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Austronesian's Traces in Sasak: Historical Linguistics Study

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ABSTRACT

The Sasak language spoken by the Sasak ethnic group in Lombok, Indonesia is one of the many Austronesian languages. As a descendant of Proto-Austronesian (PAN), Sasak is assumed to retain traces of its Austronesian heritage. This research explains the phonological characteristics of PAN in Sasak language by using the working principle in historical linguistic studies. Etymon data from Proto-Austronesian were gathered through literature review, while 200 basic vocabulary and 500 culturally vocabulary were collected through interviews. The interviews involved native speakers of four distinct Sasak dialects, with each dialect represented by three carefully selected informants based on predefined linguistic criteria. Employing a comparative method with a top-down approach, the study identified 343 PAN etyma in Sasak, of which 190 (55.39%) were determined to be inherited lexicons. Among these inherited items, 25 retained their original forms, while the remaining underwent phonological innovations. The other 153 etyma (44.61%) showed no evidence of direct inheritance. Retained Austronesian phonemes include *p, *t, *d, *m, *n, *ɲ, *s, *l, and *r —9 out of the 28 PAN phonemes—where most were regularly retained except for *r and *ɲ, which showed irregularities. Innovations were observed in *C, *c, *z, *j, *N, *S, *h, *R, *ay, *aw, and *uy. Additionally, certain phonemes, such as *k, *?, *w, *g, *ŋ, *y, *i, *u, *Ə, and *a, exhibited both retention and innovation. The retention and innovation in Sasak followed four distinct types: (1) regular retention and regular innovation; (2) regular retention and irregular innovation; (3) irregular retention and regular innovation; (4) irregular retention and irregular innovation. The high degree of innovation and non-inherited lexicon indicate that Sasak has been separated from its Austronesian ancestors for a long time. This study plays a crucial role in classifying languages within Indonesia, identifying the center of Sasak ethnic distribution on Lombok Island, and exploring the etymology of the Sasak language.

INTRODUCTION

Along with Bima and Sumbawa, Sasak is one of the dominant languages spoken by the Sasak ethnic group on the island of Lombok, West Nusa Tenggara, Indonesia. As of 2025, the number of Sasak speakers is estimated to exceed three million (Blust, 1984 & 2013; Bellwood, 1991 & 2024; Klamer, 2019). Genetically, Sasak belongs to the Austronesian language family, specifically within the West Malayo-Polynesian group. Sasak is classified alongside Malay, Javanese, Sundanese, Madurese, Balinese, Sumbawanese, and various languages spoken in Sulawesi, Sumatra, and Kalimantan, as well as languages found in the Philippines, Malaysia, and even as far as Madagascar (Blust, 1978, 1993, 2013; Meacham, 1995; Adelaar, 2005a; Bellwood, 1996; Bellwood & Dizon, 2008; Stephen, 1990; Smith, 2017; Holton, 2017; Himmelmann, 2018; Klamer, 2019; McWhorter, 2019; Corner, 2020). Linguistically, Sasak shares a close relationship with Sumbawa and Bali, forming what Mbete (1990) termed

Figure 1. Locations of Sasak language use

Proto-Balinese-Sasak-Sumbawa. Adelaar (2005b) later proposed the *Proto-Malayo-Sumbawa* hypothesis, arguing, based on both quantitative (lexicostatistics) and qualitative (exclusively shared innovation) evidence, that Sasak, Sumbawa, and Bali are closely related to Malay. This hypothesis challenges Nothofer's (1975) earlier classification, which suggested that Malay is more closely related to Javanese, Sundanese, and Madurese—a grouping he referred to as Proto-Malayo-Javanese.

Through a project funded by the Ministry of Education and Culture of the Republic of Indonesia, Herusantosa et.al (1987) classified the Sasak language into four dialects: Pujut, Selong, Suralaga, and Praya. Mahsun (2006), a dialectologist, proposed a different classification, dividing Sasak into the Pujut dialect (a-e dialect), the Pejanggik dialect (e-e dialect), the Aibukaq dialect (a-o dialect), and the Bayan dialect (a-a dialect). Thoir et.al. (1983) also identified four dialects: ngeno-ngene, ngeto-ngete, keto-kete, and meriak-meriku. However, Thoir et al.'s (1983) classification is considered inadequate because it lacks a dialectological framework. Their classification is based solely on variations of the phrase meaning 'so-so,' which is not a recognized criterion in dialectology. Additionally, previous studies have primarily focused on dialectology, identifying the number and characteristics of Sasak dialects and their prelanguage. While these studies provide valuable insights, they do not explain Sasak's status as a descendant of Austronesian from a historical linguistic perspective. A comprehensive understanding of a language's genetic lineage requires examining both its horizontal relationships with related languages and its vertical relationship with its proto-language. This genetic connection must be established through historical linguistic analysis, specifically by tracing the inheritance of linguistic elements from the parent language. By applying this approach, the study of Sasak within historical linguistics can achieve greater clarity and depth, offering a more complete understanding of its linguistic development.

If Sasak is hypothesized to be a descendant of Austronesian (AN), linguistic evidence is needed to substantiate this claim. This is because a language that descends from a protolanguage is expected to retain traces of that ancestral language (Bynon, 1979; Crowley & Bowern, 2010; Campbell, 2013; Luraghi, 2017; Blust, 2013 & 2017; McWhorter, 2019). In this study, the presence of Proto-Austronesian (PAN) elements in Sasak is conceptualized as Austronesian traces. As is well established, linguistic inheritance from ancient protolanguages to modern languages occurs through two primary processes: retention and innovation (Jeffers & Lehiste, 1979; Mahsun, 1995; Keraf, 1991; Fernandez, 1996; Ross & Durie, 1996; Crowley & Bowern, 2010; Campbell, 2013). Therefore, this study aims to analyze the transmission of Proto-Austronesian features in Sasak, examining both retained elements and linguistic innovations. The inheritance of Proto-Austronesian (PAN) elements of phonology in Sasak, as discussed in this study, is evident in the retention and innovation of phonological features (sound changes).

Tracing the linguistic lineage from

Austronesian to Sasak reveals several important aspects. First, there has been no vertical study that presents direct linguistic evidence confirming Sasak as a descendant of Austronesian. Existing historical linguistic studies have been horizontal in nature, focusing on comparisons between Sasak and neighboring languages such as Sumbawa, Balinese, and Malay (Nothofer, 1975; Mbete, 1990). Second, historical linguistic research on Sasak remains incomplete, particularly due to the absence of studies on its dispersal center. As is well known, identifying a language's center of dispersal is a core objective of historical linguistics. This study was conducted to support that objective and thus carries implications for understanding the dispersal center of the Sasak ethnic group on Lombok Island. Third, this research contributes linguistic evidence to broader, more comprehensive studies on the identity of the Sasak people as part of the Austronesian ethnolinguistic family. Fourth, it holds significance for etymological studies and the development of a Sasak etymological dictionary, as it explains the lexical changes from original PAN forms to their modern reflexes in Sasak

Several relevant diachronic studies relate to this research. Austin (2000) investigated verbs, valence and voice in Sasak. Mahsun (2006) conducted a dialectological study of the Sasak language, classifying it into four dialects, Pujut, Pejanggik, Aibukaq, and Bayan. Adelaar (2005) provided quantitative and qualitative evidence of the relationship between Sasak and Malay. In addition, Mahsun (2006) reconstructed the ancient Sasak language, while Sarwadi et.al. (2019) examined Sasak dialect variations in North Lombok, focusing on phonological and lexical differences. Austin & Nothofer (2012) examined he history of speech levels in Sasak. Austin (2014) documented aksara Sasak, an endangered script and scribal practice. Other studies have explored linguistic inheritance and classification. Paramarta et.al (2019) investigated numeral traces in Old Balinese inscription and their genetic relationship within the Malayo-Polynesian language family. Sumarlam et.al (2017) analyzed PAN reflexes in Buru to determine its linguistic position. Hadi et.al (2020) examined PAN inheritance in the Maya language of Raja Ampat, West Papua. Burhanuddin (2020) examined PAN retention and innovation in the Sula language. Burhanuddin (2021) applied a top-down approach to analyze whether Sakai is a

Malay variety. Sugianto & Hasby (2023) explored patterns of language variations used among speakers of Sasak Lombok. Burhanuddin et al. (2024) examined the origins and migration of the Sasak ethnic group in Lombok from a historical linguistic perspective. Based on heterogeneity theory, they hypothesized that the Sasak people first settled in central and eastern Lombok—in areas such as Kopang, Terara, Kotaraja, Pringgasela, Masbagik, Selong, and Pringgabaya. From this homeland, a portion migrated southward, leading to the emergence of the Pujut dialect, followed by subsequent migrations that formed the Bayan, Pejanggik, and Aibukaq dialects. Other related studies include Burhanuddin and Mahsun (2025), which reviewed the migration of South Halmahera speakers in North Maluku, and Burhanuddin et al. (2025), which investigated the origins of the Sumbawa ethnic group in West Nusa Tenggara.

Despite their historical linguistic approach, these studies do not examine Austronesian traces in the Sasak language. Research on Austronesian heritage in Indonesia is more commonly approached from archaeological perspectives. For example, Apriadi et al. (2018) analyzed Austronesian cultural traces on the east coast of South Sumatera, and Handini et al. (2018) studied the Lambanapu site to document the Austronesian diaspora in East Sumba. Moreover, Hidayah (2017) examined Austronesian traces in Gede Cave, Nusa Penida Island, Bali, while Hartatik (2019) explored the Kaharingan religion as an Austronesian influence among the Dayak people. Klamer (2019) traced the historical distribution of 650 languages across Malaysia, Indonesia, the Philippines, and Timor-Leste, noting that Austronesian historical linguistics has not fully mapped the temporal and spatial relationships between these languages. Yondri (2020) analyzed prehistoric Austronesian traces in Subang Regency, West Java. Recently, Mukramah (2024) examined sound changes from Proto-Austronesian to Minangkabau. These archaeological studies rely primarily on material evidence to track Austronesian influence, whereas the current study approaches Austronesian traces through linguistic evidence.

Language is inherently dynamic, evolving in response to its speakers' and environmental changes. As speakers seek to adapt and innovate, language naturally transforms to accommodate their needs (Mahsun, 2006). These transformations

occur due to personal and environmental factors, as well as broader influences such as geography, economy, and politics (Anttila, 1972; Arlotto, 1972; Campbell, 2013). According to Lyons (1981), diachronic language change is a gradual process rather than an instantaneous shift. It involves the transition from a *proto-language* to its modern derivatives, beginning with sound changes that eventually influence word forms. Bynon (1979) and Robins (2014) assert that these changes do not occur uniformly across all words but rather affect individual words over time, with some words remaining unchanged. Consequently, every word in a language has its own historical trajectory (Lehmann, 1973; Lass, 1984).

Sound changes from a proto-language to its modern descendants—such as the transition from Proto-Austronesian (PAN) to Sasak—can be classified into two primary types: retention and innovation (Anttila, 1972; Palmer, 1978; Crowley & Bowern, 2010). Retention refers to sounds that remain unchanged from the ancestral language. For example, PAN *aCay 'eyes' remains largely intact in Sumbawa: *mata*. Innovation occurs when a sound in the proto-language undergoes modification, deletion, or addition in the descendant language. For instance, Proto-Malay-Polynesian (PMP) *u/-#K transforms into Sumbawa: /e/, as seen in PMP: *pukul 'attack' → Sumbawa: *pukel*. Innovations can be regular or irregular (Bynon, 1979; Hock, 1986; Mahsun, 2006; Campbell, 2013). Regular innovations occur across a broad range of words, while irregular innovations are limited, affecting only a limited set of words.

According to Lehmann (1973), Hock (1986), Keraf (1991), Mahsun (1995), Crowley and Bowern (2010), Campbell (2013), both regular and irregular linguistic innovations can take various forms, including phoneme change, phoneme loss, phoneme addition, split, merger, assimilation, dissimilation, metathesis, and contraction.

Phoneme change refers to the transformation of a phoneme from the parent language into another phoneme in a more modern language. For instance, Proto-Austronesian (PAN) *i changes to Malay /e/, as seen in *ikur becoming *ekɔr* 'tail'. Phoneme loss occurs when a phoneme from the parent language is lost in its descendant languages. This can happen at the beginning (apheresis), middle (syncope), or end (apocope) of a word. For example, in Malay, the PAN *h is lost and turns into Malay: /Ø/, as in *hubi becoming *ubi* 'sweet potatoes'.

II. METHODS

This study adopts a descriptive qualitative approach, which involves explaining observed phenomena using non-numerical data presented in narrative form. Specifically, the study applies a descriptive qualitative approach within the framework of historical linguistics. The historical linguistic approach utilizes the comparative method to analyze the inheritance of protolanguage features in modern languages. In historical linguistic studies, two primary approaches—top-down and bottom-up—are used to trace linguistic evolution vertically (Crowley & Bowern, 2010;). Before discussing the specific methods used in this research, it is essential to first outline the types and sources of data. A clear description of the data types provides insight into the nature of the linguistic material analyzed, while an explanation of data sources clarifies the types of methods employed in this study.

The data in this study consist of the realization of 200 basic vocabulary Swadesh words and 500 cultural vocabulary words in the Sasak language (across its dialects, including Pujut, Selaparang, Aibukaq, and Bayan), as well as Proto-Austronesian (PAN) etymons—ancient linguistic elements—found in the *Austronesian Comparative Dictionary* compiled by Blust & Trussel (2020). The dictionary contains 1772 of PAN etymons, which serve as a key reference for Austronesian language classification. The vocabulary data (200 basic vocabulary and 500 cultural vocabulary) were collected directly from the field, with informants from 4 observation areas. Each area was selected based on the Sasak dialect classification by Mahsun (2006), which identifies four dialects. Thus, the sample of this study is four areas of Sasak language dialect speakers to collect basic vocabulary and cultural vocabulary. A minimum of three qualified informants were chosen for each observation area. Meanwhile, the PAN etymon data were sourced from online literary references, including the Austronesian Comparative Dictionary (Blust & Trussel, 2020), which Austronesian linguists for language classification.

According to Sudaryanto (2015) and Mahsun (2019), language research has three stages, namely data collection, data analysis, and presentation of

data analysis results. These three stages are taken in this study. Considering the research objectives and the type of data to be collected, this study employs two data collection methods, namely the interview method (Balal, 2025) and the literature method (Khan, 2014, Hoda, 2024, Adeyinka-Ojo, 2025, Noble, et.al, 2025). The interview method is used to collect 700 vocabulary items across 4 dialects of the Sasak language. The interviews involve presenting a glossary of 700 vocabulary items in Indonesian. Additionally, this method gathers information on regional identity, boundaries, population, education, and labor. To ensure linguistic data validity, each session involves three informants simultaneously, selected based on the following criteria (Sudaryanto, 2015; Mahsun, 2019): (1) male or female; (2) aged between 25 and 65 years (not senile); (3) parents and spouse born and raised in the village, with minimal or no migration history; (4) maximum education level of basic schooling; (5) middle social status (neither low nor high) to ensure limited mobility; (6) agricultural or laborer occupation; (7) having pride in their dialect; (8) ability to speak Indonesian; and (9) physically and mentally healthy. The literature method is used to collect PAN etymons, which are available in the Austronesian Comparative Dictionary by Blust and Trussell (2020). PAN etymons that have undergone linguistic change within the Sasak language are recorded and analyzed. This method is also used to collect Sasak language data from written sources, including the Sasak-Indonesian Dictionary published by the Language Center of West Nusa Tenggara Province.

Data analysis in this study employs a comparative method with a top-down approach, comparing elements of the ancient language (etymones) with linguistic elements found in Sasak dialects (Fernandez, 1996; Crowley & Bowern, 2010, Campbell, 2013; Ross & Greenhill, 2024). The comparison aims to identify pattern of change in the transition from PAN etymons to the Sasak language. A comparison was conducted between Proto-Austronesian (PAN) etyma and a dataset of 700 Sasak lexical items to determine inherited elements. Sasak words identified as non-inherited (loanwords or innovations unrelated to PAN) were excluded from further analysis. The remaining inherited elements were then examined and classified into two categories, retention (elements preserved from PAN) and innovation (newly developed or altered linguistic forms). Further classification of innovation patterns is conducted to determine the type of change, which may include: extracting (removal of elements), addition (introduction of new elements), assimilation (sound changes to become more similar), dissimilated (sound changes to become more distinct), metathesis (rearrangement of sounds), mergers (combining linguistic elements), split (division of one element into multiple forms), or contraction (shortening of words or sounds). Each type of change is further examined to determine whether it follows a regular or irregular pattern.

III. RESULTS

Before describing linguistic traces in the Sasak language, it is important to first examine the phonemes of both Sasak and Proto-Austronesian (PAN) to ensure a clearer and more systematic analysis.

According to Blust (2013) and Blust & Trussel (2020), Proto-Austronesian (PAN) consists of 28 phonemes, including 24 consonants (/p, t, C, c, k, ?, b, d, z, j, g, m, n, ɲ, ŋ, N, S, s, h, l, R, r, w, y/), 4 vowels (/i, u, ə, a/), and 4 diphthongs (/ay, aw, uy, iw/). In contrast, analysis of the Sasak language, as identified by Mahsun (2006) and Thoir et.al (1983), reveals a total of 25 phonemes, comprising 8 vowels and 17 consonants. The vowel system in Sasak includes /i, u, e, ə, E, o, ɔ, a/, while its consonant inventory consists of /p, b, t, d, c, j, k, g, ?, s, h, m, n, ɲ, ŋ, l, r, w, y/. The presence and distinction of these Sasak vowels can be further examined through minimal pair analysis.

a. /i/ : pari 'stingray'
   /E/ : parE 'pariah'
b. /a/ : bəla? 'split'
   /e/ : bəle? 'big'
c. /a/ : lalo 'go'
   /o   : lolo 'tree'
   /u/ : lalu 'Sasak Men's Title'
d. /a/ : balo? 'his son's grandchild'
   /ə/ : bəlo? 'palm water'
e. /e/ : bədɔk 'goit'
   /ɔ/ : bɔdɔk 'cat'

The presence of 17 Sasak consonants is demontrated in the minimal pair analysis as follows.

a. /p/ : pait 'bitter'
   /b/ : bait 'take'
b. /t/ : ituŋ 'count'
   /d/ : iduŋ 'nose'

c. /s/ : sai 'who'
    /t/ : tai 'peces'
d. /l/ : Elaq 'tongue'
    /r/ : Eraq 'later'
e. /c/ : kɔcɔr 'kettle'
    /j/ : kɔjɔr 'rigid'
f. /k/ : taŋkEl 'shell (coconut)'
    /g/ : taŋgEl 'attack, hit'
g. /ʔ/ : baraʔ 'swollen'
    /k/ : barak 'live coals'
h. /h/ : tipah 'mat'
    /ʔ/ : tipaʔ 'to'
i. /m/ : tumə 'white lice'
    /n/ : tunə 'tuna fish'
j. /ŋ/ : pEŋɔt 'mozzle'
    /ɲ/ : pEɲɔt 'dented'

The data analysis identified 343 Proto-Austronesian (PAN) etymons that have corresponding forms in Sasak. This means that out of the 700 basic vocabulary and cultural terms examined, only 343 were suitable for analysis. The influence of Austronesian heritage can be observed in Sasak vocabulary that directly traces back to PAN. However, Sasak lexicon that does not originate from the same PAN etymon (referred to as lexical differences) is not considered part of this linguistic inheritance. Thus, the inherited elements in Sasak fall into two categories: retention and innovation.

Retention of PAN to Sasak

Among the phonological elements inherited from Proto-Austronesian (PAN) into Sasak, several instances of retention have been identified, as outlined in the following data sets (b) through (ee). Prior to this, examples of PAN lexicons that have remained unchanged (retentions) in Sasak are presented in data set (a).

(a) unchanged lexicons

Gloss	PAN	Sasak
lift	*aŋkat	aŋkat
what	*apa	apa
chicken	*manuk	manuk
return	*balik	balik
cough	*batuk	batuk
split	*bəlaʔ	bəlaʔ
fruit	*buaʔ	buaʔ, etc.

(b) PAN *p

Gloss	PAN	Sasak	
rice	*pajay	pa(d,r)e	(b1)
bitter	*paʔi	pait	
arrow	*panaʔ	panaʔ	
loft	*paraw	səmpare	
stingray	*pari	pari	
paria	*pariaʔ	paria	
turtle	*pəɲu	pəɲu	
squeeze	*pərəs	pərəs	
flat	*pipih	pipi	
banana	*punti	puntiʔ	
white	*puni	putiʔ	
what	*apa	apa	(b2)
fire	*hapuy	api	
grandfather	*apu	papuqʔ	
thin	*tipis	tipis	
kapok	*kapua	kapuk	
roof	*ʔatəp	atap	(b3)
life	*ʔudip	i(d,r)up	
stay	*ʔinap	Enap	
blow	*tiyup	tiup	

Data (b1) - (b3) show that PAN: *p in initial, middle, and final position is retained (unchanged) in Sasak.

c. PAN *t

Gloss	PAN	Sasak	
thin	*tipis	tipis	(c1)
blow	*tiyup	tiyup	
burn	*tunuh	tunuh	
afraid	*takut	takut	
sugarcane	*təbu	təbu	
swallow	*tilən	tələn	
stone	*batu	batu	(c2)
roof	*qatəp	atəp	
cough	*batuk	batuk	
flat	*datar	rata	
lice	*gutu	kutu	
ask	*kutaɲa	katuan	
egg	*ʔatəlur	tələʔ	
cucumber	*ʔatimun	timu	
lift	*aŋkat	aŋkat	(c3)
four	*əmpat	əmpat	
sea	*lahut	lut	

Data (c1) - (c3) show that in the initial, middle, and final positions, PAN: *t is retained (unchanged) in Sasak.

(d) PAN *k

Gloss	PAN	Sasak	
dig	*kalih	kaliʔ	(d1)
right	*kawanan	kawan	
kapok	*kapua	kapuk	
wood	*kasiw	kayu	
you	*kaSu	kamu	
left	*kawiri	kiri	
ask	*kutaɲa	katuan	

afraid	*takut	takut	(d2)
root	*akaR	akah	
lift	*aŋkat	aŋkat	
child	*anak	anak	(d3)
stab	*tusuk	tusuk	
chicken	*manuk	manuk	
cough	*batuk	batuk	

PAN sound: *k in data (d1) - (d3) in the initial, middle, and final positions is retained (unchanged) in Sasak.

(e) PAN *ʔ

Gloss	PAN	Sasak
wet	*basaʔ	basaʔ
split	*bəlaʔ	bəlaʔ
swollen	*baRəʔ	baraʔ
fruit	*buaʔ	buaʔ
open	*hukaʔ	bukaʔ
blood	*daRaʔ	daraʔ
mother	*inaq	inaʔ
far	*jaɔʔ	jaɔʔ

*PAN Retention: ʔ in Final Position. The glottal stop *ʔ from Proto-Austronesian (PAN) is retained in Sasak primarily in word-final positions. This phonological retention is observed in several lexical items with the following meanings: 'lick', 'pee', 'young', 'vomit', 'arrow', 'turtle', 'wrong', 'index finger', and 'tongue'. The corresponding PAN reconstructions and their reflexes in Sasak are as follows: *dilaʔ, *miʔmiʔ, *mudaʔ, *utaʔ, *panaʔ, *pəɲuʔ, *salaʔ, *Cuzuʔ, *dilaʔ > Sasak: dElaʔ, mEnEʔ, ɔdaʔ, utaʔ, panaʔ, pəɲu, salaʔ, tuju?, Elaʔ.

(f) PAN *b

Gloss	PAN	Sasak	
return	*balik	balik	(f1)
live coal	*barah	barak	
new	*baʔəru	baru	
wet	*basaʔ	basaʔ	
stone	*batu	batu	
cough	*batuk	batuk	
split	*bəlaʔ	bəlaʔ	
swollen	*barəʔ	baraʔ	
rice	*bəras	bəras	
weight	*berəʔat	*bərat	
give	*bəray	beŋ	
calf	*bətiəs	bətis	
lips	*birbir	biwih	
fruit	*buaʔ	buaʔ	
trap	*bubu	bubu	
moon	*bulan	bulan	

hair	*bulu	bulu	
blind	*buca	buta	
hair	*bukes	bukes	
house	*balay	bale	
star fruit	*baliŋbiŋ	bəlimbiŋ	
star fruit	*baliŋbiŋ	bəlimbiŋ	(f2)
afternoon	*rabian	kabian	
sugarcane	*təbu	təbu	
pig	*babuy	babi	
porridge	*burbur	bubur	

Data (f1) and (f2) show that PAN: *b is retained in Sasak only in initial and middle positions.

(g) PAN *d

Gloss	PAN	Sasak	
hear	*dəɲər	deɲer	(g1)
two	*dusa	dua	
chest	*daSdaS	dada	
forehead	*daʔis	dahi	
blood	*daraʔ	daraʔ	
in	*daləm	daləm	
lick	*dilaʔ	delaʔ	
life	*ʔudip	idup	(g2)
young	*mudaʔ	ɔdaʔ	
shrimp	*ʔudaŋ	udaŋ	
burn	*cidu	sədut	

Data (g1) and (g2) show that PAN: *g is retained in Sasak only in initial and final positions.

(h) PAN *g

Gloss	PAN	Sasak
handful	*gəŋgəm	*əŋgəm

The sound PAN: *g only has irregular retention in middle position in Sasak, in data (h)

(i) PAN *m

Gloss	PAN	Sasak	
pee	*miʔmiʔ	mEnEʔ	(i1)
eyes	*maCa	mata	
chicken	*manuk	manuk	
five	*lima	lima	(i2)
father	*amax	amaʔ	
cucumber	*ʔatimun	timun	
drink	*inum	inəm	(i3)
in	*daləm	daləm	
six	*ənəm	ənəm	
handful	*gəŋgəm	əŋgəm	
needle	*zarəm	jaum	
sharp	*tazəm	tajəm	

Data (i1) - (i3) show that PAN: *m in Sasak is retained in all positions (initial, middle, and final).

(j) PAN *n

Gloss	PAN	Sasak	
chicken	*manuk	manuk	(j1)
burn	*tunuh	tunu?	
drink	*inum	inəm	
arrow	*pana?	pana?	
six	*ənəm	ənəm	
mother	*ina?	ina?	
stay	*?inəp	Enap	
this	*ini	ini	
name	*ŋajan	aran	(j2)
road	*zalan	jalan	
right	*kawanan	kawan	
weaving	*tənun	tənun	
cucumber	*qatimun	timun	

Data (j1) and (j2) show that PAN: *n in Sasak is retained only in middle and final position.

(k) PAN *ŋ dan *ɲ

Gloss	PAN	Sasak	
lift	*aŋkat	aŋkat	(k1)
sky	*laŋiC	laŋit	
ridgepole	*bubuŋan	buwuŋ	
ear	*Caliŋa	təliŋa	
nose	*ijusuŋ	iduŋ	(k2)
star fruit	*baliŋbiŋ	bəlimbiŋ	
mortar	*lusuŋ	lisuŋ	
shrimp	*?udaŋ	udaŋ	
coconut	*ɲiuR	ɲiur	(k3)
turtle	*pəɲu	pəɲu	

Data (k1) and (k2) show that PAN: *ŋ in Sasak is retained only in middle and final position, while PAN: *ɲ (in data (k3)) experiences irregular retention in the initial and middle positions.

(l) PAN *s

Gloss	PAN	Sasak	
sink	*sələm	sələm	(l1)
elbow	*sikux	siku	
dog	*asu	basəŋ	(l2)
salt	*?asira	sia	
one	*isa	sai?	
son/daughter-in-law	?asawa	sawa	
wet	basa?	basa?	
stab	*tusuk	tusuk	(l3)
clean	*kərsik	bərsi	
suck	*hisəp	hisəp	
calf	*bətiəs	bətis	(l4)
crying	*caɲis	taɲis	
on	*acas	atas	
thin	*tipis	tipis	
rice	*bəras	bəras	

Data (l1), (l2), and (l3) show that PAN: *s in Sasak is retained in all positions (initial, middle, and final).

(m) PAN *l dan *r

Gloss	PAN	Sasak	
five	*lima	lima	(m1)
sky	*laŋiC	laŋit	
run	*lariw	pəlai	
sea	*lahut	laut	
sail	*layaR	layar	
neck	*liqər	lir	
mortar	*luSuŋ	lisuŋ	
lice	*lisa?əS	lisa?	
return	*balik	balik	(m2)
split	*bəla?	bəla?	
moon	*bulaN	bulan	
hair	*bulu	bulu	
in	*daləm	daləm	
eight	*walu	balu?	
dig	*kalih	kali?	
soft	*daliS	alus	
tie	*caliS	tali?	
road	*zalan	jalan	
lick	*dila?	dEla?	
head	*?uluh	ulu	
tongue	*dila?	Ela?	
house	*balay	bale	
wrong	*sala?	sala?	
rope	*CaliS	tali	
swallow	*tilən	tələn	
ear	*Caliŋa	təliŋa	
egg	*?itəlur	*?itəlur	
sink	*sələm	kələm	
three	*təlu	təlu	
snake	*Sular	ular	
caterpillar	*kulay	ulət	
pariah	*paria?	paria	(m3)
scrath	*garut	karɔk	

Data (m1) and (m2) show that PAN: *l in Sasak experiences retention only in the initial and middle positions, while in data (m3) PAN: *r has irregular retention in the middle position

(n) PAN *w dan *y

Gloss	PAN	Sasak	
right	*kawanan	kawan	(n1)
nine	*siwa	siwa?	
son/daughter-in-law	?asawa	sawa	
sail	*layaR	layar	(n2)

The sound PAN: *w in data (n1) is retained only in middle position in Sasak, while PAN: *y in data (n2) only experiences irregular retention in middle position.

(o) PAN *i

Gloss	PAN	Sasak	
he	*ia	ia	(o1)
nose	*ijuSuŋ	iduŋ	
mother	*ina?	ina?	
this	*ini	ini	
we	*ita	ita	
they	*ida	ia	
drink	*inum	inem	
one	*isa	sai	
return	*balik	balik	(o2)
star fruit	*balimbiŋ	bəlimbiŋ	
calf	*bətiəs	bətis	
lips	*birbir	bibir	
dig	*kalih	kali?	
salt	*?asira	sia	
octopus	*?urica	kərita?	
life	*?udip	irup	
shark	*?isu	hiu	
nose	*ijusuŋ	iduŋ	
ear	*Caliŋa	təliŋa	
lice eggs	*lisə?əs	lisa?	
thin	*tipis	tipis	
coconut	*ɲiur	ɲiur	
left	*kawiri	kiri	
sew	*Ca?is	jait	
sky	*laɲiC	laɲit	
neck	*li?er	lir	
five	*lima	lima	
pariah	*paria?	paria	
stomach	*tian	tian	
flat	*pipih	pipi	
nine	*Siwa	siwa?	
cry	*Caŋis	təŋis	
afternoon	*Rabian	kəbian	
water	*waSir	ai?	
banana	*punti	puntiq	(o3)
white	*puNi	puti	
a little	*kədi	səkədi?	
now	*daNi	nani	
afternoon	*wari	təŋari	
feces	*ca?i	tai	
wife	*binahi	səbinian	
dream	*sipi	impi	
younger brother	*Suaji	adi?	
bitter	*pa?i	pait	
stingray	*pari	pari	

caterpillar	*kulay	ulət	
fruit	*buaq	bua?	
trap	*bubu	buwuh	
open	*huka?	buka?	
two	*duSa	dua	
rain	*?uzaN	ujan	
moon	*bulaN	bulan	
blind	*buCa	buta	
burn	*tunu	tunu?	
nose	*ijusuŋ	iduŋ	
life	*?udip	irup	
scabies	*kudis	gudEs	
white	*puNi	puti?	
head	*?uluh	ulu?	
mortar	*lusuŋ	lisuŋ	
rattan	*?uay	uwe	
ask	*kutaɲa	katuan	
hair	*bulu	bulu	
index finger	*Cuzu?	tuju?	
ridgepole	*bubuŋan	buwuŋ	
coconut	*ɲiur	ɲiur	(p2)
horn	*tanduk	taŋge?	
banana	*punti	punti?	
flow	*?alur	arus	
chicken	*manuk	manuk	
new	*ba?əruh	baru	
weaving	*tənun	tənun	
cucumbers	*?atimun	timun	
blow	*tiyup	tiup	
porridge	*buRbuR	bubur	
cough	*batuk	batuk	
hair	*bulu	bulu	(p3)
grandchildren	*apu	əmpu	
eight	*walu	balu?	
shark	*?isu	hiu	
stone	*batu	batu	
you	*kaSu	kamu	
lice	*kutu	gutu	
person	*Cau	tau	
turtle	*pəɲu	pəɲu	
i	*aku	aku	
elbow	*siku	siku	
milk	*susu	susu	
know	*Ca?u	tao?	
sugar cane	*təbu	təbu	
Three	*təlu	təlu	
ash	*?abu	awu	

Data (o1) - (o3) show that PAN: *i is regularly retained in all positions in Sasak.

Data (p1) - (p3) show that PAN: *u is regularly retained in all positions in Sasak.

(p) PAN *u

Gloss	PAN	Sasak	
shrimp	*?udaŋ	udaŋ	(p1)
snake	*sulaR	ular	

(q) PAN *ə

Gloss	PAN	Sasak	
four	*əmpat	əmpat	(q1)
six	*ənəm	ənəm	

rice	*bəRas	bəRas	(q2)
heavy	*bəRəqa	bərat	
turtle	*pəɲu	pəɲu	
sugarcane	*təbu	təbu	
eggs	*ʔicəlur	tələʔ	
weaving	*tənun	tənun	
three	*təlu	təlu	
roof	*ʔatəp	atəp	(q3)
clean	*kərsik	bərsi	
in	*daləm	daləm	
hear	* dəŋər	dəŋər	
handheld	*gəŋggəm	əŋggəm	
squeeze	*pəRəs	pəRəs	
navel	*pujək	pəsət	
sharp	*tazəm	tajəm	
swallow	*tilən	tələn	

Data (q1) shows that PAN: *ə retains irregularly in initial position, while data (q2) and (q3) show regular retention in middle and final position in Sasak.

(r) PAN *a

Gloss	PAN	Sasak	
dog	*asu	acɔŋ	(r1)
root	*akaR	akar	
child	*aNak	anak	
lift	*aŋkat	aŋkat	
what	*apa	apa	
up	*aCas	atas	
father	*amax	amaq	
dead	*aCay	mate	
i	*aku	aku	
ash	*ʔabu	awu	(r2)
flow	*ʔaluR	arus	
water	*wasiR	aiʔ	
swollen	*barəʔ	baraʔ	
feces	*caʔi	tai	
fire	*hapuy	api	
roof	*atəp	atəp	
chicken	*manuk	manuk	
return	*balik	balik	
live coals	*barah	barak	
new	*baʔəruh	baru	
wet	*basaʔ	basaʔ	
stone	*batu	batu	
cough	*batuk	batuk	
eyebrows	*daliS	alis	
blood	*daraʔ	daraʔ	
flat	*datar	rata	
in	*daləm	daləm	
eight	*walu	baluʔ	
dig	*kalih	kaliʔ	
road	*zalaN	jalan	
needle	*zarəm	jaum	

far	*zauʔ	jaɔʔ	
wood	*kaSiw	kayuʔ	
you	*kaSu	kamu	
right	*kawanan	kawan	
sky	*laŋiC	laŋit	
run	*laRiw	pəlai	
sail	*layaR	layar	
climb	*dakiS	taEk	
name	*ŋajan	aran	
person	*Cau	tau	
rice	*pajay	pade	
bitter	*paʔi	pait	
arrow	*panaʔ	panaʔ	
loft	*paraʔ	səmpara	
pariah	*pariaʔ	parie	
know	*Caʔu	taɔʔ	
year	*CawiN	taun	
sharp	*tazəm	*tajəm	
afraid	*takut	takut	
rope	*CaliS	tali	
cry	*CaŋiS	taŋis	
cucumber	*ʔatimun	timun	
hundred	*Ratus	ratus	
wrong	*salaʔ	salaʔ	
now	*daNi	nani	
old	*tuʔas	tɔaʔ	
stingray	*pari	pari	
afternoon	*waRi	təŋari	
scratch	*garut	karɔk	
wife	*binah	səbinian	
brother	*Suaji	adiʔ	
stomacth	*tiaN	tian	(r3)
horn	*tanduk	taŋeʔ	
bamboo	*ʔaur	aur	
shrimp	*ʔudaŋ	udaŋ	
snake	*ʔulaR	ular	
rain	*ʔuzan	ujan	
mother	*inaʔ	inaʔ	
lick	*dilaʔ	dElaʔ	
tie	*CaliS	taliʔ	
tongue	*dilaʔ	Elaʔ	
young	*mudaʔ	ɔdaʔ	
vomit	*utaʔ	utaʔ	
split	*bəlaʔ	bəlaʔ	
rice	*bəras	bəras	
heavy	*bərəʔat	bərat	
fruit	*buaʔ	buaʔ	
open	*hukaʔ	bukaʔ	
moon	*bulaN	bulan	
four	*əmpat	əmpat	
right	*kawanan	kawan	
ridgepole	*bubuŋan	buwuŋ	
correct	*kəna	kənaʔ	(r4)
blind	*buCa	buta	
two	*duSa	dua	

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salt	*?asiRa	sia
octopus	*kuRiCa	kərita?
he, she	*ia	ia
we	*ita	ita
five	*lima	lim(a,e)
eye	*maCa	mata
they	*ida	sita
one	*isa	sai?
nine	*siwa	siwa
son/daughter-in-law		
ear	*Caliŋa	təliŋa

Data (r1) - (r3) show that PAN: *a is regularly retained in all positions (initial, middle, and final) in Sasak.

Innovation of PAN to Sasak

The data analysis identified several PAN elements that have been retained in Sasak, as shown in the following data.

(s) PAN *k

Gloss	PAN	Sasak
lice	*kutu	gutu
clean	*kərsi?	bərsih
caterpillar	*kulay	ulət

Data (s) shows that PAN: *k undergoes irregular innovation into Sasak: g, b, ø in the initial position.

(t) PAN *C dan *c

Gloss	PAN	Sasak	
person	*Cau	tau	(t1)
know	*Ca?u	tahu	
year	*CawiN	taun	
rope	*CaliS	tali	
cry	*Caŋis	taŋis	
ear	*Caliŋa	təliŋa	
index finger	*Cuzu?	tunjuk	
burn	*CuNuh	tunu?	
up	*aCas	atas	(t2)
kill	*aCay	mate?	
blind	*buCa	buta	
octopus	*?uRiCa	kərita?	
heart	*?aCay	ate	
that	*iCu	eto	
eye	*maCa	mata	
dead	*aCay	mate	
egg	*?iCeluR	tələ?	
Sky	*laŋiC	*laŋit	(t3)
feces	*ca?i	tai	(t4)

Data (t1) and (t2) show that PAN: *C undergoes regular innovation into Sasak: t in the initial and middle positions, while in the final position it occurs irregularly (data (c3)). The data

(t4) shows that PAN: *c experienced irregular innovation into Sasak: t in the initial position.

(u) PAN *?

Gloss	PAN	Sasak	
ash	*?abu	awu	(u1)
flow	*?alur	arus	
roof	*?atəp	atəp	
bamboo	*aur	aur	
salt	*qasiRa	sia	
heart	*?acay	ate	
life	*?udip	i(d,r)up	
shark	*?isu	hiu	
rain	?ujan	ujan	
stay	*?inəp	Enap	
this	*?ani	ini	
head	*?uluh	ulu	
rattan	*?uay	uwe	
son/daughter-in-law	?asawa	sawa	
egg	*?itəluR	tələq	
cucumber	*?atimun	timun	
shrimp	*?udaŋ	udaŋ	
new	*ba?əruh	baru	(u2)
sewing	*Ca?iS	jait	
neck	*li?er	lir	
bitter	*pa?i	pait	
know	*ta?u	taɔ?	
feces	*ca?i	tai	
lice eggs	*lisə?əs	lisa?	(u3)
eyebrows	*da?iS	alis	
pariah	*paria?	paria	(u4)

Data (u1) and (u2) show that PAN: *? undergoes regular innovation into Sasak: ø in the initial and middle positions, while in the final position it occurs irregularly (data (u3)).

(v) PAN *b dan *d

Gloss	PAN	Sasak	
ridgepole	*bubuŋan	buwuŋ	(v1)
ash	*?abu	awu	
climb	*dakiS	taɛk	(v2)
flat	*datar	rata	(v3)
soft	*daliS	alus	(v4)

Data (v1) shows that PAN: *b undergoes irregular innovation to Sasak:w in middle position. Data (v2), (v3), and (v4) each show the irregular innovation of PAN: *d to Sasak: d, r, and ø in initial position.

(w) PAN *z, *j, dan *g

Gloss	PAN	Sasak	
road	*zalaN	jalan	(w1)
needle	*zarəm	jaum	
far	*zau?	jaɔ?	

sharp	*tazəm	tajəm	(w2)
rain	*quzaN	ujan	
younger brother	*Suaji	adi?	(w3)
nose	*ijusuŋ	iduŋ	
rice	*pajay	pad(i,e)	
name	*ŋajan	aran	(w4)
navel	*pujək	pɔsət	
handful	*gəŋgəm	əŋgəm	(w5)

Data sets (w1) and (w2) indicate that the Proto-Austronesian (PAN) phoneme *z regularly changes to /j/ in Sasak when it occurs in initial position. However, in medial position, the change is irregular. If data set (w2) is expanded, it is possible that a more regular pattern may emerge. Similarly, in data sets (w3) and (w4), PAN *j in the penultimate syllable consistently shifts to /r/ in Sasak, while in the final syllable, it changes to /r/ or /s/ irregularly. In data set (w5), PAN *g in initial position disappears irregularly in Sasak.

(x) PAN *ŋ dan *N

Gloss	PAN	Sasak	
name	*ŋajan	aran	(x1)
child	*aNak	anak	(x2)
now	*daNi	nani	
banana	*puNi	punti?	
stomach	*tiaN	tian	(x3)
moon	*bulaN	bulan	
rain	*?uzaN	ujan	
year	*CawiN	taun	

Data set (x1) shows that the Proto-Austronesian (PAN) phoneme *ŋ disappears irregularly in initial position in Sasak. In contrast, data sets (x2) and (x3) indicate that the PAN nasal phoneme *N consistently undergoes a regular sound change to /n/ in Sasak, both in medial and final positions.

(y) PAN *S dan *h

Gloss	PAN	Sasak	
nine	*Siwa	siwa?	(y1)
younger brother	*Suaji	adi?	
dream	*Sipi	impi	
you	*kaSu	kamu	(y2)
two	*duSa	dua	
shark	*?iSu	hiu	
chest	*daSdaS	dada	(y3)
nail	*kuSkuS	kuku?	
water	*waSir	ai?	
nose	*ijuSuŋ	iduŋ	
old	*tu?aS	tɔa?	(y4)
tie	*CaliS	tali?	
rope	*CaliS	tali	
lice egg	*lisə?əS	lisa?	
sewing	*Ca?iS	jait	(y5)

eyebrows	*daliS	alis	(y6)
up	*dakS	taEk	(y7)
fire	*hapuy	Api	(y8)
suck	*hisəp	isəp	
new	*ba?əRuh	Baru	(y9)
head	*?uluh	ulu	
cheek	*pipih	pipi	
dig	*kalih	Kali?	(y10)

Data set (y1) shows that the Proto-Austronesian (PAN) phoneme *S underwent irregular innovation (in the form of a split) into Sasak /s/ and zero (ø). In data set (y2), *S in the penultimate syllable also splits irregularly, resulting in /m/ and ø in Sasak. In contrast, in the ultimate syllable (see data (y3)), *S regularly disappears in Sasak. Data set (y4) shows a regular innovation of *S into glottal stop /?/ in Sasak, while in data sets (y5) to (y7), *S irregularly changes into /t/, /s/, and ø, respectively. In data set (y8), PAN *h disappears irregularly in word-initial position in Sasak—though if the dataset is expanded, the change may prove to be regular. In final position (data (y9)), *h regularly disappears. However, in some cases, *h may also undergo irregular innovation into /?/ in final position, as shown in data set (y10).

(z) PAN *R

Gloss	PAN	Sasak	
hundred	*Ratus	ratus	(z1)
salt	*?asiRa	sia	(z2)
octopus	*kuRita	kərita?	
left	*kawiRi	kiri	
stingray	*paRi	pari	
afternoon	*waRi	təŋari	
live coals	*baRah	barak	(z3)
new	*baqəRuh	baru	
swollen	*baRew	bara?	
rice	*bəRas	bəras	
heavy	*bəRə?at	bərat	
blood	*daRa?	dara?	
squeeze	*pəRəs	pərəs	
needle	*zaRəm	jaum	
lips	*biRbiR	Biwir	(z4)
porridge	*buRbuR	Bubur	
listen	*dəŋər	dəŋər	
snake	*sulaR	Ular	
bamboo	*?auR	aur	
sail	*layaR	Layar	
neck	*liqəR	Lir	
water	*waSiR	ai?	(z5)
egg	*?itəluR	təlɔ?	
give	*bəRay	bEŋ	(z6)
run	*laRiw	pəlai	(z7)

Data set (z1) shows that the Proto-Austronesian (PAN) phoneme *R undergoes irregular innovation into /r/ in Sasak. In data sets (z2) and (z3), *R regularly changes into /r/ in both penultimate and ultimate syllables. In data set (z4), *R consistently becomes /r/, while in data set (z5), it irregularly changes into a glottal stop /ʔ/. Meanwhile, in data sets (z6) and (z7), the *R phoneme disappears irregularly in Sasak.

(aa) PAN *w and *y

Gloss	PAN	Sasak	
water	*waSiR	ai?	(aa1)
root	*wakaR	akar	
afternoon	*wari	təŋari	
eight	*walu	balu?	(aa2)
honey	*wanu	lani	
left	*kawiri	kiri	(aa3)
year	*CawiN	taun	
blow	*tiyup	tiup	(aa3)

Data (aa1) indicates that the PAN phoneme *w in initial position either disappears regularly or changes into Sasak /b/ or /l/ (see data (aa2)). In penultimate syllables (data aa3), *w disappears irregularly. Data (aa4) shows that PAN *y also disappears irregularly in Sasak.

(bb) PAN *i

Gloss	PAN	Sasak	
lick	*dila?	dEla?	(bb1)
tongue	*dilaq	Ela?	
swallow	*tilən	təlan	(bb2)
egg	*qicəluR	təlɔ?	
scabies	*kudiS	gudEs	(bb3)
climb	*dakiS	taEk	
soft	*daliS	alus	(bb4)
year	*CawiN	taun	(bb5)

Data (bb1) shows that PAN *i in penultimate syllables innovates into Sasak /E/, while in data (bb2), it changes to /ə/—both occurring irregularly. In data sets (bb3) to (bb5), *i in ultimate syllables undergoes irregular innovations, becoming /e/, /E/, and /u/, respectively.

(cc) PAN *u

Gloss	PAN	Sasak	
old	*tu?aS	tɔa?	(cc1)
navel	*pujək	pɔsət	
young	*muda?	ɔda?	
dog	*asu	acoŋ	
that	*iCu	etɔ	
younger brother	*Suaji	adi?	(cc2)
octopus	*?uriCa	kərita?	(cc3)

egg	*?icəlur	təlɔ?	(cc4)
far	*zau?	jaɔ?	
sleep	*tuduR	tindu?	(cc5)
drink	*inum	inəm	(cc6)

Data (cc1) shows that PAN *u in penultimate syllables regularly innovates into Sasak /ɔ/. However, in some cases, it either disappears (data cc2) or changes to /ə/ irregularly (data cc3). In ultimate syllables, *u undergoes irregular innovations, becoming /ɔ/, /o/, and /ə/ in data (cc4), (cc5), and (cc6), respectively.

(dd) PAN *ə dan *a

Gloss	PAN	Sasak	
new	*ba?əruh	baru	(dd1)
swollen	*barə?	bara?	(dd2)
needle	*zarəm	jaum	

Data (dd1) and (dd2) indicate that PAN *ə in penultimate syllables irregularly innovates into Sasak /a/, while in ultimate syllables it also becomes /a/.

(ee) PAN *ay, *aw, dan *uy

Gloss	PAN	Sasak	
kill	*acay	mate?	(ee1)
dead	*acay	mate	
rattan	*?uay	uwe	
foot	*qaqay	nae	
rice	*səmay	mi	(ee2)
rice	*pajay	padi	
give	*bəray	bEŋ	(ee3)
caterpillar	*kulay	ulat	(ee4)
scratch	*karaw	karɔk	(ee5)
wood	*kasaw	kayu	(ee6)
fire	*hapuy	api	(ee7)
pig	*babuy	babi	

Data (ee1) shows that PAN *ay in final position regularly changes to Sasak /e/. However, in data (ee2), it changes irregularly to /i/. In data (ee3) and (ee4), it irregularly becomes /E/ and /a/, respectively, in final position. PAN *aw, as seen in data (ee5) and (ee6), undergoes irregular innovation to Sasak /ɔ/ and /u/ in final position. Similarly, PAN *uy in final position irregularly changes to Sasak /i/.

IV. DISCUSSION

As previously noted, of the 343 Proto-Austronesian (PAN) etymons identified in the Sasak language, 190 lexical items (55.39%) were classified as inherited, while the remaining 153 items (44.61%) were not. Among the 190 inherited

lexicons, two types of phonological traces of Austronesian origin were observed in Sasak: retentions and innovations.

AN traces in the form of retention

Retention elements refer to linguistic features that have remained unchanged from their parent language, Proto-Austronesian (PAN). Among the 190 inherited lexical items in Sasak—comprising both phonological retentions and innovations—25 items (13.16%) exhibit complete phonological retention. In these cases, all constituent sounds have been fully preserved without any modification from the original PAN forms (see data set (a)). Additional examples of retained lexicons in Sasak include words with meanings such as 'feather/fur,' 'four,' 'six,' 'five,' 'vomit,' 'arrow,' 'turtle,' 'wrong,' 'me,' 'milk,' 'scared,' 'sugar,' 'three,' 'blowing,' and 'stab.' The relatively low proportion of fully retained forms suggests that Sasak has been separated from its proto-language for a considerable duration, resulting in extensive lexical and phonological innovation. According to estimates by Austronesian linguists, the ancestors of Austronesian languages began migrating from their original homeland around 4,200 to 1,500 BCE. (Blust, 1984, 1995, & 2013; Bellwood, 1991, 2017, 2024; Ross, 2017; Klamer, 2019; Ross & Greenhill, 2024). The retained elements can be categorized into numerals ('three,' 'four,' 'five,' 'six'), nouns, question words, and pronouns ('fruit,' 'chicken,' 'feather,' 'turtle,' 'sugarcane,' 'milk,' 'I,' and 'what'), as well as verbs ('lift,' 'turn,' 'cough,' 'split,' 'arrow,' 'blow' and 'stab'). Phonologically, retention is observed in PAN phonemes such as *p, *t, *k, *?, *b, *d, *g, *m, *n, *ŋ, *ɲ, *s, *l, *r, *w, *y, *i, *u, *e, and *a. However, while these phonemes are retained, they often appear in etymons that have undergone phonological changes due to shifts in other sounds. Despite experiencing retention, these sounds appear in etymons that have undergone innovation. This means that the PAN etymon where phonological retention occurs has undergone innovation due to changes in other sounds.

Data (b) demonstrates the regular retention of PAN *p in initial, medial, and final positions, as observed in data (b1), (b2), and (b3) respectively. This retention occurs regularly. The etymon PAN: *pajay 'rice' > Sasak: *pa(d,r)e*, underwent changes following the process: *pajay > *paje > *pa(d,r)*

e. This transformation indicates that innovation occurred due to the shift of PAN *ay to Sasak /e/, and PAN *j to Sasak /d/, rather than any modification of PAN *p. The change of PAN: *ay > Sasak: /e/ in the final position is a regular occurrence (see data (ee1)), as is the change in PAN: *j > Sasak: /d/ in the middle position (see data (w3)). Furthermore the change of PAN: *paraw 'loft', into Sasak: *səmpare* followed the process: *paraw > *pare > *mpare > Sasak: *səmpare*.

Data (c) demonstrates the regular retention of PAN: *t in initial, medial, and final positions. The change of PAN: *tilən 'swallow' into Sasak: *tələn*, occurred due to the assimilation of *ə in the ultima syllable environment to *i in the penultimate syllable. Likewise, PAN: *?itəluR 'egg' changed into Sasak: *tələ?*, through the deletion of the initial syllable *?i- resulting in *tələr. This was followed by the lowering of the vowel *u > /ɔ/, producing *tələR, which then became Sasak: *tələ?*. The change of PAN: *R to Sasak /?/ is also observed in PAN: *waSiR 'water', which became Sasak: *ai?*. Additionally, data (d) indicates the retention of PAN *k in all positions within Sasak. For instance, PAN: *kawanan 'right' likely changed into: *kawaan following the deletion of /n/, which was then followed by the deletion of the vowel /a/), ultimately resulting in Sasak: *kawan*.

For PAN *s, data (l) indicates regular retention in medial and final positions but irregular retention in the initial position. Data (m) shows that PAN *l is consistently retained in initial and medial positions, whereas *r displays irregular retention in the medial position. Finally, data (n) reveals that PAN *w is regularly retained in the medial position, while *y undergoes irregular retention.

Data (e) shows the regular retention of PAN: *? in the final position. PAN: *Cuzu? is hypothesized to have first changed to *tuzu?, as the shift from PAN: *C to Sasak: /t/ occurs regularly (see data (t1), (t2), and (t3)). This was followed bt the change of PAN *z to Sasak /j/, another regular change (see data (w1), (w2), and (w3)), ultimately resulting in Sasak: *tujuq* 'index finger'.. Data (f) and (g) confirm the regular retention of PAN: *b and *d in initial and medial positions, respectively. However, data (h) indicates an irregular retention of PAN: *g in medial position. Data (i) shows that PAN: *m is consistntly retained across all positions. Similarly, data (j) reveals that PAN: *n experienced

regular retention in medial and final positions. Nasal PAN: *ŋ is also consistntly retained in initial and medial positions (see data (k1) and (k2)), while PAN *ɲ exhibits irregular retention in both initial and medial positions (see data (k3)). For PAN: *s in data (l) indicates regular retention in medial and final positions, but irregular retention in the initial position. Data (m) shows that PAN: *l consistently retained in initial and medial positions, whereas *r displays irregular retention in the medial position. Finally, data (n) reveals that PAN: *w is regularly retained in the medial position, while *y underwent irregular retention.

The PAN vowels *i, *u, and *a exhibit regular retention in initial position, penultimate syllables, ultimate syllables, and final position, as shown in data (o), (p), and (r), respectively. PAN *e, as seen in data (q2) and (q3), is also regularly retained in both penultimate and ultimate syllables, but its retention in the initial position is irregular (see data (q1)). The change of PAN *ijuSuŋ 'nose' into Sasak: *iduŋ* follows a systematic process: *ijuSuŋ > *ijuuŋ > *ijuŋ > *iduŋ*. The deletion of PAN *s in medial position occurs regularly in Sasak, as illustrated by PAN *waSir > *wair > *air > Sasak *ai?* 'water', as well as in PAN *duSa 'two' > Sasak *dua*. Similarly, the retention of PAN *u is evident in *ba?əRuh 'new' > *baəRuh > *baRuh > *baruh > Sasak *baru*. The deletion of the glottal stop *? in medial position is a common feature in Sasak (see data (u2)), as seen in PAN *li?er, *pa?i, *Ca?i, which become Sasak *lir* 'neck,' *pait* 'bitter,' and *tai* 'feces' respectively. Likewise, the change of PAN *R to Sasak /r/ in medial position follows a regular pattern. For example, the words for 'give,' 'needle,' and 'run' derive from PAN *beRay, *jaRum, and *laRiw, resulting in Sasak *bEŋ*, *jaum*, and *pəlai*. The likely stages of transformation are PAN *beRay > *beRi > *beri > *bei > *be > *beŋ > Sasak *bEŋ*; PAN *jaRum > Sasak *jaum*; and PAN *laRiw > *laRi > *lari > *lai > Sasak *pəlai*. Finally, the regular retention of PAN *a in the ultimate syllable is demonstrated by PAN *bəRə?at 'heavy,' which undergoes the following changes: *bəRə?at > *bəRəat (with the regular deletion of *?) > *bəRat > Sasak *bərat*.

The PAN vowels *i, u, and *a exhibit regular retention in initial position, penultimate syllables, ultimate syllables, and final position, as seen in data (o), (p), and (r), respectively. PAN *e, as shown in data (q2) and (q3), is also regularly retained in

penultimate and ultimate syllables, but its retention in the initial position is irregular (see data (q1)). The transformation of PAN *ijuSuŋ 'nose' into Sasak iduŋ follows a systematic process: *ijuSuŋ > *ijuuŋ > *ijuŋ > *iduŋ*. The deletion of PAN *s in medial position occurs regularly in Sasak, as illustrated by PAN *waSir > *wair > *air > Sasak *ai?* 'water', and by PAN *duSa 'two' > Sasak *dua*. Similarly, PAN *u is retained in *ba?əRuh 'new' through the stages: *baəRuh > *baRuh > *baruh > Sasak *baru*. The deletion of the glottal stop *? in medial position is a common feature in Sasak (see data (u2)). For instance, PAN *li?er, *pa?i, and *Ca?i become Sasak *lir* 'neck,' *pait* 'bitter,' and *tai* 'feces,' respectively. Similarly, the change of PAN *R to Sasak /r/ in medial position follows a regular pattern. The words for 'give,' 'needle,' and 'run' derive from PAN *beRay, *jaRum, and *laRiw, resulting in Sasak *bEŋ*, *jaum*, and *pəlai* respectively. The likely stages of transformation are PAN *beRay > *beRi > *beri > *bei > *be > *beŋ > Sasak *bEŋ*; PAN *jaRum > Sasak *jaum*; and PAN *laRiw > *laRi > *lari > *lai > Sasak *pəlai*. Finally, PAN *a is regularly retained in the ultimate syllable, as demonstrated by PAN *bəRə?at 'heavy,' which follows the process: *bəRə?at > *bəRəat (with the regular deletion of *?) > *bəRat > Sasak *bərat*.

The Traces of AN in the Form of Innovation

Innovative elements in language refer to features that have changes from their ancestral form in Proto-Austronesian (PAN) to Sasak. Of the 190 lexical items classified as inherited, 165 etymons (86.84%) exhibit phonological innovation. Analysis of these items reveals a range of phonological changes, as illustrated in data sets (s) through (ee). The high proportion of PAN etymons that have undergone innovation highlights the significant degree of linguistic evolution that Sasak has experienced since diverging from its ancestral roots. (Blust, 2013; Bellwood, 2017; Ross, 2017; Klamer, 2019; Ross & Greenhill, 2024).

Data (s) highlights irregular innovations where PAN *k changes into Sasak /g/, /b/, or (/ø/) in the initial position. Data (t) shows a regular innovation pattern in which PAN *C changes to Sasak /t/ in initial and medial positions (see data (c1) and (c2)), while in the final position, the innovation is irregular, also resulting in /t/ (see data (c3)). The transformation of PAN *c into Sasak /t/ in the initial position occurs irregularly (see data (t5)).

Data (u) demonstrates that PAN *? is regularly lost (/ø/) in initial and medial positions (see data (u1) and (u2)), whereas in final position, its disappearance is irregular (see data (u3)). For example, PAN *?udip 'life' undergoes innovation through the stages: *?udip > *?urip > *urip > Sasak *i(r,d)up*, where metathesis shifts *u-i to i-u. Data (v1) shows irregular innovation where PAN *b changes to Sasak /w/ in medial position, as seen in PAN *?abu > *?awu > Sasak *awu* 'ash' (where the deletion of PAN *? in initial position is a common feature in Sasak). Data (v2) reveals an irregular transformation of PAN *d to Sasak /t/ in the initial position, while in data (v3), PAN *d disappears entirely in an irregular pattern. The word expressing 'flat' is thought to have evolved through the process: *dataR > *ataR > *atar > Sasak *rata*.

The innovation of PAN *z to Sasak /j/ occurs regularly in the initial position (see data (w1)) but irregularly in the medial position (see data (w2)). Data (w3) shows a regular innovation where PAN *j becomes Sasak /d/ in the medial position, though some instances change irregularly to /r/ and /s/ (see data (w4)). PAN *g disappears irregularly in the initial position (see data (w5)). Data (x1) demonstrates that PAN *ŋ is lost irregularly in the initial position, while data (x2) and (x3) show a regular innovation of PAN *N to Sasak /n/ in medial and final positions. Data (y1) presents a regular innovation where PAN *S becomes Sasak /s/ or is lost (/ø/) in the initial position. In the penultimate syllable, PAN *S disappears and changes to /h/ (see data (y2)). In the final position of the initial syllable, PAN *S disappears regularly (see data (y3)). In final positions, PAN *S either disappears regularly (see data (y4)) or changes irregularly to /t/, /?/, or /k/ (see data (y5), (y6), and (y7)). In data (y8), PAN *h disappears irregularly in the initial position. In the final position, it either disappears regularly (see data (y9)) or changes irregularly to /?/ (see data (y10)). Data (z) illustrates a regular innovation where PAN *R becomes Sasak /r/ in medial and final positions (see data (z2) and (z4)). Additionally, in the medial position, *R is regularly lost (/ø/), while in the final position, it changes irregularly to /?/ (see data (z5)). In the initial position, *R undergoes irregular innovation to become /r/ (see data (z1)). An example of phonological change can be observed in the transformation of PAN *waRi > *wari > *ŋari > Sasak *təŋari* 'afternoon'.

Data (aa) shows the regular deletion of PAN *w in the initial position, while in the medial position, its deletion is irregular (see data (aa1) and (aa3)). In addition to being deleted, *w in the initial position can also change to /b/ or /l/ (see data (aa2)). Meanwhile, PAN *y disappears irregularly in the medial position (see data (aa4)). Data (bb) presents an irregular innovation where PAN *i changes to Sasak /E/ and /ə/ in the penultimate syllable. In the ultimate syllable, PAN *i undergoes irregular changes to /e/, /E/, and /u/ (see data (bb3), (bb4), and (bb5)). Data (cc) demonstrates a regular innovation where PAN *u becomes Sasak /ɔ/ in the penultimate syllable (see data (cc1)). Additionally, *u can disappear irregularly (see data (cc2)) or change to /ə/ in an irregular manner (see data (cc3)). In the ultimate syllable, PAN: *u changes to /ɔ/, /o/, and /ə/, each of which is irregular (see data (cc4), (cc5), and (cc6)).

Data (dd) shows that PAN *ə undergoes irregular innovation in the penultimate syllable, changing to ø or /E/ (see data (dd1)). In the ultimate syllable, *ə changes irregularly to /a/, /u/, and /ø/ (see data (dd2)). Data (ee) highlights the innovation of PAN diphthongs *ay, *aw, and *uy in the final position. In the initial position, PAN *ay regularly changes to /e/ in Sasak (see data (ee1)), but it also undergoes irregular changes to /i/, /E/, or /a/ (see data (ee2), (ee3), and (ee4)). PAN *aw changes irregularly into Sasak /ɔ/ and /u/ (see data (ee5) and (ee6)). Similarly, the diphthong PAN *uy changes irregularly to Sasak /i/ (see data (ee7)).

AN's Traces in Sasak

The Austronesian (AN) traces in Sasak can be summarized as follows. First, AN traces in Sasak consist of both retention and innovation. The number of PAN etymons that underwent retention is smaller than those that experienced innovation. This is likely due to the long period of separation between Sasak and its ancestral language. Second, retention occurs in the sounds *p, *t, *d, *m, *n, *ŋ, *s, *l, and *r, which represent 9 out of 28 PAN phonemes. The retention of these sounds is generally regular, except for *r and *ɲ, which show irregular retention. Third, several sounds exhibit both retention and innovation, including *k, *?, *w, *g, *ŋ, *y, *i, *u, *ə, and *a. Fourth, innovation occurs in the sounds *C, *c, *z, *j, *N, *S, *h, *R, *ay, *aw, and *uy (see Figure 2). Fifth, the patterns of retention and innovation can be categorized into four types: regular retention and regular innovation;
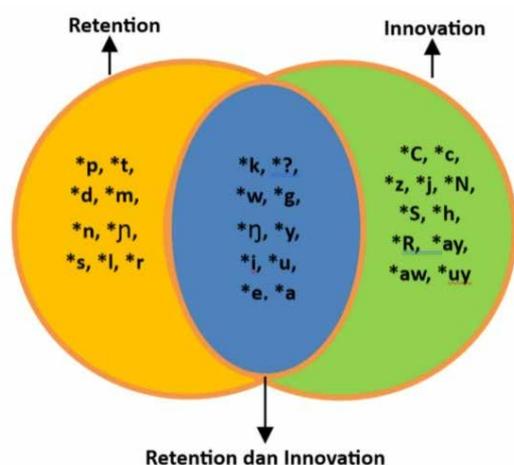
Figure 2. AN Phonological Trace Pattern in Sasak

regular retention and irregular innovation; irregular retention and regular innovation; and, irregular retention and irregular innovation.

A closer examination of sound changes in Austronesian (AN) traces within Sasak reveals several distinct types. The first type involves the changes of one sound into another, such as PAN *C > Sasak /t/ in initial and medial positions (see data (t1)). Similar cases are found in data (w1), (w2), (w3), (x), (y), (z), (bb), and (cc). The second type is deletion, exemplified by PAN *? > Sasak /ø/ (data (u)) and PAN *S > Sasak /ø/ (data (y)). The third type consists of additions, where a new sound appears in the Sasak form. For instance, PAN *ø > Sasak /?/ in the final position of words meaning 'kill' (e.g., PAN *aCay > Sasak *mate?*), or the addition of /t/ after diphthong changes, as seen in PAN *kulay 'caterpillar' > *kula > *ula > Sasak *ulat*. The fourth type is splitting, where a single PAN sound develops into multiple sounds in Sasak, such as PAN *ay > Sasak /e/ and /i/ (see data (ee1) and (ee2)). The fifth type involves merging, where two or more PAN sounds collapse into one, such as PAN *ay and *uy both becoming Sasak /i/ (data (ee2) and (ee7)). Another example is PAN *C and *c, which merge into Sasak /t/ in the initial position, as in PAN *Cau 'person' > Sasak *tau* and *Ca?i* 'feces' > Sasak *tai*. The sixth type is assimilation, where one sound influences another. This occurs in PAN *tilən > Sasak *tələn* 'swallow' through regressive or total assimilation (*i assimilated by *e). Similar patterns appear in PAN *baRe? 'swollen' > Sasak *bara?* and *deŋar* 'hear' > Sasak *dəŋər*. The seventh type, dissimilation, occurs when similar sounds change to become more distinct. Examples include PAN *bubu 'fish trap,' *bubuŋan 'ridgepole,' and *lusung 'mortar,' which

become Sasak *buwu(ŋ)*, and *lisung*, respectively, due to dissimilation of /b-b/ to /b-w/ and /u-u/ to /i-u/. The eighth type, metathesis, involves the rearrangement of sounds, as seen in PAN *?udip 'life' > Sasak *idup* (u-i > i-u), *iSa 'one' > Sasak *sai* (i-a > a-i), and *datar 'flat' > Sasak *rata* (t-r > r-t). Finally, the ninth type is contraction, where vowels or syllables are reduced. This is evident in PAN *beRay 'give' > *beRi, which undergoes a series of contractions (*semay > *semi > *smi > Sasak *mi* 'rice' and *pajay > *paday > padi 'rice'), ultimately leading to *bei > *bE > Sasak bEŋ. These diverse patterns of phonological change highlight the complex linguistic evolution of Sasak from its Austronesian roots.

V. CONCLUSION

The research findings indicate that traces of Austronesian (AN) influence in Sasak can be observed through two main processes: retention and innovation. However, the retention of AN elements in Sasak is relatively limited, with only 44.61% of the 343 examined etymons showing traces of AN, and just 13.16% (25 etymons) remaining unchanged. This suggests that Sasak has been separated from its Austronesian ancestors for a significant period. Although some AN phonemes (nine in total) exhibit retention in Sasak, they have undergone innovation due to changes in other sounds. The study also identifies phonological innovation in Sasak, with 10 phonemes exhibiting both retention and innovation, while 11 phonemes have undergone complete innovation. The changes observed in AN phonemes within Sasak can be classified as either regular or irregular. Notably, 19 out of 28 PAN phonemes have experienced innovation, a relatively high number. Thus, the types of phonological changes identified include sound shifts, deletions, additions, assimilation, dissimilation, metathesis, and contractions, indicating that all known types of phonological transformations are present in Sasak.

These linguistic findings reinforce the classification of Sasak as an Austronesian language. Furthermore, a vertical (top-down and bottom-up) approach to Sasak's linguistic features helps establish its genetic position within the Austronesian language family. This study contributes to historical linguistic research in Indonesia by supporting the classification of languages based on phonological evolution. In addition, the evidence of AN traces

in Sasak plays a crucial role in understanding the origins of the Sasak ethnic group on Lombok Island. To further substantiate these linguistic findings, interdisciplinary studies—such as archaeology and anthropology—are necessary to explore the historical connections between Sasak and its Austronesian ancestors. The evidence presented in this study enriches and opens new opportunities for comprehensive interdisciplinary research on the history of the Sasak ethnic group in Lombok. In addition, this linguistic study provides a valuable foundation for future etymological research, particularly in the development of an etymological dictionary of the Sasak language.

ETHICS STATEMENT

The authors declare that the data and descriptions in this paper do not involve human subjects, animal experiments, or were collected from social media platforms.

CREDIT AUTHOR STATEMENT

Burhanuddin: compiling the main framework of the manuscript which includes introduction, methods, results, discussion, and conclusion, and perfecting the manuscript; **Boniesta Zulandha Melani**: editing the manuscript regarding grammar, template suitability, and order of presentation of the manuscript; **Saharudin**: enriching each part of the manuscript with data and adding descriptions of each part.

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DECLARATION OF COMPETING INTERESTS

The authors declare that they have no competing financial interests or personal relationships that that could have appeared to influence the work reported in this paper.

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