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The Language Family Relation of Local Languages in Gorontalo Province: A Lexicostatistic Study

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ABSTRACT

This study aims to find out the relation of language family and glottochronology of Gorontalo language and Atinggola language in Gorontalo Province. The research employed a comparative method, and the research instrument used a list of 200 basic Morris Swadesh vocabularies. The data source was from documents or gloss translation of 200 basic vocabularies and interview of two informants (speakers) of Gorontalo and Atinggola languages. Data analysis was done by using the lexicostatistic technique. There were four indicators used to determine the word family. The results of data analysis reveal that there are 109 or 55.05% word pairs of the word family out of 200 basic vocabularies of Swadesh. From 109 related words, it can be specified by these following results: (a) 10 identical word pairs (5.05%), (b) 26 words of one different phoneme (13.13%), (c) 45 pairs of words with correspondence phonemic (22.73%), (d) 28 words of phonetic equivalent (14.14%). The results of this study also show that the glottochronology of Gorontalo language and Atinggola language are (a) Gorontalo and Atinggola languages are one single language at 1.377 + 122 years ago, (b) Gorontalo and Atinggola languages are one single language at 1.449 - 1.255 years ago. This study concludes that (a) the relation of the kinship of these two languages is in the family group, (b) glottochronology (separation time between Gorontalo language and Atinggola language) is between 1.4 to 1.2 thousand years ago or in the 12th – 14th century.

Keywords: Kinship Level, Lexicostatistics Study, Relation.

1. Introduction

Every region in Indonesia has its own local language, and sometimes even one region has two or more languages that are maintained and used by its speaker within the community. BPS (Statistic Bureau, 2010) through SP2000 and SP2010 documented 1211 languages (1158 local languages), and Gorontalo as one of the provinces in Indonesia with its local language has been included in the data.

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The existence of a large number of local languages is the most prominent asset and plays a vital role in developing Indonesian vocabulary. Therefore, it is imperative to take strategic steps to maintain, preserve and promote local languages.

Given a large number of local languages in the territory of Indonesia, this study is limited to Gorontalo and Atinggola languages in Gorontalo Province. Both languages of this area are used by the people of Gorontalo based on the area where they live. The language of Gorontalo (BG) is used by people who live in Gorontalo city, Gorontalo regency, Boalemo regency, Pohuwato regency, some parts of Bone Bolango regency, and some parts of North Gorontalo regency. Atinggola language, in contrast, is used by people who live in Atinggola sub-district, which is part of North Gorontalo regency. Both languages are produced by the speakers of the community, among others, as a means of communication within the family, community, and ceremonies. However, the use of both languages has currently been influenced by Malay Manado due to the high mobility rate of the opening of Manado land transportation with Gorontalo.

The importance of the role of local languages as defined in the Constitution Article 32 Paragraph (2) affirms that "the State respects and maintains local languages as national cultural treasures." In the Constitution, Chapter XV, Article 36, in its elucidation, states that well-maintained local languages by its speakers would be respected and nurtured by the state because those local languages are part of a living Indonesian culture. The role of local languages in relation to the function of local language itself in inter-ethnic communication in the community is, among others, used as (a) communication tools within the family and community, (b) customary language means, (c) national languages, (d) identity identification and regional pride.

In addition, Mahsun (2000) argues that the functions of local language as one of the decisions in National Language Politics Seminar are: (1) the symbol of regional pride, (2) the symbol of regional identity, (3) a means of communication within the family and local communities. Besides, in relation to the Indonesian language, local languages are functioning as (a) support of national languages; (b) introductory language in primary schools at the beginning level to facilitate the teaching of Indonesian language and other subjects; and (c) development and support of local culture.

Various status and functions of local languages as previously mentioned are expected to be implemented in language life in each region by exploiting the potential in the area itself to the fullest. This is because local language is one of the essential assets for the area. If we look at the context in which these two languages are spoken, the languages of Gorontalo and Atinggola sometimes do not only have the same vocabulary, but also the different ones. Therefore, Bynon (1979) and Saussure (1988) confirm that sound changes in the form of correspondence can be viewed from linguistics and geography. For that reason, it is necessary to conduct an in-depth assessment of both languages. One form of assessment is undertaken, among others, through research "Historical Relation of Local Language in Gorontalo Province (A Lexicostatistic Study)."

Lexicostatistic is a technique of grouping language, which is more likely to prioritize the study of words (lexicon) statistically and set the grouping based on the percentage of similarities and differences of a language from other languages (Keraf, 1991). This study was conducted to find out the relationship between the two languages that can be viewed by the form of vocabulary and its meaning. In Gorontalo and Atinggola languages, in addition to the same or similar words, there are also different words from both languages. The existence of a vocabulary that has the same or similar form indicates a feature that both languages have a kinship. Language family can be studied both in terms of phonological and morphological. Chaer (2007, p. 104) points out that "the language family study looks for phonological and morphological equations of the language family and makes the proto-reconstructions of languages of the language family". Nothofer cited in Sastra (1993) also states that when languages are related, the language comparison can be done with the principle of sound regularity.

This research is expected to reveal the basic origin vocabulary and how the family relation of the two languages is. This is important due to some consideration, including (a) as one of the efforts of preserving the two languages through the documentation of the related word list, (b) the decline in the number of speakers of the local languages, (c) the insistence of Malay Manado or other languages, (d) the use of the language of this region began to decline, (e) there is currently no research that examines the kinship of these two languages.

The problem statements of this study are (a) what is the relation of Gorontalo language and Atinggola language family level? (b) what is the glottochronology between Gorontalo language and Atinggola language? The aims of this study are (a) finding the relation of Gorontalo language and Atinggola language family levels, (b) determining the glottochronology between Gorontalo language and Atinggola language.

Further, the benefits of this study are (a) the documentation of local languages (Gorontalo and Atinggola languages) as one of the language preservation efforts used by the people of Gorontalo in general, and especially for its speakers, (b) as a reference in the learning related to the local content curriculum in the Province of Gorontalo.

2. Literature review

2.1 The nature of comparative historical linguistics

Comparative historical linguistics is a branch of linguistics that discusses about language in the field of time and the changes in the language elements that occur within that particular field of time. The data of a language from two or more periods are compared carefully to obtain the rules of change that occur in that language (Keraf, 1991).

To compare two or more languages, one of the approaches found in historical comparative linguistic studies is lexicostatistics. Lexicostatistic is one approach in the study of comparative historical linguistics that according to Keraf (1991), lexicostatistic is a technique in grouping the languages that tend to prioritize the observation of words (lexicon) statistically in order to define the grouping based on the percentage of similarities and differences of a language from other languages. Fernandes (1993) notes that lexicostatistics is a technique capable of determining kinship rankings between two or more languages by comparing vocabulary and determining the extent of similarity that exists: a technique for grouping a language family. This theory is reinforced by Dyen (1965) who reveals the theory of the place and origin of Austronesian languages by using lexicostatistics approach.

2.1.1 Basic lexicostatistical assumptions

According to Keraf (1991), the underlying assumptions of lexicostatistic are described as follows:

1) Some vocabularies of a language are very difficult to change when compared to other parts.
2) The retention of the basic vocabulary is constant throughout the ages.
3) The basic vocabulary changes in all languages are the same.
4) If the percentage of two language families is known, then it can be calculated when the two languages are separated.

Based on that principle, the separation time of the two language families with the percentage of known language family is shown in the table below.

Table 2.1: Language family relation

Word family number between A - B	Percentage of word family	The separation time between language A – B in the past (divided into 2)
200-162	100-81	0 -500
162-132	81-66	500-1.000
132-106	66-53	1.000-1.500
106-86	53-43	1500-2000
86-70	43-35	2000-2500
70-56	35-28	2500-3000
56-44	28-22	3000-3500
44-36	22-18	3500-4000
36-30	18-15	4000-4500
30-24	15-12	4500-5000

Source: Keraf (1991, p. 125)

The percentage of word retention of word family every thousand years rounded up to 81%. The age of separation in thousands of years should be divided by two because each language in a thousand years will lose 19%. This is in accordance with the opinion of Swadesh (1952) and Hockett (1963) that the change in vocabulary generally reaches between 19% in every thousand years or is able to survive between 81%. In addition, Keraf (1991) suggests that one of the underlying lexicostatistical assumptions is that the basic vocabulary changes in all languages are the same. It has been tested in 13 languages, and the results show that in every 1000 years, the basic vocabulary of a language survives between 86.4-74.4% or with an average of 80.5%.

2.1.1 The implementation procedures of Lexico statistic technique

The steps of applying lexicostatistic techniques are shown as follows (Keraf, 1991).

1) Collecting the basic vocabulary of the related language.
2) Counting the word family.
3) Calculating the percentage of kinship based on predetermined word family, to determine the kinship level of the language.
4) Calculating the age or separation time between the two languages.
5) Calculating the error term to determine the possibility of a more precise separation time.

2.2 The Nature of language family

One of the languages that can be used to interact with others in the social environment is the local language. The local languages spoken by people in each of these regions sometimes have similarities in both form and meaning. Such conditions indicate that the language has a kinship relationship. Mbete (1990) points out that the appearance of the same inherited traits in language family can reveal the closeness of the kinship of the languages, and the proto language system can also be traced.

Language family is a branch of linguistics that traces the relationship between a language with one another in terms of phonological and morphological aspects. According to Kridalaksana (2008), language family is the relationship between two or more languages derived from the same source called ancient language. This study of language family aims to see the level of kinship of comparable language relations. Comparable languages can be viewed from the similarity of form and meaning. A calculation is then carried out to determine the kinship level of the languages.

Word family or cognate words are used to identify groupings or subgroups of comparable languages. Bellwood (2000) suggests that cognition is a word for having equivalence of meaning and sound considered to have been derived from a mother tongue to one or more derivative languages and not a borrowed word from an outside language.

A language can be said to be related to another language if it shows kinship indicators. Keraf (1991) suggests four language family indicators.

1) Identical
2) Having a phonemic correspondence
3) Phonetic resemblance
4) One different phoneme

Those indicators require accuracy and thoroughness in determining language family. The determination of the percentage of word family can be accomplished by identifying all pairs of word family based on the four indicators.

The formula of calculating the percentage of word family is shown as follows: $C = \frac{K}{G} x\ 100\ \%$

Information:

C = word family

K = number of word family

G = number of words counted

Status or size between languages and other languages is through grouping by kinship category. Below is the category of kinship language level.

Tabel 2.2: The level of language family

Language Level	Word Family Percentage
language	81 above
family	37-80
stock	12-36
Microphylum	4-11
Mesophylum	1-3
Macro phylum	1 below

Source: Keraf (1991, p. 135).

2.3 The calculation of age and separation time of language

The determination of language age is accomplished by looking at the relationship between a proto-language with the language family. Parera (1991) mentions the term of language separation that the language age and separation time is the time of the separation of a language from its origin. The separation time in question is the age or time of the language family apart from the language origin or proto-language.

According to Keraf (1991), the calculation of language age between languages with each other can be done by using the following formula:

$$W = \frac{\log C}{2 \log r}$$

Information:
W = length of time apart in units of thousands of years ago
C = the percentage of related spoken words of two languages
r = retention, i.e. a constant percentage in 1000 years.
Log = logarithm
The stages of completion of the above formula are explained as follows.
a. Looking for logarithms C and r in the logarithm list
b. The logarithm r is multiplied by 2
c. The result of logarithm C is divided by the result of (b)
d. The result of division of (no.c) shows the separation time in thousands of years

2.4 Error count calculation

The separation between the two languages takes place gradually, so that specific counts are necessary to avoid mistakes. Keraf (1991) proposes statistical techniques to calculate the error term with the following formula:

$$S = \sqrt{\frac{C(1-C)}{n}}$$

S = standard error in percentage of word family
C = percentage of word family
n = number of comparable words (both family and non-word family)
Below is the procedure of the calculation formula above.
(1) Subtracted by C;
(2) C is multiplied by the result of (1);
(3) Results of 2 divided by n;
(4) Drawing the root of the result of 3;
(5) The result of 4 is the error term of the percentage of the word family

With the results obtained in (4) above, the standard error calculation in a year is accomplished by the following steps:

1) The error period of the word family percentage of (4) added to C;
2) Amounts in (1) are treated as new C, to be included in the time calculation formula;

3) The new time calculation as obtained in (2) is reduced by the first amount of time (see no.c). This new number is added and subtracted by the first number (from c) to obtain the error term from the actual state.

3. Research methodology

3.1 Method

The method employed in this study was a comparative method with lexicostatistic technique. This technique was used to trace and determine the language family relation and separation time between Gorontalo and Atinggola languages.

3.2 Sites and data source

The site of this study was in Gorontalo Province, including Gorontalo language spoken in Gorontalo city and regency of Gorontalo, and Atinggola language spoken in Atinggola sub-district, North Gorontalo regency. Sources of data involved the recording or 200 gloss translations from informants (speakers) of Gorontalo language and Atinggola language. Another source of data was the results of an interview with the informants. The criteria of informants who became the source of data were the speakers in accordance with the requirements presented by Mahsun (2007) are: (a) male or female; (b) aged between 25-65 years (not senile); (c) the parents, spouses or husbands of the informants were born and raised in the village and rarely or never leave their village; (d) having minimum completed education of primary and secondary education (primary to junior high school); (e) medium social status (not low or not high) in the expectation of not being too high in mobility; (f) farming or labor; (g) having pride in its isolation; (h) physically and mentally healthy. To complement the criteria, this study adds other criteria regarding the objectives of this study, including: (i) being able to speak Gorontalo and Atinggola languages fluently; (j) understanding and speaking Indonesian well.

3.3 Technique of data collection

The data were collected from observation, translation, and interview. Observation was conducted to observe and determine appropriate informants and in accordance with the region and criteria that had been set. Translation was intended to obtain the data directly from the informant through the gloss translation of 200 basic vocabulary of Gorontalo and Atinggola language. Interviews were conducted directly with the informants to obtain clarity and clarification of data obtained from translations.

The techniques used in data collection were:

a. Observation Technique: to observe and determine appropriate informants and in accordance with predetermined areas and criteria.
b. Translation technique: to obtain data directly from the informant through gloss translation gloss basic vocabulary using BG (Gorontalo language) and BA (Atinggola language).
c. Interview technique: conducted by way of direct interviewing the informants in the selected village used as the source of data in order to obtain clarity and clarification of data obtained from the translation.

3.4 Technique of data analysis

Techniques of analyzing data are based on the lexicostatistic stages (Keraf, 1991). The data analysis steps are explained as follows.

1. Calculating basic word family

Below are the procedures performed in calculating the word family:

a) Removing the unaccounted gloss
b) Isolating bound morphemes
c) Setting the word family
d) Calculating the percentage of kinship by using the following formula

$$\frac{\text{Numbers of words family x 100\%}}{\text{Numbers of comparable words}} = \ldots \% \text{ (kinship percentage)}$$

2. Determining the categories of kinship level

Procedures performed in calculating the related or word family, including a) removing the unaccounted gloss translations; b) isolating bound morpheme; c) determining the word of kin. The language family indicator is (a) the pair is identical, (b) having phonemic correspondence, (c) having a phonetic similarity, and (d) a different phoneme; d) calculating the percentage of kinship based on the word family that has been established using the following formula:

$$\frac{\text{Numbers of words family x 100\%}}{\text{Numbers of comparable words}} = \ldots \% \text{ (kinship percentage)}$$

3. Calculating the age and separation time of both languages with the following formula:

$$W = \frac{\log C}{2 \log r}$$

4. Calculating the error term using the formula: $S = \sqrt{\frac{c\ (1-c)}{n}}$

5. Analysis conclusion

4. Findings and discussion

4.1 Kinship relation of Gorontalo language and Atinggola language

a. Determining basic word family

1) Uncounted gloss translations

Based on 200 Swadesh vocabularies that have been translated into Gorontalo language and Atinggola language, there are two glosses that cannot be counted as displayed in the table below.

Table 4.1: Uncounted gloss translation

No	Word List Number	Gloss	Gorontalo language	Atinggola language
1	24	several	0	0
2	1 and 55	/abu/ = /debu/	Peyahu'o	Peyabu'o

Gloss no. 24 includes an empty gloss because it does not have a pair either in BG or BA. Both gloss, / abu / and / debu / in Gorontalo language are / peyahu'o /, and / peyabu'o /in Atinggola language. Both have different but equally meaningful forms, therefore, only gloss no. 1 / abu / is selected.

2) Determination of the word family

The determination of kinship is based on the language family indicator, namely: (a) the pair is identical, (b) having one different phoneme, (c) having phonemic correspondence, and (c) having a phonetic similarity (Keraf, 1991).

a) Identical pairs

The identical word pairs are pairs of words in which all of the same formed phonemes can be viewed in the table below.

Table 4.2: Identical word pairs

No	Word List Number	Gloss	Gorontalo Language	Atinggola Language
1	4	Aku [I]	Wa'u	Wa'u
2	44	Burung [bird]	buurungi	buurungi
3	71	Engkau [you]	Yio	Yi'o
4	87	Hitam [black]	Yitomo	Yitomo
5	106	Kami, kita [we]	ami	ami
6	109	Karena [because]	Karna	Karna
7	120	Kutu [louse]	Utu	Utu
8	136	Makan [to eat]	Monga	Monga
9	148	Nyanyi [to sing]	Manyanyi	Manyanyi
10	177	tahun [year]	tawunu	tawunu

b) One different phoneme

Pairs of words that have one different phoneme are presented in the table below.

Table 4.3: Word pairs with one different phoneme

No	Word List Number	Gloss	BG	BA
1	1	abu [dust]	Peyahu'o	Peyabu'o
2	12	asap [smoke]	polo'o	poho'o
3	23	Batu [stone]	botu	batu
4	27	Benih [seed]	Bili	bini
5	28	bengkak[swollen]	matango	mantango
6	35	Binatang[animal]	Binaatangi	Binaatango
7	41	Bunuh [to kill]	patea	Pateo
8	46	Cacing [worm]	luwanti	ruwanti
9	52	darah[blood]	Duhu	Dugu
10	53	Datang [to come]	mona'omai	Mora'omai
11	70	empat[four]	Wopato	Opato
12	85	Hijau [green]	moidu	moido
13	100	Jantung [heart]	Putu	Pusu
14	108	kanan[right]	olowala	olowana
15	110	kata (ber) [to say]	Lo'ia	Moroia
16	118	Kulit [skin]	Alipo	Aripo
17	129	Lidah [tongue]	Dila	Dira
18	134	Lutut [knee]	hu'u	bu'u
19	138	Mata [eye]	Mato	Mata
20	150	Panas [hot]	Patu	Pasu
21	152	Pasir [sand]	hungayo	bungayo
22	158	Pikir [to think]	Pikilangi	Pikirangi
23	164	Rambut [hair]	huwo'o	buwo'o
24	167	sayap[wing]	polipi'o	poripi'o
25	180	Tanah [land]	huta	buta
26	192	Tikam [to stab]	Ngamo	Ngamuo

c) Word pairs with phonemic correspondence are shown in the following table.

Table 4.4: Word pairs with phonemic correspondence

No	Word List Number	Gloss	Gorontalo Language	Atinggola Language
1	2	Air [water]	taluhu	sarugo
2	3	Akar [root]	wua'ata	wa' ato
3	7	Angin [wind]	Dupoto	Hibuto
4	19	Bapak [father]	Tiyamo	Siyama
5	22	Basah [wet]	bata	bisao
6	31	Berat [heavy]	buheto	Bogato
7	33	Besar [big]	Damango	Sorago
8	37	Buah [fruit]	hungo	bunga
9	38	Bulan [moon]	Hulalo	Bura
10	40	Bunga[flower]	hula'o	buha'o
11	45	Busuk [rotten]	Hutodu	Butodo
12	50	Dan [and]	Wawu	Agu
13	68	Duduk [to sit]	hulo'o	tu'o
14	76	gigi[tooth]	dungito	Ngipo
15	79	Gunung [mount]	hu'idu	Bu'ido
16	91	Ia [he/she]	tio	ota

17	94	Ikat [to tie]	Tihuto	Sigoto
18	95	istri[wife]	Dile	dere
19	97	Itu [that]	uyito	Bayitu
20	99	Jalan [street]	Dalalo	Dara
21	125	Leher [neck]	bulo'o	Tigogo
22	126	lelaki[man]	Talolai	rora'i
23	132	Ludah [saliva]	Yiohu	Duha
24	144	mulut[mouth]	Ngango	ngusu
25	145	Muntah [puke]	tu'o	su'a
26	151	Panjang [long]	haya'o	Sahato
27	163	Putih [white]	puti'o	Moputi
28	165	Rumput [grass]	hu'oyoto	Hi'uto
29	166	satu[one]	Tuwawu	Hobatu
30	176	Tahu [to know]	Otawa	Motawu
31	183	Tebal [thick]	Hulodu	Bunodo
32	184	Telinga [ear]	Bulonga	bongora
33	186	Terbang [to fly]	Tumboto	rumayugo
34	188	Tetek [breast]	Tutu	Susu
35	194	Tiup[to blow]	Hiipo	Hiupa
36	195	Tongkat[stick]	tuunggudu	sungkudo
37	200	Usus [intestine]	Tonia	Tinai

d) Word pairs with phonetic similarity

Word pairs with phonetic similarity are presented in the table below.

Table 4.5: Word pairs with phonetic similarity

No	Word List Number	Gloss	Gorontalo Language	Atinggola Language
1	6	Anak [child]	Wala'o	ana'o
2	10	Api [fire]	tulu	ruto
3	11	Apung [to float]	Lantungo	Ranta-ranta'o
4	21	Baru [new]	bohu	bagu
5	25	belah (me)/ [to cut]	Buta'o	Momota'o
6	29	Berenang [to swim]	Mololangi	Moninangi
7	30	Berjalan [to walk]	Na'o	Morora'o
8	58	Dengar [to hear]	Dungohi	Dongoga
9	66	Dorong [to push]	Wuntude	Undudo
10	78	Gosok [to brush]	Hihito	Gigisa
11	83	hidung[nose]	Wulingo	Uingo
12	86	Hisap [to suck]	Intopo	Insopa
13	114	Kering [dry]	hengu	gango
14	115	Kiri [left]	oloihi	oroigi
15	119	Kuning [yellow]	Lalahu	Dahago
16	122	langit[sky]	hulungo	gorungo
17	123	Laut [sea]	deheto	dagato
18	124	Lebar [wide]	Tanggalo	Tangkaro
19	127	Lempar [to throw]	Dembengo	Dampengo
20	131	Lima [five]	Limo	Rima
21	133	Lurus [straight]	Tulidu	Turido
22	143	minum [to drink]	mongilu	monginumo
23	175	Tajam [sharp]	Lalito	Ranito
24	182	Tarik [to pull]	Bantango	Pantango
25	191	tiga[three]	Totolu	Toru
26	197	Tulang [bone]	Tulalo	Tura

b. Percentage determination of word family

The results of the analysis indicate that from the 200 words (Swadesh), the number of words that have complete word pairs in Gorontalo and Atinggola languages are 198, including 89 unrelated words and 109 related words with the following details.

1) 10 identical pairs: $\frac{10 \times 100\ \%}{198}$ =5.05%
2) 26 word pairs of one different phoneme: $\frac{26 \times 100\ \%}{198}$ =13.13%
3) 45 word pairs with phonemic correspondence: $\frac{45 \times 100\ \%}{198}$ =22.73%
4) 28 word pairs of phonetic similarity: $\frac{28 \times 100\ \%}{198}$ = 14.14%

Thus, there is 109-word family in total or 55.05%, and the relation kinship level between Gorontalo language and Atinggola language is in the category of the language family. This is because in the theory proposed by Keraf (1991), the percentage of word family is between 37 –80 for defining a language family.

4.2 Glottochronology determination (Age and separation time between Gorontalo language and Atinggola language)

The separation time between Gorontalo language and Atinggola language employs the following formula.

$$W=\frac{\log C}{2 \log r}$$

Known: C = 55.05% = 0.55

r= 80.5% = 0.805

$$W=\frac{\log 0.55}{2 \log 0.0805} = \frac{-0,598}{2x(-0,217)} = \frac{-0,598}{0.434} = 1.377$$

Given the calculation above, it can be concluded that the separation time of the two languages is 1,377 years ago. Accordingly, the separation time between Gorontalo language and Atinggola language can be considered a single language about 1.3 millennia ago (one thousand and three hundred years ago). Since the separation between two languages is impossible in a given year of 1.377 years ago, a period of separation of the languages must be established. Therefore, in order to avoid an error, statistical techniques are still required to calculate the error term (Keraf, 1991).

4.3 The calculation of error term

The technique used to avoid errors in statistics is to give an estimate that something occurs not in a certain time, but within a certain period of time. To calculate the error term, the following formula is utilized:

$$S = \sqrt{\frac{c\ (1-c)}{n}}$$

Known: C = 55.05% = 0, 55

n = 198

$$S=\sqrt{\frac{0.55\ (1-0.55)}{198}} = \sqrt{\frac{0.55 \times 0.45}{198}} = \sqrt{\frac{0.2475}{198}} = \sqrt{0.00125} = 0.035 \text{ (rounded up as 0.03).}$$

The result of the error term calculation in that formula is summed up with the percentage of the word family to get the new C, so that it becomes: 0.03 + 0.55 = 0.58. The result of this new C calculation becomes the basis for determining the split time between both languages by using the time-separation formula as follows. So:

$$W=\frac{\log C}{2 \log r} = \frac{\log 0.58}{2 \log 0.805} = \frac{0.545}{2x(-0.217)} = \frac{0.545}{0.434} = 1.255 \text{ years ago.}$$

The calculation result of the formula above is then used to calculate the error term by: the old time reduced by new time so that the result: 1.377- 1.255 = 0.122 = 122. This figure should be added and reduced by an old time to get the age or time separation of both languages.

Based on the mentioned results, it can be claimed that the ages of both languages are as follows:

(a) Gorontalo language and Atinggola language were single languages at 1.377 + 122 years ago. This means BG and BA are single languages at 1.377 years ago with an error term of + 122).

(b) Both languages were single languages at 1.449 – 1.255 years ago. (1.449 = (1.377 + 0.122) – 1.255 = (1.377-0.122).

(c) The two languages began to separate from a proto language between 1.4 - 1.2 millennia or 14-12 centuries ago.

Given that the separation time of the two languages cannot be calculated by the absolute year, it is better to use thousands of years (millennium) or hundreds of years (century) units. Therefore, the separation numbers between the two languages mentioned above should be read as 1.4 – 1.2 thousand years ago or 14 - 12 centuries ago (Keraf, 1991).

5. Conclusion

The conclusions that can be drawn from the results of this study are:

1) The relation of kinship level of Gorontalo language and Atinggola language in Gorontalo Province can be classified into the level of language family. This is evidenced by the presence of 109 word pairs of words family or 55.05% with details, including (a) 10 identical word pairs (5.05%), (b) 26 words of one different phoneme (13.13%), (c) 45 pairs of words with correspondence phonemic (22.73%), and (d) 28 words of phonetic equivalent (14.14%).

2) Gorontalo language and Atinggola language were single languages at 1.449 – 1.255 years ago. Both languages began to separate from a proto language between 1.4 - 1.2 thousand years or 14-12 centuries ago.

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