National Language Comprehension In Rural Sabah

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OUTLINE

1 Introduction

From 1978 to 1981, the Summer Institute of Linguistics carried out a linguistic survey of the state of Sabah, East Malaysia, in cooperation with the state government. The survey, described in King and King (1985), was carried out in two phases. The first phase focused on gathering lexical information, in the form of wordlists; the second phase involved direct testing of intelligibility between related dialects and languages.

At each village where dialect intelligibility testing was carried out, subjects were also tested for their ability to understand the national language, Bahasa Malaysia. The results of that testing, presented in this paper, provide an assessment of levels of passive bilingualism within a certain segment of the state's population. the adult members of indigenous ethnic groups living in rural areas.

1 1 *The nature of the sample*

The results of this study must be interpreted quite carefully in the light of who was tested and how they were tested. The survey data is revealing in many ways, but any conclusions drawn must not be over-generalized.

Since the primary intent of the survey was to gather data on the indigenous languages and dialects of the state, only native speakers of these languages were chosen as subjects for the testing. No data was gathered from non-Malayo-Polynesian immigrant groups in the state: the Chinese, Indians, Pakistanis, Europeans, etc. No testing was done among the very recent immigrant groups, such as Javanese, Bugis and Iban, although lexical data was collected from these groups.

No children under 15 years of age were selected as subjects for the intelligibility testing, since children are not, in some respects, fully competent native speakers of their own languages. Thus no children under 15 are included in our data on national language comprehension.

The survey technicians made every effort to collect data only in the home areas of the language groups being studied. This means that the vast majority of the survey data was collected in rural villages; almost no testing was done in major towns or cities.

Thus, as mentioned above, our sample represents the rural, adult, indigenous population of Sabah. Each of these qualifications is important. The Chinese in particular are likely to have very different educational backgrounds and patterns of language use from the indigenous population, which will result in very different patterns of bilingualism. A Dusun or Murut person living in a city is quite likely to understand Bahasa Malaysia better than his cousin back in the home village. And it is very possible, judging from the trends in our data, that children 9-14 years old might have scored significantly above the general average on national language comprehension, if they had been tested.

1.2 *Testing Method*

The testing for national language comprehension followed the same method used for testing dialect intelligibility The procedure is described clearly in Casad (1974).

Each subject was asked to listen to a simple first-person narrative in Bahasa Malaysia. His comprehension of the text was measured by asking him to answer 10 factual questions relating to the content of the text. The person's score on the test represents the number of correct answers out of 10 questions, with half-points granted for partially correct answers.

The test questions were inserted into the text immediately following the sentences which they related to. This ensured that the scores were not affected by the subject's short-term memory skills. For the dialect intelligibility testing, the questions which a subject had to answer were recorded in the subject's own mother tongue. For the national language testing, however, the questions (as well as the text) were recorded in Bahasa Malaysia.

The vocabulary and grammar of the test passage were essentially those of standard Bahasa Malaysia on a simple, conversational level. The results could have been quite different if Brunei Malay or one of the varieties of *Pasar* Malay spoken in Sabah were used. However, the speaker on the Bahasa Malaysia test tape was a native Sabahan, so that foreignness of accent was not a problem to the subjects.

The Bahasa Malaysia testing was usually done last, after the subject had taken one home-town test and five dialect intelligibility tests. By the time the subject took the national language test, he was generally quite familiar with the test procedure, minimizing the effects of any "learning cruve".

In interpreting the test results, it is important to remember precisely what was tested: passive ability (i.e., listening comprehension rather than speaking ability) for a simple narrative in a restricted, familiar semantic domain; and ability in standard Bahasa Malaysia, rather than some variety of local Malay The interpretation of the results will be discussed further in section 4 below

1.3 *Variables measured*

For each subject in the test sample, the survey technicians filled out a *Language Assistant Profile*[1], listing various pieces of demographic and sociological information. This paper discusses the relationship between comprehension of Bahasa Malaysia and some of these factors.

The following factors are examined in this study: the subject's age in years (AGE); sex, male or female (SEX); years of formal education (EDU); extent of travel (TRAVEL); degree of linguistic diversity of adult home (LANGUAGE); occupation (OCCUP); mother tongue (SPOUSE); home district (DISTRICT); and comprehension score in national language (MAL).

Other factors which were examined included the subject's birth-place, (relative to his home language area) and the linguistic diversity of his childhood home. However, no significant relationship was found between these factors and the test scores.

2. Corelation Patterns

The measurements used in this study are of two basic types: 1) number scales, like age, years of education, test scores; and 2) categories, like sex and occupation. For numerical data, the technique of correlation analysis is very useful for finding relationships among two or more variables.

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[1] The Language Assistant Profile sheets, individual score sheets, wordlists and other raw data collected in the survey have been placed in the Sabah State Archives, and are available for use by other intersted scholars.

A *correlation coefficient*[2] is a measurement of the strength of relationship between two variables, x and y. The values of the coefficient, r, range between -1 and $+1$ If $r = O$, no relationship exists between the two variables. If $r = a$, then y is directly proportional to x, and perfectly predictable in terms of x. If $r = -1$, y is inversely proportional to x. In general, the closer r is to $+1$ or -1, the stronger the relationship between x and y.

Table 1 lists the correlation coefficients for various pairs of variables in the study

VARIABLES	CORRELATION (r)
1. MAL & EDU	.5972
2. EDU & AGE	-.4878
3. MAL & SPOUSE	.2974
4. MAL & TRAVEL	.2816
5. MAL & AGE	-.2730
6. EDU & SPOUSE	.2641
7 EDU & TRAVEL	.2310

Table 1. Spearmann rank-order correlation coefficients for national language comprehension study (Suluk data excluded)

Number of cases N = 1028[3]
Significance for all pairs = .001[4]

The strongest relationship in our survey data is the correlation between MAL and EDU (line 1 of Table 1). This correlation tells us that the more schooling a person has, the better he is likely to understand Bahasa Malaysia - which is what we would expect. We should note that Bahasa Malaysia is the medium of instruction for all normal education in the rural areas. Table 1 shows that education

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[2] In this study, the Spearman rank-order correlation coefficient was used. This measurement is non-parametric, so it can handle simple ranking scales (like "extent of travel") as well as true numerical measurements; and it makes no assumptions about the distribution of the data.

[3] All correlations are computed for the same sample set, consisting of just those cases for which no data was missing. There were 1048 such cases, out of a total of 1475 subjects tested. Twenty of the cases, the Suluk sample, was excluded from this part of the study, leaving 1028 cases for the correlation analysis.

[4] Significance measured by a 2-tail test. Statistical significance is a measure of the likelihood that an observed pattern is the result of random variation. Sig = .001 says that there is less than 1 chance in 1000 of random events producing an apparent correlation this strong for this many cases. For this part of the study, no correlation values are considered if the significance was greater (i.e., worse) than .001

is the single most important factor influencing a person's comprehension of the national language, in our study

Among the Suluk test group, this trend was strikingly reversed. Many of the Suluk test subjects had only recently arrived from the Philippines, and so knew very little Malay. Many of them were well educated, some even college graduates - but the medium of instruction was English. On the other hand, some subjects in the Suluk group had been living in Sabah for many years, and so understood Bahasa Malaysia fairly well, even though they had received no formal education.

There were only 20 Suluk subjects in the sample, out of a total of 1475 subjects; so the statistical effect of this problem is very small. However, because of the strong relationship between test scores and education, and the distorting effect of education outside Malaysia on this pattern, the Suluk data is excluded from Table 1 through 7

The negative correlation between MAL and AGE (line 5) means that, on the average, young people understand Bahasa Malaysia better than their elders. This trend is clearly related to the even stronger negative correlation between EDU and AGE (line 2), which says that young people tend to be better educated than older people. In many rural areas, government primary schools have only recently been established, so that older people in those areas had no opportunity for formal education when they were young. The better education of today's young people is reflected in their level of understanding of the national language.

Line 4 of Table 1 says that the more widely a person has travelled, the better he is likely to understand Bahasa Malaysia. Again, this matches our intuitive expectations. Line 3 tells us that people who marry someone from a different language or dialect group tend to understand Bahasa Malaysia better than those who marry someone from their own group. Both of these correlations are significant, but much weaker than the effect of education discussed above.

Lines 6 and 7 of Table 1 tell us that people with more education tend to travel more widely and are more likely to marry outside their language group than people with little or no education.

It is clear that these five variables (MAL, AGE, EDU, TRAVEL, SPOUSE) are interrelated in very complex ways, and for some of the patterns discussed above it is unclear whether any direct cause and effect relationship exists. However, for the two strongest correlations in the data, the direction of causality seems clear Education certainly increases a person's ability to understand the national language; and increased schooling is obviously the result, and not the cause, of having been born relatively recently

3. Tabulation of the Data

Non-numerical variables, like sex and occupation, are not suitable

for correlation analysis. However, simple tabulation of the data can reveal interesting patterns and relationships.

3.1 *Comparison by sex*

In our sample, men on the average scored significantly better than women on the national language test. As Table 2 shows, the men's scores averaged 7.40 (out of 10), while women averaged 6.13. The absolute difference in these scores, only 1.27 points out of 10, is not large; but it can be shown to be statistically significant.[5]

	NO. OF CASES	MEAN SCORE	STANDARD DEVIATION
MEN	889	7.40	2.82
WOMEN	565	6.13	3.53
TOTAL	1454	6.91	3.18

Table 2. Breakdown of national language comprehension scores by sex.
(Suluk data excluded)

In section 2, we showed that understanding of Bahasa Malaysia correlates positively with education and extent of travel. In our sample, men tend to be better educated than women and to travel more widely Again, the differences are small but Statistically significant. Table 3 shows the comparison of these measurements.

	MEAN EDU	NO OF CASES	STD. DEV	MEAN TRAVEL	NO. OF CASES	STD. DEV.
MEN	3.68	890	3.72	2.38	893	0.91
WOMEN	2.89	563	3.80	2.06	553	0.70
TOTAL	3.37	1453	3.77	2.26	1446	0.85

Table 3. Breakdown of education and extent of travel by sex.
(Suluk data excluded)

[5] Student's t is a statistical measurement used to test such hypotheses. The distribution of t allows us to calculate the odds that the apparent difference in scores is purely accidental, the effect of sampling error. For the data on men's and women's scores shown in Table 2, t = 7.22, with 1009 degrees of freedom. The t test used here uses separate estimates of variance for the two subgroups, since the large difference in standard deviations suggests that the variance in scores is different for men and women. The significance rounds off to .0000, meaning that there is essentially no chance that the difference in scores is accidental.

The fact that men scored better than women on the national language test is partly explained by their slightly higher level of education and generally wider range of travel. Other factors are certainly involved as well, but may be more difficult to quantify. For instance, men may tend to be more active than women in certain types of interaction with other language groups and/or government officials, even in the home area.

Although the difference in mean values for TRAVEL between men and women is statistically significant,[6] the scale itself is so subjective that it is probably misleading to attempt such a precise numerical comparison. A more realistic approach is shown in Table 4 below.

TRAVEL	MEN		WOMEN	
	No.	%	No.	%
1	47	5.3	68	12.3
2	614	68.8	422	76.3
3	129	14.4	34	6.1
4	48	5.4	18	3.3
5	55	6.2	11	2.0
Total	893	100.0	553	100.0

Table 4. Extent of travel tabulated by sex.
(Suluk data excluded)

Key: No. = number of cases
%
= percentage
TRAVEL = extent of travel outside subject's home language area:
1 = never left language area
2 = travel only to neighbouring districts
3 = state-wide travel
4 = travel outside Sabah
5 = lived for 1 year or more outside

Table 4 shows that most of the sample group had travelled only to neighboring districts. A higher proportion of women than men reported that they had never travelled outside their home language area (12.3%

[6] For EDU, t = 3.89 with 1451 degrees of freedom. The t test here uses a pooled estimate of variance. Significance = .001. For TRAVEL, t = 7.55 with 1375 degree of freedom.

vs. 5.3%). Conversely, a higher proportion of men than women had travelled to other parts of the state (14.4% vs. 6.1%), travelled outside the state, e.g., to Sarawak, Brunei or West Malaysia (5.4% vs. 3.3%), or actually lived for extended periods outside their home language area (6.2% vs. 2.0%). These figures give a more accurate comparison of the travel patterns for men and women, confirming that men tend to travel more widely than women.

3.2 *Education and age group*

The positive correlation between education and comprehension of Bahasa Malaysia was the strongest relationship in the study, as discussed in section 2. The data on education and test scores is tabulated below (Table 5).

EDUCATION IN YEARS	NO OF CASES	MEN SCORE	STD. DEV
0	666	5.02	3.144
1 - 3	113	7 39	2.427
4 - 6	317	8.46	1.970
7 - 9	209	9.58	0.976
10^{+}	80	9.62	0.992
Total	1385	6.951	3.179

Table 5. Breakdown of national language test scores by years of education.
(Suluk data excluded)

The figures in Table 5 give dramatic support to our earlier statement that formal education is a crucial factor in determining how well people understand the national language. The first six years of schooling, i.e., primary school, appear to be the most significant. A detailed breakdown of test scores shows that there is little improvement after the seventh year of school.

This is not to say that the average Form 5 graduate is not significantly better in Bahasa Malaysia than the average Form 1 graduate. The leveling-off seen in Table 5 is due to the nature of the test, which measures only passive comprehension of simple narrative material. After 7 years of schooling, most people can achieve close to a perfect score on this test. Other kinds of tests would be needed to distinguish between higher levels or different kinds (e.g., active vs. passive) of proficiency in the national language.

It is interesting to note that, among people with no formal education (line 1 in Table 5), men scored significantly better than women on

the Bahasa Malaysia test.[7] However, for all other educational levels, men and women scored equally well. Thus, education is a great leveling factor with respect to passive bilingualism in the state; even two or three years of formal education seem to be enough to outweigh whatever other factors (social, cultural, economic, etc.) cause men to understand Bahasa Malaysia better than women. When they are educated to the same level, men and women understand the national language equally well.

Table 6 shows the breakdown of Bahasa Malaysia test scores by age group:

AGE IN YEARS	NO OF CASES	MEAN SCORE	STD. DEV
15-19	241	8.17	2.631
20-29	391	7.86	2.849
30-39	285	6.87	2.955
40-49	245	5.87	3.439
50-59	160	5.41	3.085
60-69	104	5.68	3.315
70+	21	5.48	3.150
Total	1447	6.92	3.183

Table 6. Breakdown of national language test scores by age group. (Suluk data excluded)

Again, these figures reflect the negative correlation between MAL and AGE discussed in section 2: young people, on the average, understand Bahasa Malaysia better than their elders. The age group between 30 and 39 years old seems to the transitional group. The average for the 30-39 group is almost exactly the same as the mean score for the entire sample set. The largest drops in the mean score in Table 6 are between the 30-39 year old group and the age groups immediately above and below it. Above 50 years of age, there is no significant decline in test scores with increasing age.

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[7] Average scores on the national language test for subjects with no formal education:

	N	MEAN SCORE	STD. DEV
MEN	354	5.66	2.906
WOMEN	312	4.29	3.247
TOTAL	666	5.02	3.144

$t = 5.75$ with 664 degrees of freedom.

In section 2 we suggested that the relationship between national language comprehension and age was largely due to differences educational background. The strong negative correlation between AGE and EDU showed that younger people in rural areas are better educated on the average than older people. Table 7 shows the average amount of education for each age group, comparing levels for men and women within each group.

AGE IN	NO. OF CASES			MEAN EDU			STD. DEV		
YEARS	Men	Women	Total	Men	Women	Total	Men	Women	Total
15-19	109	143	252	7.63	5.44	6.39	3.05	3.56	3.52
20-29	244	155	399	5.77	4.39	5.23	3.35	4.11	3.72
30-39	183	95	278	3.12	1.63	2.61	3.27	3.04	3.27
40-49	158	88	246	1.96	0.16	1.32	2.73	0.92	2.42
50-59	104	48	152	0.93	0.04	0.65	1.94	0.29	1.67
60-69	69	31	100	0.70	0.00	0.48	1.25	0.00	1.09
70+	19	3	22	0.21	0.00	0.18	0.72	0.00	0.67
Total	886	563	1449	3.69	2.89	3.38	3.73	3.80	3.77

Table 7. Breakdown of educational level by age group and sex. (Suluk data excluded)

The decreasing level of education among older age groups is seen very clearly in the three columns labeled MEAN EDU in Table 7. Another clear pattern is that men tend to be better educated than women in every age group. The figures suggest that, in the rural areas of the state, not only do boys tend to get more schooling than girls, but parents were historically slower to send their daughters than their sons to school.

Almost none of the women in the sample above 40 years of age had any schooling whatsoever. However, the mean values of EDU indicate that a substantial proportion of the women below 30 in the sample had completed at least primary school. Thus the 30-39 age group seems to be the transitional group in terms of women's education. Women in this age group were the first girls to attend school in most rural areas.

3.3 Occupation

Table 8 shows a breakdown of Bahasa Malaysia test scores by occupation.

The largest occupational category in the sample consists of those subjects who identified themselves as farmers or fishermen (line 2). The mean score for this group was slightly below the average for the entire sample. Housewives scored far below average on the test. This

OCCUP	N	MAL	STD. DEV
Housewife	209	4.92	3.634
Agric/Fish	478	6.68	2.931
Government	233	8.47	2.212
Student	50	9.44	1.456
Business	18	9.53	1 194
Other	157	7.50	3.278
Total	1145	7.00	3.203

Table 8. Breakdown of national language test scores by occupation

group was largely made up of women over 30, the least educated segment of the population.[8]

The "Government Employees" category includes village headmen, native chiefs, people working in government offices, teachers, and (in a few cases) people employed on government agricultural schemes. The mean score for this group was well above the average of the entire sample.

Students scored very well as a group, averaging 9.44 out of 10. Since all subjects chosen for the test were at least 15 years old, those subjects who were still full-time students were likely to be in Form 3 or higher, and thus quite proficient in Bahasa Malaysia. A small number of subjects said they were in business. This group was also above average in education and scored very well on the test.

3.4 District and language group

Most of the indigenous languages in Sabah are members of one of four main language families: Dusunic (including Kadazan/Dusun, Rungus, Bisaya, Lotud, Tatana, etc.); Murutic (including roughly 12 distinct languages); Paitanic (including Sungai/Tambanua, various dialects of the Upper Kinabatangan area, etc.); and Bajau. In addition to these four families, a number of other Western Austronesian languages are spoken in various parts of the state, including Lundayeh, Banggi, Ida'an/Begahak, Suluk/Tausug, Illanun, Tidung, and Brunei/Kadayan. The more recent immigrant groups, such as Javanese, Bugis and Iban, are not included in this study

Table 9 shows average Bahasa Malaysia test scores for each language family. There is a clear ranking, with the speakers of Paitanic languages

[8] The average age of the subjects who called themselves house-wives was 35.8 years; the average level of education was 1.59 years.

[9] Average educational level for students was 8.64 years; for businessmen, 7 17 years.

scoring lowest, Murutic groups next, Dusunic groups next and Bajau highest.

FAMILY	NO. OF CASES	MEAN SCORE	STD. DEV
Paitanic	244	5.10	3.492
Murutic	245	6.38	3.42
Dusunic	705	7.20	2.958
Bajau	125	8.37	2.232
Other Western Austronesian	156	7.87	2.669
Total	1475	6.89	3.194

Table 9. Mean test scores by language family.

There is a fairly high range of variation within each language family Table 10 shows a ranking of 48 language and (in some cases) dialect groups by their average scores on the national language test in our study The average level of education for each group is also shown in the same table.

We must be very careful in interpreting the figures shown in Table 10. In most cases, the sample size for a particular language group is too small to be certain that the sample is truly representative of the group as a whole. Certain general trends emerge from the table which are consistent with the other patterns observed in the data; but the figures for an individual language group should not be taken as seriously as the figures for language families or other larger subsets of the sample.

	Language Group	Language Family	Avg. Mal	N	Std. Dev.	Avg. Edu	N.	Std. Dev.
1.	Bisaya	Dusunic	9.45	19	1.641	6.68	19	3.250
2.	Papar	Dusunic	9.25	8	0.707	3.63	8	5.290
3.	Tempasuk Dusun	Dusunic	9.23	11	1.723	5.18	11	3.842
4.	Coastal Kadazan	Dusunic	9.02	42	2.180	5.12	41	3.550
5.	Lotud	Dusunic	8.98	30	2.002	5.69	29	4.028
6.	W Coast Bajau	Bajau	8.94	40	1.988	4.40	40	4.313
7.	Nabay Murut	Murutic	8.84	19	1.901	7.60	15	4.469
8.	Illanun	other	8.75	20	1.916	5.50	20	4.594
9.	Brunei/Kadayan	other	8.73	37	1.661	2.97	36	4.306
10.	Tatana	Dusunic	8.70	20	2.297	5.40	20	3.979
11.	Kagayan	Bajau	8.50	10	1.616	5.33	9	4.183
12.	Balangingi	Bajau	8.45	10	1.462	3.20	10	2.898
13.	Gana	Murutic	8.30	28	1.843	3.69	26	3.095
14.	Kuijau	Dusunic	8.24	50	2.127	6.15	47	3.244
15.	Lundayeh	other	8.22	9	1.228	0.89	9	1.453

16.	Ida'an/Begahuk	other	8.21	42	2.206	3.74	43	3.959
17.	Apin-Apin Kuijau	Murutic	8.13	8	2.656	3.25	8	3.694
18.	Beaufort Murut	Murutic	8.11	9	2.247	2.44	9	3.283
19.	Southern Sama	Bajau	7.99	65	2.496	3.59	59	3.802
20.	Dumpas	Dusunic	7.90	10	2.183	5.80	10	4.158
21.	Central Dusun	Dusunic	7.80	258	2.690	4.39	262	4.022
22.	Klias River Kadazan	Dusunic	7.75	10	2.276	4.13	8	3.357
23.	Paluan Murut	Murutic	7.36	33	2.673	3.47	34	3.212
24.	Tambanua/Sungai	Paitanic	7.27	65	2.360	2.17	60	3.201
25.	Tidung	other	7.18	28	2.903	2.00	28	2.789
26.	Sugut Kadazan	Dusunic	7.00	10	3.504	1.80	10	2.573
27.	Tangara Murut	Murutic	6.90	10	3.836	6.00	10	3.464
28.	Lobu (Ranau District)	Paitanic	6.79	7	2.956	2.43	7	2.699
29.	Kimaragang	Dusunic	6.70	10	2.751	2.10	10	2.846
30.	Abai Sungai	Paitanic	6.20	10	1.814	1.90	10	4.013
31.	Dusun-Murut	Murutic	6.15	20	3.189	3.28	18	4.319
32.	Kuala Monsok Dusun	Dusunic	6.00	7	4.163	2.83	6	2.317
33.	Pandewan Murut	Murutic	6.00	9	2.500	3.30	10	4.322
34.	Tomani Murut	Murutic	5.94	9	2.543	3.56	9	2.963
35.	Pensiangan Murut	Murutic	5.57	35	3.781	1.61	33	2.850
36.	Minokok	Dusunic	5.57	30	3.070	2.65	26	3.199
37	Kalabakan Murut	Murutic	5.56	8	2.896	0.00	9	0.000
38.	Suluk	other	5.45	20	4.081	5.50	20	4.594
39.	Eastern Kadazan	Dusunic	5.31	70	3.437	2.20	65	3.275
40.	Rungus	Dusunic	5.30	70	2.504	2.34	88	3.301
41.	Talantang Dusun	Dusunic	5.20	20	1.281	2.00	20	2.734
42.	Baukan Murut	Murutic	4.88	20	4.322	3.76	17	3.153
43.	Timugon Murut	Murutic	4.59	16	4.168	3.88	16	4.097
44.	Serudung Murut	Murutic	4.50	10	3.028	0.60	10	1.897
45.	Tebilung	Dusunic	4.25	20	2.124	1.20	20	2.984
46.	Kadazan-Tambanus	Dusunic	4.20	10	1.874	0.86	7	2.268
47	Upper Kinabatangan	Paitanic	4.09	162	3.542	1.56	156	2.533
48.	Salalir Murut	Murutic	2.10	10	2.675	1.15	13	2.340
	Total	all	6.89	1475	3.194	3.40	1473	3.788

Table 10. Average national language comprehension scores and years of education by language and/or dialect group (groups ranked by average MAL)

In assessing the degree of bilingualism within a particular group, it is important to determine the degree of variation within that group. If we merely state that group X achieved an average score of 50% on a particular test, we have no way of knowing whether everyone in the group scored 50% or whether half the people got perfect scores while the other half scored zero. Obviously the difference between these two situations is important.

[10] Dusun-Murut includes Tambuat Murut (see King and King, eds.)

The standard deviation is a statistical measurement of the amount of variation within a sample group. The larger the standard deviation, the greater the variation in scores within the sample set. For example, no one in the Kalabakan Murut test set had any formal education, so the value of EDU was the same (0) in each case. Since there was no variation in these values, the standard deviation in EDU for that sample is zero.

Notice that the standard deviation for the education measurement are generally higher than those for the Bahasa Malaysia test scores, even though the mean value of EDU for the whole data set is less than half the mean value of MAL (the size of the standard deviation is also dependent on the size of the mean). The large variance in levels of education is a deliberate characteristic of our sample. At each test point, the survey technicians made every effort to include subjects with a wide range of educational background, including both men and women from various age groups.

The figures for national language comprehension in Table 10 reveal an intresting geographical pattern. Groups living on the west coast of the state seem to understand Bahasa Malaysia best. Coastal Muslim groups are generally above average, with the notable exception of the Suluk (see section 2 above). Of the traditionally pagan groups in the interior, those in the north and west tend to understand Bahasa Malaysia better than those in the south and east.

Note that in general, the groups in the upper half of the list are better educated than those in the lower half, though there are numerous exceptions to the general pattern. The Lundayeh scored much better than their level of education would lead us to expect probably due to the importance of Brunei Malay as a trade language in the Sipitang district, where the Lundayeh live. As noted before, the Suluk scores were much lower than normal for their average level of education, because many of the subjects were educated in the Philippines rather than Malaysia.

The geographical pattern noted above is further borne out in Table 11, which lists the average national language scores by district.

DISTRICT	AVG. MAL	N	STD. DEV	AVG. EDU	N	STD. DEV.
Tuaran	9 54	62	0.911	6.24	62	3.784
Kota Belud	9.29	77	1.702	5.25	80	3.992
Papar	9.25	46	1.608	5.02	46	4.091
Sandakan	8.94	45	1.538	4.86	44	4.257
Kuala Penyu	8.84	57	1.783	4.14	56	4.083
Penampang	8.60	42	2.296	3.98	42	3.948
Beaufort	8.51	41	2.140	4.62	37	3.647

Kota Kinabalu	8.49	36	2.570	4.03	34	4.338
Labad Datu	8.47	66	2.049	2.91	66	3.551
Sipitang	8.42	19	1.539	3.46	28	4.443
Ranau	7.78	46	2.992	3.98	46	3.815
Keningau	7 66	173	2.657	4.63	159	3.796
Semporna	7.38	30	2.870	3.80	25	3.379
Tambunan	6.27	51	3.001	3.24	50	3.690
Labuk-Sugut	6.16	80	2.983	1 96	77	3.139
Kudat	6.05	40	2.773	2.86	58	3.522
Pitas	5.61	80	2.352	1.72	78	2.768
Tenom	5.60	30	3.546	3.22	36	3.382
Tawau	5.49	48	3.596	2.67	49	4.012
Kota Marudu	5.30	80	2.275	2.56	80	3.575
Pensiangan	4.90	45	3.807	2.00	54	3.204
Kinabatangan	4.63	281	3.415	2.18	266	3.037
Total	6.89	1475	3.194	3.40	1473	3.788

Table 11. National language comprehension scores and levels of education by district.

The figures in Table 11 confirm the fact that subjects on the west coast generally scored better than subjects from other areas of the state. Of the ten districts with the highest average 48 scores, eight are on the west coast. The mean scores for west coast districts are clustered tightly between 8.42 (Sipitang) and 9.54 (Tuaran), while scores for other districts are generally lower and cover a much wider range.

Two possible explanations suggest themselves for this pattern. One would be the traditional importance of Malay, and especially Brunei Malay, as a trade language on the west coast. On the east coast, Suluk (Tausug) was the traditional trade language, and it is still widely understood by other east coast groups. While there are significant differences between local Malay and standard Bahasa Malaysia, fluency in one would certainly enhance comprehension of the other

The second possible reason for higher scores on the west coast is the frequency of contact between people from different language families there, such as between the Dusun and Bajau in Tuaran and Kota Belud (the two districts with the highest average test scores). Malay is the *lingua franca* in these contact situations. This may also account for the relatively high scores in Sandakan and Labad Datu, where there is contact between members of indigenous groups from the interior and the coastal Muslim groups.

The mean scores for Tawau are unexpectedly low This is because no testing was done in the city of Tawau proper The intelligibility

testing in the Tawau district concentrated on the Murutic groups in the remote areas of Kalabakan and Serudung, on the Suluk, and on the Tidung.

4. Interpreting the data

The previous two sections have explored various factors relating to passive bilingualism in rural Sabah, based on the results of comprehension testing. But what do these test scores really mean?

The Casad method, on which the testing procedure was based, was originally designed for testing inherent intelligibility between related dialects. In the case of related dialects, a figure of 80% (8 correct answers out of 10) is a commonly used threshold for defining the limits of effective communication. When members of group A score, on the average, less than 80% on a test from a related dialect, B, the linguistic differences between the two dialects are a significant barrier to communication. Members of group A are unlikely to understand adequately information presented to them in dialect B.

On the other hand, if speakers of A can typically score higher than 80% on dialect B, even when they have never heard B spoken before, then B may be an effective medium for communicating information to members of group A. (In some situations, e.g., between traditional enemies, language attitudes may prevent effective communication even where linguistic differences are small).

If our national language test scores could be evaluated in the same way as inherent intelligibility testing scores, we could use the same threshold figure (8 correct answers out of 10) to define "adequate" (for some purposes) comprehension. However, there are important differences between bilingualism and inherent intelligibility (i.e., intelligibility between related dialects).

Inherent intelligibility is due to linguistic similarity A person's ability to speak his own language automatically allows him to understand, to a certain extent, speakers of related dialects. For this reason, inherent intelligibility tends to be fairly uniform throughout a population. Every member of group A will understand related dialect B more or less equally well.

Bilingualism, on the other hand, is the result of language learning due to a person's experience with the second language. Each individual must learn the second language for himself. Some individuals learn faster than others, and some individuals have far greater exposure to the second language than others. For these reasons, there is typically a wide variation in second language proficiency within a population.

Because inherent intelligibility is relatively uniform within a population, a group's average score on an intelligibility test can be a very useful measurement. However, average scores for an entire population on a bilingualism test are absolutely useless. It is true, but meaningless, to say that the average score state-wide on the Bahasa Malaysia test

was 68.9% (or 6.89 out of 10). Bilingualism test scores must be broken down according to the relevant parameters - age, sex, education, etc. - as in section 3 above.

Another difference between bilingualism and inherent intelligibility has to do with domains of competence. There are generally no domain restrictions on intelligibility based on linguistic similarity. However, bilingual ability is often greater in some situations or semantic domains than in others. A person will use a second language more proficiently in those situations he most frequently confronts in the second language. Thus, even a person who could understand quite well the simple travel narrative used in the national language test may not be able to understand health information, agricultural instruction, political speeches, etc., adequately in Bahasa Malaysia.

In interpreting the results of bilingualism testing it is also important to consider the level of complexity of the test material. A person's ability to understand relatively simple speech tells us very little about his ability to handle more complex material.

Barbara Grimes (in press) has suggested that simple narrative material, like the text used in the Bahasa Malaysia test, requires comprehension ability roughly equivalent to level 2 on the Foreign Service Institute (FSI) scale of second language proficiency. More technical material dealing with health problems, agriculture, politics, etc., would require comprehension ability equivalent to FSI level 3 at least. Another test would have to be designed and carried out to assess comprehension of this kind of material.

Taking all of these factors into consideration, what questions can reasonably be answered based on the national language testing data discussed here? We have said that this test measured only FSI level 2 comprehension, and that the results are valid only for the adult population in rural aras, not for the population of the state as whole.

If we take 80% as a threshold value defining satisfactory comprehension of the test material, the test results provide an answer to this question: what segments of the indigenous adult population in rural areas are able to understand Bahasa Malaysia at least on a level equivalent to FSI level 2? Table 12 presents an answer to this question along the primary parameters of sex and age.

AGE	MEN		WOMEN	
	Fraction	%	Fraction	%
15-29	256/345	74.2	174/293	59.4
30-49	173/348	49.7	62/191	32.5
50^{+}	73/199	36.7	16/91	17.6

Table 12. Proportion of subject scoring 8 out of 10 or better on Bahasa Malaysia comprehension test, by age and sex groups.

Three age groups seem to be most relevant for both comprehension of Bahasa Malaysia and educational level. Table 12 shows that 74.2% of the men under 30 in our sample scored 8 out of 10 or better on the national language test, as compared with 59.4% of the women. In the 30-49 year old group, 49.7% of the men and 32.5% of the women achieved this score, while of subjects over 50, only 36.7% of the men and 17.6% of the women scored as high as 8 out of 10.

To the extent that our sample is representative of the population from which it was drawn, the figures in Table 12 can be read as percentages of the various age and sex groups among the rural indigenous population who are able to understand simple narrative material in Bahasa Malaysia. The corresponding percentages for more complex or technical material would presumably be lower.

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Footnotes

1. The Language Assistant Profile sheets, individual score sheets, wordlists and other raw data collected in the survey have been placed in the Sabah State Archives, and are available for use by other intersted scholars.
2. In this study, the Spearman rank-order correlation coefficient was used. This measurement is non-parametric, so it can handle simple ranking scales (like "extent of travel") as well as true numerical measurements; and it makes no assumptions about the distribution of the data.
3 All correlations are computed for the same sample set, consisting of just those cases for which no data was missing. There were 1048 such cases, out of a total of 1475 subjects tested. Twenty of

the cases, the Suluk sample, was excluded from this part of the study, leaving 1028 cases for the correlation analysis.

4. Significance measured by a 2-tail test. Statistical significance is a measure of the likelihood that an observed pattern is the result of random variation. Sig = .001 says that there is less than 1 chance in 1000 of random events producing an apparent correlation this strong for this many cases. For this part of the study, no correlation values are considered if the significance was greater (i.e., worse) than .001.
5. Student's t is a statistical measurement used to test such hypotheses. The distribution of t allows us to calculate the odds that the apparent difference in scores is purely accidental, the effect of sampling error. For the data on men's and women's scores shown in Table 2, t = 7.22, with 1009 degrees of freedom. The t test used here uses separate estimates of variance for the two subgroups, since the large difference in standard deviations suggests that the variance in scores is different for men and women. The significance rounds off to .0000, meaning that there is essentially no chance that the difference in scores is accidental.
6. For EDU, t = 3.89 with 1451 degrees of freedom. The t test here uses a pooled estimate of variance. Significance = .001. For TRAVEL, t = 7.55 with 1375 degree of freedom.
7. Average scores on the national language test for subjects with no formal education:

	N	MEAN SCORE	STD. DEV
MEN	354	5.66	2.906
WOMEN	312	4.29	3.247
TOTAL	666	5.02	3.144

t = 5.75 with 664 degrees of freedom.

8. The average age of the subjects who called themselves house-wives was 35.8 years; the average level of education was 1.59 years.
9. Average educational level for students was 8.64 years; for businessmen, 7.17 years.
10. Dusun-Murut includes Tambual Murut (see King and King, eds.)