Lexicostatistics of Gayo Language with Mandailing Language

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Abstract: This working paper is a report of research on lexicostatistics of Gayo language with Mandailing language. The research method used in this research is comparative method with lexicostatistics technique. The results of this study show quantitatively shown that closely related kinship relation on cognate percentage of 37% kinship level between Gayo language with Mandailing language. The calculation of the Gayo language split with the Mandailing language was 2,292 thousand years ago. Or, in other words, the computation time of Gayo language with Mandailing language can be declared a single language about 2,292 thousand years ago.

1 INTRODUCTION

Lexicostatistics is a technique that allows us to determine the level of relations between the two languages, using the most convenient way, eg by comparing the vocabulary in those languages which can then be viewed and determined the level of similarity between the vocabulary of the two languages. The thus, the extent to which a kinship relation of one language to another can be known.

All languages of the world, especially in certain regions, have kinship levels including languages in Aceh and in North Sumatra. The kinship rate of a language is based on the resemblance of form and lexical meaning due to direct inheritance. This is in line with those suggested by Keraf (1984: 37) that the basis for establishing kinship levels is the similarity of form and meaning to direct inheritance. Similar word forms between different languages with similar or similar meanings reinforced with similarities of grammatical elements, will lead us to conclude that the languages are derived from the same Proto language. In the Indonesian encyclopaedia mentioned that the words of relatives are words that are still derived from the same source.

In this study, the two languages studied ie Gayo language with Mandailing language which became the target in this study will be proved the level of kinship of both languages. Then proceed with counting the time separation of the two languages.

This research is very important for the preservation of the Gayo regional language with the Mandailing regional language.

2 METHOD

This study was studied using comparative method. The comparative method of comparing 200 of Swadesh's basic vocabulary which is translated in Gayo and Mandailing languages to obtain the related data is analyzed quantitatively using lexicostatic techniques. With this technique can be obtained the number of percentage of each language cognate.

The next step is to calculate the level of kinship of the language compared, with the formula put forward by Keraf, (1984: 172).

$$C = \frac{K}{G} \times 100\% \tag{1}$$

C = kognates or a related word
K = number of related vocabulary
G = number of glos

Then calculate the time separation of the two languages by counting using the formula put forward by (Crowley, 1992: 178; Keraf, 1984: 130).

$$t = \frac{\log c}{2 \log s} \tag{2}$$

t = time of separation in thousands (melenium) years ago
r = retention or percentage constant in 1000, or also called index
c = percentage of relatives
log = logarithm of

The above formula can be completed by going through the stages:

(1) First step, look for the logarithms c and r in the logarithm list

(2) Multiply the logarithm r by 2

(3) The result of logarithm c is divided by the result of (2)

(4) The result of division (3) denotes the time separation in thousands of years. This last result can be converted into regular years after multiplying by 1000 years. Since the separation does not occur within a certain year, it is better to maintain it in the form of thousands of years (melenium).

3 ANALYSIS

Based on the method used above, found a number of vocabulary relatives between Gayo language with Mandailing language.

Table 1. Vocabulary Relatives

No.U/Data	BG	BM	Glos
1/3	uyət	urat	'vein'
2/4	anak	anak	'child'
3/19	bataŋ	bataŋ	'stem'
4/20	atu	batu	'stone'
5/23	bətul	botul	correct'
6/25	bərət	borat	'heavy'
7/30	rəmalan	mardalan	'to walk
8/32	nipi	marmipi	'dream'
9/33	bəlusa	osa	'breath'
10/34	bərpikir	marpikir	'thinking'
11/37	bintaŋ	bintaŋ	'star'
12/38	uah	buah	'fruit'
13/39	ulən	bulan	'moon'
14/41	buŋə	buŋo	'flower'
15/43	buruk	busuk	'rotten'
16/47	danau	danau	'lake'
17/48	rayoh	daroh	'blood'
18/50	uluŋ	buluŋ	'leaf'
19/51	awu	abu	'dust'
20/52	i	i	'in'
21/54	tuyoh	toru	'under'
22/59	roa	dua	'two'
23/60	kunul	hundul	'sit'
24/61	uki	ikur	'tail'
25/62	opat	opat	'four'
26/63	ko	ho	'you'
27/64	sira	sira	'salt'
28/65	ipon	ipon	'tooth'
29/66	gugur	roŋgur	'thunder'
30/68	ate	ate-ate	'liver'
31/69	iyuŋ	iguŋ	'nose'
32/70	etuŋ	etoŋ	'count'
33/74	urən	udan	'rain'
34/82	ralan	dalan	'road'
35/92	kayu	hayu	'wood'
36/94	uluŋ	ulu	'head'
37/95	keriŋ	horiŋ	'dry'
38/96	kilət	kilat	'flash'
39/98	kitə	hita	'us'
40/100	kulit	hulit	'skin'
41/102	kutu	utu	'louse'
42/106	laŋit	laŋit	'sky'
43/107	lut	laut	'sea'
44/111	delah	dila	'tongue'
45/112	maŋan	maŋan	'eat'
46/115	mata	mata	'eye'
47/116	mate	mate	'die'
48/121	manutuŋ	manutuŋ	'burn'
49/122	bəlah	bolah	'crack'
50/125	unuh	mambunuh	'kill'
51/128	pilih	pilih	'chose'
52/131	tanom	mananom	'plant'
53/138	munətok	manoktok	'knock'
54/151	inum	inum	'drink'
55/154	nik	naek	'up'
56/155	gərəl	goar	'name'
57/156	rəŋit	roŋit	'mosquito'

58/157	jəma	jolma	'people'
59/167	uok	obuk	'hair'
60/171	sara	sada	'one'
61/172	aku	au	'I'
62/174	təmuni	tabuni	'hide'
63/175	səmpit	sompit	'narrow'
64/179	bətih	boto	'know'
65/180	tun	taon	'year'
66/181	təjəm	tajom	'sharp'
67/183	tali	tali	'string'
68/184	tanoh	tano	'land'
69/188	pirə	pira	'egg'
70/189	tərbaŋ	habaŋ	'fly'
71/193	tulu	tolu	'three'
72/195	nipis	nipis	'thin'
73/198	tumpul	tuppul	'dull'

3.1 Gayo and Mandailing Language Lexicostatistics

Gayo and Mandailing languages are two closely related languages whose historical relationship is very close. On this occasion will be described quantitative analysis of the relationship between Gayo language with Mandailing language precedes qualitative analysis. The purpose of the quantitative analysis is to find a glimpse of the relation of kinship between the languages compared in order to establish a quantitative family tree diagram. In addition, based on the results obtained at that stage, the next step is taken in the form of qualitative analysis.

Of the two hundred basic words of Swadesh (Blust Revision, 1980), 73 words are found to be related between Gayo and Mandailing languages. Thus we can calculate the kinship rates between the two by using lexicostatic calculations:

Kinship level:

$$C = \frac{K}{G} \times 100\% \qquad (3)$$

C = cognates or a related word
K = number of related vocabulary
G = number of glos

$$= \frac{K}{200} \times 100\% = \frac{73}{200} \times 100\% = 37\%$$

Using a reference from Crowley and Keraf, Gayo languages with Mandailing languages are in the category of a single clump or stock.

3.1.1 Graph of Gayo Language Percentage and Mandailing Language

At this stage can be determined percentage of cognate between the corresponding languages compared can be seen in the following graph :
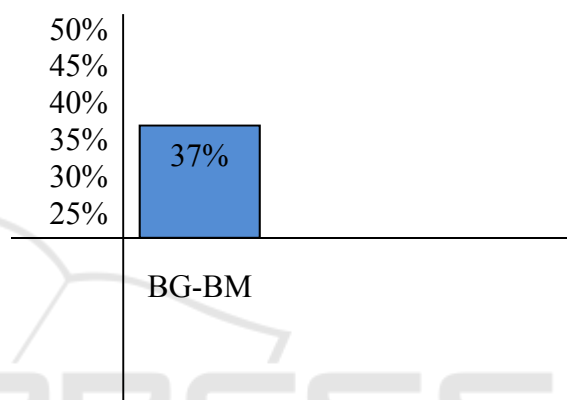

Figure 1: percentage of cognate between the corresponding languages

The graph above shows that the percentage of the word relatives of the Gayo language with the Mandailing language is 37%. Based on percentage comparison, it can be concluded that between Gayo language with Mandailing language have close kinship level.

After knowing the percentage of relatives of the language compared, the next step compiles a genealogy chart (stammbaum) from Gayo and Mandailing languages.

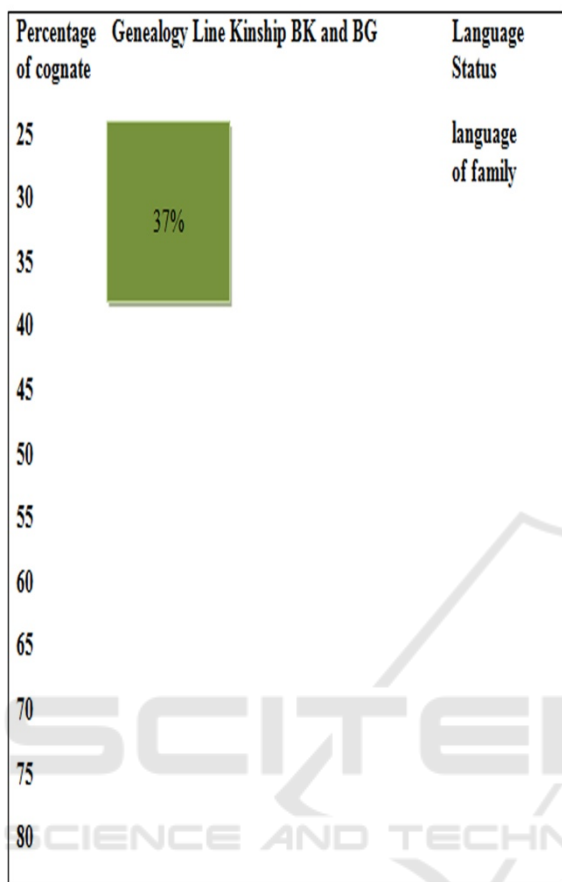### 3.1.2 Genealogical Grotes of Gayo Language and Mandailing Languages

Percentage of cognate	Genealogy Line Kinship BK and BG	Language Status
25		language of family
30	37%	
35		
40		
45		
50		
55		
60		
65		
70		
75		
80		

Figure 2: Percentage of comparison of Gayo language with Mandailing language,

According to Swadesh (1955: 101) if the relationship between languages shows the percentage of cognate from 36% to 80% then the percentage indicates the relationship as a family of language. If the lexicostatistics criterion is applied here, the percentage range between the compared languages is Gayo language with Mandailing language, the percentage number of 37% is as a language-family relation. Thus, the results achieved in this lexicostatistic analysis can be a working hypothesis for the next research phase, that is qualitative analysis.

3.2 Gayo Language Timer with Mandailing Language

To calculate the time separation, used the formula: t =

t = time of separation in thousands (melenium) years ago
r = retention or percentage constant in 1000, or also called index
C = percentage of relatives
Log = logarithm of

$$t = \frac{\log c}{2\log r} \qquad (4)$$

$$= \underline{\log 37\%}$$
$$2 \qquad \log \qquad 80,5\%$$

$$= \underline{-0,431}$$
$$-0,188$$

$$= 2.292 \; thousand \; of \; years$$

The calculation of the Gayo language split with the Mandailing language was 2,292 thousand years ago. Or, in other words, the computation time of Gayo language with Mandailing language can be stated:
1. Gayo language with Mandailing language is considered to be a single language about 2,292 thousand of years ago,
2. Gayo language with Mandailing language is expected to begin to separate from a proto language sometime around the third century BC.

4 CONCLUSIONS

Based on the analysis can be drawn the following conclusions:

4.1 Kinship Level

Both languages that have been studied are Gayo language with Mandailing language has been proven its relation as a related language. Quantitatively it is shown that the kinship relation between Gayo language with Mandailing language 37% of 73 related words, in laminicatatistic classification kinship at 37% level referred to as family status (family).

4.2 Calculation of Language Split Time

The calculation of the Gayo language split with the Mandailing language was 2,292 thousand years ago. Or, in other words, the computation time of Gayo

language with Mandailing language can be declared a single language about 2,292 thousand years ago.

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