Ethnic identity and criminal offending in a New Zealand birth cohort

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Abstract

There has been a great deal of debate and speculation regarding the high levels of involvement of Māori New Zealanders in the criminal justice system. The present investigation examined the role of Māori cultural identity in predicting criminal offending in a New Zealand birth cohort studied from birth to the age of 21. There were statistically significant ($p < .0001$) bivariate associations between both sole Māori identification and Māori/other cultural identification, and both: (a) official convictions for property/violent offending during ages 17-21; and (b) self-reported violent and property offending during ages 17-21. Control for a range of potentially confounding factors related to family socio-economic status, family functioning, and personal adjustment reduced the associations between sole Māori identity and criminal offending to statistical non-significance (both $p$ values > .40). However, the association between Māori/other cultural identity and criminal offending remained statistically significant (both $p$ values < .05) after control for confounding. The findings suggest that while sole Māori cultural identification is not associated with increased rates of criminal offending, persons of Māori/other cultural identification are at increased risk of violent and property offending.
There have been ongoing concerns regarding the over-representation of Māori in the New Zealand justice system. Māori are more likely to come to the attention of police authorities, more likely to be arrested and convicted, and more likely to be incarcerated when compared to other groups classified by ethnicity (Department of Corrections, 2001; Doone, 2000; Ministry of Justice & Ministry of Social Development, 2002). Furthermore, Māori are more likely to reoffend, leading to higher recidivism rates for this ethnic group (Nadesu, 2007). This pattern of ongoing engagement by Māori with police authorities and the corrections service can be observed in the available literature reporting on New Zealand incidence and prevalence rates of offending since the 1970’s (Fifield & Donnell, 1980; Newbold, 2007).

In view of this over-representation, a range of explanations have been forwarded in an attempt to understand the nature of the greater involvement of Māori in the criminal justice system. Most of these views have been informed by the school of strong constructionism or its local Māori-specific variant known as kaupapa Māori research (Jackson, 1987, 1988; Maynard, Coebergh, Anstiss, Bakker & Huriwai, 1999; McFarlane-Nathan, 1999; Smith, 1999). Briefly characterised, this view proposes that historical and structural factors have severely disrupted Māori social organisation. Over time, and as a consequence of this disruption, Māori collective well-being has been diminished, which has led to the over-representation of Māori amongst those who offend and re-offend. Variations on this theme populate the literature. These generally make reference to colonisation, historical oppression, marginalisation, institutional racism, or urbanisation as factors of explanatory worth in understanding offending by Māori individuals (Department of Social Welfare, 1988; Jackson, 1988; McFarlane-Nathan, 1999; Pratt, 1990; Smith, 1999; Walker, 2004). However, the significant focus in this literature is to be found in the emphasis placed on Māori cultural identity (Durie, 1998; Kawharu, 2001; Maxwell & Morris, 1999; Maynard et al. 1999; McFarlane-Nathan, 1999; Singh & White, 2000).
The relationship between offending by Māori and cultural identity has now become inextricably linked (Coebergh, Bakker, Anstiss, Maynard & Percy, 2001; Maxwell & Morris, 1999; Maxwell, Robertson, Kingi, Morris & Cunningham, 2004; Maynard et al., 1999; Te Puni Kokiri, 2000). In the wake of concerns that inter-ethnic comparisons between Māori and non-Māori offenders failed to capture what is popularly described as the ‘diverse realities’ of Māori, attention was directed toward developing Māori cultural identity scales (see Durie, 1995a, 1998). While the principal objective of these scales was to distinguish so-called Māori experience from that of non-Māori, an underlying assumption common to the numerous identity profiles created, was that as a consequence of diminished Māori collective well-being, Māori identity had been similarly affected (Durie, 1995b; Ratima, Potaka, Durie & Ratima, 1993). Accordingly, Māori cultural identity was conceptualised along a continuum with various weightings given to individuals on the basis of their degree of ethnic self-identification, level of participation in Māori domains, and knowledge of Māori language, beliefs, and values.

Applied to the problem of Māori being over-represented in the justice system, the idea that an afflicted cultural identity is a causal or contributing factor of offending by Māori took root. Nowhere is this more apparent than in the prevention strategies formally adopted by the Department of Corrections in New Zealand that aim to reduce offending by Māori (Coebergh et al. 2001; Department of Corrections, 2001, 2003; Maynard et al. 1999). The notion that cultural identity is directly related to offending by Māori is a key premise underpinning the Department of Correction’s policies, programmes, and research designed to target Māori. As the department’s intervention logic makes explicit, offending by Māori stems from problems with their cultural identity, which once resolved, will reduce the probability of a Māori individual re-offending (Department of Corrections, 2003; Maynard et al, 1999; McFarlane-Nathan, 1999; Nathan, Wilson & Hillman, 2003). The rationale provided for this viewpoint, is that cultural identity as ascertained by the
degree of ethnic identification, level of participation in cultural activities, and extent of contact an individual has with family members is correlated to criminal attitudes and degree of pro-social behaviour exhibited by Māori. The degree of cultural identity possessed by a Māori individual is therefore theorised as a proxy measure of their likelihood to offend or reoffend (Coebergh, 2001; Maynard et al, 1999). Using the terms often employed to describe this perspective (Durie, 1995a; 1995b): a secure Māori identity is believed to act as a protective factor for an offence free lifestyle while a compromised Māori identity indicates a heightened risk that an individual will offend or re-offend (Te Puni Kokiri, 2000). On these grounds, the Department of Corrections provides culturally based rehabilitation to Māori. Important to note is that different cultural identity scales utilise a range of terms to denote variability in the degree of identification individuals report relative to Māori culture.

In addition to this theorising about the relationship between Māori cultural identity and offending, there have been ongoing debates about the extent to which the over-representation of Māori in the corrections system is due to socio-economic factors. In support of these arguments there has been generally consistent evidence to suggest that control for social, economic and related factors reduces, but does not eliminate, ethnic differences in offending rates (Fergusson, Horwood & Swain-Campbell, 2003). For these reasons it is important that analyses of the linkages between ethnic identification and crime take into account the association between ethnic identification and social disadvantage (Fergusson, 1998). A further point is that these issues are undoubtedly complicated by debates over the measurement of offending. In particular it has been suggested that officially recorded offending statistics are biased as a result of processes that lead to higher rates of arrest and conviction amongst Māori quite independently of their actual rates of offending (Jackson, 1988; Maxwell et al. 2004). These claims have been supported by studies suggesting detectable bias in the arrest and conviction rates for Māori (Fergusson,
Horwood & Lynskey, 1993; Fergusson, Swain-Campbell & Horwood, 2003). For these reasons it is important that ethnic differences in offending are assessed on the basis of both officially recorded offending and self-reported offending.

Against this background, the linkages between crime rates and ethnic status are likely to involve complex relationships between ethnic identification, social disadvantage, and offending behaviours. It is unlikely that these complexities are adequately represented by the dichotomous comparison of offending by those who claim Māori ethnic status and those who do not. Moreover, given the emphasis placed on the notion of the diverse realities of Māori and the role of Māori cultural identity to serve as either a protective or risk factor for offending, a more fine-grained analysis examining these relationships is required.

In this paper we address these issues by reporting on a study of the linkages between ethnic identification and rates of both self reported and officially reported crime in a New Zealand birth cohort studied to the age of 21. Underlying this analysis was a concern to learn the extent to which variations in ethnic identification acted as risk or protective factors in the development of criminal offending.

The aims of this study were:

1) To document the linkages between ethnic identification (measured as non Māori, sole Māori, and Māori/other ethnic identity) and rates of officially recorded and self-reported property and violence offences.

2) To examine the linkages between ethnic identification and social, family and childhood factors.

3) To estimate the linkages between ethnic identification and risks of crime taking in to account social, family and childhood factors.
Method

The data were gathered during the course of the Christchurch Health and Development Study (CHDS). In this study a birth cohort of 1265 children (635 males, 630 females) born in the Christchurch (New Zealand) urban region in mid-1977 has been studied at birth, 4 months, 1 year and annually to age 16 years, and again at ages 18, 21 and 25 years. Information from a variety of sources has been used including: parental interviews; teacher reports; self-reports; psychometric assessments; medical and other record data. (Fergusson & Horwood, 2001; Fergusson, Horwood, Shannon, & Lawton, 1989). The analyses were based on 984 study participants for whom information was available for ethnic identity and criminal convictions to age 21 years (77.8% of the original sample). All study information was collected on the basis of signed and informed consent from study participants.

Ethnic Identity

At age 21 respondents were asked about their ancestry, ethnic identification, level of participation in Māori cultural domains, and proficiency in the Māori language (Broughton, Fergusson, Rimene, Horwood, & Sporle, 2000). These are widely used as standard indicators to determine degrees of Māori ethnic identification and Māori cultural identity. On the basis of this questioning, 11.1% of sample members self-identified as New Zealand Māori. A further break-down of this group showed 45.9% reporting sole Māori identity and 54.1% reporting Māori ethnic identity and identity with another ethnic group. For the purposes of the present analysis, those reporting sole Māori identity were classified as having a sole Māori identity, while those reporting both Māori identity and another ethnic identity were classified as having Māori/other ethnic identity. All other participants were classified as being non-Māori. The descriptors of ‘sole Māori’, ‘Māori/other ethnic identity’, and ‘non-Māori’ were originally recommended by Pomare, Keefe-Ormsby,
Ormsby, Pearce, Reid, Robson & Watene-Haydon (1995) in their analyses examining ethnic trends in public health epidemiology.

Comparisons of the sole Māori and Māori/other group showed consistent differences between the groups in terms of several aspects of Māori culture, including: frequency of marae visits \( (p < .001) \); being a member of a Māori group, organisation or sports team \( (p < .05) \); being a member of a kapa haka (cultural performance) group \( (p < .001) \); attending tangi (funeral) or unveiling \( (p < .001) \); listening to Māori language radio programmes and watching Māori language television programmes \( (p < .001) \); and listening and watching programmes in the English language about Māori \( (p < .001) \).

**Officially Recorded Property/violence Convictions, Ages 17-21**

Data on convictions over the period 17-21 years were obtained from records held by the New Zealand Police. These records were obtained following signed and informed consent from the young person. Of the 1,011 cohort members asked for permission to search their police records, 97.3% agreed to provide permission and 2.7% declined. For each participant, a record of the date of arrest, type of offence, date of court appearance, number of convictions and sentence was gathered. For the purposes of the present analysis, data on convictions were classified to provide a measure of convictions for property or violent offences. Property offences included theft, burglary, breaking and entering, wilful damage, fire setting, and related offences. Violent offences included assault, fighting, robbery, use of a weapon, threats of violence against a person, and similar offences.

**Self-reported Property/violent Offending**

At ages 18 and 21, respondents were questioned about their criminal behaviours since the previous assessment using an instrument based on the Self-Report Delinquency Inventory (SRDI: Elliott & Huizinga, 1989) supplemented by additional custom-written survey items.
This information was used to derive count measures of the number of self-reported property and/or violent offences committed in each year from age 17 to age 21. Property offences were defined to include theft, burglary, breaking and entering, vandalism, fire setting, and related offences; violent offences included assault, fighting, use of a weapon, or threats of violence against a person. In order to avoid issues pertaining to the influence of outliers, each of the measures was truncated to a maximum of 50 property or violent offences at ages 18 and 21.

Covariate Factors

A range of covariate factors were chosen for the analyses, based on: (a) their correlation with ethnic identity; and (b) previous research on the present cohort suggesting that the factors were related to property/violent offending. The following covariate factors were chosen for inclusion in the analyses:

Socio-demographic Background

Maternal age. Maternal age was assessed at the time of the survey child’s birth.

Paternal education. Paternal education was assessed at the time of the survey child’s birth using a three point scale which reflected the highest level of educational achievement attained. This scale was: 1 = father lacked formal educational qualifications (had not graduated from high school); 2 = father had secondary level educational qualifications (had graduated from high school); 3 = father had tertiary level qualifications (had obtained a university degree or equivalent qualification).

Family living standards (0-10 years). At each year a global assessment of the material living standards of the family was obtained by means of an interviewer rating. Ratings were made on a five point scale that ranged from “very good” to “very poor”. These ratings were summed over the 10 year period and divided by 10 to give a measure of typical family living standards during this period.
**Family socioeconomic status (at birth and at age 14).** This was assessed at the time of the survey child’s birth, and again at age 14 using the Elley-Irving (1976) scale of socioeconomic status for New Zealand. This scale classifies SES into 6 levels on the basis of paternal occupation ranging from 1 = professional occupations to 6 = unskilled occupations.

**Family Functioning**

**Family adversity measure.** A measure of family problems was calculated using a count measure of 38 different measures of family disadvantage during the period 0-15 years, including measures of disadvantaged parental background, poor pre-natal health practices and perinatal outcomes, and disadvantageous child-rearing practices (Fergusson, Horwood, & Lynskey, 1994).

**Parental alcoholism/alcohol problems, criminal offending, and illicit drug use.** When sample members were aged 11, their parents were questioned about parental use of illicit drugs. At the 15 year assessment parents were further questioned concerning their history of alcoholism or alcohol problems and criminal offending. On the basis of this questioning 11.9% of the sample were classified as having a parental history of alcoholism/alcohol problems, 12.4% of the sample as having a parental history of criminal offending, and 24.9% as having a parental history of illicit drug use.

**Parental use of physical punishment (childhood physical abuse).** At ages 18 and 21 sample members were asked to describe the extent to which their parents used physical punishment during childhood (Fergusson & Lynskey, 1997). Separate questioning was conducted for mothers and fathers. This information was used to create a 4-level scale reflecting the most severe form of physical punishment reported for either parent: parents never used physical punishment; parents rarely used physical punishment; at least one parent used physical punishment on a regular basis; at least one parent used physical
punishment too often or too severely, or treated the respondent in a harsh or abusive manner.

*Individual Characteristics*

*Gender.* Recorded at birth.

*Mean grade point average, ages 11-13.* At each assessment from 11-13 years, teacher ratings were obtained of the child’s school performance in each of five curriculum areas (reading, handwriting, written expression, spelling, and mathematics). Ratings were made using a 5-point scale ranging from very good to very poor. The teacher ratings were summed across years and curriculum areas and then averaged to provide a teacher rating grade point average for each child (α=.96).

*Leaving school without qualifications.* At age 18, sample members were questioned regarding their educational history. In particular, information was obtained on the number of School Certificate subjects attempted and grades received. The New Zealand School Certificate examinations consist of a series of national exams taken by the majority of students in their third year of high school (Year 11). Typically students take between four and six examination subjects, for which they receive a grade ranging from A to E. For the purposes of the present analysis, sample members were classified as leaving school without qualifications if they had left school by age 18 without achieving at least one A, B or C grade in School Certificate examinations.

*Statistical Analysis*

The bivariate associations between the three-group measure of ethnic identity and property/violence convictions and self-reported offending were modelled by fitting a series of negative binomial regression models to the observed data (White & Bennetts, 1996). These models were of the form:

\[
\log (Y_i) = B_0 + B_1 X_{1i} + B_2 X_{2i} \\
(\text{EQ1})
\]
where \( \log(Y_i) \) was the log of the outcome \( Y \) for the \( i \)th participant and \( X_1, X_2 \) were design variates.

In each case the parameters of the fitted model were used to derive tests of significance of the overall association of ethnic identity with each outcome, and pairwise comparisons between groups. Specifically, a test of the joint hypothesis that \( B_1 = B_2 = 0 \) led to a chi squared test of the overall association between ethnic identity and the outcome. Similarly, the test of significance on the parameter \( B_1 \) provided a test of the pairwise difference between the sole Māori group and the non-Māori group, the test on the parameter \( B_2 \) provided a test of the pairwise comparison between the Māori/other ethnic identity group and the non-Māori group, and the difference between the parameters \( B_1-B_2 \) provided a test of the pairwise comparison between the sole Māori and Māori/other ethnic identity group. A similar procedure was used to examine the associations between covariates and the measure of ethnic identity. In addition, the parameters of the fitted models were used to calculate the incidence rate ratio (IRR) for each outcome for the sole Māori and Māori/other ethnic identity groups, relative to the non-Māori group.

To adjust the observed associations between ethnic identity and outcomes for confounding, the regression models above were extended to include the covariate factors. In fitting these models both forwards and backwards methods of covariate selection were used to identify the best fitting and most parsimonious model representation for each outcome. These models were of the form:

\[
\log(Y_i) = B_0 + B_1 X_{1i} + B_2 X_{2i} + \sum B_j Z_{ji} \quad \text{(EQ2)}
\]

where \( Z_j \) were the set of covariate factors.

From the parameters of final fitted model for each outcome tests of the adjusted association between ethnic identity and the outcome and tests of pairwise between group differences were constructed for each outcome as described above. Estimates of the adjusted means or percentages for each outcome were obtained using the methods
described by Lee (1981). Finally, the parameters of the final fitted models were used to calculate the IRR for each outcome.

Sample Attrition and Sample Bias
As noted previously the sample size available for analysis represented 77.8% of the initial sample of 1265 individuals who entered the study at birth. To test for selection bias arising from the processes of sample attrition, the sample included in the analysis was compared with remaining cohort members on a series of measures collected at the time of birth. These comparisons suggested evidence of small but statistically significant ($p < .05$) tendencies for sample members from socio-economically disadvantaged backgrounds (low parental education, low SES family, single parent family) to be under-represented in the analysis sample. To examine the extent to which the study findings may have been influenced by these small biases the analyses were repeated using the data weighting methods described by Carlin et al (Carlin, Wolfe, Coffey, & Patton, 1999). These analyses produced almost identical conclusions to the results reported here, suggesting that the findings were unlikely to have been influenced by selection bias.

Results

Association Between Ethnic Identification and Property/violent Crime
Table 1 shows the sample subdivided by ethnic identity at age 21 into groups of non-Māori ($N = 875$), sole Māori identity, ($N= 50$) and Māori/other ethnic identity ($N = 59$). For each group, the Table compares rates of property and violent crime using the incidence rate ratio (IRR). Crime is measured using both officially recorded offending and self-reported offending. The Table also reports mean numbers of offences and standard deviations. The Table shows:
1. For officially recorded offences there were clear differences in rates of offending depending on ethnic identity. Compared to non-Māori, those with sole Māori identification have rates of property and violent offending that were 1.82 (95% CI: 1.13-2.91) times higher. In contrast, those of Māori/other identity have rates of officially recorded offending that were 9.08 (95% CI: 7.17-11.48) times higher than non-Māori.

2. Similar, but less marked trends are evident for self reported offending. Compared to non-Māori, those with sole Māori identity had rates of offending that were 3.71 (95% CI: 1.43-9.62) times higher, whereas those of Māori/other ethnic identity had rates that were 6.85 (95% CI: 2.84-16.53) times higher.

\[\text{INSERT TABLE 1 HERE}\]

*Social, Family and Related Factors Associated With Ethnic Identification*

One explanation of the associations between ethnic identity and offending shown in Table 1 is that these associations could reflect social, economic and individual differences related to ethnic identification. This issue is examined in Table 2, which shows the associations between ethnic identification at age 21 and a series of socio-economic, family and individual factors. This Table reveals two general trends.

First there was a consistent tendency for those of non-Māori background to have an advantaged childhood in the areas of family socio-economic background, family functioning and educational achievement. In contrast, the backgrounds of those of sole Māori and Māori/other ethnic identity appear to be similar on nearly all measures. However, if anything those of sole Māori background appear to be slightly more disadvantaged than those of Māori/other identity background.

\[\text{INSERT TABLE 2 HERE}\]
Associations Between Ethnic Identification and Crime, Adjusted for Social, Family and Childhood Factors

As explained in the Methods section, the associations between ethnic identification and crime described in Table 1 were adjusted for the social, family and related factors in Table 2 using Poisson and negative binomial regression modelling techniques. The results of this analysis are summarised in Table 3 which shows the associations between ethnic identification and offending adjusted for the factors in Table 1. The adjusted results lead to the following conclusions:

1. After adjustment for socio-economic and related factors, rates of offending by sole Māori were not significantly different from those of non-Māori (convictions: IRR = 0.89; 95%CI: 0.19-4.26; self-reported offending: IRR = 1.46; 95%CI = 0.55-3.91).

The implication of these results is that the elevated rates of crime for sole Māori shown in Table 1 appear to be related to the higher rates of socio-economic, family and childhood adversity to which this group was exposed.

2. In contrast, adjustment for social, family and childhood factors did not explain the elevated rates of offending found the Māori/other ethnic identity group (convictions: IRR = 5.33; 95%CI: 1.39-20.40; self-reported offending: IRR = 3.95; 95%CI = 1.53-10.15). The implication of this finding is that, independently of a number of confounding factors, being of Māori/other ethnic identity was a risk factor for property and violent crime.

INSERT TABLE 3 HERE

Discussion

In this analysis, we have used data gathered over the course of a 21-year longitudinal study to examine the linkages between ethnic identification and crime, using both officially
recorded and self-report measures of offending. The principal concern of this analysis was to examine the extent to which variations in ethnic identification were related to the development of criminal offending. The major findings and their implications are discussed below.

First the unadjusted findings showed a clear and consistent pattern in which risks of offending were ordered such that: non-Māori had the lowest risks, sole Māori had an intermediate level of risk, and the Māori/other ethnic identity group had the highest risk. These results held for both self-reported and officially recorded offending by respondents.

One explanation for the divergence in outcome between the sole Māori and Māori/other identity groups was that these reflect differences in socio-economic and childhood factors as a result of the sole Māori individuals having more advantaged childhoods. However, comparisons of the social, family and childhood backgrounds of the sole Māori and Māori/other identity groups showed that both groups had similar backgrounds with the sole Māori group having been slightly more exposed to greater disadvantage.

Statistical correction for the effects of childhood background on the linkages between ethnic identity and crime suggested that a substantial amount (but not all) of these linkages was explained by the higher exposure of those classified as Māori to childhood, family and social adversity. These adversities included poorer family economic circumstances, higher levels of family adversity, and lower levels of educational achievement. These findings are consistent with previous New Zealand literature which has suggested that a substantial component of the connection between ethnicity and crime in New Zealand is mediated by social, economic and related factors (Fergusson, Horwood & Lynskey, 1993; Fergusson, Horwood, & Swain-Campbell, 2003; Fergusson, Swain-Campbell, & Horwood, 2003). However, there was also evidence to suggest that the association was also mediated via cultural identity. In particular, after adjustment for
childhood factors, those of sole Māori ethnicity had rates of criminal offending that were similar to those of non-Māori. In contrast, even after controlling for childhood factors, those of Māori/other identity remained at a higher risk of offending. These findings were most evident for officially-recorded convictions, while similar but less marked findings were evident for self-reported offending. The findings would appear to provide empirical support for the view that variations in cultural identity are related to criminal offending outcomes, such that sole Māori identity mitigates the effects of exposure to childhood adversity while having a Māori/other identity does not.

However, alternative explanations of the evidence should also be considered. First, the analyses presented here explicitly assume a uni-causal relationship in which variations in Māori identity have the potential to alter offending risks. However, it is possible that there is a more complex interplay between offending risk and cultural identity, such that increased risk of offending encourages a compromised cultural identity, and a compromised cultural identity encourages increased risks of crime. Alternatively, it could be argued that cultural identity may be related to unmeasured variables that have effects of the risks of criminal offending. For example, research suggests that strength of cultural identity is linked to differences in values (Carter, Yeh, & Mazzula, 2008; Gaines et al., 1997; Yeh, Carter, & Pieterse, 2004). Also, strength of cultural identity has been linked to a number of outcomes, including conflict management (Ting-Toomey et al., 2000). It could therefore be argued that the associations between cultural identity and offending risks may be due to the influence of additional, unmeasured variables correlated with both cultural identity and offending.

A second and more complex issue is the finding of this study that shows that having a non-Māori cultural identity was associated with risks of crime similar to having a sole Māori cultural identity. These findings suggest that it may not be so much the notion
of cultural identification which is important, as the security of cultural identity (Phinney, Lochner, & Murphy, 1990).

Finally, while the present study suggests that holding a mixed cultural identity is associated with increased risks of crime, the processes which underlie this relationship are by no means clear. Key issues to be resolved include: (a) the interplay between involvement in crime and ethnic identification; (b) the role of secure identity in reducing crime; and (c) the factors that lead to heightened vulnerability to crime amongst those with a compromised Māori identity.

**Limitations**

There are a number of limitations that apply to these results. First, the findings are based on a particular birth cohort born in a specific place and at a particular time. The extent to which these findings generalise to other cohorts of New Zealanders is therefore open to debate and awaits further research. In addition, although a wide range of childhood factors were controlled for, it is possible that this analysis failed to control for other variables that may influence disadvantage. Other potential confounding variables could therefore be identified and controlled for in order to strengthen future analyses. Furthermore, measures of offending are likely to be subject to errors of measurement. Officially recorded offences are known to reflect the social processes that lead to the identification of offending (France & Homel, 2006), whereas self report measures are subject to errors from under-reporting (Fergusson, Horwood & Swain-Campbell, 2003). However, the fact that different methods are subject to different biases, leads to the same general conclusions, suggesting that it is unlikely that the study findings are a consequence of errors of measurement in the classification of offending behaviours. In addition, it should be noted that the present study was conducted using a relatively small sample of Māori participants, as the percentage of Māori living on the South Island of New Zealand...
tends to be somewhat smaller than that on the North Island (Statistics New Zealand, 2007). It is unclear, however, whether the relatively small number of Māori participants would have affected the results of the study. Finally, we directly acknowledge the problems associated with using ethnicity and/or identity as a methodological variable in empirical research. Extensive commentary has been made in the literature about this issue (Chapple, 2000; Helms, Jernigan & Mascher, 2005; Kertzer & Arel, 2002; Marie, Forsyth & Miles, 2004). In the context of elucidating on the problem of Māori being over-represented in the criminal justice system however, our employment of ethnicity for these analyses is necessary.

Acknowledgements

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References


Table 1. Associations between ethnic identity and: (a) officially recorded property/violence convictions (ages 17-21); and (b) self-reported property/violent offending (ages 17-21).

<table>
<thead>
<tr>
<th>Measure</th>
<th>Ethic identity</th>
<th>Non-Māori identity $(n = 875)$</th>
<th>Sole Māori identity $(n = 50)$</th>
<th>Māori/other ethnic identity $(n = 59)$</th>
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<td>Officially recorded property/violence convictions (ages 17-21)</td>
<td>IRR (95%CI)</td>
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<td>$1.82^b$</td>
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<td>(1.47)</td>
<td>(1.41)</td>
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<td>(60.0)</td>
<td>(179.0)</td>
<td></td>
</tr>
</tbody>
</table>

N.B. Statistics with a differing superscript letter are significantly different (Wald $\chi^2$, $p$<.05).

$^1$Negative binomial regression
Table 2. Associations between ethnic identity and family socioeconomic background,
family functioning, and personal covariate factors.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Ethic identity</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-Māori</td>
<td>Sole Māori identity</td>
<td>Māori/other ethnic identity</td>
<td>p</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(n = 875)</td>
<td>(n = 50)</td>
<td>(n = 59)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sociodemographic background</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD) maternal age</td>
<td>26.3 a</td>
<td>23.1 b</td>
<td>23.5 b</td>
<td>&lt;.0001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4.76)</td>
<td>(4.18)</td>
<td>(4.27)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% father lacked formal educational qualifications</td>
<td>44.3 a</td>
<td>67.4 b</td>
<td>60.0 a,b</td>
<td>&lt;.0001</td>
<td></td>
</tr>
<tr>
<td>Mean (SD) family living standards ages 0-10 ²</td>
<td>2.8 a</td>
<td>3.2 b</td>
<td>3.0 c</td>
<td>&lt;.0001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.45)</td>
<td>(0.41)</td>
<td>(0.44)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD) SES category at birth ²</td>
<td>3.4 a</td>
<td>4.5 b</td>
<td>4.1 b</td>
<td>&lt;.0001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.4)</td>
<td>(1.3)</td>
<td>(1.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Family functioning</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD) family adversity score</td>
<td>6.6 a</td>
<td>11.9 b</td>
<td>11.1 b</td>
<td>&lt;.0001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4.9)</td>
<td>(6.1)</td>
<td>(6.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Parental history of criminal offending</td>
<td>11.3 a</td>
<td>29.8 b</td>
<td>29.6 b</td>
<td>&lt;.0001</td>
<td></td>
</tr>
<tr>
<td>% Parental history of alcoholism</td>
<td>10.7 a</td>
<td>21.3 b</td>
<td>27.8 b</td>
<td>&lt;.0001</td>
<td></td>
</tr>
<tr>
<td>% Parental history of illicit drug use</td>
<td>22.2 a</td>
<td>34.8 a,b</td>
<td>42.9 b</td>
<td>&lt;.0001</td>
<td></td>
</tr>
<tr>
<td>% exposed to harsh/abusive physical punishment</td>
<td>15.2 a</td>
<td>44.0 b</td>
<td>23.7 c</td>
<td>&lt;.0001</td>
<td></td>
</tr>
<tr>
<td><strong>Individual characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% male gender</td>
<td>50.9 a,b</td>
<td>42.0 a</td>
<td>59.3 b</td>
<td>&lt; .05</td>
<td></td>
</tr>
<tr>
<td>Mean GPA ages 11-13 ²</td>
<td>2.48 a</td>
<td>2.71 a,b</td>
<td>2.79 b</td>
<td>&lt;.0001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.83)</td>
<td>(0.95)</td>
<td>(0.96)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% leaving school without qualifications</td>
<td>16.5 a</td>
<td>30.4 b</td>
<td>27.5 b</td>
<td>&lt;.0001</td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

N.B.  Statistics with a differing superscript letter are significantly different (Wald $\chi^2$, $p<.05$)

1 Logistic regression for percentage measures; multiple regression for continuous measures

2 Lower means correspond to more positive outcomes
Table 3. Associations between ethnic identity and: (a) officially recorded property/violence convictions (ages 17-21); and (b) self-reported property/violent offending (ages 17-21), after adjustment for covariate factors

<table>
<thead>
<tr>
<th>Measure</th>
<th>Ethic identity</th>
<th>Non-Māori identity</th>
<th>Sole Māori identity</th>
<th>Māori/other ethnic identity</th>
<th>Significant Covariates¹</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(n = 875)</td>
<td>(n = 50)</td>
<td>(n = 59)</td>
<td></td>
</tr>
<tr>
<td>Officially recorded property/violence convictions (ages 17-21)</td>
<td>IRR (95%CI)</td>
<td>1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.89&lt;sup&gt;a&lt;/sup&gt;</td>
<td>5.33&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1-5</td>
</tr>
<tr>
<td></td>
<td>Adjusted Mean</td>
<td>0.31</td>
<td>0.28</td>
<td>1.64</td>
<td></td>
</tr>
<tr>
<td>Self-reported property/violent offending (ages 17-21)</td>
<td>IRR (95% CI)</td>
<td>1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.46&lt;sup&gt;a,b&lt;/sup&gt;</td>
<td>3.95&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1, 4, 5</td>
</tr>
<tr>
<td></td>
<td>Adjusted Mean</td>
<td>7.56</td>
<td>11.08</td>
<td>29.86</td>
<td></td>
</tr>
</tbody>
</table>

N.B. Statistics with a differing superscript letter are significantly different (Wald $\chi^2$, $p<.05$).

¹Covariates: 1 = family adversity score; 2 = parental history of illicit drug use; 3 = parental history of criminal offending; 4 = childhood physical punishment; 5 = gender.