



Phonological Variation in the Miyah and Maybrat Languages in the Vogelkop Area, Southwest Papua

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Abstract. This study is preliminary in the study of synchronic dialectology that analyzes phonological variation, retention, innovation, and divergence between Miyah and Maybrat to explain the pattern of phonological relationships between the two. The research data were sourced from 200 basic Swadesh vocabulary items collected through interviews and recordings of 20 informants from five speaking regions, namely Miyah, Aifat, Ayamaru, Aitinyo, and Mare. This study uses a qualitative descriptive approach with an intralingual matching method to compare phonological realization in vowels, diphthongs, single consonants, and consonant clusters. The results showed that Miyah and Aifat tended to maintain a more retentive form, Ayamaru and Aitinyo showed a transitional position with a number of innovations, while Mare showed stronger innovations, especially in the vowel system and some consonants. Patterns of vowels, diphthongs, consonants, and consonant clusters indicate systematic innovation, limited innovation, and gradual divergence that are unevenly distributed between dialects. These findings show that the Miyah–Maybrat difference does not form a completely definite phonological boundary, but rather shows a gradual chain of phonological variation. Thus, this study supports the interpretation that Miyah and Maybrat are more accurately understood as varieties in a dialectal continuum synchronously.

Keywords: Miyah–Maybrat, synchronic dialectology, phonological variation, retention, innovation, dialect continuum.

1 Introduction

Miyah and Maybrat are two varieties of regional languages that live and develop in the Burung Kepala (Vogelkop) area, Southwest Papua. Miyah is spoken by the Miyah people who live in Tambrau Regency, while Maybrat is used by the Ayamaru, Aitinyo, Aifat, and Mare people who are administratively located in Maybrat Regency,

with some Aitinyo speakers also found in South Sorong Regency [1]. Geographically, these two speech regions are located in adjacent areas and have strong social, historical, and ecological connections, thus allowing linguistic interactions to occur that produce variations in phonological forms between speech regions.

The study of the relationship between Miyah and Maybrat has long been an important issue in West Papuan linguistics. Cowan in Voorhoeve noted a fairly high level of lexical similarity, which is around 80%, so that the two were once placed in the Central West Papua group [2]. These findings suggest a significant linguistic proximity. However, in the mapping of evolving languages, Miyah (Karon Dori) and Maybrat are often treated as two distinct linguistic entities, thus creating inconsistencies in the determination of linguistic status. This condition shows that there is a conceptual gap between genealogical classification and linguistic reality in the field, especially when language boundaries cannot always be defined decisively.

This problem is strengthened by methodological limitations in the study of Papuan languages. Reesink asserts that many of the early classifications in the Bird's Head region still rely on limited lexical data and therefore do not necessarily represent the linguistic structure as a whole. Klammer also pointed out that the limitations of language documentation in Papua cause comparative analysis to often not be able to comprehensively describe the relationships between varieties [4]. As a result, existing language mapping tends not to fully capture the internal dynamics of language variation, especially at the phonological level.

On the other hand, most previous studies have focused more on lexical aspects and general descriptions of language structure, while studies that specifically examine phonological variations between varieties in a continuous speech region are still limited. In fact, phonological variation is one of the most sensitive indicators in describing linguistic differentiation at the synchronous level. This gap suggests the need for a more detailed approach to look at how sound variations are dispersed and form patterns of relationships between varieties.

In a dialectology perspective, the differences between varieties are not always binary. Varieties that are administratively considered to be distinct languages may exhibit a continuous relationship if the variation between them is gradual. Conversely, the same language can exhibit significant internal variations. Therefore, the synchronic dialectology approach becomes relevant to describe the distribution of language variation under current conditions, specifically phonological variation as the basis for the analysis of relationships between varieties.

Based on these conditions, this study offers an approach that focuses specifically on the analysis of phonological variation as the main unit of description, rather than on historical reconstruction or determination of sound correspondence. This focus is the main differentiation from previous research that tends to place lexical data as the main basis for classification. Thus, this study places phonological variation as the main

instrument for reading Miyah and Maybrat linguistic relationships in a synchronous perspective.

The relationship between Miyah and Maybrat in this study is not understood dichotomy, but rather in the framework of the dialect continuum, which is a condition when linguistic variation is gradually spread among adjacent speaking regions. In this framework, the varieties of Miyah, Aifat, Ayamaru, Aitinyo, and Mare are positioned as a series of speech systems that show a gradual pattern of phonological variation, both in the form of vowel changes, consonant changes, dissipation, and other variations in sound realization.

This study used data on 200 basic Swadesh vocabulary items analyzed to identify patterns of phonological variation in each variety. Through this approach, this study is expected not only to provide an empirical description of the Miyah–Maybrat phonological variation, but also to offer a new perspective in the study of Papuan dialectics by placing phonological variation as the main basis for evaluating inter-species relationships.

Thus, the main contribution of this research lies in the effort to fill the study gap that has so far not paid attention to synchronous phonological variation in determining the relationship between speech systems in the Bird's Head area, as well as providing an alternative interpretation of the linguistic status of Miyah and Maybrat that is not solely based on genealogical classification.

2 Theoretical Framework

This research is based on synchronous dialectology, which is an approach that examines language variation based on the distribution of linguistic forms over a certain period of time without historical reconstruction. Synchronous dialectics views language variation as a structured system that can be explained through geographical, social, and intensity of interaction between speaking communities. Trudgill asserts that dialectal variation is the result of complex interactions between social and geographical factors, while Labov points out that linguistic innovations can spread differently between regions or social groups [6][7]. In the context of this study, a synchronic approach is strictly used to describe the distribution of Miyah and Maybrat phonological variations without tracing historical changes.

The main object of this study is phonological variation, which is understood as the difference in sound realization at the segmental level, including vowels and consonants. These variations can appear in the form of changes in vowel quality, articulation shifts, dissipation, addition of segments, as well as variations in consonant realization such as lending, gain, or changes in the place of articulation. Crowley and Bowerman, as well as Campbell, explain that patterns of sound variation that appear systematically in

synchronous data can be used to describe relationships between language varieties without having to refer to diachronic reconstruction [8][9].

In this study, the analysis of phonological variation was focused on the distribution of sound forms that appeared in speech data between the varieties of Miyah, Aifat, Ayamaru, Aitinyo, and Mare. The variation is categorized synchronously into three main forms, namely retention, innovation, and divergence. Retention refers to a phonological form that appears stably in more than one variety without significant changes. Innovation refers to a form that shows a difference in realization in one or more varieties compared to other varieties. Campbell asserts that innovation is a key indicator of the dynamics of language variation in a changing or diversified system [9]. In this study, retention and innovation are not interpreted historically, but as descriptive categories based on the distribution of synchronous data.

Divergence is used to describe the condition when one corresponding phonological form exhibits a different realization in each variety. Trask explains that divergence arises when language forms develop in different directions, resulting in variation between varieties [10]. In the context of this study, divergence is understood as the result of a non-uniform distribution of retention and innovation between speech regions, thus forming a pattern of synchronous variation.

To explain the pattern of distribution of these variations, this study uses wave theory as an interpretive framework. Schmidt states that language change does not always spread through strict genealogical branching, but can spread gradually from one region to another. François reinforces this view by showing that inter-dialect relationships can form overlapping networks of innovation dissemination [11][12]. In this study, wave theory is not used for historical reconstruction, but rather as an interpretive model of the distribution of synchronous variation.

In addition, this study uses the concept of dialect continuum as the final interpretive framework. Chambers and Trudgill explain that within the dialect continuum, differences between varieties are gradual without strict linguistic boundaries, especially in geographically adjacent regions [13]. In this study, the concept is used to interpret whether the distribution of Miyah–Maybrat phonological variations shows a clear boundary or instead forms a continuous gradation.

Thus, the theoretical framework of this research consists of synchronous dialectology as the main framework, phonological variation as the object of analysis, retention–innovation–divergence as the descriptive category of data, and wave theory and dialect continuum as an interpretive framework. All of these theoretical tools are used consistently to describe the distribution of Miyah–Maybrat phonological variations at the synchronous level.

3 Method

This research uses a qualitative descriptive method with synchronic dialectology approach. A qualitative descriptive method is used to describe and classify phonological variations in Miyah and Maybrat varieties. The synchronic dialectology approach is used because this study compares linguistic forms in a certain period of time based on data from several observation points.

This study was conducted in five regions of speech, namely Miyah, Aifat, Ayamaru, Aitinyo, and Mare. The Miyah region is represented by the Senopi and Ases observation points in Tambrauw Regency. The aifat region is represented by Konja and Kisor in Maybrat District. Ayamaru region is represented by Kambuskato and Koma-Koma in Maybrat District. The aitinyo region is represented by Sowaisau in Maybrat Regency and Bagaraga in South Sorong regency. The Mare region is represented by Seni and Seya in the Maybrat District. Thus, there are 10 observation points in this study.

The initial Data of the study in the form of 200 basic vocabulary Swadesh obtained directly from informants in the field. From the 200 vocabulary, 112 vocabulary were selected that showed lexical equivalence between Miyah and Maybrat varieties. The corresponding vocabulary is used as the main data for the analysis of phonological variation because it allows the comparison of sounds between dialects. Vocabularies that show full lexical differences are not taken as the main basis in phonological analysis because they do not have a commensurate form to be compared in sound.

Informants in this study amounted to 20 people. Each observation point is represented by two informants. Informants were selected based on several criteria, namely native speakers of Miyah or Maybrat, born and raised in the observation area, actively using their local language, have relatively low mobility outside the study area, are around 40-60 years old, have a maximum of high school education, and have a good speech and hearing aid. The criteria were used to obtain relatively stable local language data.

Data collection is done through interview, recording, and recording techniques. Interviews were conducted using Swadesh basic vocabulary lists as the main instrument. Recording is carried out in order to write down the phonemic and phonetic forms spoken by the informant. Recording is done to document the informant's speech and facilitate rechecking of the realization of sounds obtained in the field.

Data were analyzed using intralingual padan method. This method is used to compare the linguistic elements contained in the varieties Miyah, Aifat, Ayamaru, Aitinyo, and Mare. Comparison was done at the level of vowels, diphthongs, single consonants, and consonant clusters. The analysis was directed at identifying differences in sound realization and grouping phonological variations into categories of retention, innovation, and divergence.

The data analysis procedure is carried out through several stages. First, the vocabulary data is sorted between forms that have lexical equivalence and forms that show full lexical distinction. Second, matching shapes were identified to find variations in sounds between dialects. Third, the phonemic and phonetic forms are compared to see the realization of sounds at each observation point. Fourth, sound variations are classified based on the type of phonological changes, such as vowel changes, diphthong changes, consonant changes, sound dissipation, sound addition, and cluster reduction. Fifth, the variation is grouped into the categories of retention, innovation, and divergence as the basis of phonological analysis.

4 Result and Discussion

4.1 Classification of the Miyah and Maybrat Vowel and Consonant Phoneme

Based on the data of 200 basic Swadesh vocabulary words, vowels and consonant phonemes in Miyah and Maybrat varieties can be classified based on their articulatory characteristics. This classification is important to provide a preliminary overview of the sound system on which the analysis of phonological variation is based in the next section. In this section, vowel phonemes are classified based on tongue position and lip shape, while consonant phonemes are classified based on place and way of articulation. Thus, the presentation of this phoneme classification serves as a descriptive foundation before the discussion of vowel variations, diphthongs, consonants, and Miyah and Maybrat consonant clusters.

Table 4.1 Classification Vowel of the Miyah and Maybrat Vowel Phonemes

Tongue Height	Front	Central	Back
High	i		u
	ɪ		ʊ
Open mid	e		o
		ə	
	ɛ		ɔ
Low		ɐ	
	a		ɑ

Based on Table 4.1, the vowel sounds in the Miyah–Maybrat data can be classified based on tongue position and lip shape. Based on the vertical position of the tongue, vowels consist of high vowels, middle vowels, and low vowels. High vowels include [i], [ɪ], [u], and [ʊ]. Middle vowels include [e], [ɛ], [ə], [o], and [ɔ]. Low vowels include [a], [ɐ], and [ɑ]. Based on the horizontal position of the tongue, vowels can be distinguished into front, center, and back vowels. Front vowels include [i], [ɪ], [e], [ɛ], and [a]; central vowels include [ə] and [ɐ]; While back vowels include [u], [ʊ], [o], [ɔ], and [ɑ].

Based on lip rounding, vowels can be distinguished into round vowels and non-round vowels. Rounded vowels include [u], [ʊ], [o], and [ɔ], while non-rounded vowels include [i], [ɪ], [e], [ɛ], [ə], [a], [ɐ], and [ɑ]. Thus, [i] can be described as a rounded front high vowel, [ɪ] as a rounded front near-high vowel, [u] as a rounded back high vowel, [ʊ] as a rounded back high vowel, [e] as a rounded front middle vowel, [ɛ] as a rounded front lower middle vowel, [ə] as a non-rounded middle vowel, [o] as a rounded back middle vowel, [ɔ] as a rounded lower middle vowel, [a] as a non-rounded front/middle low vowel, [ɐ].

Table 4.2 Classification Consonant of the Miyah and Maybrat Consonant Phonemes

Manner of articulation Place of articulation	Bilabial	Labio-dental	Dental	alveolar	Postal-veolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d			c ɟ	k			ʔ
Nasal	m			n		ɳ	ɲ	ŋ			
Trill				r							
Tap or Flap											
Fricative (Geser)		f		s	ʃ			x			h
Africative					tʃ						
Lateral Fricative											
Approximant	w						j				
Lateral approximant				l							

Based on Table 4.2, Miyah–Maybrat consonant phonemes can be classified based on place and way of articulation. Based on the place of articulation, the consonants found include bilabial, labiodental, alveolar, postalveolar, retroflex, palatal, velar, and glottal consonants. Bilabial consonants include /p/, /b/, /m/, and /w/. Labiodental consonants include /f/. Alveolar consonants include /t/, /d/, /n/, /r/, /s/, and /l/. Postalveolar consonants include /ʃ/ and /tʃ/. Retroflex consonants include /ɳ/. Palatal consonants include /c/, /ɟ/, /ɲ/, and /j/. Velar consonants include /k/, /g/, /x/, and /ŋ/, while glottal consonants include /ʔ/ and /h/.

Based on the way it is articulated, the Miyah–Maybrat consonant phonemes consist of inhibited, nasal, vibrating, fricative, africat, approximate, and lateral consonants. Inhibited consonants include /p/, /b/, /t/, /d/, /c/, /ɟ/, /k/, /g/, and /ʔ/. Nasal consonants include /m/, /n/, /ɳ/, /ɲ/, and /ŋ/. Vibrating consonants include /r/. Fricative consonants

include /f/, /s/, /ʃ/, and /h/. African consonants include /tʃ/. The approximant consonants include /w/ and /j/, while the lateral consonants include /l/.

The classification shows that the Miyah–Maybrat consonant system has a fairly diverse distribution of sounds, both in terms of place and way of articulation. These phonemes are the basis for seeing the pattern of consonant variation and consonant clusters in the next section. In variation analysis, some phonemes can show different phonetic realizations in certain dialects, e.g. /h/, which in some data can be realized as [x] and in certain varieties it changes to [ʔ]. Therefore, this phoneme classification serves not only as an inventory of sounds, but also as a basis for explaining Miyah–Maybrat phonological retention patterns, innovations, and divergence.

4.2 Vowel Variation

This section discusses vowel and diphthong variations in Miyah and Maybrat data. The discussion focused on sound changes that show retention patterns, limited innovations, systematic innovations, and phonological divergence.

Vowel Variation /a/: [a] ~ [ɑ] ~ [ɐ]. The vowel /a/ is the vowel that shows the strongest pattern of change in the Miyah–Maybrat data. These vowels have three main realizations, namely [a], [ɑ], and [ɐ]. Miyah as a point of comparison shows the realization of [a]. This realization was maintained by Aifat, so that Miyah and Aifat were in a retentive position. Ayamaru and Aitinyo show the change of /a/ to [ɑ], while Mare shows the change of /a/ to [ɐ]. Data that show this pattern include /tafoh/ 'api', /ndafuf/ 'flower', /tama/ 'come', /amu/ 'we/us', and /mapuf/ 'short'. In /tafoh/ 'api', Miyah and Aifat show [tafox], Ayamaru and Aitinyo show [tafox], while Mare shows [təfoʔ]. This form shows that the vowel /a/ is retained as [a] in Miyah and Aifat, shifts backwards to [ɑ] in Ayamaru and Aitinyo, and is centralized to [ɐ] in Mare.

A similar pattern appears in /amu/ 'we/us'. Miyah and Aifat show [amu], Ayamaru and Aitinyo show [ɑmu], while Mare shows [ɐmʊ]. In this data, the change of /a/ ~ [ɑ] in Ayamaru and Aitinyo shows a vowel backwardness, while the change of /a/ ~ [ɐ] in Mare shows a vowel centralization. The change in Mare is also accompanied by the loosening of /u/ ~ [ʊ], but the change is related to the vowel variation /u/, not the core of the variation /a/. In /ndafuf/ 'flower', Miyah shows [ndafuf], Aifat [tafuf], Ayamaru and Aitinyo [ndafuf], while Mare [təfof]. In the Aifat form, there is a change in the initial consonant from [nd] ~ [t], but the vowel /a/ is retained as [a]. Therefore, for the analysis of the vowel /a/, Aifat is still categorized as a retentive form. Ayamaru and Aitinyo show innovation [ɑ], while Mare shows advanced innovation [ɐ].

Thus, the change status of the vowel /a/ indicates a gradual divergence. This status is more appropriate than simply "retention and innovation" because /a/ evolves into three distinct realizations: [a] in Miyah and Aifat, [ɑ] in Ayamaru and Aitinyo, and [ɐ] in Mare. This pattern shows a phonological gradation from a more retentive form to a

more innovative form. Therefore, the vowel /a/ is one of the main proofs of the existence of a dialect continuum in the Miyah–Maybrat relationship.

Vowel Variations /i/: [i] ~ [ɪ]. The vowel /i/ shows two main realizations, namely [i] and [ɪ]. Miyah shows the realization [i], and this realization is maintained by Aifat, Ayamaru, and Aitinyo. Mare differs in that it realizes /i/ as [ɪ]. Thus, the change in /i/ does not show gradual divergence like the vowel /a/, but shows retention in most varieties and innovation is limited to Mare. This pattern can be seen in /wasi/ 'smoke', /ati/ 'true', /tenin/ 'kiss', /nsepi/ 'sewing', and /mbin/ 'dull'. In /wasi/ 'asap', Miyah and Aifat show [wasi], Ayamaru and Aitinyo show [wasi], while Mare shows [wɛsɪ]. In the data, the change of [a] ~ [ɑ] in Ayamaru and Aitinyo and [a] ~ [ɐ] in Mare is part of the vowel variation /a/. Meanwhile, the relevant variation for /i/ is the change [i] ~ [ɪ] in Mare. In /tenin/ 'kiss', Miyah, Aifat, Ayamaru, and Aitinyo show [tənin], while Mare shows [tenɪn]. This data is important because it shows that the change of /i/ ~ [ɪ] in Mare does not depend on the presence of the vowel /a/. In other words, the loosening of /i/ ~ [ɪ] is a stand-alone innovative feature of Mare. Gloss /amu/ 'we/us', Miyah and Aifat retain [amu], Ayamaru and Aitinyo show [amu], while Mare shows [ɐmʊ]. In this data, Ayamaru and Aitinyo only show innovations in the vowel /a/, while /u/ remains [u]. In contrast, Mare shows two changes, namely /a/ ~ [ɐ] and /u/ ~ [ʊ]. Thus, the change of /u/ ~ [ʊ] is indeed one of the characteristics of vowel innovation in Mare. Thus, the pattern of changing the vowel /u/ ~ [ʊ] shows retention in Miyah, Aifat, Ayamaru, and Aitinyo, while innovation is limited to Mare.

Vowel Variations /e/: [e] ~ [ɛ]. The vowel /e/ indicates two main realizations, namely [e] and [ɛ]. Miyah retained [e], and this form was also retained by Aifat, Ayamaru, and Aitinyo. Mare shows the change of /e/ ~ [ɛ]. Thus, the change status /e/ is a limited innovation to Mare. This pattern is seen in /mase/ 'big', /mes/ 'blood', /take/ 'tie', and /hate/ 'flea'. In /mes/ 'blood', Miyah, Aifat, Ayamaru, and Aitinyo show [mes], while Mare shows [mɛs]. This data is a strong example because the changes that seem to lie mainly in the quality of the vowel, i.e. [e] ~ [ɛ]. In /take/ 'ikat', Miyah and Aifat show [take], Ayamaru and Aitinyo [take], while Mare [teke]. In the data, Ayamaru and Aitinyo retain /e/ as [e], but change /a/ ~ [ɑ]. Mare changes /a/ ~ [ɐ] and /e/ ~ [ɛ]. Phonologically, the change of /e/ ~ [ɛ] is a decrease in the front intermediate vowel. Vowels [e] are more closed than [ɛ], so the change of [e] ~ [ɛ] indicates a shift towards a lower or more open vowel. Thus, the pattern of change and status becomes clear: Miyah, Aifat, Ayamaru, and Aitinyo are retentive, while Mare is innovative in a limited edition.

Vowel Variations /ɛ/: [ɛ] ~ [e]. The vowel /ɛ/ has two main realizations, namely [ɛ] and [e]. However, in contrast to /e/, the change in /ɛ/ in the data does not occur absolutely at all positions. Miyah retains [ɛ], and Aifat, Ayamaru, and Aitinyo generally also retain [ɛ]. Mare shows a tendency to change /ɛ/ ~ [e] in some positions, but still retain [ɛ] in others. Therefore, the change status /ɛ/ is more appropriately called innovation limited to Mare, rather than systematic innovation. The 'rotten' /menis/ data shows a pattern of [menis] in Miyah, Aifat, Ayamaru, and Aitinyo, while Mare shows

[menis]. In the Mare form, the vowel /ɛ/ in the first syllable changes to [e], and /i/ changes to [ɪ]. The /fenia/ 'female' data also show a similar pattern: Miyah and Aifat [fenia], Ayamaru and Aitinyo [fɛnɛ], while Mare [fɛniɑ]. In this data, Mare shows the change of [ɛ] ~ [e], [i] to [ɪ], and [a] ~ [ɑ].

However, other data show that Mare does not always convert [ɛ] ~ [e]. In /seken/ 'star', Mare indicates [sekɛn]. In this form, the initial vowel is elevated to [e], but the final vowel remains [ɛ]. In /menem/ 'width', Mare shows [mbenɛm], which still retains [ɛ] in the final quarter. In /haperek/ 'balik', Mare shows [mberɛʔ], so [ɛ] also still appears. Based on this evidence, the change of /ɛ/ ~ [e] does not indicate full innovation or systematic innovation. This vowel change shows that the vowel /ɛ/ in tends to increase to [e] in certain positions, but retention [ɛ] still occurs in other positions. Thus, the altered status /ɛ/ is a limited innovation to Mare, with a type of alteration of the front intermediate vowel.

Vowel Variations /o/: [o]~[ɔ]. The vowel /o/ indicates two main realizations, namely [o] and [ɔ]. Miyah retained [o], and this form was also retained by Aifat, Ayamaru, and Aitinyo. Mare denotes the change of /o/ ~ [ɔ]. Thus, the change status /o/ is a limited innovation on Mare. The /om/ 'rain' data shows a clear pattern: Miyah, Aifat, Ayamaru, and Aitinyo show [om], while Mare shows [ɔm]. In /tesom/ 'main', Miyah, Aifat, Ayamaru, and Aitinyo show [təsom], while Mare shows [tesɔm]. In this data, Mare shows two changes, namely /ə/ ~ [e] and /o/ ~ [ɔ]. In /poh/ 'abu', Miyah and Aifat show [pox], Ayamaru and Aitinyo [box], while Mare [bɔx]. The change [p] ~ [b] in Ayamaru, Aitinyo, and Mare is a consonantal change, while the vowel changes still shows /o/ ~ [ɔ] in Mare. Phonologically, the change of /o/ ~ [ɔ] is a decrease in the posterior intermediate vowel. The vowel [o] is more closed than [ɔ], so [o] ~ [ɔ] indicating the opening or decrease of the vowel. Therefore, the description "vowel increase" in the initial table should be corrected to a decrease in vowels. Thus, the /o/ pattern is parallel to /e/. Both show a decrease in vowels in Mare: /e/ ~ [ɛ] and /o/ ~ [ɔ]. This pattern shows that Mare has a tendency to realize intermediate vowels more openly.

Diphthongs Variations /ai/: [ai] ~ [ɑi] ~ [ɐi]. The diphthongs /ai/ have three main realizations, namely [ai], [ɑi], and [ɐi]. Miyah retains [ai], and Aifat also retains the same form. Ayamaru and Aitinyo show the change of the first element of the diphthong, i.e. /a/ to [ɑ], resulting in [ɑi]. Mare shows a change in two diphthongs, namely /a/ ~ [ɐ] and /i/ ~ [ɪ], resulting in [ɐɪ].

The data /ait/ 'he is male' clearly shows this pattern: Miyah and Aifat [ait], Ayamaru and Aitinyo [ɑit], while Mare [ɐɪt]. The change in Ayamaru and Aitinyo parallels the /a/ vowel pattern to [ɑ]. The change in Mare parallels the vowel pattern of /a/ ~ [ɐ] and /i/ ~ [ɪ]. This means that diphthongs /ai/ changes are not a stand-alone process, but follow the pattern of single vowel changes described earlier. Thus, the diphthong /ai/ status is a gradual divergence. The form [ai] in Miyah and Aifat indicates retention, [ɑi] in Ayamaru and Aitinyo indicates innovation in the first element, while [ɐi] in Mare shows further changes to divergence.

Diphthongs Variation /au/: [au]~[əu]~[əʊ]. The diphthongs /au/ have three main realizations, namely [au], [əu], and [əʊ]. Miyah retains [au], and Aifat also retains the same form. Ayamaru and Aitinyo show the change of the first element /a/ ~ [ə], resulting in [əu]. Mare shows a change in two elements, namely /a/ ~ [ə] and /u/ ~ [ʊ], resulting in [əʊ].

The diphthong /au/ 'she's female' data shows the pattern: Miyah and Aifat [au], Ayamaru and Aitinyo [əu], while Mare [əʊ]. As with the diphthongs /ai/, the change in /au/ also follows the pattern of change of the single vowel. The /a/ element changes to [ə] in Ayamaru and Aitinyo, then to [ə] in Mare. The /u/ element remains [u] in Ayamaru and Aitinyo, but becomes [ʊ] in Mare. Thus, the diphthong /au/ status is a gradual divergence. This pattern shows a cascading difference from [au] to [əu] and then to [əʊ]. Diphthong[au] indicates retention in Miyah and Aifat, [əu] indicates innovation in Ayamaru and Aitinyo, and [əʊ] indicates divergence in Mare.

Diphthongs Variations /ia/: [ia] ~ [iɛ] ~ [iɑ]. The diphthongs /ia/ have three main realizations, namely [ia], [iɛ], and [iɑ]. Miyah retains [he], and Aifat basically also retains the diphthong[ia] element. Ayamaru and Aitinyo show changes in two elements, namely /i/ ~ [ɪ] and /a/ ~ [ɐ], resulting in [iɛ]. Mare renders /i/ ~ [ɪ] and /a/ ~ [ɑ], thus producing [iɑ].

This pattern is seen in /emsiah/ 'hunting' and /nsia/ 'with'. In /emsiah/ 'hunting', Miyah shows [emsiɑx], Aifat [musiɑx], Ayamaru and Aitinyo [mʊsɪɐx], while Mare [wʊfiɑx]. Despite changes in the initial segments, the diphthongs are still comparable, namely [ia], [iɛ], and [iɑ]. In /nsia/ 'with', Miyah shows [nsia], Aifat [tesia], Ayamaru and Aitinyo [tesɪɐ], while Mare [tesia]. Aifat undergoes a change in the beginning of the word, but still retains the diphthong.

Thus, diphthongs /ia/ show retention in Miyah and Aifat, but divergences in Ayamaru, Aitinyo, and Mare because diphthongs /ia/ do not only undergo changes in one element, but in two elements at once. Ayamaru and Aitinyo show the loosening of /i/ to [ɪ] and the centralization of /a/ to [ɐ], while Mare shows the loosening of /i/ to [ɪ] and the backing of /a/ to [ɑ].

Diphthongs Variations /ie/: [iɛ] ~ [iɐ]. The diphthongs /ie/ show two main realizations, namely [iɛ] and [iɐ]. Miyah retains [iɛ], Aifat also retains [iɛ], and Mare in the available data still retains [iɛ]. In contrast, Ayamaru and Aitinyo show a change of /ie/ ~ [iɐ]. As such, this change status is innovation limited to Ayamaru and Aitinyo. This pattern is seen in /tien/ 'lying down' and /tiet/ 'four'. Miyah and Aifat show [tien] and [tiet]. Ayamaru and Aitinyo show [ɟien] and [ɟiet], and Mare shows [tien] and [ɟiet]. Thus, Miyah, Aifat, and Mare show retention in diphthongs /ie/, while Ayamaru and Aitinyo show limited innovation in the form of [iɐ].

Diphthongs Variation /uo/: [uɔ]~[ʊɔ]~[ʊɔ̃]. The diphthongs /uo/ have three main realizations, namely [uɔ], [ʊɔ], and [ʊɔ̃]. Miyah retains [uɔ], and Aifat also retains the

same form. Ayamaru and Aitinyo show a change in two diphthongs, namely /u/ ~ [ʊ] and /ɔ/ ~ [o], resulting in [ʊo]. Mare shows a change in the first element /u/ ~ [ʊ], while the second element remains [ɔ], thus producing [ʊɔ].

This pattern is seen in /ayuo/ 'sun'. Miyah and Aifat show [ajuɔ], Ayamaru and Aitinyo show [qjuo], while Mare shows [ɛjuɔ]. This data shows two layers of change. First, the initial vowel /a/ changes to [ɛ] in Ayamaru and Aitinyo, and to [ɛ] in Mare. Second, the diphthongs /uɔ/ change to [ʊo] in Ayamaru and Aitinyo, and [ʊɔ] in Mare. The status of /uɔ/ divergence is limited because it has three realizations, namely [uɔ], [ʊo], and [ʊɔ]. It is called limited because the data supporting this pattern only appears in one main example, namely /ayuo/ 'sun'. In this pattern, Miyah and Aifat maintain [uɔ], Ayamaru and Aitinyo show innovation in both diphthongs, while Mare shows innovation in the first element.

Vocal Changes and Diphthongs Based on the overall data, the patterns of vocal changes and diphthongs of Miyah and Maybrat showed a systematic, non-random distribution. Miyah and Aifat tend to be in a repressive position because they maintain the same realization. Ayamaru and Aitinyo show a position of intermediate innovation, mainly through the deformation of the vowel /a/ ~ [ɛ], which affects the diphthongs /ai/ and /au/. Further innovation is in Mare, which can be seen through singular vowels such as /a/ becoming [ɛ], /i/ ~ [ɪ], /u/ ~ [ʊ], /e/ becoming [ɛ], /ə/ ~ [e], and /o/ ~ [ɔ]. Thus, vowel and diphthong variations support a gradual series of phonological changes.

4.3 Consonant Variation

This section discusses the variations of consonants and consonant clusters in the Miyah and Maybrat data. The discussion focused on sound changes that show retention patterns, limited innovations, systematic innovations, and phonological divergence.

Consonant Variation /p/: [p] ~ [b]. The consonant /p/ shows a fairly systematic pattern of change. In Miyah and Aifat, /p/ is retained as [p]. In contrast, in Ayamaru, Aitinyo, and Mare, /p/ changes to [b]. This pattern can be seen in the data /poh/ 'ash', /mapuf/ 'short', and /apan/ 'snake'. In /poh/ 'abu', Miyah and Aifat show [pox], while Ayamaru–Aitinyo and Mare show forms with the realization of [b], i.e. [box] and [bɔx]. In the 'short' /mapuf/, Miyah and Aifat indicate [mapuf], Ayamaru–Aitinyo [mabuf], and Mare [mɛbɔf]. In /apan/ 'snake', Miyah and Aifat retain [p], while Ayamaru–Aitinyo and Mare show [b].

Phonologically, the change of /p/ ~ [b] is a process of voicing or vowelization. The voiceless bilabial consonant [p] changes to the voiced bilabial consonant [b]. This change occurs at the beginning of the word and the middle of the word, especially at the position between vowel components or at the beginning of a syllable. Since the same change appeared in Ayamaru, Aitinyo, and Mare, but did not occur in Miyah and Aifat, the status was a systematic innovation in Ayamaru–Aitinyo–Mare. Thus, the /p/ pattern becomes [b] showing a clear division between the retentive group and the

innovative group. Miyah and Aifat retain [p], while Ayamaru, Aitinyo, and Mare develop [b]. This pattern supports the gradation of consonant changes in the Miyah–Maybrat relationship.

Consonant Variation /k/: [k] ~ [g]. The consonant /k/ in the data /kewian/ 'meat' shows a retention pattern in Miyah, Aifat, Ayamaru, and Mare, but changes in Aitinyo. Miyah and Aifat show [kewian], Ayamaru shows [kewɪən], Aitinyo shows [gɛwɪən], while Mare shows [kewan]. In this data, the change of the initial consonant /k/ to [g] appears only in Aitinyo. Phonologically, the change of /k/ ~ [g] is a voicing or voicing process, that is, the change of the voiceless inhibit velar consonant [k] to the vowel inhibit velar consonant [g]. The change status /k/ ~ [g] is a limited innovation to Aitinyo, not a full divergence. Mare does show a change in the vowel structure or diphthongs in the form [kewan], but the initial consonant remains [k]. Therefore, for the analysis of the consonant /k/, Mare remains a retentive group. Thus, this data shows local innovation in Aitinyo.

Consonant Variation /t/: [t] ~ [j]. The consonants /t/ in the data /tien/ 'lying down' and /tien/ 'sleeping' show retention patterns in Miyah, Aifat, and Mare, but change in Ayamaru and Aitinyo. Miyah and Aifat show [tien], Mare also shows [tien], while Ayamaru and Aitinyo show [jien]. Thus, the initial consonant /t/ is retained as [t] in Miyah, Aifat, and Mare, but changes to [j] in Ayamaru and Aitinyo. Phonologically, the change of /t/ ~ [j] indicates the process of palatalization, i.e. the change of the voiceless inhibited alveolar consonant [t] to the voiced palatal consonant [j]. This change is also accompanied by a redundancy because [t] is voiceless, while [j] is voiced. Therefore, this process can be called palatalization by vowelization. Thus, the consonant [t] shows retention in Miyah, Aifat, and Mare, while innovation is limited as [j] in Ayamaru and Aitinyo.

Consonant Variation /t/: [t] ~ [j] ~ [j]. The consonant /t/ in the data /tiet/ 'four' shows a different pattern from /tien/ 'lying down/sleeping'. In /tiet/ 'four', Miyah and Aifat retain [t] in the form [tiet]. Ayamaru and Aitinyo show [jiet], while Mare shows [jiet]. Thus, the consonant /t/ develops into two different realizations in the innovative variety, namely [j] in Ayamaru–Aitinyo and [j] in Mare. Phonologically, the change of /t/ ~ [j] indicates palatalization and vowelization, while the change of /t/ ~ [j] indicates further leniency. [j] is a consonant of the palatal barrier of voice, while [j] is a consonant of the palatal approximation of the voice. Thus, the change from [t] ~ [j] ~ [j] shows a weakening and shift of the articulation site towards the palatal. The status of this change is a gradual divergence. It is called divergence because /t/ does not just change into one shape, but into two different forms, namely [j] and [j]. It is called gradual because [j] in Mare can be understood as a weaker form than [j] in Ayamaru and Aitinyo. Thus, the /t/ pattern in the 'four' data shows retention in Miyah and Aifat, palatal innovation in Ayamaru–Aitinyo, and further lean in Mare.

Consonant Variation /x/: [x] ~ [ʔ]. The consonant /x/ shows a retention pattern in Miyah, Aifat, Ayamaru, and Aitinyo, but undergoes changes in Mare. In the /tafoh/ 'api' data, Miyah and Aifat show the form [tafox], Ayamaru–Aitinyo shows [tafox], while Mare shows [təfoʔ]. The same pattern is also seen in the /ndah/ 'dog' data, namely Miyah [ndex], Aifat and Ayamaru–Aitinyo [mɛtɛx], while Mare [mɛtəʔ]. In both data, the final consonant [x] is retained in most varieties, but changes to [ʔ] in Mare. Thus, the /x/ consonant shows retention in Miyah, Aifat, Ayamaru, and Aitinyo, but shows limited innovation in Mare. The change of /x/ ~ [ʔ] occurs at the end position of the word. Phonologically, this change can be understood as lenition or glotalization, i.e. the change from a voiceless velar fricative [x] to a glottal inhibition [ʔ].

Consonant Variation /s/: [s] ~ [ʃ]. The consonant /s/ shows retention in Miyah, Aifat, Ayamaru, and Aitinyo, but changes to [ʃ] in Mare. The /mɛmsiax/ 'hunting' data shows that Miyah retains [s], Aifat [musiax] shows [s], Ayamaru–Aitinyo [mɔsɪɛx] retains [s], while Mare shows [ʃ] in the form [wʊʃiax]. This change occurs in the middle position of the word. Phonologically, the change of /s/ ~ [ʃ] is a process of sibilant palatalization, i.e. the change of the voiceless alveolar fricative [s] to the voiceless postalveolar fricative [ʃ]. This change does not change the meaning, but shows variations in the realization of consonants between dialects. Thus, Miyah, Aifat, Ayamaru, and Aitinyo show retention by retaining [s], while Mare shows limited innovation by showing [ʃ].

Variation Ø~[x]. The variation of Ø to [x] ~ [h] indicates the addition of sounds in the Mare variety. The data of /mof/ 'good', /tʊm/ 'beri', /tu/ 'count', and /tuf/ 'three' show that Miyah, Aifat, Ayamaru, and Aitinyo do not have additional segments at any given position, while Mare shows the addition of consonantal elements, such as [moxɔf], [tɛxɔm], [tɛxɔ], and [tɛxɔf]. Therefore, this change only occurs in Mare. Phonologically, the change of Ø ~ [x] is an epenthesis process, which is the addition of sound segments to the previously empty position. Thus, this pattern of consonant change shows retention in Miyah, Aifat, Ayarumaru, and Aitinyo, while innovation is limited to Mare.

Cluster Variation /nd/: [nd]~[m]. The /nd/ clusters in the /ndah/ 'dog' and /ndit/ 'narrow' data show extensive changes in the Maybrat variety. In Miyah, the /nd/ cluster is maintained as [nd], e.g. [ndɛx] in 'dog' and [ndit] in 'narrow'. On the other hand, Aifat, Ayamaru, Aitinyo, and Mare show forms with the initial elements [m], such as [mɛtɛx], [mɛtəʔ], [mɛtit], and [mɛtit]. Phonologically, this change is not enough to be described as a simple /nd/ change to [m], since the Maybrat form shows a more complex restructuring, such as the emergence of the form [mɛt-] or [mɛt-]. However, in terms of initial correspondence, it can be seen that the [nd] cluster in Miyah is not maintained in the Maybrat variety, but is replaced by a bilabial nasal element [m] accompanied by a subsequent change in phonological structure. This process can be understood as cluster reduction accompanied by assimilation and change of articulation site. The alveolar cluster [nd] loses its cluster structure and transforms into a bilabial nasal element [m].

Since this pattern appears in all Maybrat varieties compared, namely Aifat, Ayamaru, Aitinyo, and Mare, its status is a systematic innovation in the Maybrat family. Thus, the variation of /nd/ ~ [m] shows a clear separation between Miyah as a retentive form and Maybrat varieties as an innovative group. This pattern is important because it shows the existence of a common innovation within the Maybrat family.

Cluster Variation /ns/: [ns]~[t]. The /ns/ cluster in the /nsia/ 'with' data shows systematic changes in the Maybrat variety. Miyah retains the initial cluster [ns] in the form of [nsia]. In contrast, Aifat, Ayamaru, Aitinyo, and Mare show early realizations of [t], such as [təsia], [təsɿ], and [tesia]. Thus, the /ns/ cluster in Miyah corresponds to [t] in all Maybrat varieties. Phonologically, the change of /ns/ ~ [t] involves cluster reduction, denalization, and fortisi. The [ns] cluster loses the nasal element [n] and the fricative element [s], then realized as a silent alveolar barrier [t]. Since the result of the change in the form of [t] is an inhibition consonant, this process can be called fortisi, which is the strengthening of the cluster/fricative structure to the inhibition. The change status of /ns/ ~ [t] is a systematic innovation in the Maybrat clump. This status is correct because all Maybrat varieties in the data show the shape [t], while Miyah retains [ns]. Thus, this pattern is one of the evidence of shared innovation in Maybrat that distinguishes it from Miyah, while retention is in Miyah.

Cluster Variation /ŋg/: [ŋg] ~ [k]. The /ŋg/ cluster in the 'cold' /ngganam/ data shows a pattern that is not the same across all Maybrat varieties. Miyah retains [ŋg] in the form [ŋganəm]. Ayamaru and Aitinyo also retain the [ŋg] cluster, despite the change of the vowel /a/ ~ [ɑ] in the form [ŋganəm]. In contrast, Aifat and Mare show the change of the cluster /ŋg/ ~ [k], i.e. [kanəm] in Aifat and [kenəm] in Mare. Phonologically, the change of /ŋg/ ~ [k] indicates cluster reduction, denalization, and devoicing. The nasal element [ŋ] is missing, while the voiceless element [g] changes to the voiceless inhibition [k]. Since this change only appeared in Aifat and Mare, while Miyah, Ayamaru, and Aitinyo retained [ŋg], its status was not a systematic innovation of the entire Maybrat. A more appropriate status is limited divergence or limited innovation in Aifat and Mare. As such, this data does not show an overarching change within Maybrat, but does show an uneven distribution of innovations.

Cluster Variation /ŋg/: [ŋg] ~ [m]. The /ŋg/ cluster also shows another pattern of change, namely to [m], as seen in the 'red' /nggek/ data. Miyah retains the initial form [ŋg] in [ŋgɛʔ]. On the other hand, Aifat, Ayamaru, Aitinyo, and Mare show forms with the initial element [m], such as [mekɛʔ] or [mekeʔ]. Thus, in this data the /ŋg/ cluster in Miyah corresponds to [m] in all Maybrat family. Phonologically, the change of /ŋg/ ~ [m] indicates cluster reduction, assimilation, and change of articulation place. The velar cluster [ŋg] turns into the bilabial nasal [m]. In phonetic explanation, [m] bilabial nasal consonants are voweled. Furthermore, the change of the cluster /ŋg/ ~ [k] on the 'cold' data, which only appears on Aifat and Mare. Thus, the cluster /ŋg/ exhibits two different patterns of change: one in the form of systematic innovation to [m], and the other in the form of a limited divergence to [k].

Cluster Variation /ns/: [ns]~[s]. The /ns/ cluster in the 'float' /nsoso/ data shows the realization of [ns] in Miyah, Aifat, and Mare, but changes to [s] in Ayamaru and Aitinyo. Miyah shows [nsoso], Aifat [nsoso], Ayamaru–Aitinyo [soso], and Mare [nsoso]. Thus, the /ns/ cluster was maintained in Miyah, Aifat, and Mare, but was reduced in Ayamaru and Aitinyo. Phonologically, the change of /ns/ ~ [s] constitutes cluster reduction through the removal of the nasal element [n]. The result is a voiceless alveolar fricative [s]. This status of change can be called a limited innovation to Ayamaru–Aitinyo. If put in a divergence subsection, then a safer term is limited divergence, because the distribution of the data divides the varieties into two groups: the group that retains [ns] and the group that converts it to [s].

Cluster Variation /nd/: [nd] ~ [t]. The /nd/ cluster in the /ndafuf/ 'flower' data shows the realization of [nd] in Miyah, Ayamaru, and Aitinyo, but changes to [t] in Aifat and Mare. Miyah indicates [ndafuf], Aifat [tafuf], Ayamaru–Aitinyo [ndafuf], and Mare [tefuf]. Thus, Aifat and Mare show cluster reduction, while Miyah, Ayamaru, and Aitinyo maintain the [nd] cluster. Phonologically, the change of /nd/ ~ [t] indicates denasalization, devoicing, and cluster reduction. The nasal element [n] is missing, and the vowel inhibition element [d] is transformed into the voiceless inhibition [t]. Thus, the result of the change is a voiceless inhibited alveolar consonant [t]. The original text needs to be corrected because it refers to the result of the change as "alveolar consonants, fricatives, voiceless /s/". The status of this change is a finite divergence. It is so called because a single cluster of /nd/ produces two distribution patterns: [nd] in Miyah, Ayamaru, and Aitinyo, and [t] in Aifat and Mare. Thus, innovation did not spread throughout Maybrat, but appeared in only a few varieties.

Cluster Variation /mb/: [mb] ~ [w]. The /mb/ cluster in the 'slippery' /mbosok/ data shows the realization of [mb] in Miyah, Ayamaru, and Aitinyo, but changes to [w] in Aifat and Mare. Miyah shows [mbosok], Aifat [wosok], Ayamaru–Aitinyo [mbosok], and Mare [wosok]. Thus, the /mb/ cluster is not maintained in Aifat and Mare, but is retained in Miyah, Ayamaru, and Aitinyo. Phonologically, the change of /mb/ ~ [w] indicates cluster and lens reduction. The bilabial nasal-inhibition cluster [mb] transforms into a labial-velar approximation [w]. This change indicates a weakening of the consonant structure as the complex cluster changes to a single approximate sound. This process also involves the loss of nasal elements and inhibitions in the cluster. The status of this change is a finite divergence. It is so called because the distribution of data forms two groups, namely the group that retains [mb] and the group that converts it to [w]. Thus, Aifat and Mare show innovation, while Miyah, Ayamaru, and Aitinyo show retention.

Cluster Variation /mb/: [mb] ~ [m]. The /mb/ cluster also shows another pattern of change, which is to [m], as seen in the 'hot' /mbe/ data. Miyah shows [mbe], Ayamaru–Aitinyo [mbe], and Mare [mbe], while Aifat shows [mepe]. In this data, Aifat does not fully maintain the [mb] cluster, but realizes it with the initial element [m] accompanied by subsequent changes in phonological structure. Phonologically, the change of /mb/ ~

[m] is a reduction of clusters, specifically the removal of the inhibit element [b] and the preservation of the nasal element [m]. However, the form of Aifat [mepe] indicates that this change is not only /mb/ ~ [m], but also involves the addition or change of the next segment. Therefore, the safest analysis is to status that the /mb/ cluster in Miyah corresponds to the initial form [m] in Aifat. This change status is a limited innovation to Aifat, not a full divergence. Miyah, Ayamaru, Aitinyo, and Mare retain [mb], while only Aifat shows the change to [m].

4.4 General Discussion of the Miyah and Maybrat Phonological Relationship

Based on the overall analysis of vowel, diphthong, consonant, and consonant cluster variations, the Miyah–Maybrat relationship shows a gradual pattern of phonological change. Differences between dialects do not arise as completely firm boundaries, but as a series of variations from more retentive forms to more innovative forms. Miyah shows high phonological retention; Aifat shows a strong closeness to Miyah; Ayamaru and Aitinyo occupy transitional positions, while Mare shows more prominent innovations, especially in the vocal system and some consonants. Thus, the Miyah–Maybrat relationship is more accurately read as a network of gradual phonological variations rather than as a completely absolute phonological separation.

This pattern is in line with the concept of dialect continuum in dialectology. In the dialect continuum, differences between dialects do not always appear as sharp boundaries, but as a series of variations that change gradually from one speaking region to another. In the context of Miyah–Maybrat, the series appears in the Miyah, Aifat, Ayamaru–Aitinyo, and Mare patterns. This sequence is not intended as a historical lineage, but as a synchronic description of the distribution of phonological variation between dialects. Therefore, the interpretation in this study is synchronous and is not intended to establish the historical status of Miyah and Maybrat finally.

The vowel and diphthongs data provide important evidence of these gradations. The vowel /a/ shows gradual divergence because it is realized as [a] in Miyah and Aifat, [ɑ] in Ayamaru and Aitinyo, and [ɐ] in Mare. The diphthongs /ai/ and /au/ also show a gradual change from [ai] and [au] in Miyah–Aifat, to [ɑi] and [ɑu] in Ayamaru–Aitinyo, and then to [ɐi] and [ɐu] in Mare. However, not all diphthongs follow the same direction of change. In /ie/, the main innovations appear in Ayamaru and Aitinyo, while Miyah, Aifat, and Mare tend to retain [ie]. In /uo/, Ayamaru and Aitinyo show more complex changes compared to Mare. This suggests that phonological innovations do not always move in a single straight line, but can appear selectively in certain varieties.

At the consonant level, the pattern of change appears to be more branched. Some of the changes show relatively systematic innovations, such as /p/ to [b] in Ayamaru, Aitinyo, and Mare, as well as the change of the cluster /nd/ ~ [m], /ns/ ~ [t], and /ŋg/ ~ [m] in the Maybrat variety. However, some other changes are limited and do not spread to all varieties, such as /k/ ~ [g] in Aitinyo, /s/ ~ [ʃ] in Mare, /ŋg/ ~ [k] in Aifat and Mare,

and /mb/ to [w] in Aifat and Mare. The pattern suggests that one phonological form in Miyah can develop into several different realizations within the Maybrat variety.

This phenomenon can be explained through wave theory and the concept of innovation diffusion. Language changes do not always spread uniformly throughout the speech region, but they can spread partially, stop in certain varieties, or produce different forms in other varieties. Labov distinguishes between the transmission and diffusion of language change, especially in explaining how linguistic innovations can spread unevenly within speaking communities (1998). In line with that, François emphasizes that interlinguistic or interdialect relationships cannot always be adequately explained through tree models, especially when innovation spreads overlapping and forms a complex network of relationships (2015). In the Miyah–Maybrat data, patterns such as /p/ ~ [b] in Ayamaru–Aitinyo–Mare, /k/ ~ [g] only in Aitinyo, and /s/ ~ [ʃ] only in Mare indicate an uneven diffusion of innovation.

From a data-driven dialectological perspective, these findings also show the importance of reading variation aggregatively. Nerbonne explained that the study of modern dialectology needs to pay attention to many linguistic features because one feature is not enough to describe the relationship between dialects as a whole (2009). Wieling and Nerbonne also emphasize that dialectometrics can help to see patterns of variation more systematically through the measurement of many linguistic features (2015). In this study, the interpretation of the Miyah–Maybrat relationship is not only based on a single change in sound, but on a combination of vowel patterns, diphthongs, single consonants, and consonant clusters. Therefore, the phonological evidence found provides an empirical basis for viewing the Miyah–Maybrat relationship as a series of interconnected variations.

Methodologically, the results of this study show that the determination of linguistic relationships is not enough based only on language labels, language codes, or administrative boundaries. Language codes and labels are important as markers of classification, but they do not always describe dialectal relationships in detail. In the Miyah–Maybrat context, phonological data show the existence of co-maintained forms, local innovations, systematic innovations, and limited divergence. Thus, the determination of the relationship between language and dialect needs to consider the distribution of variation at observation points, not just external classifications.

Thus, based on synchronous phonological evidence, the Miyah–Maybrat relationship is more accurately understood as a dialectal continuum. Miyah and Aifat show strong retention, Ayamaru and Aitinyo show a transitional position, while Mare is in a more innovative position. Although there are quite obvious phonological differences, these differences still form a chain of interconnected variations. Therefore, the results of this study provide an initial basis for understanding the Miyah–Maybrat relationship as a gradual network of dialectal variations, rather than as a completely absolute phonological separation.

5 Conclusion

Based on the analysis of vowels, diphthongs, consonants, and consonant clusters, this study shows that the Miyah–Maybrat phonological relationship cannot be explained simply as a completely firm separation of two languages. The data showed retention, limited innovation, systematic innovation, and unevenly distributed divergence in each variety. Miyah tends to retain a more retentive form; Aifat shows a strong phonological affinity with Miyah, Ayamaru and Aitinyo occupy transitional positions, while Mare shows more prominent innovations, especially in the vocal system and some consonants.

At the vowel and diphthong, the pattern of change shows a fairly clear phonological gradation. The vowels /a/ as well as the diphthongs /ai/ and /au/ show a gradual divergence from the more retentive form to the more innovative form. However, not all diphthongs change in the same direction. Some diphthongs show more selective innovation in certain varieties. This shows that the Miyah–Maybrat phonological changes are not entirely linear, but form a complex and gradual pattern of variation.

At the level of consonants and consonant clusters, the pattern of change appears to be more branched. Some changes indicate joint innovation in the Maybrat variety, while other changes appear only in certain varieties. Thus, phonological innovations do not spread uniformly across varieties, but emerge through limited, gradual, and branching distributions. This pattern shows that the Miyah–Maybrat relationship is more accurately understood as a network of phonological variations than as a completely absolute phonological separation.

Thus, based on synchronic phonological evidence, Miyah and Maybrat are more accurately understood as varieties that are in a dialectal continuum. However, this study is not intended to establish the linguistic status of Miyah and Maybrat in a final way, but rather provides an initial empirical basis that the relationship between the two needs to be analyzed through the distribution of phonological variation, rather than solely based on language labels, language codes, or administrative boundaries.

In line with these limitations, further research needs to expand the amount of lexical data, observation points, and number of informants so that the pattern of the Miyah–Maybrat relationship can be explained more comprehensively. In addition, it is also necessary to use a dialectometric approach, isoglos mapping, and analysis of other linguistic aspects such as lexicon, morphology, and syntax. In that way, the Miyah–Maybrat relationship can be tested more measurably and not just rely on early phonological evidence. This kind of follow-up approach is important to strengthen understanding of language and dialect boundaries in Southwest Papua, especially in speaking areas that exhibit complex networks of variation.

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