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LEXICOSTATISTICS OF MALAY AND MALAGASY LANGUAGES: COMPARATIVE HISTORICAL LINGUISTIC STUDY

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Abstract: This study examines the kinship of the Malay language and the Malagasy language. These two languages come from the same proto language, namely Proto Austronesian (PAN). Departing from the researchers' assumptions about the linguistic relationship both at the phoneme and morpheme levels, there is a close kinship system or relationship between these two languages. Even though they are geographically and geo-politically separated, preliminary research on these two languages shows several universal features, one of which is that both languages are agglutinative languages. Therefore, this study is an attempt to find empirical evidence about the separation time between Malay and Malagasy by using language grouping methods and lexicostatistical techniques. The first stage, the researchers collect 300 basic vocabularies compiled by Swadesh (1995). The method used in providing the data is the referential method, while the technique used is the note-taking technique. Second, the researchers determine which pairs of the two languages are cognate languages. Third, the researchers calculate the age and separation time of the two languages. Fourth, the researchers calculate the error term to determine a more precise separation time. The result of this research indicates that Malay and Malagasy were a single language at 4223-3951 thousand years ago and began to separate from their proto languages in 2201-1929 BC.
Keywords: *comparative historical linguistics; kinship; lexicostatistics; Malagasy language; Malay language.*

INTRODUCTION

History reveals there is a strong and pivotal relationship between Madagascar and Indonesia. Some scientific and academic evidences unveil that the ancestors of the Madagascar people came from the archipelago. In addition to the similarities in the physiology of the people with Indonesian, another similarity is found in the language. Madagascar's official language is Malagasy, which is believed to be similar to other Indonesian languages, such as Banjarese Malay, Dayak, and some Sabah languages in Malaysia. Ducros (2018) argues that the Malagasy language comes from the Southeastern Barito language in Borneo, Kalimantan. This is also approved by Serva & Pasquini (2020) who highlighted that Malagasy has a very strong connection to one of the languages in Indonesia. In addition to the previous fact, Beaujard (2011) and Serva *et al.* (2013) in their researches attempt to investigate historically about the early migration of Indonesian people to Madagascar in accordance with what has been done by Dahl (2011) in his previous research in the same scientific area. The opinion of these experts concludes from some forensic linguistic evidences in which it is true that the Malagasy language originated in Borneo. It is estimated that the first Indonesians got to Madagascar by sea about one thousand to two thousand years ago. The most likely explanation about the ancestors of the

Madagascar is that they did not sail alone but were brought as slaves by Malay sailors. Evidences from other studies say that the Madagascar community comes from approximately 30 women from Indonesia (Ramanantsoa *et al.*, 2021) and this has been concurred by Goodman & Jungers (2018) and Serva (2018). The most recent study on this area was written by Serva & Pasquini (2022) who concur that Malagasy language was initially identified as a member of the Austronesian Family around the beginning of the 17th century. It is particularly similar to several of the languages spoken in Indonesia. Dahl, who in 1951 clearly established a startling kinship with Maanyan, spoken in the South-East of Kalimantan, is responsible for the connection to a specific Indonesian language. The introduction of Bantu terminology has been extremely restricted; in contrast, the genetic makeup of the Malagasy people is primarily African and Indonesian. While linguistics and genetics concur that Indonesian sailors colonized Madagascar in the second half of the first millennium, they dispute on the significance of East Africa in this process.

The facts above are very interesting to be studied further from a linguistic perspective as said by Dardanila *et al.* (2020) that an analytical approach was carried out to know how far the historical relations of one language with another were compared. It is enhanced further by Aminin & Dacholfany (2021) who state that related languages have their history of development that needs to be studied historically. Therefore, the Comparative Historical Linguistic Study tries to connect and relate the points of knowledge that are still tenuous in discussing the kinship of the Malay language used in Indonesia with the Malagasy language. As two languages that come from the Austronesian family, and have the same type, namely Agglutinative, then the search for language kinship, the time of separation of languages and when these two languages are in the same family need to be studied more deeply.

Researches related to lexicostatistics in the Proto Austronesian family (PAN) only focus on the comparison of languages in the archipelago, and only a few discuss other languages such as Malagasy, Cebuano, Ilokano, and the Austronesian language family located in Pacific Island countries. Therefore, this research tries to fill the gap in knowledge related to the discussion in the same area.

Some studies on lexicostatistics have been carried out, such as Reid (2018; 2017) attempts to research the Philippine language as one of the Austronesian languages and the result of the research which breaks the assumption that Tagalog has more words related to Ilokano than Bikolano, but it unveils that Tagalog, Ilokano, and Bikolano have the same proportion of cognates. Current research on another lexicostatistics study conducted by Wardana *et al.* (2022) which discovered that The results of this study indicate that Malay and Tagalog share about 28% of words that are related and fall into the category of Stock Clumps. Other results also show that Malay and Ilocano historically and linguistically are closer and classified as category of language stock with the cognate or related words as much as 31%. Meanwhile, research conducted by Sofiyatunnida & Hendrokumoro (2021) on lexicostatistics of Malay and Mandailing reveals that Batak Mandailing and Malay have a percentage of 58% kinship. Based on lexicostatistical calculations of 200 lists of Swadesh's vocabulary in Batak Mandailing and Malay, 114 kinship vocabularies and 84 non-relative vocabularies are found. The conclusion of this research is that Batak Mandailing and Malay are related and belong to the language family level. Another study on Malay was conducted by Istiqamah (2017) who claims that that (1) the kinship level of Acehnese language with Malay is 48.4%, (2) Acehnese language and Malay began to separate from its proton language (parent language) since 1,635 years ago, (3) the Acehnese language with the Malay language is included in the classification of the language family. Further research about Lexicostatistics is presented by Mbangi & Marafad (2018) which found that According to the analysis's findings, which were based on the lexicostatistic technique, there is a quantitative 39% vocabulary similarity between the Tolaki and Culambacu languages. Both languages diverged from a protolanguage around 230–307 years ago.

Abner *et al.* (2020) reveal that the study of sign language families and histories is less advanced and suggest a lexicostatistic analysis utilizing modern quantitative techniques and discuss the tools and techniques for annotation that can make this approach easier. Another research on Austronesian language that is close to both Indonesian Language and Malagasy Language is conducted by Paul & Ralalaoherivony (2020) and Cole & Hermon (2018) which presented in a thorough investigation of the languages spoken in the Philippine territory of the Zambales Mountains, a lexicostatistic survey was carried out. Six separate languages were defined as a result of the survey, which involved the gathering and analysis of about forty-word lists in a region where the linguistic situation was previously mostly

unknown. This article proposes a general-use computer software that significantly improved the accuracy and speed of the lexicostatistic analysis and presents the survey results as a language tree. Arokoyo & Lagunju (2019) examine African languages of Yorùbá, Àkúrẹ́ and Ìkàrẹ́ Àkókó Dialects and discovered that Standard Yorùbá and kré had a greater cognate percentage (86.40%), followed by kàré, kókó, and kré (74.60%), and Standard Yorùbá and kàré, kókó (78.90% cognates). This study found that Standard Yorùbá and kré have a higher degree of mutual intelligibility than Standard Yorùbá and kàré kókó, although kàré kókó and kré have a lower level of mutual intelligibility. Adjacent to this research, Hendrokumoro & Temaja (2019) conducted a study on Malagasy and Ma'anyan language and revealed that the findings show that both languages' lexicostatistical cognate percentage is 37%. The two languages diverged from their protolanguage between 273 BC and 94 CE, according to glottochronology calculations (2018). Four different types of sound modifications and seven sets of sound correspondence are found qualitatively. Nurhayati (2017) in her findings indicate that the Malay (Indonesian) and Bugis languages are related. There are 72 terms in the Bugis language that are kin to words in the Indonesian language. There are 14 similarly identical words among the 72 comparable words, as well as insertions, metathesis, sound modifications, sound increments, and sound disappearances. Based on these findings, it was also discovered that the Malay language (Indonesian), along with the Bugis language, split out from their parent language 414 years ago. Last but not least, Ntelu (2017) exposed that The findings of this study further demonstrate that the glottochronology of the Gorontalo and Atinggola languages is as follows: (a) at 1.377 + 122 years ago, Gorontalo and Atinggola languages were one single language; (b) at 1.449 - 1.255 years ago. The study's findings are (a) that these two languages are related through kinship and (b) that the separation of the Gorontalo and Atinggola languages occurred between 1.4 and 1.2 thousand years ago, or in the 12th to 14th century.

Lexicostatistics technique not only serves to determine the percentage of related words and calculate language age, but can also be used for grouping kin languages. Languages that show a high percentage of kinship are groups that are closer in membership, while those with a low percentage of kinship are groups whose membership level or kinship is more distant. According to Keraf (in Indrariani, 2017) Lexicostatistics is a technique in language grouping that tends to prioritize statistically observing words (lexicon). Meanwhile, Glottochronology groups the lexicon between languages to calculate the age of related languages. This echoes Starostin (2013) about Both "glottochronology" and "lexicostatistics," two approaches originally put forth by Swadesh in (Suzuki, 2019) to construct relative genetic classifications of languages based on percentages of related items in their basic lexicons, have not been particularly well-liked by mainstream comparative linguists because of an early set of critical works that called into question their general veracity. The majority of lexicostatistical research is avowedly quantitative; it has primarily focused on analyzing pairwise comparisons of languages to determine the percentage of cognate forms they contain and has built trees from the results of these pairwise comparisons, which are then presented in matrices or are displayed in tree-like cladograms after being expressed in tables of percentages (Grant, 2010).

Swadesh (1995) proposed a classification of language kinship systems, namely:

Table 1. *Classification of language kinship systems (Keraf, in Indrariani 2017)*

Language Level	Separation Time in Centuries	Percentage of Relatives
Language	0-5	100-81
Language Family	5-25	81-36
Stock	25-50	36-12
Micro Phylum	50-75	12-4
Meso Phylum	75-100	4-1
Macro Phylum	100-more	1-less than1%

METHOD

This research was examined using language grouping methods and lexicostatistical techniques. The first stage, the researchers collect 207 basic vocabularies compiled by Swadesh (1955). The method used in providing this data is a referential method, while the technique used is a note-taking technique (Kesuma, 2007, p.48; Sudaryanto, 1993, pp.13-16; Sudaryanto, 1988, p.5). Second, determine the word kin (cognate) to find the percentage of kinship from the three languages by classifying based on: (a) identical pairs, (b) phonemic correspondence pairs, (c) phonetically similar pairs, (d) different pairs. one phoneme. Third, calculate the age and separation time of the three languages and also calculate the error range to determine a more precise separation time. Fourth, the preparation of the classification of kinship systems, whether as one language

(language), language family (subfamily), language family (stock), micro phylum, meso phylum, or macro phylum (Keraf, 1996).

RESULTS AND DISCUSSION

Based on the cognate percentage, Malay and Malagasy are included in the Family of stock family with the word relatives reaching up to 16.5%. Loanwords from Malay and (to a lesser extent) Javanese have been incorporated into Malagasy, and they occasionally refer to historical details that historians, archaeologists, and anthropologists were previously unaware of competent to establish Loanwords indicate that the earliest Malagasy settlers in the East. The Malays had already established contact with Africa during the Malay Era. Madagascar contacts took a while. This time frame began prior to the move. until after interactions between Austronesians and East Africans, when Madagascar has a multicultural society as a result of the presence of Africans (mostly Bantus). We are able to phase Malay-Malagasy encounters because of two factors. a number of time periods, including the appearance of Banjarese Malay loanwords and the Malay loanwords that haven't undergone any significant etymological phonological alterations. When the first European settlers arrived, Malay had surpassed Chinese as the primary interethnic language in Southeast Asia and beyond. It served as the interethnic commerce language, but it had also evolved into the language of Islam, probably because Muslim traders from the Middle East and India were the first to introduce Islam to the harbor towns of the archipelago.

Malacca's status as the epicenter of Islamic Malay culture was terminated by the entrance of the Portuguese. The position of the Malay was unaffected. The nature of the Portuguese Reconquista required them to go beyond trade because they had been fighting the "Moors" both inside and outside of Portugal for ages. They launched an aggressive campaign to spread Catholicism. And they spoke Malay, which was the most generally recognized language, for this purpose. For instance, the Jesuit Francis Xavier spent considerable time in Malacca studying Malay before going to East Indonesia to convert the Moluccans (Adelaar & Himmelmann, 2019)

The distinctive feature of Madagascar is that it is essentially monolingual, meaning that the local dialects that make up the Malagasy language are closely linked to one another. A small Comoran village that speaks Bantu is located in the northwest, and there used to be a purportedly Arabic-speaking settlement in the southeast. There are also several immigrants and expatriates from France, China, Pakistan, and India. However, the nation can be characterized as being linguistically homogeneous overall. Ecologically and economically, however, it is not, which is ultimately the cause of the national language's development's resemblance to the Philippine situation (Adelaar & Himmelmann, 2019)

The official language of Madagascar, as well as a number of communities on Mayotte in the Comores, is Malagasy. The exact level of mutual intelligibility of Malagasy lects is difficult to measure despite having a standard written form due to the widespread use of a standard variation. There are many dialects of Malagasy, but the most significant ones are Merina, Tanala, Betsileo, Antankarana, Tsimehety, and Sakalava (Blench, 2018).

Adelaar (2017; 2021) strengthens his findings in his early research by saying that if linguistic areas are not required to be physically adjacent to one another, Southern Borneo and Madagascar constitute one such area. It is supported by four structural linguistic characteristics that appear in the languages Ngaju, Ma'anyan, Banjar Malay, and Malagasy. Considering the shortcomings of the many formulations of the idea of the Linguistic Area. Both the applicability of this notion and the veracity of the relevant aspects may be questioned in light of this result.

Lexicostatistics on Malay and Malagasy

After determining the word relatives, the next step is to find the percentage of relatives with the formula:

$$C = \frac{Vt}{Vd} \times 100\%$$

Information:
C= relative word;
Vt= number of relatives' vocabulary;
Vd= amount of gloss calculated

$$C = \frac{Vt}{Vd} \times 100\% =$$

$$\frac{33}{200} \times 100\% = 0{,}165 \times 100\% = 16.5\ \%$$

Once the percentage of relatives is known, we can calculate the separation time from Malay and Malagasy

is known: C = 16.5 %
log r = 80,5 %

asked: W= .....?

answer:

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

$$W = \frac{\log -1.833}{2 \times \log 0{,}805}$$

$$W = \frac{-1{,}833}{2 \times (-0{,}217)}$$

$$W = \frac{-1{,}833}{-0{,}434}$$

$$W = 4{,}223$$

The split time is multiplied by 1000 so that the result becomes 4.223. So, the calculation of the initial separation time for Malay and Malagasy is 4.223 years ago. In other words, the calculation of the initial separation time of Malay and Malagasy can be expressed as follows: (1) Malay and Malagasy are thought to have formed a single language about 4,223 years ago. (2) Malay and Malagasy are thought to have started to separate from their proto language around 2201 BC (calculated in 2022).

After the results of the separation of Malay and Malagasy are known, the next step is to calculate the error term. This is done to avoid miscalculations and to set a more precise separation time. It should be remembered that to anticipate errors in statistics is to give an estimate, not in a certain time, but in a certain time period. The following formula can be used to calculate the error term:

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

S = Standard error in the percentage of relative words
C = Percentage of relative words
n = Number of words compared, both relatives and non-relatives

is known: C = 0.16
n = 200
asked: S = ….?
answer:

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

$$S = \sqrt{\frac{0{,}16\,(1-0{,}16)}{200}}$$

$$= \sqrt{\frac{0{,}16 \times 0{,}84}{200}}$$

$$S = \sqrt{\frac{0{,}1344}{200}}$$

$$= 0{,}0259 \text{ (rounded to 0, 02)}$$

The result of this standard error (0.02) is summed with the percentage of initial relatives (C1) to get C2 (C2 = C1 + S). So C2 the result is 0.16+0.02=0.18. With C2, the separation time can be calculated again, using the same formula:

C2 = 18%
log r = 0,805

W2 = ...?

$$W2 = \frac{\log 0{,}18}{2 \log 0{,}805}$$

$$W2 = \frac{-1{,}715}{2 \times -0{,}217}$$

$$W2 = \frac{-1{,}715}{-0{,}434}$$

W2= 3,951.

This separation time is eventually multiplied by 1000 to get 3,951. Thus, we can calculate the error term is = W1 – W2 = 4.223 – 3.951 = 272.

So, the age of Malay and Malagasy can be expressed as follows: (1) Malay and Malagasy are thought to have formed a single language around 4223 – 3951 years ago. (2) Malay and Malagasy are a single language in 4495-3951 years ago. (3) Malay and Malagasy are thought to have started to separate from the Proto Malay language around 2201-1929 BC (calculated in 2022).

CONCLUSION

Malay and Malagasy come from the same family, namely the Proto Austronesia (PAN) family whose kinship is found through the lexicostatistical technique as much as 16.5% and is included in the Family of stock group. Malay and Malagasy were a single language 4495-3951 years ago and were separated from their proto language around 2201-1929 BC.

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