PARTICIPATION IN THE MODERN SECTOR AND THE WIDTH OF URBAN INTERETHNIC INTERACTION: A CAUSAL MODEL OF DATA FROM PAPUA NEW GUINEA

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Ralph Bulmer was Professor of Anthropology at the University of Papua New Guinea when I arrived there in 1972 to take up a position as senior tutor. I began doing fieldwork for my PhD on urban ethnicity six months later, just as he was leaving the department. Although this topic is far removed from Kalam ethnozoology, my focus was on categorisation, an exploration of the origins of Papua New Guinean urban ethnic categories, as well as the formation of urban ethnic groups. Ralph encouraged and facilitated my research from the very beginning, and I have always been very grateful for his support.

In this paper, I present a causal model of the effects of a number of variables on the width of interethnic interaction. Although I make little direct reference to the aforementioned urban ethnic categories, they do form the basis for the model and the original data. The reader may consult Levine (1976), and Levine and Levine (1979) for fuller discussion of urbanisation in Papua New Guinea and dynamic aspects of ethnic categorisation, as I have limited myself to presenting new material here.

This discussion can stand alone however, as an attempt to give an explanation of the combined effects of education, employment, ethnic origin, residence and length of time in town on interethnic interaction. I think it will be useful in any situation where these variables are fundamental to urbanisation, and a set of urban ethnic categories can be obtained. Indeed, one of the most important aspects of urbanisation as a social process in all newly developing countries is that people with varied regional, social and cultural origins mingle in the towns. Residence, employment and recreational activities all provide contexts which encourage or permit interethnic interaction. The increase in the range of social interaction is both a universal consequence of urbanisation itself, and a factor which in turn influences its further course.

The particular aspect of interethnic interaction which I explored in Port Moresby and Mt Hagen was variation in the range of primary interethnic ‘social recreational interaction’, interaction which was friendly and entered into by choice. It was proposed that individuals who had social characteristics associated with participation in the ‘modern’ urban sector would be more likely to have such voluntary interaction with people from other areas whether or not they maintain identification with their clan or tribal group.
To test this hypothesis a sample survey was carried out in the two towns (see Levine 1976:171-273). The analysis of the data was limited to exploring frequencies and cross tabulations. The resulting tables showed that amount of formal education, level of employment, modernity of area of origin and quality of residential area all were associated with width of interaction.

As is typical with this method of analysis, some refinements of variables and controls were made. One contingency table, for example, indicated that New Guinea highlanders (the most recently contacted regional population in the country) who generally score lowest of the regional categories, have the same range of interethnic interaction as other residents of Port Moresby’s low covenant housing areas, when level of education is controlled for. Although results such as these are sufficient to demonstrate the validity of the general hypothesis, elaboration of the relationships between the variables is desirable. It would be especially interesting to see how they combine to affect this form of interaction. Which variables are more important? Which influences are direct, which work through other variables, or do both occur? In order to answer these sorts of questions the survey data was reanalysed and a new model developed.

THE SURVEY AND ITS REANALYSIS

Some familiarity with the survey and sampling methods is necessary to appreciate the reanalysis. Since a full account of the earlier study already exists (Levine 1976), only a very brief recapitulation will be made now.¹

The survey was carried out as a structured interview (developed from an unstructured pilot survey). Three ‘activity’ questions are relevant to this paper. Respondents were asked to indicate the ethnic category of people they (1) went to the movies with, (2) the pub with, and of those they considered (3) ‘good friends’. Since administrative boundaries are used as a basis for ethnic identification (Levine 1976, Levine and Levine 1979), each respondent was read a list of such categories along with the relevant question; e.g. ‘Who are your good friends in town?’ The interviewer ticked responses by category for each question. These were added together for an interaction score and also divided by the number of questions relevant to the respondent. Women, for example, did not go to pubs, nor did some men who opposed drinking in principle. Certain individuals did not go to movies. By dividing everyone’s score by the number of relevant activities (it was assumed the ‘friends’ question should apply to everyone) the adjusted interethnic interaction score removed the bias of counting categories more than once.² As a measure of width of interethnic interaction the adjusted scores could be compared with respect to the background of the interviewees. Data on sex, age, type of residence, area of origin, language spoken, time of arrival in town, marital status, origin, occupation and number of years of formal education, was collected during each interview.

The interviews were carried out in Tok Pisin, Hiri Motu or English as appropriate. Survey forms in each language were printed and tested. (The interviewers were fluent in the language used.) The sampling frame in each town was made from maps of residential areas. A random sample was gathered in Mt Hagen, as the town is relatively small. A stratified sample was taken in Port Moresby because categories of interest and resources did not permit a simple random sample of that city (see Levine 1976:188-96). An equal number of people were interviewed from migrant settlements (sometimes called ‘squatter’ settlements) with Papuan and with New Guinea highlander residents, as these were considered interesting to compare. Army, police and university dormitories were also sampled for this reason, as were low covenant housing areas (housing for what were then relatively elite and middle-level employees of the civil service and private companies), one ‘no covenant’ area (relocated migrant settlers) and Hanuabada, an urban Motuan village.

Although considerably larger, the Port Moresby sample of 639 (vs. Mt Hagen’s 212) is problematical for constructing a causal model. While the Port Moresby data may be usefully employed for the purposes of (for example) comparing a sample of highland migrant settlers with Papuan settlers or villagers with army personnel, to collapse the strata into a representative urban sample of Port Moresby as a whole, one must be able to weight each category precisely. This unfortunately requires more knowledge of the Port Moresby population during the relevant period (1973-1974) than exists. Administrative and census boundaries did not coincide with the categories of the sampling frame. I could weight the whole sample by area of origin (using the 1971 census figures) but the fact that the survey’s strata were unweighted housing areas means that the result would not adequately represent the urban population. Each stratum could conceivably be analysed separately, but they are very small, and a separate causal model for each one would prove unwieldy.

The Mt Hagen data does not suffer from these drawbacks and consequently has been used as the basis for the model.

THE MT HAGEN MODEL

During the fieldwork period in Mt Hagen virtually the entire adult Papua New Guinean population consisted of migrants from rural areas, many from the highlands. As a variable in this causal model, region of origin comes first in the chain. Since formal education for the population of Mt Hagen at this time also began
The Width of Urban Interethnic Interaction

before arrival in the town, it is also a variable prior to urban residence. Level of education is, however, linked to area of origin, due to the uneven nature of regional development in Papua New Guinea. So education may be seen as at least partially a result of origin. Education itself greatly affects one’s employment prospects in the urban economy as is typically the case in any country, and thus employment comes after education in the model.

Papua New Guinea was especially notable for the way in which housing was related to employment in the mid 1970s. Planned areas were inhabited by people with government or private sector jobs which required qualifications. The unskilled and unemployed sometimes received barrack space or were left to fend for themselves in the settlements. So housing area was related to employment, but the shortage of planned accommodation in some towns complicated this. The model takes housing as at least a partial result of employment, because residence outside of settlements depended on qualifications.

A fifth variable which seems to have obvious importance to interethnic interaction is the amount of time spent in the town. One would expect that more time in a town would generally relate to the establishment of a wider network. Time should have something to do with origin and perhaps also be dependent upon employment. But it is a somewhat problematic variable, since there is great circularity in urban migration in Papua New Guinea (Gamaut et al. 1977).

In a weak causal ordering (a requirement for models of the type being constructed) the width of interethnic social recreational interaction should depend upon origin, years of formal education, employment and residence, with time’s position to be determined. These variables also relate to one another as indicated in the discussion above. To evaluate this model a path analysis was undertaken. In path analysis (Kendall and O’Muircheartaigh 1977, Nie et al. 1975) the ordering is specified by the researcher, and a diagram of the relationships is presented, with arrows indicating causal relations. Numbers on the diagram associated with each arrow, termed path coefficients, are standardised partial regression coefficients or beta weights. These measure how much impact an increase of one standard deviation of an independent variable has on a dependent variable while controlling for the others (Nie et al. 1975:387). This technique enables us to order, specify and compare the effects of the variables despite the fact that they are measured in different units, as well as to measure their total impact.

In this model education was measured by number of years of schooling. Time was years spent in the town. Residence and origin are binary variables. Residence measures whether the individual lived in a migrant settlement (0) or not (1); origin, if the respondent is from the highlands (0) or a coastal region (1). The coding for region reflects local usage. Papua New Guinea is conceptually divided into either four regions, the highlands, Papua, New Guinea coast and New Guinea Islands, or just highlands and coast. The latter is especially prevalent in highland areas like Mt Hagen.

Since few New Guinea Islanders lived in Mt Hagen (the survey picked up only four) the highlands/coast dichotomy was adopted. Binary variables also have the advantage of properly being conceived of as interval measures and present no conceptual problems for path analysis (Kendall and O’Muircheartaigh 1977:20-2). Employment was measured in terms of the respondent being unemployed (1), unskilled (2), semi-skilled (3), or skilled (4), as a good spread of this variable was obtained.4

The only arrows included in the diagram are those found significant at the .05 level. Direct paths are simply read at the relevant arrow. Employment for example, has the largest direct effect on score, .423. Indirect effects are obtained by multiplying paths leading to the dependent variable; e.g. origin affects score

Figure 1. Path Diagram for Mt Hagen
through the sequences education and employment as well as through employment itself and via employment and residence. The figures in parentheses represent 'error' terms. The various effects are summarised below.

Employment has the greatest effect on range of interaction, virtually all of it direct. Origin (highland/coastal) had no statistically discernible direct influence on interaction (the link was not significant at the .05 level and no direct arrow appears) but did exert an effect through the other variables in various ways. The most important indirect path here was from origin to score via employment, .114, the other five paths were each less than .04.

The effect of education was positive, but again indirect, a surprising finding because it seemed so clearly important in the initial analysis. What's more, the total effect was less than that of employment and origin and only slightly more than the direct effect of time in town.

Residence also contained elements of surprise. The negative direct effect on score means that living outside a settlement (coded 1) has a negative influence on width of interaction. The negative relationship between employment, education and residence occurs because of the fact that unskilled barracks dwellers are living in provided housing and some skilled workers are in settlements, due to the shortage of housing. The paths from these variables through residence are positive, however (since negative numbers multiplied together are positive), and thus fall into line with the nature of their effects via other paths.

Time is a variable that turns out to be fairly puzzling. There are any number of logical links one could make between time, origin, education, employment and residence. But in the Mt Hagen sample none of these connections was discernible at the .05 level. Only the direct link with interaction score proved statistically significant.

This may be due to the fact that two-thirds of the town's population (according to the 1971 census) was from the Western Highlands. Local people use the town and adapt to it in ways that are different from migrants from further afield. Non-highlanders are usually recruited to Mt Hagen on the basis of their qualifications and may move to and from the town according to the dictates of employment. Western Highlanders (the district then included what is now the Enga as well as the Western Highlands Province) move into and out of employment and urban residence. They cluster in the unskilled, unemployed job categories, settlements and barracks. As a category of the urban population their periods of residence seem to have little to do with differences in these variables, but spending more time in the town does, in itself, result in a certain widening of interethnic interaction.

CONCLUSIONS

This analysis has allowed for a greater specification of the effects of the factors seen in an earlier study to influence the widening of ethnic networks in Mt Hagen town. Variables that were analysed as discrete, or were combined in a limited sense in contingency tables (Levine 1976) have been pulled together in one model. This indicates that employment influences the width of ethnic networks more than origin, education or time spent in Mt Hagen town. Indeed its impact is about as much as these three variables combined. Origin and education have significant effects, but only through other variables. Time in town seems not to relate directly to education, employment, residence or origin, but does have a direct effect on width of ethnic networks. Presented in this form, the analysis not only enables more precision, but provides a model which may be employed for comparative purposes, either in Papua New Guinea, where a new generation has come of age in the towns, or elsewhere.

NOTES

1. I would like to thank Marlene Levine for her help with the original survey and for reading a draft of this paper.
2. The adjusted score could underestimate numbers of categories if individuals participated in separate activities with people from different areas; e.g. went to the pub with people from one place and the movies with people from another. Comparing the two kinds of scores in Levine 1976 shows that they move consistently together. The adjusted scores show less of a spread, of course.
3. This was done using SAS Standard, Means, and Regression procedures on Victoria University's IBM 4341. R. Renner, consulting statistician, gave advice about the model. M. Robb and J. Gellen of Computing Services helped when runs crashed. I alone am responsible for the data and analysis.

4. This is, of course, an ordinal classification which the model treats as interval. There is some debate about the appropriateness of this practice in the literature. Textbook examples of path analysis (e.g. Nie et al. 1975:387, Pine 1977:354-76, de Vaus 1986:171-83) in social science proceed in this fashion.

5. Many other variables, not part of the model, affect the various dependent variables. The variance not accounted for is indicated by these terms. In the case of a complex phenomenon like interethnic interaction, we expect only to be able to account for part of the variance in scores when constructing a model. The error terms in the model and total variance it accounts for seem very comparable to those of a well known study in sociology, for example (see Pine 1977:371).

REFERENCES


SOME SAMOAN OBSERVATIONS ON SCIENCE AND SCIENTISTS

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There is in Western Samoan society an intense interest in the process, content and products of formal education. This interest and commitment is evident in the actions of districts and villages which are either building, upgrading or rebuilding their schools or raising money for the facilities thought essential to the good school. While part of this enthusiasm for school building may reflect traditional inter-village rivalry and the importance of having a larger and better school than an adjoining village, there is undoubtedly a genuine concern with the school as school. The commitment to the content is evident in the respect for the written word and for the knowledge which it is believed will take the villager's children to town and the townsman's children overseas. While part of the respect for the content of education may be due to the fact that it is increasingly delivered in a language with which many parents are not familiar, there is a genuine respect for the knowledge which will open minds and doors. The belief in the by-product of education is reflected in the increasing prominence and, more significantly, control which formally educated Samoans are given in national and even village political activity. While part at least of this belief may derive from a group's desire to harness any talent which might give them a competitive advantage over like groups, there is ample evidence that the presence of highly educated Samoans can make a material difference to outcomes in a number of activities.

As a consequence, considerable expense and effort is invested in getting children into schools and keeping them there for as long as is possible. Entire families become involved in various ways in the promotion and support of individuals in this select group in whose reflected glory they will eventually live. The effort intensifies as children rise through the system and come within reach of the academies from which they can graduate to enter overseas educational institutions. The successful completion of courses, and the award of certificates, tasi pasi, may lead to lavish graduation celebrations, fa'auuga, in which the family publicly celebrates both the achievements of the individual and the family which made them possible. Framed certificates marking achievements from the completion of the Pitmans Shorthand (elementary) to the award of