Comment on "Gaps and Glissandos..."

Adrian E. Raftery


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COMMENTS

COMMENT ON "GAPS AND GLISSANDOS . . ."*

(Comment on Tyree et al., ASR, June 1979)

ADRIAN E. RAFTERY
Trinity College, Dublin

Tyree, Semyonov and Hodge (1979), hereafter TSH, examined the relationships between social mobility, economic development and the "shape of the social stratification system." They concluded that social mobility has a close association with the latter, of which its association with economic development is a spurious consequence. This comment points out that their social mobility data was incorrectly transcribed from the source articles for four of the 24 countries with major errors in each case, and that the regression analysis on which their assertion is based is unsound. A reanalysis leads to different conclusions. The relationships between mobility and TSH's explanatory variables differ markedly between the developed and the underdeveloped countries. Mobility seems to vary with GNP in the same way as income inequality: first decreasing then increasing with GNP.

DATA

TSH used a mobility measure which they said was based only on urban sons of urban fathers. Their sample size N = 8950 for the Canadian data from McRoberts et al. (1976: Table 1) wrongly includes class VI (farmers); the correct value is N = 5201. For the Philippines data from Bacol (1971: Table 1), they give N = 8892, but excluding fishermen and loggers gives only N = 5492 on the basis of Bacol's "weighted sample size," and reduces the log odds ratio from 2.25 to 1.94. For Puerto Rico, using Miller (1960) they report N = 1785 which includes agricultural day labourers; excluding them leaves N = 795. For Hungary, based on Andorka (1971: Table 1) they take "office attendants" to be white collar, which contradicts Table 7 of the source as well as being implausible, and reduces the log odds ratio from 1.87 to 1.57.

Table 1 gives revised log odds ratios for the 24 countries. TSH gave a linear function of the log odds ratio, but here we give the log odds itself as it is easier to reproduce. We also give the per cent foreign born (p.c.f.b) for each country which TSH used but did not tabulate, expanding their coverage using the 1977 UN Demographic Yearbook.

REGRESSION ANALYSIS

TSH's conclusion is based on two regressions, one of which relates mobility to GNP and a measure of income inequality, while the other relates mobility to GNP and the proportional size of the middle class (midocc). In standard form the revised equations are

\[
(1) \text{mobility} = \frac{-0.279 \text{ GNP} + 0.579 \text{ inequality}}{R^2 = 0.59} \\
(2) \text{mobility} = \frac{-0.045 \text{ GNP} + 0.680 \text{ midocc}}{R^2 = 0.51}
\]

with standard errors shown below the coefficients. As in TSH, "mobility" is inversely related to the chance of moving. Replacing GNP by log GNP makes little difference. (1) and (2) resemble TSH's equations but the values of $R^2$ are lower.

Table 1. Social Mobility Log Odds Ratios and Per Cent of the Population Foreign Born (p.c.f.b.): 24 Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Mobility</th>
<th>p.c.f.b.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>1.28</td>
<td>18.4</td>
</tr>
<tr>
<td>Belgium</td>
<td>1.97</td>
<td>7.6</td>
</tr>
<tr>
<td>Brazil</td>
<td>2.37</td>
<td>2.3</td>
</tr>
<tr>
<td>Canada</td>
<td>1.06</td>
<td>15.6</td>
</tr>
<tr>
<td>Chile</td>
<td>2.03</td>
<td>1.4</td>
</tr>
<tr>
<td>Colombia</td>
<td>3.25</td>
<td>0.3</td>
</tr>
<tr>
<td>Denmark</td>
<td>1.69</td>
<td>2.1</td>
</tr>
<tr>
<td>France</td>
<td>1.62</td>
<td>8.2</td>
</tr>
<tr>
<td>Great Britain</td>
<td>1.43</td>
<td>5.2</td>
</tr>
<tr>
<td>Hungary</td>
<td>1.87</td>
<td>6.8</td>
</tr>
<tr>
<td>Israel</td>
<td>0.70</td>
<td>44.9</td>
</tr>
<tr>
<td>Italy</td>
<td>2.16</td>
<td>—</td>
</tr>
<tr>
<td>Japan</td>
<td>2.03</td>
<td>0.6</td>
</tr>
<tr>
<td>Mexico</td>
<td>2.04</td>
<td>0.6</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1.68</td>
<td>3.9</td>
</tr>
<tr>
<td>Norway</td>
<td>1.87</td>
<td>1.7</td>
</tr>
<tr>
<td>Philippines</td>
<td>1.94</td>
<td>0.2</td>
</tr>
<tr>
<td>Poland</td>
<td>2.10</td>
<td>6.4</td>
</tr>
<tr>
<td>Puerto Rico</td>
<td>1.59</td>
<td>2.7</td>
</tr>
<tr>
<td>Spain</td>
<td>2.08</td>
<td>1.1</td>
</tr>
<tr>
<td>Sweden</td>
<td>1.66</td>
<td>4.0</td>
</tr>
<tr>
<td>United States</td>
<td>1.39</td>
<td>5.4</td>
</tr>
<tr>
<td>West Germany</td>
<td>2.11</td>
<td>—</td>
</tr>
<tr>
<td>Yugoslavia</td>
<td>1.76</td>
<td>0.8</td>
</tr>
</tbody>
</table>

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* Direct all correspondence to: Adrian E. Raftery, Department of Statistics, Trinity College, Dublin 2, Ireland.

I am grateful to Eamonn Mullins for helpful comments.

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Equations (1) and (2) are badly flawed in two ways. First, the residuals for two countries, Israel and Colombia, are very large and may be outliers. Leaving them out changes (1) to

\[
\text{mobility} = -0.532 \text{ GNP} + 0.346 \text{ inequality} \\
\text{R}^2 = 0.59
\]

Now GNP is highly significant while inequality is hardly significant. This is the opposite of what TSH claimed to have established and shows that inferences based on (1) are unstable.

The second problem is that leaving out important variables, e.g., in (1) midocc and pcfb, can seriously bias the estimates of the coefficients and the residual variance, as pointed out by Johnston (1972:169). Indeed the residuals from (1) are significantly correlated with pcfb (r = -0.57), and so inferences from (1) are invalid. The same is true of (2).

To assess the effect of the four variables we must start by including them all in the regression, which increases R^2 to .78. The coefficient of GNP is still small and insignificant, and the model is more stable than (1) in that leaving out Israel and Colombia does not change this. The only variables to make large contributions are inequality and pcfb. It may be objected that inequality and midocc were intended by TSH as alternative measures of the same thing and that including them both would introduce multicollinearity and reduce the significance of the underlying structural variable. However, the theoretical justification for this seems tenuous and, in fact, as we see below the correlation between them is small.

RESULTS BY LEVEL OF DEVELOPMENT

However, such regressions do not allow valid inferences to be drawn because the dependence of mobility on the four variables is different among the developed and the underdeveloped countries. Drawing a line through the GNP figures designates Brazil, Chile, Colombia, Mexico, the Philippines, Spain and Yugoslavia as underdeveloped (in 1965). The other 13 countries for which we have complete data are considered developed, and for these

\[
\text{(3) mobility} = -0.212 \text{ GNP} - 0.102 \text{ineq} - 0.463 \text{midocc} - 0.579 \text{pcfb} \\
\text{R}^2 = 0.95
\]

The fit is very good and there are no large residuals. The only variables to make significant contributions are midocc and pcfb, but there is no basis for asserting that midocc is the main correlate. Indeed, even the reality of the association is open to doubt as it may be a spurious consequence of other, e.g., demographic and educational variables, which are important for mobility.

For the underdeveloped countries things are less clear but markedly different. Here

\[
\text{(4) mobility} = 1.01GNP + 0.962 \text{ineq} - 1.035 \text{midocc} - 0.110 \text{pcfb} \\
\text{R}^2 = 0.82
\]

Only pcfb can be left out without reducing R^2 considerably, and so (4) does not allow us to assert that GNP is unimportant for mobility. The coefficient for GNP is positive, while in (3) it is negative, suggesting that at a low level of development, greater productive capacity may be associated with less mobility rather than more. This would result if mobility first decreased and then increased or remained stable as GNP increased. A similar phenomenon for income inequality was first noticed by Kuznets (1955) and more fully documented by, e.g., Fourastié and Bazil (1980:214). Of course the coefficient of GNP, while large, is not quite statistically significant. This may well be because (4) is based on only seven observations, and further data would be needed to reach firm conclusions.

In (3) the correlation between inequality and midocc is a nonsignificant -0.40 and in (4) it is only -0.26. Thus the inclusion of both does not cause multicollinearity. This also casts doubt on TSH's view that they are alternative measures of the same thing, i.e., of how continuous a social structure is.

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SOCIAL MOBILITY AND IMMIGRANTS OR IMMIGRANTS AND SOCIAL MOBILITY*

ANDREA TYREE
State University of New York at Stony Brook

MOSHE SEMYONOV
Haifa University and the University of Nebraska

Raftery raises three issues in his comment. First, we got some of our four-fold tables wrong—including farm fathers when we said we didn’t. He seems to be right—and for two populations, the Philippines and Puerto Rico, our errors are consequential. Our Canadian error turns out not to be so. The difference between his and our collapsing of the Hungarian data can well be seen as a matter of honest disagreement—one on which we are willing to yield if he sees the matter as important. For reasons he does not indicate, he also gets a different value for mobility in Yugoslavia. In general our measures and his are in agreement and, as he reports in his equations 1 and 2, one gets rather the same results with one set as with the other.

The second issue Raftery raises has to do with an additional variable: we did not talk about immigration. He is not entirely correct here. We devoted two columns of text to two asides noting that the four countries with the most circulatory mobility have histories of providing permanent homes to unusually large numbers of immigrants relative to their sizes. We presented zero-order correlations between structural variables and percent foreign born and speculated about their interpretation.

We did not pursue the matter in the article because we could not plausibly include immigration or percent foreign born in a causal logic promoting differences in circulatory mobility. We saw immigrants not as a given that influences how a social order functions, but as people attracted differentially to countries. In this context the dependent variable of our original article, circulatory mobility, is inde-

* Direct all correspondence to: Andrea Tyree, Department of Sociology, SUNY–Stony Brook, Stony Brook, NY 11794.