Bhatnagar (1990: 69) argues that "increasing level of socio-economic development... is inversely related to the volume of crimes". However, this conclusion receives only weak support from his own statistical analysis. The latter, like Nayar's, is based on cross-section regressions at the state level, with only 20 observations.

TABLE 1

List of regression variables

Variable name	Definition	Sample mean
MURDER	Murders per 100,000 persons, 1980-82 (unweighted average of 1980, 1981, 1982 annual figures)	**35.3**
LIT	Crude literacy rate, 1981 (%)	**33.8**
URBAN	Proportion of the population living in urban areas, 1981 (%)	**20.5**
SENINDEX	Sen index of rural poverty for the region where the district is situated, 1972-3	**0.18**
SC	Proportion of scheduled-caste persons in the population, 1981 (%)	**15.8**
ST	Proportion of scheduled-tribe persons in the population, 1981 (%)	**8.6**
FMR	Female-male ratio: females per 1,000 males, 1981	**935**
Q5RATIO	Ratio of male q_5 to female q_5 (q_5 is the probability of dying before age 5), 1981	**0.96**

Sources: *Crime in India* (Government of India, annual), for murder rates; Government of India (1988), for Q5RATIO; Jain *et al.* (1988), for SENINDEX; Census of India 1981 for the other variables.

The district is a useful unit of analysis in this context. It is, indeed, natural to focus on the murder rate as a characteristic of the *society*, rather than on the propensity of particular individuals or households to commit murders. A higher level of aggregation than the district, on the other hand, would miss important local variations in murder rates and their social context. A state-level analysis, in particular, would be too coarse, as there are wide inter-district variations in murder rates within states. In Uttar Pradesh, for instance, the annual murder rate varies from 2.9 per 100,000 persons

in Garhwal to 106 per 100,000 persons in Pilibhit.

Our dependent variable, MURDER, is the annual number of murders per 100,000 persons. For this variable, we have taken an (unweighted) average of the annual values for 1980, 1981 and 1982. This helps to even out transient variations in murder rates, which are unlikely to have much to do with the right-hand side variables (the latter, with the exception of the poverty index, do not vary much from year to year).

The state-level values of MURDER are given in Table 2. Madhya Pradesh and Uttar Pradesh are in a league of their own, with more than 50 murders per 100,000 persons per year. At the other end of the scale are Kerala, Himachal Pradesh and Jammu and Kashmir, with MURDER values below 20. The murder rate in Jammu and Kashmir, of course, is likely to have shot up since 1981.

Table 2 also gives state-level values of the independent variables. The latter require little elaboration, except for the poverty indicator. In the absence of district-level poverty estimates, our poverty indicator (SENINDEX) is the "Sen index" for the *region* where the relevant district is situated. The "region" is an intermediate unit between the district and the state. Most states have three to five regions, each made up of a collection of contiguous districts. The implicit assumption being made here is that poverty levels do not vary a great deal between districts within a specific region.[4] Another qualification is that the reference year for SENINDEX is not 1981 but 1972-3, the closest year for which region-level poverty estimates are available. For further discussion of these qualifications, the reader is referred to Murthi, Guio and Drèze (1995).

Aside from those listed in Table 2, we tried a number of other independent variables, including population density, the proportion of agricultural labourers in the population, and the Gini

[4] Strictly speaking, it is enough to assume that intra-regional variations in poverty levels are uncorrelated with the right-hand side variables in the regression equations.

coefficient of per-capita expenditure.[5] However, these variables had unstable coefficients, and were not statistically significant. To reduce multicolinearity problems, we dropped them from the regressions reported in the next section.

TABLE 2: State-level values of the regression variables

	MURDER	LIT	URBAN	SENINDEX	SC	ST	FMR	Q5RATIO
Andhra Pradesh	26	29.9	23.3	15.8	15	5.9	975	1.06
Bihar	32	26.2	12.5	24.8	15	8.3	946	0.86
Gujarat	26	43.7	31.1	15.5	7	14.2	942	0.92
Haryana	27	35.4	21.9	3.7	19	0.0	970	0.82
Jammu & Kashmir	9	26.7	21.1	3.4		0.0	892	1.03
Karnataka	25	38.5	28.9	14.5	15	4.9	963	1.02
Kerala	15	70.4	18.7	20.9	10	1.0	1032	1.12
Madhya Pradesh	51	27.9	20.3	19.3	14	23.0	941	0.96
Maharashtra	25	47.2	35.0	25.1	7	9.2	937	1.01
Orissa	7	34.2	11.8	37.8	15	22.4	981	1.03
Punjab	28		27.7	3.8	27	0.0	935	0.88
Rajasthan		24.4	21.1	13.2	17	12.2	919	0.89
Tamil Nadu	31	46.8	33.0	17.6		1.1	977	1.02
Uttar Pradesh	50	27.2	18.0	13.0	21	0.2	885	0.84
West Bengal	27	39.9	26.5	28.4	22	5.6	911	0.98

[5] The Gini coefficient, like SENINDEX, was a region-level variable for 1972-3. This is likely to be a poor indicator of "trend" levels of economic inequality around 1981, as the Gini coefficient varies a great deal from year to year (see Drèze and Srinivasan, 1996). It is possible that a better index of economic inequality would have more explanatory power.

We begin with simple OLS estimation. The possibility of a feedback effect of MURDER on the female-male ratio will be addressed through instrumental-variable (IV) estimation.

4. EMPIRICAL FINDINGS

The main results are presented in Table 3. Our "baseline" regression appears in the first column. None of the coefficients related to "development" variables (LIT, URBAN and SENINDEX) are significant. Thus, crime rates do not appear to decline (or, for that matter, increase) as a simple by-product of development. Among these variables, LIT comes closest to statistical significance (in fact, it is significant at the 10 per cent level). The hypothesis that education has a negative effect on crime rates is thus consistent with the findings reported in Table 3, even though it does not receive direct support from these findings.[6] In this connection, it is worth recalling that Kerala has some of the lowest crime rates in the country, not only in terms of murders but also in terms of other crimes (see footnote 1).[7]

These findings on the relation between development and crime (i.e. that there is no simple connection between the two) are consistent with those of Bhatnagar (1990). Among the various socio-economic variables and development indicators examined by the author (pp. 59-67), none showed a statistically significant correlation with murder rates at the state level. The author also found that literacy had a negative (though not statistically significant) effect on all types of crime, with the notable exception of "cheating".

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[6] In some of the alternative specifications we experimented with (as in the second column of Table 3), LIT did have a statistically significant (negative) coefficient.

[7] Recent surveys in the United Kingdom and the United States indicate exceptionally high rates of dyslexia among criminal offenders: around 50 per cent, compared with 4 to 20 per cent in the general population (Dyspel Project, 1998). One possible reason for this is that the sense of alienation arising from being unable to read or write in a highly literate society reduces the hold of social norms among educationally disadvantaged persons. In India, the alienation may be less severe, but there is nevertheless much evidence that illiterate persons have strong feelings of social marginalisation (The PROBE Team, 1999).

In contrast with these somewhat inconclusive findings, the baseline regression points to strong correlations between murder rates and the social composition of the population. In other words, crime rates seem to be more closely linked to stable features of the social structure (e.g. the caste and gender composition of the population) than to short-term economic or development variables. The strongest correlation is with the female-male ratio, which is *negatively* correlated with the murder rate (i.e. murder rates are higher in districts with low female-male ratios). This correlation is extremely robust, as can be guessed from this variable's large t-ratio: no matter which other variables are included or excluded from the regression, we found that the female-male ratio remained highly significant, always with a negative sign.[8]

The second column of Table 3 shows what happens if the female-male ratio is dropped from the regression. The main difference with the baseline regression is that LIT and URBAN are statistically significant. Further, the coefficient of URBAN is now *positive* (i.e. more urbanised districts have higher murder rates). However, this regression equation is misspecified, since it omits a variable of crucial importance, namely the female-male ratio. Thus, while urbanization appears to have a positive effect on murder rates (Table 3, column 2), this effect is entirely "accounted for" by the higher masculinity of the population in the more urbanised districts (Table 3, column 1). The more general lesson is that analyses of crime in India are likely to be seriously incomplete, perhaps even distorted, if they fail to take into account the gender dimension of the problem.

The baseline regression also indicates that districts with a higher proportion of scheduled-caste or scheduled-tribe persons in the population have higher murder rates (this feature applies to all the variants appearing in Table 3). It is tempting to jump to the conclusion that these sections of society have a higher propensity to kill their fellow human beings, but this does not follow. For one thing, it is equally possible that members of these social groups have a high propensity to be the *target* of murders. A related line of explanation is that violence arises in part from caste conflicts, and that

[8] Preliminary analysis of 1991 data generates the same pattern.

the latter are particularly likely in areas where disadvantaged castes account for a larger share of the population.

TABLE 3
Regression results

Independent variable	MURDER	MURDER	MURDER-PM	MURDER	MURDER
Estimation method	OLS	OLS	OLS	IV	OLS
Constant	160.7	36.0	184.9	130.9	163.5
Literacy rate (LIT)	-0.17 (-1.61)	-0.44** (-4.28)	-0.16 (-1.51)	-0.23 (-1.86)	-0.06 (-0.59)
level of urbanization (URBAN)	-0.11 (-1.22)	0.20** (2.39)	-0.13 (-1.35)	-0.04 (-0.33)	-0.06 (-0.70)
Sen index of poverty (SENINDEX)	-1.33 (-0.09)	-15.63 (-1.01)	-0.44 (-0.03)	-7.06 (-0.44)	4.03 (0.27)
Scheduled castes' population share (SC)	0.33** (3.06)	0.50** (4.40)	0.35** (3.08)	0.36** (3.19)	0.29** (2.79)
Scheduled tribes' population share (ST)	0.37** (4.22)	0.26** (2.84)	0.37** (3.99)	0.36** (3.99)	0.47** (5.17)
Female-male ratio (FMR)	-0.14** (-6.79)	-	-0.16** (-7.61)	-0.10** (-2.57)	-0.09** (-4.14)
ratio of male to female child mortality (Q5RATIO)	-	-	-	-	-50.24** (-3.75)
R^2	0.26	0.14	0.28	0.25	0.29
Number of observations	332	332	332	332	331

** Significant at 1% level (t-ratio in brackets).

To illustrate the last possibility, consider the following model. The population is divided into two groups, "disadvantaged caste" (with N_d members) and "privileged caste" (with N_p members). Every day, members of the population encounter each other at random, in pairs. If a pair consists of two persons from the same caste, there is no conflict. If they belong to different castes, there is a conflict with probability q. Then it easy to show that the number of daily conflicts (say C) is

$$C \equiv n_d(1-n_d)qN$$

where N is the total population and $n_d \equiv N_d/N$ is the population share of the disadvantaged caste. Clearly, C peaks at $n_d = 0.5$, and increases with n_d as long as $n_d < 0.5$.[9]

5. GENDER AND CRIME

Let us now consider some possible explanations for the negative coefficient of the female-male ratio in the baseline regression.

DEMOGRAPHIC WEIGHTS?

The first explanation that comes to mind is a plain "demographic" one: since men are more violent than women, populations with a higher proportion of men naturally have higher murder rates. Closer scrutiny of the results, however, indicates that the link between female-male ratios and murder rates is mediated *principally by variations in sex-specific murder rates*, rather than by variations in the demographic weights used to aggregate these sex-specific murder rates. Formally, the murder rate (say k for short) may be written as

$$K \equiv m.k_m + f.k_f \equiv k_m - (k_m - k_f).f \qquad (1)$$

[9] The are other possible reasons why the likelihood of caste conflict might be positively related to the share of disadvantaged castes in the population. As the latter rises, for instance, the higher castes may find it harder to perpetuate the subjugation of the lower castes without resorting to violence.

where m and f are the proportions of men and women in the population, respectively, k_m is the "male murder rate" (i.e. number of murders committed by men divided by male population) and k_f is the female murder rate. Equation (1) substantiates the demographic explanation: if k_m and k_f are uncorrelated with f, a regression of k on f would still yield a negative coefficient as long as k_m is larger than k_f. However, the same equation indicates that the coefficient would be smaller than k in absolute value. By contrast, using the baseline regression (Table 3, first column) and the identity $f \equiv FMR/(1+FMR) \approx FMR/2$, we find that the implicit coefficient of f is about *eight times* as large as the mean value of k. In other words, the female-male ratio accounts for a much larger proportion of the inter-district variation in murder rates than we would expect from the demographic explanation alone.

To illustrate the point, consider the contrast between Garhwal and Pilibhit in Uttar Pradesh. Since the proportion of males in the population is about 13 per cent higher in Pilibhit than in Garhwal, we would expect the murder rate itself to be up to 13 per cent higher in Pilibhit than in Garhwal, based on the demographic explanation alone (i.e. assuming identical sex-specific murder rates in the two districts). In fact, the murder rate is about 30 times as high in Pilibhit (106 per 100,000) as in Garhwal (2.9 per 100,000); further, the baseline regression suggests that about one third of this gap is accounted for by the contrast in female-male ratios (0.85 in Pilibhit versus 1.08 in Garhwal).

To look at this issue from another angle, we can shift the focus from the murder rate (MURDER) to the number of murders *per male*, say MURDER-PM. Note that, when k_f is close to zero (which is the case in India), MURDER-PM is essentially the same as k_m. As the third column of Table 3 shows, the regression results are much the same when MURDER is replaced with MURDER-PM on the left-hand side, reinforcing the notion that the results are driven by variations

in sex-specific murder rates (specifically, k_m) rather than in the weights (m, f) used in aggregating these sex-specific murder rates to obtain k. In fact, if the sex-specific murder rates were independent of the female-male ratio, we would expect the latter to have a *positive* coefficient in this regression, bearing in mind the identity

$$MURDER - PM \equiv k_m + k_f . FMR \qquad (2)$$

(the latter follows from dividing both sides of (1) by m). The third regression in Table 3 invalidates this prediction.

OLDENBURG'S HYPOTHESIS

Next, we turn to Oldenburg's (1992) explanation of the negative bivariate correlation between murder rates and the female-male ratio in Uttar Pradesh. Oldenburg advanced the hypothesis that, in areas with high levels of violence, preference for male children is particularly strong, because sons are valued as a protection against violence as well as for the exercise of power: "my hypothesis [is] that families in west central UP want (or need) more sons than families elsewhere because additional sons enhance their capacity to literally defend themselves or to exercise their power" (Oldenburg, 1992, p.2659). In this line of explanation, the direction of causation runs from violence to low female-male ratios, rather than the other way round.

Oldenburg's hypothesis prompted an incisive rejoinder from Arup Mitra (1993), who argued that this hypothesis gives too much weight to the "physical security" factor in fertility decisions: "protection from violence such as disputes with neighbours (leading to murders) is just one single component of the huge spectrum of social security the parents expect to derive from having more sons" (p. 67). This statement, however, merely challenges the idea that regional variations in female-male ratios might be *primarily* due to variations in levels of violence. Even then, Oldenburg's

hypothesis may still have some merit in explaining the observed *correlation* between female-male ratios and murder rates.

To test this hypothesis, we move from OLS estimation to a standard two-stage procedure, where the female labour-force participation rate (FLAB) is used as an "instrumental variable" for the female-male ratio. More precisely, in the first stage the female-male ratio is regressed on FLAB and the other independent variables listed in Table 3. In the second stage, we re-run the baseline regression (Table 3, first column), with the female-male ratio in each district being replaced by the *predicted* female-male ratio derived from the first-stage regression. Roughly speaking, this procedure essentially amounts to using female labour-force participation as an exogenous proxy for the female-male ratio. This procedure works well (in particular, the first-stage regression gives an excellent fit), mainly because female labour-force participation has a strong influence on the female-male ratio, as several studies have pointed out.[10]

If Oldenburg's hypothesis were correct, and provided that the murder rate does not influence (and is not influenced by) the level of female labour-force participation, then we would expect the coefficient of FMR in this two-stage regression to be devoid of significance.[11] Instead, as the fourth column of Table 3 shows, the coefficient of FMR in this two-stage regression is much the same as before, and is still statistically significant. This suggests that the female-male ratio influences the murder rate, rather than the other way round (as argued by Oldenburg), *or* that the female-male ratio and the murder rate are jointly influenced by something else.

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[10] See particularly Rosenzweig and Schultz (1982), Sunita Kishor (1993), Murthi, Guio and Drèze (1995). This influence seems to work mainly through differential survival rates of boys and girls: boy preference is particularly strong in areas with low rates of female labour-force participation.

[11] The possibility of a direct interaction between female labour force participation and the murder rate cannot be ruled out. In particular, high levels of violence may deter women from working outside the household. A tentative indication that this direct interaction may not be important is that, when added as an additional right-hand-side variable in the baseline regression, FLAB is not statistically significant.

VIOLENCE AND PATRIARCHY

What could this something-else be? One possibility is "patriarchy": patriarchal values and practices manifest themselves both in high levels of violence and in a strong preference for male children (leading, in turn, to low female-male ratios). A certain amount of anthropological evidence is consistent with this line of analysis. Marvin Harris (1980, 1993), among others, has noted the close connection between warfare and patriarchy, and also how the latter manifests itself inter alia in high levels of female infanticide and selective neglect of female children. It is possible that the history of warfare in specific parts of India, such as the Gangetic plain, has left a legacy of highly patriarchal values and practices, leading both to continuing violence and to strong male preference. In this connection, it is interesting to note that the "martial castes" of north India are notorious both for their fiercely patriarchal culture and for low female-male ratios.[12] There is also some evidence (and not just from Hindi films) that they have high murder rates.[13] While these particular communities represent a small section of the population, the fact that they are often seen as role models by large sections of the society (Srinivas, 1989) gives them much social influence in some areas.

Another possible aspect of this patriarchal nexus relates to land ownership. In India, both regional contrasts and comparisons between different communities suggest a close relation between gender inequality and land property. For instance, female-male ratios tend to be particularly low among the property-owning castes (Miller, 1981). Similarly, areas of densely-populated fertile land, with a long history of settled agriculture and private land ownership (e.g. the western Gangetic plain), tend to be associated with low levels of female labour force participation, an emphasis on the joint family, patrilocal post-marital residence, the practice of dowry, and related patriarchal norms.[14] All

[12] See Drèze and Gazdar (1997), pp. 105-7, and the literature cited there.

[13] In a study of village Palanpur (western Uttar Pradesh) spanning five decades, Drèze and Sharma (1998) note that most murders over this period were committed by Thakurs. The authors also mention various other indicators of the continuing influence of militaristic values among the Thakurs: they have the monopoly of guns in the village, spend time in body-building, strive to get jobs in the army and the police, etc.

[14] These associations need not apply if land inheritance is matrilineal; this is one possible reason why they have limited relevance in Kerala, which has a tradition of matrilineal inheritance for a substantial section of the population.

these, in turn, lead to a devaluation of female children relative to male children, and low female-male ratios. These particular communities and regions are also likely to be prone to property-related conflicts and violence. Thus, if a substantial proportion of all homicides are property-related, we would expect a negative association between female-male ratios and murder rates, mediated by property relations.[15] Unfortunately, we are unable to pursue this hypothesis, for want of suitable data.

SEX-SPECIFIC MIGRATION

At this point, it is useful to note that the female-male ratio (FMR) reflects a mixture of two different factors: (1) the relative survival rates of boys and girls, and (2) sex-specific migration. Thus, a district with a low female-male ratio may be characterised either by a sharp anti-female bias in child survival, or by high levels of net male in-migration.[16] While the former may be seen as a symptom of patriarchy, the latter is an entirely different phenomenon. To distinguish between the two, the last column of Table 3 presents one more variant of the baseline regression, where the ratio of male to female child mortality (Q5RATIO) is included as an additional right-hand-side variable. The results are much the same as before, and, interestingly, *both* FMR and Q5RATIO are highly significant, with a negative sign. This suggests that a strong connection between female-male ratios and crime rates remains even after controlling for the "patriarchy effect" (captured by Q5RATIO). One possible reason for this is that male in-migration, like patriarchy, simultaneously reduces the female-male ratio and enhances the murder rate. The underlying causes of the latter effect remain speculative.

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[15] There is some evidence that many murders have something to do with property and property disputes; see e.g. Unnathan and Ahuja (1988), p.65. According to Edwardes (1924, p.18), "most of the murders committed in districts as widely separated as the Panjab, Bombay, and Burma" relate to "three powerful stimuli": "*Zan*, *Zar*, and *Zamin*, or 'woman, gold, and land'". The source of this information, however, is not clear from the text; and of course, the situation may have changed a great deal since these lines were written.

[16] Female migration can be plausibly overlooked here. Women do "migrate" at the time of marriage (from their natal home village to their husband's village), but this is unlikely to affect district-specific female-male ratios; similarly with post-marital female migration, in so far as married women rarely migrate without their families.

6. CONCLUDING REMARKS

This is as far as we have been able to go, for the time being, with the available data. The connections identified in this paper, particularly between murder rates and female-male ratios, call for further investigation. What seems clear is that there is a strong link of some kind between gender relations and violence (not just violence against women, but violence in the society as a whole). Further, this link seems to be far more important in understanding regional variations in murder rates than, say, the level of development or the rate of urbanization. Earlier studies of crime in India seem to have missed this crucial link. Similarly, standard criminology textbooks pay little attention to the relation between gender and crime (except through the specific prism of "crime against women"). Yet, this issue may be crucial in understanding crime patterns in different societies.

We end with two qualifications, which also point to directions of further research. First, this statistical enquiry needs to be combined with other sources of evidence on the sociology of crime in India, such as police records and ethnographic studies. Direct information on who commits murders, for what reasons, and so on, would be of great value in helping to interpret the rudimentary data analysed in this paper.[17] As things stand, we lack basic clues such as whether the murders recorded in *Crime in India* are mainly individual acts, or whether they take place in the context of collective incidents such as riots.

Second, this paper has taken a "static" view of crime, which relates murder rates to various district characteristics at a single point of time. The sociology of crime, however, suggests that the *changes* that are taking place in society may also have much influence on crime rates.[18] For instance,

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[17] Some useful sources here are Edwardes (1924), Bayley (1963), Unnathan and Ahuja (1988), Das and Chattopadhyay (1991), among others.

[18] See, e.g., Robert Merton's (1938, 1957) "strain" theory of crime, which builds on Emile Durkheim's (1951) notion of *anomie* ("normlessness"), most likely to prevail at times of rapid social change. Various other sociological theories of crime also involve an explicit or implicit focus on the pace of social change.

while there may be little relation between the level of urbanization and the murder rate, a high *rate of growth* of cities may be associated with a high crime rate in urban areas. Similarly, the level of per-capita income may matter less than, say, the rate of economic growth or fluctuations in economic activity.

The last qualification has a bearing on the relation between development and crime. As we saw earlier, cross-section analysis reveals no strong link between the two. Yet, there has been a sustained increase in murder rates in the 1970s and 1980s, a period of rapid economic development. The two observations are not inconsistent, bearing in mind that the pace of change may have an influence of its own.

REFERENCES

Bayley, David H. (1963), "Violent Public Protest in India: 1900-1960", *The Indian Journal of Political Science*, 24.

Bhatnagar, R.R. (1990), *Crimes in India: Problems and Policy* (New Delhi: Ashish Publishing House).

Das, S., and Chattopadhyay, B.(1991), "Rural Crime in Police Perception: A Study of Village Crime Notebooks", *Economic and Political Weekly*, January 19.

Deaton, Angus (1997), *The Analysis of Household Surveys* (Baltimore: Johns Hopkins).

Drèze, Jean, and Srinivasan, P.V. (1996), "Poverty in India: Regional Estimates, 1987-8", Discussion Paper No. 70, Development Economics Research Programme, London School of Economics.

Drèze, Jean, and Gazdar, Haris (1997), "Uttar Pradesh: The Burden of Inertia", in Drèze, J.P., and Sen, A.K. (eds.), *Indian Development: Selected Regional Perspectives* (Oxford and New Delhi: Oxford University Press).

Drèze, Jean, and Sharma, Naresh (1998), "Palanpur: Population, Society, Economy", in Lanjouw, P., and Stern, N.H. (eds.), *Economic Development in Palanpur over Five Decades* (Oxford and New Delhi: Oxford University Press).

Durkheim, Emile (1951), *Suicide: A Study in Sociology*, translated by J. Spaulding and G. Simpson (Glencoe, Ill: Free Press).

Dyspel Project (1998), "Dyslexia and Offending: Intervention for Change" (London: Dyspel Project).

Edwardes, S.M. (1924), *Crime in India*, reprinted 1988 (Jaipur: Printwell Publishers).

Government of India (annual), *Crime in India* (New Delhi: Bureau of Police Research and Development, Ministry of Home Affairs).

Government of India (1988), " Child Mortality Estimates of India", Occasional Papers, No.5 of 1988, Demography Division, Office of the Registrar General, Ministry of Home Affairs, New Delhi.

Harris, Marvin (1980), *Cultural Materialism: The Struggle for a Science of Culture* (New York: Random House).

Harris, Marvin (1993), "The Evolution of Human Gender Hierarchies: A Trial Formulation", in Miller, B. (ed.), *Sex and Gender Hierarchies* (Cambridge: Cambridge University Press).

Jain, L.R., Sundaram, K., and Tendulkar, S.D. (1988), "Dimensions of Rural Poverty: An Inter-Regional Profile", *Economic and Political Weekly*, November (special issue).

Kishor, Sunita (1993), "'May God Give Sons to All': Gender and Child Mortality in India", *American Sociological Review*, 58.

Merton, Robert K. (1938), "Social Structure and Anomie", *American Sociological Review*, 3.

Merton, Robert K. (1957), *Social Theory and Social Structure* (New York: Free Press).

Miller, Barbara (1981), *The Endangered Sex* (Ithaca: Cornell University Press).

Mitra, Arup (1993), "Sex Ratio and Violence: Spurious Results", *Economic and Political Weekly*, January 2-9.

Murthi, M., Guio, A.C., and Drèze, J.P. (1995), "Mortality, Fertility and Gender Bias in India: A District Level Analysis", *Population and Development Review*, 21.

Nayar, Baldev Raj (1975), *Violence and Crime in India: A Quantitative Study* (Delhi: Macmillan).

Oldenburg, Philip (1992), "Sex Ratio, Son Preference and Violence in India: A Research Note", *Economic and Political Weekly*, December 5-12.

Rao, S. Venugopal (1981), *Dynamics of Crime* (New Delhi: Indian Institute of Public Administration).

Rao, S. Venugopal (ed.) (1988a), *Perspectives in Criminology* (Delhi: Vikas).

Rao, S. Venugopal (1988b), "Contemporary Trends of Crime", in Rao (1988a).

Rogers, John D. (1989), "Theories of Crime and Development: An Historical Perspective", *Journal of Development Studies*, 25.

Rosenzweig, Mark R., and Schultz, T. Paul (1982), "Market Opportunities, Genetic Endowments, and Intrafamily Resource Distribution: Child Survival in Rural India", *American Economic Review*, 72.

Saksena, N.S. (1987), *Law and Order in India* (New Delhi: Abhnav Publishers).

Srinivas, M.N. (1989), *The Cohesive Role of Sanskritization and Other Essays* (Delhi: Oxford University Press).

Subramanian, K.S. (1992), "Political Violence, Social Movements and the State in India", Discussion Paper 308, Institute of Development Studies, University of Sussex.

Unnathan, T.K.N., and Ahuja, Ram (1988), "Sub-culture of Violence: The Indian Context", in Rao (1988a).

The PROBE Team (1999), *Public Report on Basic Education in India* (New Delhi: Oxford University Press).

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