Research Design for Investigating a Socio-Economic Hypothesis of Crime Amongst Maoris

1968

JOINT COMMITTEE ON YOUNG OFFENDERS

Research Design for Investigating a Socio-Economic Hypothesis of Crime amongst Maoris

July 1968

SUMMARY: The incidence of offending is much higher amongst Maoris than amongst non-Maoris. Only a small part of the difference can be accounted for by possible sources of error in the statistics. Two approaches to explaining the difference - one in terms of "cultural" factors, the other in terms of "socio-economic" factors - are outlined. The second approach has been rather neglected, and a means of testing it is proposed. In its essentials, the method is to divide the population into socio-economic strata, and to determine for each stratum whether the rate of offending amongst Maoris is similar to that for non-Maoris, or whether a substantial disparity still remains.

1. The high incidence of crime amongst Maoris

1.1 Although Maoris make up less than 8% of the population they contribute about a quarter of all appearances in Court. The high level of offending amongst Maoris is one of the most commonly remarked aspects of New Zealand crime. It received a separate section in the "Hunn Report", which states:

> "The most disturbing cause of public concern today is juvenile delinquency, or adolescent offending as some prefer to call it: and the most serious aspect of it is the inordinately high incidence of law breaking by Maoris." *

The following tables provide a comparison between Maori and non-Maori rates of offending over recent years:

---

* Hunn, J.K. Report on Department of Maori Affairs, 24 August 1960, Government Printer, 1961, p. 32.

(This report has become popularly known as the "Hunn Report")

(i) Children's Court: Distinct cases, aged 10-16 years, expressed as a rate per 10,000 of the population aged 10-16 years.*

Year	Overall rate	Maori rate	Non-Maori rate	Ratio of Maori to Non-Maori rate
1963	131	412	102	4.0
1964	141	448	109	4.1
1965	148	445	116	3.8

(ii) Magistrates' Court: Distinct arrest cases (convictions only), expressed a a rate per 10,000 of the population aged 17 years and older.

Year	Overall rate	Maori rate	Non-Maori rate	Ratio of Maori to Non-Maori rate
1963	79	319	66	4.8
1964	80	321	67	4.8
1965	82	335	68	4.9

* (a) Figures for offenders were obtained from the Statistics of Justice (published by the Department of Statistics) for the years 1963, 1964 and 1965; the 1965 figures are the most recent which are available at present (i.e. July 1968). Rates were calculated using mean population figures, which are put out by the Department of Statistics.

(b) In table (i) the age of ten is taken as the lower limit because it is the age of criminal responsibility. The age of sixteen is taken as the upper limit because the Children's Court has jurisdiction over cases of misconduct by young people of age sixteen and younger. Seventeen-year-olds can also be dealt with in the Children's Court, but in practice about three quarters of them appear in the Magistrates' Court.

(c) The "overall rate" is the rate for the combined Maori and non-Maori population.

(d) The "ratio of Maori to non-Maori rate" is here simply the Maori rate divided by the non-Maori rate. A ratio of 4.8, for example, means that the Maori rate is 4.8 times as large as the non-Maori rate.

(iii) Supreme Court: Persons convicted, expressed as a rate per 10,000 of the population aged 17 years and older.

Year	Overall rate	Maori rate	Non-Maori rate	Ratio of Maori to Non-Maori rate
1963	1.6	5.8	1.4	4.1
1964	1.2	5.0	1.0	5.0
1965	1.5	5.1	1.3	3.9

1.2 The rates for Supreme Court cases are not as stable as the other rates because the numbers involved are fairly small. (For the years 1963-65, the numbers of Maoris convicted in the Supreme Court were 49,43 and 46.) Consequently the ratio of the Maori to non-Maori rate is rather unstable (ranging from 3.9 to 5.0) but still shows a disproportionately high rate for Maoris in each of the three years. The ratio is stable for Children's Court and Magistrates' Court cases; for the former, the rate is about four times greater for Maoris than for non-Maoris, and for the latter it is nearly five times greater. Thus although the size of the disparity between the rates for Maoris and non-Maoris varies, its direction is completely consistent: for each of the years considered, and in each of the three types of Court, Maoris showed a substantially higher rate.

1.3 As all the tables show similar disparities between Maori and non-Maori rates, they can conveniently be summarised into the following table:

Children's Court, Magistrates' Court and Supreme Court combined: distinct cases * expressed as a rate per 10,000 of the population aged 10 years and older.

Year	Overall rate	Maori rate	Non-Maori rate	Ratio of Maori to non-Maori rate
1963	90	352	74	4.8
1964	93	363	76	4.8
1965	96	375	78	4.8

The table shows that for the years 1963-65 offending was approximately five times more prevalent amongst Maoris as non-Maoris.

---

* For the purposes of calculating the combined rate the number of offences was taken as the sum of cases defined in tables (i), (ii) and (iii) in paragraph 1.1. That is, total offences equals distinct Children's Court cases aged 10-16 plus distinct arrest cases convicted in the Magistrates' Court plus total number of persons convicted in the Supreme Court.

1.4 Is the disproportionately high incidence of Maori crime a recent or a long-standing phenomenon, and has the disparity been growing or diminishing? The statistical appendices of the "Hunn Report" show that in 1930 the incidence of Maori offending (as measured by number of summary convictions of Magistrates' Court arrest cases) was slightly lower than the incidence of non-Maori offending. However, over the next decade non-Maori offending declined slightly while Maori offending increased dramatically, and by 1940 the Maori rate had grown to one and a half times as great as the non-Maori rate.* Has the gap continued to widen in recent years? The following table shows the Magistrates' Court rates for 1963-65 juxtaposed with the rates for 1953-55. (Unfortunately the Justice Statistics for the earlier years do not give separate Maori/non-Maori figures for the Children's Court, so it is not possible to make a similar comparison of Children's Court rates.)

Magistrates' Court: Distinct arrest cases (convictions only) expressed as a rate per 10,000 of the population aged 17 years and older.

Year	Maori rate	Non-Maori rate	Ratio of Maori to non-Maori rate	Year	Maori rate	Non-Maori rate	Ratio of Maori to non-Maori rate
1953	206	63	3.3	1963	319	66	4.8
1954	192	64	3.0	1964	321	67	4.8
1955	216	66	3.3	1965	335	68	4.9
Mean value**	205	64	3.2		325	67	4.9
				Percent increase in between 1953-55 and 1963-65	59%	5%	53%

* Hunn, op cit. p. 173

** The value given as the mean ratio is the ratio of the mean rates; it is not the mean of the separate ratios.

1.5 The table demonstrates that the situation has been deteriorating over the past fifteen years. Between 1953-55 and 1963-65 the non-Maori rate rose by only 5%, but the Maori rate rose by 59%; as a consequence Maori offending, which had been approximately three times more prevalent than non-Maori offending over the former period, had become almost five times as prevalent by 1963-65.

2. Is the difference a statistical artifact?

2.1 It might be suggested that the disparity is - in part at least - the result of inaccuracies in the statistics about the Maori people. It is certainly true that racial classifications are rather haphazard and are made in different ways in different circumstances. Census figures depend on self-report: people are asked to specify the components of their racial make-up (for example, ¾ Maori, ¼ European and ⅛ Indian). The method has the obvious disadvantages that a person can lie, or might be ignorant of or mistaken about his ancestry. Racial classification of arrest cases and of inmates of Department of Justice institutions depends on self-report given orally to Police or institution staff. Children who appear in the Children's Court are classified by Child Welfare Officers on the basis of whatever information they happen to have. Officers are instructed not to ask specifically about race, so often the classification is simply in terms of whether a child matches up to the Officer's notion of what a Maori is like. The Government Statistician defines Maoris as "all persons with half or more of Maori blood"; all the classifications mentioned above are based on this definition, but the type of information used to make the classification (i.e. whether a self-report entered on a form, a reply to an oral question, a judgment by an official, etc) depends on the reason why the data about race is required.

2.2 The principal source of information about the racial composition of the population is the Census. It would be foolhardy to suggest that this information is accurate. Inspection of the racial distribution for those who acknowledge some Maori ancestry raises immediate doubts. The following figures are from the 1961 Census.

Officially classified as Maori (i.e. half or more Maori blood) (83%)	Full Maori	51%
	Three-quarter-caste Maori, remainder European.	12%
	Half-caste Maori, remainder European	18%
	Half or more Maori, remainder other (i.e. non-European) races	1%

Officially classified as non-Maori (i.e. less than half Maori blood) (17%)	Quarter-caste Maori, remainder European	17%
	Less than half Maori, other cases	¼%

It is clear that those who acknowledge at least some Maori blood tend to claim to be at least half Maori, and over fifty percent of such people in fact claim to be full Maori. This proportion is extremely unlikely; there is much truth in the rather unkind adage that "the only place you will see a full Maori these days is outside a pub". It seems likely that what a person enters under "Race" on a Census form is influenced at least as much by his sense of ethnic self-identification as by any calculation of proportion of Maori ancestry. This is not necessarily a weakness of the classification system. Some observers argue that if the term "Maori" is to mean anything at all it should relate to a person's conception of himself rather than to a purely formal specification of ancestry. In this view, if a person thinks of himself as a Maori and is regarded as such both by Pakehas and by other Maoris, then he should be counted as a Maori irrespective of how little Maori blood he might have. If this is accepted the "errors" inherent in the self-report system are actually desirable and result in more realistic classifications than would a strict application of the "half-or-more-by-blood" definition.

Similar comments also apply to the classification of offenders, leading to the conclusion that what is recorded as an offender's race need not bear a very close relation to his actual proportion of Maori blood. Furthermore, a person could be classified differently on different occasions. For example, he might appear as non-Maori in a Census return, be judged to be Maori for the purposes of Children's Court statistics, appear in the Magistrates' Court as a non-Maori, followed by another appearance as a Maori.

2.3 While these observations suggest that statistics for Maoris do not correspond very closely to the Government Statistician's "half-or-more-by-blood" definition, they do not, by themselves, account for the disparity between Maori and non-Maori rates of offending. In fact, the disparity could be regarded as a validation of the classification procedure because a random or arbitrary procedure would result in groups which were similar to one another. The inadequacies of the statistics offer an explanation only if it can be demonstrated that they include sources of error which systematically inflate Maori rates and/or depress non-Maori rates.

If this could be demonstrated, the disparity would be regarded as merely a statistical artifact; if it could be demonstrated that this was not so, the Maori/non-Maori classification would be regarded as meaningful and the disparity as "real", deserving and explanation in terms of the differences between people classified as Maori and non-Maori.

2.4 If the high Maori crime rate is the result of an artifact, it is most likely to be either that the figures for the number of Maori offenders are too high or the figures for the number of Maoris in the population are too low. These are discussed separately.

(i) The figures for Maori offenders could be inflated through non-Maoris being recorded as Maoris. If, for example, people with a quarter Maori blood tended to be recorded as Maoris when they appeared in Court but tended to appear as non-Maoris in the Census, the result would be an artificial inflation of the Maori rate. The weakness of this theory is that the procedure for classifying race is essentially the same for both the Census and the Magistrates' Court figures, relying on self-report in both cases. Undoubtedly there are some offenders with less than half Maori blood who think of themselves as Maoris and give their race as Maori, but presumably they also report their race as Maori in Census returns. There is certainly no evidence of a widespread trend amongst offenders to claim to be Maoris when interviewed by the Police but to claim to be non-Maoris under most other circumstances; if anything, the reverse trend might be expected. For a Children's court case the racial classification derives not from a self-report but from a judgement by a Child Welfare Officer. It would be conceivable that Officers were using very loose standards and were recording as Maori virtually everyone who showed some sign of brown skin colouring; however, there is no evidence to suggest this, and the disparity between Maori and non-Maori rates is less for Children's Court cases than for Magistrates' Court cases.*

---

* If rates are standardised with respect to age structure, however, the ratio of the Maori to the non-Maori rate for Magistrates' Court cases shrinks to about the value of the ratio for Children's Court cases. (Ref paragraphs 2.7 and 2.8).

A quite different type of explanation might be advanced: that perhaps offending is not substantially more prevalent amongst Maoris, but that a Maori offender is much more likely, to end up with a conviction recorded against his name than is a Pakeha offender. It might be argued, for example, that a Maori behaving in a mildly suspicious manner, or out very late at night, is more likely to be stopped and questioned by the Police than is a Pakeha; that, when questioned about an offence, a Maori offender is more likely to immediately confess than is a Pakeha; that a Maori offender is less likely to be dealt with in ways not involving Court and is more likely to be reported to the Police when caught committing offences such as theft from an employer; and that a Maori offender is less likely to plead innocence in Court or to be defended by a lawyer. It might be concluded, in other words, that the dice are loaded against the Maori offender compared with his Pakeha counterpart, and the overall effect is that a disproportionate number of Maori offenders appear in Court and are convicted.

It seems likely that this effect does in fact exist; but it is difficult to conceive of it being large enough to account for more than a fraction of the difference between the Maori and Pakeha levels of offending. It is possible, for example, that the effect could give rise to a Maori rate which was one and a half times as great - or perhaps even double - the Pakeha rate; but to explain the five to one disparity in this way is to assert that four out of every five non-Maori offenders are in effect "let off". This is too improbable to merit serious consideration, particularly when it is appreciated that the Magistrates' Court figures are for arrest cases only, which are all relatively serious.

To conclude, the possible effects considered here could give rise to a small difference in offending between Maoris and Pakehas, but cannot account for the very large difference which is found to exist.

(ii) The rates for Maoris could also be inflated if the population figures for Maoris were too low. In theory this could arise through Maoris being missed in the Census or being mis-classified as Pakehas; in practice both possibilities are unlikely. No doubt a small number of people are missed during a Census, and probably Maoris are more likely to be missed than Pakehas, but the total number of Maoris missed almost certainly does not amount to more than a few percent at most, while to account for the differences in offending it would be necessary for 75% of the Maori population to be missed. This is clearly absurd. Census mis-classification of Maoris is a more feasible source of error. To produce an inflation of the crime rate it would be necessary for a substantial number of people with half or more Maori blood to represent themselves as having less than half Maori blood in their Census returns.

There is no data available which would conclusively establish whether this happens, but the distribution of Maoris according to fraction of Maori blood suggests the opposite tendency. More specifically, the low proportion of people reporting some Maori blood but less than half suggests that most people with Maori blood have a fairly strong tendency to regard themselves either as definitely Maoris or definitely Pakehas, the former cases claiming to be at least half Maori (irrespective of how small the proportion might actually be) and the latter cases usually not acknowledging any Maori blood at all.

2.5 There is a quite different type of factor which also deserves mention: the differences in age structure between the Maori and Pakeha populations. This would not be likely to affect the figures given in paragraph 1.1 for the Children's Court because these are based on a narrow age range (10-16 years) but it could affect the rates for the Magistrates' Court, which are based on a very wide age group (all people aged 17 years and older).

2.6 The Maori population contains proportionately fewer old people. For example, of all Maoris aged 17 years or older, only 17% are in the "fifty-plus" group; the corresponding figure for non-Maoris is 35%. Furthermore, the older age groups have relatively low levels of offending. It might be expected, therefore, that even if age-specific offending rates for Maoris and non-Maoris were the same, the overall "17 and older" rate would be higher for Maoris simply because the Maori population contains a higher proportion of people in the offending-prone younger age groups.

2.7 The following table shows offending rates for age groups within the "17 and older" group. The table corresponds to that shown in paragraph 1.1 (ii), but for brevity figures are given for the year 1965 only.

Magistrates' Court: Distinct arrest cases, 1965, (convictions only), expressed as rates per 10,000 of the specified age groups.

Age group (years)	Overall rate	Maori rate	Non-Maori rate	Ratio of Maori to non-Maori rate
17 - 20	225	744	180	4.1
21 - 24	176	654	134	4.9
25 - 29	94	320	73	4.4
30 - 39	65	190	56	3.4
40 - 49	61	139	57	2.4
50 +	30	77	29	2.7
All ages	82	334*	68	4.9

There is clearly considerable variation with respect to age in the ratio of Maori to non-Maori offending: for the 21-24 year old group, the ratio is 4.9, while for the 40-49 group it is only 2.4. It is also clear that the difference in age structure must be boosting the overall ratio of 4.9, because the ratios for the age groups are, with one exception, all less than 4.9.

2.8 How great is the "boosting effect"? The following table shows three different ways of indicating this.

---

* The table in paragraph 1.1(ii) gives the overall Maori rate as 335, not 334. The former figure is based on all convictions of distinct arrest cases irrespective of age and includes a few (11) aged 16 years or younger; the latter figure is an overall rate for the cases making up the age-specific rates and thus is based only on cases aged 17 and older. There were 20 cases similarly excluded from the non-Maori rate, but these were not sufficient to produce a change in the value of the rate which remained at 68. Similarly, the overall rate remained at 82.

Type of standardisation	Maori rate	Non-Maori rate	Ratio of Maori to non-Maori rate	
No standardisation	334	68	4.9	*
Rates standardised with respect to the non-Maori population structure	250	68	3.7	
Rates standardised with respect to the Maori population structure	334	84	4.0	
Rates standardised with respect to age-specific rates (using the overall rates for the age groups).	103	81	1.3	*

The rates given in the first row are the unstandardised rates which are quoted from the bottom row of the previous table; they are included only as a basis for comparison. The rates in the second row are standardised with respect to age-structure taking the non-Maori population as a standard population; they show the values the rates would take if the Maori and non-Maori populations both had the same structure as the non-Maori population, but retained the age-specific offending rates which are shown in the previous table. Naturally the non-Maori rate is not affected by this standardisation, but the Maori rate falls from 334 to 250, and the ratio becomes 3.7. The third row gives rates which are standardised with respect to the Maori population: the Maori rate is unchanged, but the non-Maori rate rises from 68 to 84, giving a ratio of 4.0. These two standardisations are opposite faces of the same coin: the first transforms the age structure of the Maori population into that of the non-Maori population; the second does exactly the reverse. The results are similar, but not identical. They indicate that if it were not for differences in age structure the disparity between Maori and non-Maori rates of offending would be about four to one instead of five to one. The rates in the fourth row of the table are obtained by applying the same set of age specific rates (namely, those given as "overall rates" in the table in paragraph 2.7) to the two age structures; any difference between the Maori and non-Maori rates obtained in this way is entirely due to differences in age structure. The ratio obtained from these rates 1.3. In other words, differemces in age structure alone would give a Maori rate which was about 30% greater than the non-Maori rate; the actual Maori rate is almost 400% greater.

2.9 The foregoing discusses possible sources of systematic error in the statistics which could artificially inflate the apparent level of offending amongst Maoris. It is considered that there might be such sources of error, but that at best they account for only a small part of the five to one disparity between the Maori and non-Maori rates. Thus it is concluded that a substantial part of the disparity remains unexplained and is worthy of the serious attention of students of crime in New Zealand.

3. Socio-economic and cultural approaches to crime amongst Maoris

3.1 Some observers hold that "cultural" factors are at the root of the high incidence of crime amongst Maoris.* For example, it has been asserted that the concept of private property that was current in early Maori society affects the corresponding concept amongst modern Maoris in such a way as frequently to lead to trouble with the modern law. Another variation of the "cultural" theory gives importance to the breaking down of Maori culture, and especially of traditional sanctions, tapu, and the authority of the elders. According to this theory, it is those Maoris who are partly "Pakeha-ized" who are most likely to offend, because they find themselves "between two worlds"; on coming to the city to seek work or to see the bright lights such people will, it is held, be especially likely to offend against both modern and ancient mores.

3.2 Other observers point out that susceptibility to crime varies with socio-economic status, and hold that a reason why age-specific rates of court appearances for Maoris exceed those for non-Maoris at all age levels is that a large proportion of the Maori population corresponds in socio-economic status to that smaller proportion of the non-Maori population which, for various reasons, is particularly prone to register convictions. What may be called the "young labourers syndrome" can be observed in most Western countries.

3.3 It would be naive to assume that sociological and cultural variables are, or can be, independent of one another. However, it may be that one of the two theories is able to account plausibly for far more of the difference between European and Maori crime rates than the other. For this reason, and because of the practical difficulties to conducting research which uses both types of variables, it is worth while trying to test these theories against one another.

---

* For example, Marris A., "Some Aspects of Delinquency and Crime in New Zealand". J. Polynesian Soc. 64, 1 March 1955, 5-15.

3.4 Neither theory has been systematically put to the test and most of the available evidence is equivocal. Many people find the "cultural" hypothesis is in harmony with their own impressions. The hypothesis is difficult to test because of the lack of an objective and reliable measure of acculturation. The socio-economic hypothesis has not received as much attention as the "cultural" hypothesis, and this is in itself perhaps a reason for urging that it be investigated more thoroughly. The Joint Committee Research Unit in 1961 found by means of a rough calculation that if the crime rates are calculated as a proportion of number of those who earned less than £700 per year, instead of as a proportion of the entire age/sex group, the crude rate for Maoris is reduced to about twice that for Pakehas, instead of four and a half times, as it is for the unadjusted rates. Although this calculation does not justify any firm conclusion, the reduction is sufficiently large to suggest that a more sophisticated attack on the problem would be well worthwhile.

3.5 At present, most thinking about Maori crime appears implicitly to accept the pre-eminence of "cultural" factors. Substantial confirmation of the socio-economic hypothesis would tend to stimulate an "about-turn" of our thinking. It would bring out of the shadow the seldom-voiced view that there is no distinct problem of crime amongst Maoris, but rather the more general problem of a high incidence of crime amongst people of low socio-economic status, there being a high rate of Maori crime only because a large proportion of the Maori people happen to be in this category. To argue at length about the value of research in this area is to labour the obvious, however. It suffices to say that if the conflict between the "cultural" and socio-economic hypothesis of Maori crime were resolved in favour of one or the other, preventive programmes could be designed on a sounder basis, and much current criminological research could be profitably re-directed.

4. <u>A formulation of the socio-economic hypothesis for research purposes</u>

4.1 The research problem may be stated as follows:

If the Maori population were identical with the Pakeha population in a limited number of primarily sociological variables, all relating to social and economic conditions, would the crime rates of the two groups be approximately the same (assuming that the "cultural" differences remained as at present)?

4.2 To test the hypothesis it is necessary to decide what sociological variables will be used and to estimate the levels of offending which obtain for the Maori and Pakeha populations when they are standardised with respect to the variables.

5. A procedure for testing the hypothesis

5.1 Basically what is required is the separation of the population into groups which are relatively homogeneous with respect to socio-economic status, and the further subdivision of these into Maoris and non-Maoris, with crime rates being computed for each of the racial/socio-economic groupings thus arrived at. Two types of data would be used: that obtained from the most recent Census, and that obtained from a special survey of offenders made for the purposes of the study.

5.2 In the New Zealand Census the Personal Schedule and the Dwelling Schedule contain questions which relate to socio-economic status; there are questions about the type of employment, income, type of housing and so on. These are taken as the socio-economic variables. The two Schedules may be treated as one, as the coding onto punch-cards allows access to all the data gathered for any individual.* The first step is to decide upon an index of socio-economic status based on the Census variables. This is discussed in section 7; for the moment, it will be assumed that the index has been defined. It is taken to be in the form of a weighted sum of the Census variables. Thus:

$$s = c_0 + c_1x_1 + c_2x_2 + \ldots + c_mx_m$$

where s is the index, $x_1, x_2, \ldots x_m$ are the m socio-economic variables used to compute s, and $c_0, c_1, \ldots c_m$ are constants.

---

* In March 1965 Mr S.W. Slater (who was then Research Officer to the Joint Committee), and the writer of this paper, put up proposals for a study which was the prototype of the present study. It was found at that time that the data from the 1961 Census had been put onto punch cards in such a way that it could not be used for the study (the data from a person's Personal Schedule could not be related to the data from his Dwelling Schedule); however, the Department of Statistics indicated that this limitation probably would not apply to the 1966 data, and suggested that the Research Unit take up the matter again in middle or late 1968, by which time the Department hoped to have finished its analysis. The earlier formulation of the study was contained in a paper for the Joint Committee, called Means of Investigating a Socio-Economic Hypothesis of Crime Amongst Maoris, by S.W. Slater and J.Jensen. The present account differs in some respects from the previous one, but some parts remain relatively unchanged; and parts of this paper (particularly in section 3) are taken almost verbatim from the earlier one.

"weights" of the variables). (For example, x_1 might be whether the house in which the person is living has running water, scored as 1 if there is hot water, 0 if there is not; x_2 might be whether there is a flush toilet; x_3 might be the person's annual income; and so on. To obtain the person's s-value, his scores on the x's are multiplied by the corresponding c's, which are the same for all people and indicate the relative contribution of the different variables to the overall measure of socio-economic status. The products thus obtained are added together to give the s-value; a large s-value would indicate high status, a small s-value low status.) The index is calculated for a sample of Census cards, and the distribution of scores obtained. For convenience the scores will be grouped, the groups being labelled G_1, G_2, ... G_n. (For example, G_n might contain all those with s scores from, say, 0 to 20; G_{n-1} those with scores from 21 to 40; and so on. G_1 is the group which is highest in socio-economic status, and thus has the highest scores. G_n is the bottom group, and has the lowest scores.) The purpose of this procedure is to obtain an estimate of the socio-economic distribution of the population. Suppose it is found that a proportion p_1 of the population is in group G_1, a proportion p_2 of the population is in G_2, ... a proportion p_n of the population is in G_n; the p's then specify their desired distribution.

5.3 Information concerning the socio-economic variables (x_1, x_2, ... x_m) is obtained for a sample of offenders. The s scores are computed, and the distribution of offenders is obtained.

This is here specified as: $q_1, q_2, \ldots q_n$, where the q's give the proportions of offenders in the socio-economic groups corresponding to the p's for the general population.

5.4 Suppose total number of offenders is Q and total population is P. Then the number of offenders in any group G_i is q_iQ, and the number of people in the group is p_iP. The offender rate for the group is therefore given by: q_iQ/p_iP. The rate is calculated separately for Maoris and for Pakehas in each group. For group G_i, the Maori rate is labelled r_{Mi} and the non-Maori rate r_{Ni}. This yields the following set of rates:

Socio-economic Group	Maori rate	Non-Maori rate	Combined rate
G_1	r_{M1}	r_{N1}	r_1
G_2	r_{M2}	r_{N2}	r_2
.	.	.	.
.	.	.	.
.	.	.	.
G_i	r_{Mi}	r_{Ni}	r_i
.	.	.	.
.	.	.	.
.	.	.	.
G_n	r_{Mn}	r_{Nn}	r_n

These rates provide the basis for the evaluation of the socio-economic hypothesis. If the hypothesis is correct, the rates in any one row should be similar, but rates can be expected to vary considerably from one row to another;

that is, there should be considerable variation between the rows, but little between columns. If the hypothesis is incorrect, and after standardisation according to socio-economic criteria there is still a considerable difference between Maori and non-Maori offending remaining to be explained, the Maori rate for each socio-economic group can be expected to be considerably higher than the non-Maori rate; i.e. r_{Mi} will be considerably greater than r_{Ni}, for each value of i. It is not expected, of course, that the hypothesis will entirely explain the disparity; the interest will lie in seeing how much of the disparity it can account for.

5.5 How, precisely, will the table of rates be used to evaluate the hypothesis? Several different approaches can be adopted.

(i) Simple inspection

This would involve simply looking at the rates and coming to an intuitive judgement about the extent which there appeared to be reasonable uniformity within rows.

(ii) Standardised rates

In paragraph 5.2 p_i is defined as the proportion of the population which falls into socio-economic group G_i. Suppose G_i is split according to race, with p_{Mi} and p_{Ni} being the proportions of the Maori and non-Maori populations in G_i. The p_M's and the p_N's then define the separate socio-economic distributions of Maoris and non-Maoris.

It can be easily proved that the overall Maori rate r_M, is $(r_{M1}p_{M1} + r_{M2}p_{M2} + \ldots + r_{Mn}p_{Mn})$; the non-Maori rate, r_N, is given by the corresponding relationship between the r_{Ni} and p_{Ni} values. The r_M and r_N are the types of rates given in the first section of this paper; the former is about five times as large as the latter, and it is this disparity that the hypothesis seeks to account for. It is possible to construct a standardised rate by applying the rates for one race to the socio-economic population distribution of the other. Let $r_{M/N}$ be the overall Maori rate standardised for the non-Maori population. Then:

$$r_{M/N} = r_{M1}p_{N1} + r_{M2}p_{N2} + \ldots + r_{Mn}p_{Nn}$$

This is the value which would be obtained for the Maori rate if the Maori population had the same socio-economic structure as the non-Maori. In other words, the standardisation eliminates the effects, on the rate, of socio-economic differences between the Maori and non-Maori populations. (The procedure is based on the same rationale as that for any other standardised rate - for example, a standardised birth rate, or death rate - except that the more common standardisations are with respect to age structure of the population, while this one is with respect to socio-economic structure.) $r_{M/N}$ can now be compared with r_N. If the socio-economic hypothesis accounts for all of the disparity between Maori and non-Maori offending, the two rates will be the same. The extent to which they differ is the extent to which the disparity is not accounted for by the hypothesis. For example, if after standardisation the ratio of Maori to non-Maori rates was 4:1 (compared with a

ratio of 5:1 before standardisation) it would be concluded that only a negligible reduction in the disparity had been achieved, and that the hypothesis was almost worthless; on the other hand, a ratio of 2:1 (say) after standardisation would indicate that the hypothesis was substantially upheld, and had considerable utility in explaining the disparity. An alternative procedure is to standardise the non-Maori rate with respect to the Maori population, giving the value for the non-Maori rate which would be obtained if the non-Maori population had the same socio-economic distribution as the Maori population. The equation is the same as previously except that the M's and N's are reversed, giving:

$$r_{N/M} = r_{N1}p_{M1} + r_{N2}p_{M2} + \ldots + r_{Nn}p_{Mm}$$

$r_{N/M}$ is compared with r_M. The results obtained by the two procedures will be similar but not identical.

(iii) The ratio of the Maori to non-Maori rate

In the first section of this paper the Maori rate divided by the non-Maori rate is used as a measure of the disparity. The same criterion could be applied to the rates shown in the table in paragraph 5.4, with r_{Mi}/r_{Ni} being calculated for each group G_i. The ratios would give a measure of the extent to which there were differences due to race within the groups. An average of the ratios (perhaps a weighted average) could be used as a index of the overall disparity not accounted for by the socio-economic hypothesis. This procedure is not particularly rigorous, but it is straightforward and easy to understand, and would be

useful as a rough-and-ready evaluation of the hypothesis.

(iv) Regression method

The approach described in this section is to define a measure of how well offending can be predicted solely on the basis of socio-economic information about a person, and then to determine how much the additional accuracy is obtained by incorporating information about race. Let Prob(O) be defined as the probability that a member of the population will be an offender, given his s score. The probability is taken to be a linear function of s;

$$\text{Prob}(O) = a + ds$$

where a and d are constant values. That is, the probability value for a person is obtained by multiplying his s score by the constant, d, and adding the constant a. The equation is characterised by the constant values; these must be such that the equation has maximum efficiency in predicting offending. The standard method of obtaining constants is the least-squares regression. All the data which would be required would already have been obtained for the calculation of the r_{Mi} and r_{Ni} rates. The equation would be evaluated in terms of the extent to which it accounted for offending. The most straightforward method would probably be to correlate the Prob(O) values with actual offending. (The correlation would probably be greater than 0.1, but would not be large.) This whole procedure is then repeated with information about race being incorporated into the linear function. The function would thus become:

$$\text{Prob}(O) = a' + b'r + d's$$

where a', b' and d' are constants and r is race, scored 0 for non-Maori and 1 for Maori. The constants are determined by t the standard least-squares multilinear regression method (technically known as "beta-weighting"). As before, the efficiency of the equation is determined. The socio-economic hypothesis would be considered to be upheld if the incorporation of race into the equation failed to produce a substantial improvement in efficiency.

(v) Analysis of variance

An analysis of variance for the table of rates in paragraph 5.4 would give a quantitative estimate of the extent to which the total variation in the table could be accounted for by variation between rows and variation between columns; the hypothesis would predict that the former would be considerably greater than the latter.

6. Collection of data

6.1 The Census data will have to be made available if the project is to be carried out. As the punch cards do not contain names, no breach of confidentiality would be involved.

6.2 The whole Census could be used, or all of those within a certain age range, but this would include vastly more data than would be necessary, and would not be sensible. Optimum sample size is a matter for calculation, after consultation with experts in multivariate analysis and with computer experts.

6.3 Arrangements for the collection of data about offenders will have to be made through negotiation with the Departments involved (namely, the Child Welfare Division, and either the Police or the Justice Department). The data will have to be gathered in brief interviews, involving probably about ten questions. Such questions could be added to those asked in the course of ordinary duty by officers dealing with offenders. This will involve a certain amount of inconvenience to those who will have to gather the information. If both the Police and Justice Departments decided that such extra questioning of offenders would impose an undue burden on their officers, it would still be possible to perform the

study using only data about offenders who appear in the Children's Court, collected by Child Welfare Officers. This would perhaps limit the generality of the conclusions which could be drawn, but the study would still be well worth proceeding with.

6.4 No calculations have yet been made about the size of the offender sample. The size depends in part on the classification of socio-economic status which is adopted, and the distribution of the population. The greater the number of groups G_1, G_2. ... G_n (i.e. the greater n is)

the larger the sample which will probably be required to ensure reasonable confidence limits for the proportion of offenders in each group (i.e. to ensure reasonable limits for each of q_1, q_2, ... q_n).

7. The index of socio-economic status

7.1 An essential part of the procedure for testing the hypothesis is the assignation of the population, and of offenders, into n socio-economic groups (G_1, G_2, ... G_n),

and this in turn depends on having an adequate socio-economic index by which a score (s) can be calculated for each member of the samples. In section 5.2 it was stated that the index would take the form of a linear equation, namely:

$$s = c_0 + c_1x_1 + c_2x_2 + \ldots c_mx_m$$

where s is the score used as a measure of socio-economic status, the c's are constants and the x's are the Census variables. However, no indication was given previously of how the constants would be determined; obviously, it on this that the validity of the index hinges.

7.2 The ideal index for the purposes of this study would be one which provided maximum discrimination (probably on the least-square criterion) between offenders and non-offenders. To construct such an index, data would be required about a random sample of the population, all of whom could be categorised as offenders or non-offenders. Unfortunately this data is not available; for a sample of Census cards it cannot be determined which relate to offenders and which to non-offenders.

7.3 In the absence of the "ideal index" three alternatives are proposed, each with special advantages and some weaknesses.

(i) An index which discriminates between Maoris and Pakehas

The Census data includes race. It is proposed that basically

the index should relate to "Maori-ness", the constants (c's) being computed to give the maximum discrimination between Maoris and Pakehas. The hypothesis would predict that Pakehas who were socio-economically like the bulk of Maoris would have the same crime rate as Maoris, while those Maoris who were "socio-economic Pakehas" would have a similar crime rate to Pakehas. This procedure amounts to adopting an entirely socio-economic definition of "race" and then seeing whether there is any remaining variation in offending which can only be explained in terms of the conventional "blood" definition. The advantages of this approach are that it does not include any subjective judgments about the relative importance of the various Census variables, and it provides an instrument which might find wider use than just the present study (Cf. paragraph 8.3). However, it might be argued that it would be preferable to have a definition of socio-economic status which is conceptually independent of race.

(ii) An index which discriminates offenders from Census cases

In paragraph 7.2 it was stated that it would not be possible to construct an index based on the maximum discrimination between offenders and non-offenders in the general population. However, it is possible to get an approximation to this by simply regarding all Census cases as being non-offenders, and calculating the constants which would give maximum discrimination between these cases and those offenders about which data had been gathered. The main advantage of this method is that it would be an approximation to the "ideal index"; the drawback is that the best level of discrimination possible might be very low, so that the approximation might be a very poor one.

(iii) An ad hoc social class scale

This would be constructed simply by assigning weights which - on an intuitive basis - seemed to reflect the relative importance of the variables to an evaluation of social class. (In practice, one of the standard procedures for constructing rating scales could be employed. Essentially, these make use of the evaluations of a number of "judges". Items on which there is substantial disagreement between judges are eliminated; the weights for the remaining items are obtained by averaging the values assigned by the judges.) Alternatively, it would be possible to apply some widely accepted class scale to a special sample, and to derive a set of weights which would give a "best fit" to the scale. This would entail quite a lot of extra effort, however, and the index thus arrived at might still only be a very rough approximation to the conventional scale; the possible advantages probably would not justify the extra work involved. The advantages of the sort of ad hoc social class scales discussed here lies in fact that they are derived independently of information about either race or offending; also, they might correspond more closely than the other methods to the commonly held notion of "social status". The disadvantage is that they rely on subjective judgements.

7.4 If the calculation of socio-economic scores is done by computer - as would seem most practicable - there would be little extra effort required to perform the calculations three times, using each of the different types of index. This would give three slightly different tests of the hypothesis.

8. Comments

8.1 The foregoing is a fairly broad account of the research design. It does not discuss such details as a definition of "offender" the number of socio-economic groups according to which the population will be classified, and so on, because decisions on such matters are best made after further preliminary work has been done and some of the data has been collected.

8.2 There is a point about the sampling which is worth noting here, however. It might prove desirable to confine the study to one particular age group (e.g. 18 year olds); or to a series of age groups (e.g. 16, 18, 20, 22, 24 year olds); or to an age range (e.g. 16-25 years of age.) Such restriction of the sample could simplify the work and strengthen the study theoretically, although if the study were to be confined to a one year age group the result would lack generality, and would probably have to be repeated for other age groups at some later time if the socio-economic hypothesis were to be regarded as having been adequately tested. It might also be desirable to confine the study to male offenders because the incidence of female offending is relatively low.

8.3 The index proposed in paragraph 7.3, (i), involves determining which of the variables are most clearly associated with "Maoriness" and constructing a function which would discriminate most efficiently between Maoris and Pakehas in terms of the socio-economic variables used. This would be useful information in itself, and could provide a compact measure of the degree to which Maori socio-economic standards have approached those of Pakehas, and of the rate of approach in future. This is a measure which should prove useful to students of the New Zealand community. It would also be possible to investigate a socio-economic hypothesis concerning, say, the health of the Maori people in the same way as for crime. Here death rates or rates of incidence of notifiable diseases would replace crime rates in the final comparisons.

8.4 This study would be valuable piece of criminological research. One of its most attractive features is that it makes use of a huge body of data which has already been collected - the Census data. It would not be practicable to conduct a study of this type if the information which is required about the population at large had to be gathered

specifically for the study. By using the design described above it is possible to perform a valuable large-sample piece of research "on the cheap".

8.5 The major drawback to the study is the fact that the Census schedules contain only a limited amount of socio-economic information, certainly rather less than one would wish. Thus if the study failed to uphold the socio-economic hypothesis of crime amongst Maoris, the hypothesis would not be considered to be conclusively disproved, though it would be rendered much less plausible.

J. Jensen
Research Officer

Joint Committee on Young Offenders