

ON COMPARATIVE TSOU*

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1. Introduction

The Austronesian languages in Formosa (Dyen 1963, 1969, Ferrell 1969) can be divided into three main groups. The Atayalic group in the north includes Atayal and Seediq. The Tsouic group in central Formosa includes Tsou(T), Kanakanavu (K), and Saaroa(S). The rest belong to the Paiwanic group, comprising Bunun, Rukai, Paiwan, Puyuma, Ami, Saisiyat, and all the "plains" tribe languages. Yami, spoken on the small island Botel Tobago (Lan Yü 蘭嶼) southeast of the Formosa island, is generally considered a Philippine language because of its close relationship to Ivatan, a northern Philippine language in northern Luzon.

The Proto-Formosan language (PF) as reconstructed by Ogawa and Asai (OA 1935:5-13) has nineteen consonant phonemes: p, b, m, t₁, t₂, d₁, d₂, n₁, n₂, k, ŋ, q, s, l, r₁, r₂, j(y), w, h(?); and four vowel phonemes: a, i, u, ɛ. A point of great interest to the Austronesian comparativists (cf. Dyen 1965:289) is that many Formosan languages agree in distinguishing three pairs of consonants with apical articulation, t₁ and t₂, d₁ and d₂, n₁ and n₂. For years, the Austronesian scholars had distinguished only one voiced stop pair d₁-d₂ evidenced by the other Austronesian languages (PA *Z and *D), but failed to distinguish the other two pairs. Evidence from the Formosan languages suggests that each member of the other two pairs has to be reconstructed as a Proto-Austronesian (PA) phoneme because they clearly contrast in the same environment. It has been suggested by Dyen (1965:289) that the distinction is between the

*An early version of this paper was written at the University of Hawaii in early 1969. This is a revised version incorporating data from Shigeru Tsuchida's (1971) "List of Words of Formosan Languages", a copy of which was kindly sent to me by Dr. Byron Bender. I wish to express my thanks to Professors George Grace, Fang Kuei Li, Stanley Starosta, Gary Parker, John Wolff and Shigeru Tsuchida for suggestions for improvement, although I alone am responsible for any mistakes.

dental stop and affricate for the pair $*t_1$ and $*t_2$, and between the dental and alveolar nasals for the pair $*n_1$ and $*n_2$.

One purpose of this paper is to reconstruct Proto-Tsouic (PT)¹. Our main interest is to find out the interrelationship of the three Tsouic languages and some of the specific developments in the individual languages. Since more information is available for Tsou, more can be said about the development of this particular language. In this study, we shall also trace back to PA and discuss its Formosan reflexes.

2. Historical Reconstruction

2.1 Comparative Vocabulary²

<u>Gloss</u>	<u>Tsou</u>	<u>Kanakanavu</u>	<u>Saaroa</u>	<u>Proto-Tsou</u>
and	ho	--	ta	*Na
arrow ³	epacu	rupacu	ripasu	*rapaju
ashes	fu:	?a:vu	?avu?u	*?avu
bamboo shoots	--	cuvu?u	cuvu?u	*cuvu?u
banana ⁴	fuhafuha	ta-vanuvanu	ta-vuluvulu	*ta-vuNavaNu
bark	eaptu	lapatu	--	*lapatu
bear	cmoi	cumai	cumi?i	*cumai
bee	--	a:nu	a?u?u	*aNu

1. The comparative work of this paper is based on second-hand sources: the descriptions of Tsou by Tung(1964), Kanakanavu by Yan (1964) and Sung(1966, 1969), Saaroa by Ting(1967), and the word lists for all the three languages by OA(1935 Appendix: 1-55), Ferrell(1969:75-418) and Tsuchida (1971:1-40). When there are discrepancies in the data given by the different investigators, I have made my own judgments in choosing the correct forms for comparison. In making a choice, the following factors came into consideration: (1) the linguistic background of the individual investigator, (2) the regular sound correspondences among the languages and the general development of the individual language, and (3) my personal field experience with other Formosan languages, particularly Rukai.

Many errors in the manuscripts have been corrected with the help of Tsuchida's word list. I would also like to take the opportunity to thank Ting for making his Saaroa word list available to me.

2. Since stress mostly falls on the penultimate syllable in all the Tsouic languages, it is left unmarked in the comparative vocabulary. It can be assumed that PT also had the stress in the penult position.

3. The Tsou form means to draw a bow or slingshot.

4. The Tsou form refers to wild bananas.

On Comparative Tsou

Gloss	Tsou	Kanakanavu	Saaroa	Proto-Tsou
belly	cfu?o	vucukə	civuka	*cəvuka, *vucukə
betel nut	fi?i	aviki	--	*aviki
bird	zomə	alamə ¹	ałamə	*azamə
bitter	maemə marəmə	--	marəmə	*marəmə
blood	hmueu --	nimuru?u cara?ə	-- cara?ə	*Nimuru?u *cara?ə
boat	--	?avaŋə	?avaŋə	*?avaŋə
bone	cəehə cərxə	--	culəŋə	*culəNə
bottle	pania	pania	pania	*pania
bow	fsueu fsuru	--	vu:ru	*vusuru
bracelet	--	pituka	pituka	*pituka
brain	punu:	--	punu?u	*punu?u
buffalo	--	kalavuŋu	kalavuŋu	*kalavuŋu
burn	--	muacunu	muaculə	*muacuNə
buy	--	pu?a	pu?a	*pu?a
cake	--	cunuku	culuku	*cuNuku
camphor	c?osə	cakusə	--	*jakusə ²
cat	ŋiau	ŋiau	ŋiau	*ŋiau
charcoal	--	vara	vara?a	*vara
cheek	--	cimi?i	cumi?i	*cumi?i
chicken	teoua tro?ua	tariku:ka	turuku:ka	*tarukuka
chopsticks	--	aratiŋi	aratiŋi	*aratiŋi
claw	hu?o	?anuka	?aŋuku	*?aNuka

1. The Kanakanavu form alamə means "meat", while those in the other two languages mean "bird". I am indebted to Shigeru Tsuchida for identifying the Kanakanavu form with this cognation.

2. The Saaroa cognate has been lost, so the other Tsouic languages provide no clue as to whether the initial is PT*c or *d. Nevertheless, the same cognate in the other Formosan languages such as Tanan Rukai Dakusə, Pazeh dakəs, and Bunun dakos indicate that the initial is PF *d₂ and PA *D, so it must be PT *j. (See §2.2 and §2.3.)

On Comparative Tsou

<u>Gloss</u>	<u>Tsou</u>	<u>Kanakanavu</u>	<u>Saaroa</u>	<u>Proto-Tsou</u>
clothes	--	tikuru	tikuru	*tikuru
cold	soeuma sorma	--	ma-saruma	*ma-saruma ¹ *ma-jaruma
comb	--	siariakucu	siriakucu	*siriakucu
crab	--	?apasu	?apasu	*?apasu
dance	--	musurauvu	musuarauvu	*musurauvu
deer	--	vutunu	vutu <u>u</u>	*vutu <u>Nu</u>
deer (pygmy)	--	tauru <u>ŋu</u>	tauru <u>ŋu</u>	*tauru <u>ŋu</u>
die	mcoi	ma-macai	maci?i ma-maci	*macai
dog	--	tacau	tasau	*tajau
door	phi <u>ŋi</u>	ta-pini <u>ŋ</u> -a	--	*piNi <u>ŋi</u>
dream	ce:i	--	salili	*jalili
drink	mimo	mi:ma	mima	*mima
eel	--	varu <u>ŋa</u>	varu <u>ŋa</u>	*varu <u>ŋa</u>
egg	fcueu fcuru	?icu:ru	--	*?icuru *vicuru
eight	voeu	a:lu	ku-alu	*walu
evening	eofna	ruvana	ruvana	*ruvana
eye	--	vuaini	vulai <u>i</u>	*vulaiNi
far	covihi	ara-caini	ma-sai <u>ta</u>	*ma-jawiNi
fat/pork	simeo simro	--	?imar <u>u</u>	*simar <u>u</u>
father	amo	--	ama?a	*ama
feather	eopu <u>ŋu</u> rop <u>ŋu</u>	?a:pu <u>ŋu</u>	?alapu <u>ŋu</u>	*?alapu <u>ŋu</u>
field (wet rice)	chana	cana:	--	*caNana
field (swidden)	--	?u:ma	umu:ma	*?uma

1. A prefix (or suffix) is set apart from its stem by a hyphen, while an infix is indicated by slashes.

Gloss	Tsou	Kanakanavu	Saaroa	Proto-Tsou
fire	puzu	apulu	apuɬu	*apuzu
fish	--	vutukulu	vutukuɬu	*vutukuzu
five	eimo	li:ma	ku-lima	*lima ¹
flea	timeo	?atimua	?atimula	*?atimula
flesh	--	tina?ana	tiɬa?aɬu	*tiNa?aNu
foot	caphu	--	sapaɬu	*japaNu
forehead	--	taucu?u	taucu?u	*taucu?u
four	suptu	su:pata	pa:tɔ	*supatu
foxtail	piho	pi:ni	piɬi?i	*piNi
fruit	--	macu?u	masu?u	*maju?u
go	--	muaca	muasa:la	*muajala
gourd	tofa	tavu	tavu?u	*tavu
grandchild	--	na:mu	ɬamu	*Namu
grandfather	--	ta:mu	ta:mu/tamu?u	*tamu
gun	--	nantu	ɬaɬitu	*NaNitu
hair(head)	f?usu	vakusu	vaka:	*vakusu
hair(body)	--	kunucu	?ukuɬucu	*kuNucu
hand	emucu/mucu	ramucu	ramucu	*ramucu
hat	ceopuŋu	carapuŋu	sarapuŋu	*jarapuŋu
head	fŋu:	na-vuŋu	vuŋu?u	*vuŋu
hear	--	t/um/a-timana	t/um/a-timaɬa	*t/um/a-timaNa
heart (organ)	t?uhu	tukunu	--	*tukuNu

1. Like many other Formosan languages, the Tsouic languages have three different forms for each numeral with different uses: cardinal, things and people. In this comparative vocabulary, we shall list only the cardinal form for each numeral. In Saaroa the numerals from five to ten have the prefix ku- (ku- in ku-namu "nine" due to the vowel assimilation).

On Comparative Tsou

<u>Gloss</u>	<u>Tsou</u>	<u>Kanakanavu</u>	<u>Saaroa</u>	<u>Proto-Tsou</u>
heavy	ecvəhə recvəhə	ma-icu:nu	ma-li:səhə	*ma-lijəwəNə
hemp fibre	ŋei ŋri:	ŋi:ri	--	*ŋiri
high	--	ma-ləŋəcai	laŋuca	*ma-ləŋəcai
hoe	taimau	talimau	talimau	*talimau
hot	--	ma-cici	ma-cici	*ma-cici
how much	pio /pizo	u-pia-ini	u-pia-ini	*pia
I	naʔo /aʔo	i:ku /-ku	ilaku /-aku	*aku
intestine	sru:	si:u	iluʔu	*silu
iron	--	nəmanə	lənəmanə	*Nəmanə
kill	o-pcoi	pai-pacai mia-pacai	pa-paci pa-papaci	*pa-pacai
know	bochio	--	macaʔia	*macaŋia
language	--	ka:ri	kari	*kari
laugh	cocvo	ma:-caca	ma-ca:ca:	*ma-cacawa
leaf	ehəŋə	ranəŋə	raʔəŋə	*raNəŋə
left	vei-na vri-na	i:ri	iri	*wiri
leopard	euʔho rʔuxo	ukunau ukunu	lukuʔu	*lukuNau ¹
lightning	--	ʔa:palatə	ʔa:palata	*ʔapalatə
lime	hapueu	ʔapuru	ʔapuru:ʔu	*ʔapuru
louse(head)	ʔcu:	ku:cu	kucuʔu	*kucu
louse(body)	--	caracə	caracu	*caracə
mat	--	sikamu	sikamə	*sikamə
mirror	--	aniŋu	aʔiŋu	*aŋiŋu
money/ silver	--	vanituku	vaʔituku	*vaŋituku
moon	feohə	vuənə	vulaʔə	*vulaNə

1. Cf. Paiwan and Puyuma rikulau, Rukai (Tanan and Budai) Likulau, where the first vowel is i. There may have been an assimilation of *i to *u in pre-Tsouic.

On Comparative Tsou

<u>Gloss</u>	<u>Tsou</u>	<u>Kanakanavu</u>	<u>Saaroa</u>	<u>Proto-Tsou</u>
mortar	suhŋu	--	ɬu:ŋu	*suNuŋu
mother	ino	c-i:na	inaʔa	*ina
navel	--	puluka	ina puluka	*pazuka
near	--	ara-cani	ma-saɬi	*ma-jaNi
necklace	suku:	sinuʔu	iluʔu	*siNuʔu
new	faeva	vaʔurua	varuʔa	*varuwa
night	fejna frɛŋna	vu:rua varuŋana	varuʔu varuŋana	*vaʔuru *varuŋana
nine	sio	si:a	ku-sia	*sia
one	coni	ca:ni	ca:ni	*cani
onion	--	aumaŋ	aumaŋ	*aumaŋ
orange	fuvʔo	vuaʔa	--	*vuwakə *vuwaʔa
paper	--	sunata	sulata	*suNata
person	cou	ca:u	--	*cau
pestle	pŋei pŋiri	--	paŋiri	*paŋiri
pig (wild)	fuzu	vavulu	--	*vavuzu
pigeon	--	tavaru	tavaru	*tavaru
pine tree	seŋa	alaŋa	alaŋa	*saləŋa
plant (poisonus)	--	tuncu	tuɬucu	*tuNucu
pus	fəʔa	və:kə	vəkəʔa	*vəkə
rabbit	--	lituka	lituka	*lituka
rain	c/um/oeha macha	ʔucana	usaɬa	*ʔujaNa
rainbow	--	varanuvana	varaɬuvaɬu	*varaNuvaNa
rice (husked)	fuesə fursə	--	avaraa	*varasa
rice (cooked)	na-veu na-vru	u:ru	ʔu:ru	*wuru
right	vhona	anana	aɬana	*waNana
river	cʔoeha	cakəraŋa	sakuraɬa	*jakəraNa
road	ceona	ca:nə	salaʔa	*jalanə

On Comparative Tsou

<u>Gloss</u>	<u>Tsou</u>	<u>Kanakanavu</u>	<u>Saaroa</u>	<u>Proto-Tsou</u>
rock	fatu	va:tu	vatu?u	*vatu
root	emisi rmisi	ramisi	rami:	*ramisi
rope	te:si tresi	talisi	tali: ¹	*talisi
rotten	cmo?u	--	cumaku	*cumaku
sacred place	--	cakuara	cakuara	*cakuara
saliva	neoi	na:i	nali?i	*nalai
sand	fuefu?u fuefu?u	lavuku	lavuku	*lavuku
sea	--	tanamu	tanamu	*tanamu
seed	tutu	--	tutu:	*tutu
seven	pitu	pi:tu	ku-pitu	*pitu
sharp	--	ta-varavara	ma-varavara	*ma-varavara
shoot	pono, (pna:)	mua-pana-u panantu	ua-pana pa:la:titu	*pana *paNaNitu
sibling (older)	ohaeva oxarva	--	ala:ua	*aNaluwa
sing	--	cani	sali	*jaNi
sit	--	tuapuru	tuapuru	*tuapuru
six	nomu	na:mu	ka-namu	*namu
sky	enuca nucu	ka:nucu	lanica	*lanucu
snake	fkoi	vunai	vuli?i	*vuNai
sneeze	pasuŋi	--	ma:uŋu	*masuŋu, *pasuŋu
snow	euho	urana	urula	*uruNa, *aruNa
soul	hicu	--	i:icu	*iNicu
star	coneoha	--	acaŋalala	*acaŋalaNa
stone	skuzu	sanulu	?a:ulu	*saNuzu
straight	sucu su:cu	--	mauucu	*ma-sauucu
sugar cane	tufusu	--	tavasu	*tavasu

1. The Saaroa form refers to an ornament on a woman's forehead.

On Comparative Tsou

<u>Gloss</u>	<u>Tsou</u>	<u>Kanakanavu</u>	<u>Saaroa</u>	<u>Proto-Tsou</u>
sun	hie	taniara	taɬiaria	*taNiara
swim	--	makanaɣulu	makataɣulu	*makaNaɣulu
tail	civ(i)ci	ici:ci	isi:si	*ijiwiji
take	maeo	uma:la	uma:la	*u-mala
ten	--	ma:nə	ku-maɬə	*maNə
thick	--	makicimara	makisumara	*ma-kijumara
thin	xipsi	ma-nipi	ma-ɬipi:	*ma-Nipisi
thorn	cama	--	ta:sama	*tajama
thou	su: na-su	i:ka-su	iɬa-u	*kasu
three	tueu	tu:lu	tu:lu	*tulu
throw	--	matupunu	mata:punu	*matapunu
thunder	--	sululuɣa	sululuɣa	*sululuɣa
tongue	--	?avasə	?avasə	*?avasə
tooth/fang	hisi	anisi	aɬi:	*aNisi
turn around	--	takusə:lə	takusə:lə	*takusasələ
two	euso	cu:sa	su:a	*jusa
urine	sifu	i:vu	ivu	*sivu
vein	veocə	uracə	?uracə	*?uracə
village	hosa	ta-nasə	ta-ɬa:	*ta-Nasə
vomit	teavto travto	--	ta:ruta	*tarawuta
walk	coicoinu co:co:nə	mua-ca:ca	mua-sa:sala	*mua-jajala
wash (limbs)	emucu	ma-ramucu	ma-ra-ramucu	*ma-ramucu
water	chumu	canumu	saɬumu	*jaNumu
we (exc.)	a-?mi na-?mi	i-kimi i:-kimi	--	*kimi
we (inc.)	a-?to na?-to	i-kita i-ki:ta	iɬa-ta	*kita
weave	--	t/um/a-tinunu	t/um/a-tinu:n	*t/um/inunu
weep	--	t/um/a-taɲi	t/um/a-taɲi: t/um/aɲi:	*t/um/aɲi

On Comparative Tsou

<u>Gloss</u>	<u>Tsou</u>	<u>Kanakanavu</u>	<u>Saaroa</u>	<u>Proto-Tsou</u>
white	--	ta-pu:ni-a	ma-puɿi	*ma-puNi
wind	poepe	paraipara	--	*paraipara
wing	pvoʔo	pa:kʉ	puakʉ	*pawakʉ
worm/insect	eoi roi	kulai	kuliʔi	*kulai
ye	mu: na-mu	i:ka-mu	iɿa-mu	*kamu
year	--	cainana	caiɿa	*caiNa
yellow	hofʔoea xofʔora	ta-navikarʉ	--	*ma-Navikarʉ

2.2 Sound Correspondences

In the sound correspondences listed below, the PA phonemes follow Dyen (1965, 1969b), the PF phonemes follow OA(1935:5-13), and the PT phonemes are reconstructed as based on the comparative vocabulary listed above.

<u>PA</u>	<u>PF</u>	<u>PT</u>	<u>T</u>	<u>K</u>	<u>S</u>	<u>Examples</u>
*p	*p	*p	p	p	p	feather, fire, how much, kill, seven, shoot
*t	*t ₁	*t	t	t	t	flea, four, seven, stone, three
*C	*t ₂	*c	c	c	c	bear, bone, die, hand, person, vein
*Z	*d ₁	*j	c	c	s	foot, hat, heavy, river, road, sing, tail
*D	*d ₂					
*k	*k	*k	ʔ	k	k	belly, betel-nut, claw/fingernail, hair, louse(head), river
*q	*h	*ʔ	∅	ʔ	ʔ	ashes, claw, egg, necklace
*b	*b	*v/β	f	v	v	ashes, belly, hair, head, moon, rice (husked), rock
*w	*w	*w/v	v	∅	∅	eight, far, heavy, laugh, left, orange, rice(cooked), right, sibling(older), tail
*y	*y	*y/z	z	ɿ	ɿ	bird, fire, pig(wild), stone
*S	*s	*s	s	s	∅	bow, four, hair, intestine, root, straight, tooth, two, village
*m	*m	*m	m	m	m	drink, father, five, flea
*n	*n ₁	*n	n	n	n	bathe, bottle, mother, one, six

PA	PF	PT	T	K	S	Examples
*N	*n ₂	*N	h/x ¹	n	ɬ ²	claw, leaf, moon, right, river, tooth, water
*ŋ	*ŋ	*ŋ	ŋ	ŋ	ŋ	cat, feather, hat, head, leaf, night
*j	*r ₁	*ø	ø	ø	ø	how many/much, name, rice plant
*R	*r ₂	*r	e/r ³	r	r	egg, hand, leaf, left, lime, rice (husked), river, root
*l	*l	*l	e/r ³	l	l	five, hoe, pine tree, rope, sand, take, three
			e/r ³	ø	l	bone, feather, flea, intestine, leopard, moon, road, saliva
*i	*i	*i	i	i	i	drink, five, flea, left, mother, seven
*u	*u	*u	u	u	u	claw, hair(body), hand, pig(wild), seven, stone
*e	*ẽ	*u	u	u	u	hair, pine tree, six, sugar cane, vein
*a	*a	*a	o	a	a	drink, eight, father, five, flea, mother, person
			a	a	a	bark, bottle, cat, father, lime, sky, stone

2.3 Discussion

Variants have been reconstructed for some items. Some suspicious cognates are left un-reconstructed because of the complications involved. Some of the reconstructed PT forms listed in this paper may not go back to the PA forms as reconstructed by Dempwolff or Dyen.

Based on the regular sound correspondences, the following phonemes are reconstructed for Proto-Tsou, 16 consonants: p, t, c, ɟ, k, ʔ, v/β, w/v, y/z, s, m, n, N, ŋ, l, r; 4 vowels: i, u, u/ə, a.

The following regular sound correspondences present no problem in reconstructing PT phonemes:

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1. The Tsou reflexes are /h/ in the Tapanu and Tfuea dialects but /x/ in the Duhtu dialect, as transcribed by Ogawa and Asai (1935:Appendix) and Tsuchida (1971).
 2. The symbol /ɬ/ stands for the voiceless lateral ɬ in Saaroa.
 3. Tsou reflexes are /e/ in the Tapanu and Tfuea dialects as transcribed by Tung (1964) but /r/ in the Duhtu dialect as recorded by Tung (1964) and Tsuchida (1971).

On Comparative Tsou

<u>PT</u>	<u>T</u>	<u>K</u>	<u>S</u>	<u>PT</u>	<u>T</u>	<u>K</u>	<u>S</u>
*p	p	p	p	*ŋ	ŋ	ŋ	ŋ
*t	t	t	t	*r	e/r	r	r
*c	c	c	c	*i	i	i	i
*k	ʔ	k	k	*u	u	u	u
*s	s	s	∅	*ɬ	ɬ	ɬ	ɬ
*m	m	m	m	*a	a	a	a
*n	n	n	n				

2.3.1 Stops and Affricates

The t-t-t correspondence contrasts with that of c-c-c in the same positions: initially, e.g. "hoe" and "one", "three" and "bear", medially, e.g. "deer" and "head louse", "rock" and "die", finally (if the final weak vowels are not treated as phonemic), e.g. "four" and "vein". As Dyen (1965:289) pointed out, the phonemic distinction should go back to PA, although it is not found in any other Austronesian languages outside Formosa. The reflex of the new phoneme in the Tsouic languages is invariably the voiceless dental affricate /c/, hence it is reconstructed as PT*c¹.

Still another set of correspondence c-c-s also contrasts with that of c-c-c in the same environments, e.g. "water" and "one", "laugh" and "walk". Now that c-c-c has been reconstructed as *c, c-c-s cannot be reconstructed as *c; nor can it be reconstructed as *s because the dental fricative has to be reserved for the correspondence s-s-∅ (see §2.3.2). What, then, is the PT form for the correspondence c-c-s? It corresponds to /d/ and /D/ in the other Formosan languages such as Rukai, Paiwan and Puyuma; that is to say, there are historically two different sources for the correspondence: PF *d₁ and *d₂, viz. PA *Z and *D, but merged in PT. If it is reconstructed as *d for PT, that does not explain the fact that it has been merged with the dental affricate in both Tsou and Kanakanavu; Saaroa is the only language that distinguishes the two correspondences c-c-c and c-c-s. Judging from the phonetic

1. Cf. the reflexes in the other Formosan languages are /s/ in Atayal, Saisiyat and Pazeh, /θ/ in Thao, /T/ (retroflexed dental stop) in Puyuma, also /c/ in Paiwan and Rukai. Dyen (1965) reconstructed it as PA *C.

value of the reflexes in the Tsouic group, all the three languages indicate that it is a dental, affricate in Tsou and Kanakanavu but fricative in Saaroa, and it is very close to the voiceless dental affricate. Historically it is derived from the voiced dental stop or fricative *d/Z and voiced retroflexed stop *D. It can then be inferred that the PT phoneme is probably the voiced dental affricate *j, different from *c only in voicing. The voicing quality has been lost in the modern Tsouic languages, thus *j is rendered /c/ in Tsou and Kanakanavu, with the stop quality further lost in Saaroa /s/.

As mentioned above, PT *j is derived from two different sources: PF *d₁ (PA *Z) and PF *d₂ (PA *D). For example, the items "road", "rain" and "water" are derived from PF *d₁, whereas the items "foot", "fruit", "river" and "camphor" are derived from PF *d₂. They have completely merged in the Tsouic languages, although the distinction is kept in the other Formosan languages such as Rukai. Perhaps the only trace of the distinction in the Tsouic languages is the item "two", for which we get the correspondence e/r-c-s, distinct from c-c-s. But this is only an exception that could be thrown out as a doubtful cognate. Ogawa and Asai's (1935:11) statement of the sound change PF *d₂ > Tsou j (Tapaŋu) or ʃ is based on only one example -- the exceptional case¹. It is neither theoretically sound nor systematically economical to set up a new phoneme for PT based on only one such example.

The correspondence ʔ-k-k is quite regular and can be reconstructed as PT *k, derived from PA *k. In other words, the velar stop regularly changed to the glottal stop in Tsou proper.

The correspondence Ø-ʔ-ʔ is also fairly regular and thus reconstructed as PT *ʔ, for which Ogawa and Asai reconstructed PF *h and Dyen reconstructed PA *q.

2.3.2 Fricatives

As mentioned in the previous section, the correspondence s-s-Ø can be reconstructed as PT *s, derived from PF *s and PA *S. The fricative is generally lost in the Saaroa language, but kept in the

1. The symbols /j/ and /ʃ/ used in Ogawa and Asai are equivalent to /e/ in Tung and /r/ in Tsuchida. Tung has /r/ for Duhtu also.

item ku-sia/u-sia/sa-sia "nine" for unknown reasons. As for the items ʔapasu "crab" and ʔavasɿ "tongue", the Saaroa forms may have been borrowed from Kanakanavu since they are identical in the two languages.

The correspondence of the labial fricatives f-v-v can be reconstructed as PT *v. Since it is derived from the voiced bilabial stop PA *b, that would mean the change of two features [continuant] and [strident] from PA to PT, and Tsou proper involves the further change of still another feature [voice]. An alternative reconstruction for the correspondence would be PT *β. There are three justifications for this alternative: (1) The change *b > *β involves only a single feature [continuant] and thus it is simpler. (2) The phoneme /v/ in Kanakanavu and Saaroa has the variant [β] preceding the round vowel /u/ and in the final position (Yan 1964:137), and in fact it has a strong "bilabial colouring" in the other positions (Ting 1967:919)¹. (3) There is another correspondence v-∅-∅ which can be reconstructed as PT *v only if the correspondence f-v-v is not also reconstructed as PT *v. The two sets of correspondence contrast in items such as "rock" and "eight" in the initial position and "evening" and "orange" in the medial position. Perhaps it could be claimed that a disadvantage of reconstructing *β is that it is not a very common sound. But it is found in some Austronesian languages such as Fijian. If the second alternative reconstruction is accepted, then the evolution of Tsou proper has involved a reasonable series of sound changes: *b > *β > *v > f.

As stated in the preceding paragraph, the correspondence v-∅-∅ can only be reconstructed as PT *v provided that the correspondence f-v-v is not reconstructed as PT *v, or else the former will have to be reconstructed as PT *w, which is also derived from PA and PF *w. Now that the PT phoneme has been lost in two languages and kept as /v/ only in Tsou proper, it would seem a little far-fetched³ to reconstruct it as PT *w, exactly identical with PA and PF². An-

1. Cf. the phonetic symbol b was originally used in Tsuchida's field notes transcribing Saaroa (see Ferrell 1969:83-400), but later he changed it to v in his wordlist (Tsuchida 1971).

2. Cf. the parallel sound change from PA *w to Rukai v, e.g. *walu > vaLu "eight", *waRih > vai "sun, day", *wanaN > vanal "right", *wiRih > viri "left".

3. But note Tsou may have w~v and y~z alternations. (See §2.4.1).

other defect of reconstructing PT *w would be the lack of symmetry if there was not also a PT *y, and the latter involves the reconstruction of the correspondence z-l-l̥.

The correspondence z-l-l̥ is derived from PA and PF semivowel *y¹. However, to reconstruct it as PT *y would ignore the phonetic features as reflected in the modern Tsouic languages. The proto-phoneme has three different reflexes in the three languages: the voiced fricative /z/ in Tsou, the voiced lateral in Kanakanavu, and the voiceless lateral /l̥/ in Saaroa. It cannot be reconstructed as *l because the lateral is for the correspondence e-l-l̥ (see §2.3.3). Neither can it be appropriately reconstructed as *l̥ since the voiceless lateral is an uncommon speech sound. The only alternative, then, is to reconstruct it as PT *z.

As a summary, there are two alternatives for the reconstruction of the three correspondences:

<u>PT</u>	<u>T</u>	<u>K</u>	<u>S</u>
*v/β	f	v	v
*w/v	v	∅	∅
*y/z	z	l	l̥

Either of the alternatives is equally reasonable. The phonetic value of a proto-phoneme is indeterminable. As long as the reconstructed sound system looks like that of a real language, we would have to be contented with that. The main purpose of the reconstruction is to identify the sound correspondences and determine the internal relationships of the genetically related languages.

2.3.3 Liquids

PF *r₁ is completely lost in PT, and there is no trace in any of the modern Tsouic languages². PF *r₂, viz. PA *R, comes down.

1. OA's symbol for the palatal semivowel is /j/.

2. The j-j-j (glide) correspondence is observed in the items "how much" and "rice plant" if based on the data given by Ogawa and Asai (1935). However, their transcription is not phonemic. The glide [j] is phonetically predictable, hence it is treated as non-phonemic in the Tsouic languages by all the other investigators (Tung, Yan =Sung, Ting and Tsuchida).

On Comparative Tsou

to PT as *r exhibited in the correspondence e/r-r-r. In the phonemic transcription of Tsou proper, Tung gives /e/ for Tfuea and Tapaŋu, and Tung and Tsuchida give /r/ in thier transcription of the Duhtu dialect of Tsou. There is, therefore, no problem in the reconstruction of the correspondence as PT *r.

Both the correspondences e-l-l and e-Ø-l have derived from PA as well as PF *l. In Kanakanavu the lateral generally gets lost preceding the low vowel *a; but the items "sand" and "take" are exceptions to the general rule if they are not loans from Saaroa. Elsewhere the lateral is kept in the language.

2.3.4 Nasals

There is no problem in reconstructing the three nasals for proto-Tsou: *m, *n, *ŋ. The correspondence h/x-n-ɿ can be reconstructed as an alveolar nasal *N to be distinct from the dental nasal *n¹. In the correspondence only the Kanakanavu sound is a nasal, the Saaroa sound is a voiceless lateral, and the Tsou dialects are the velar and glottal fricatives. These reflexes seem to indicate that the proto-phoneme is a sound somewhere between the dental and velar nasals. Ogawa and Asai (1935:6-7) reconstruct it as PF *n₂, and Dyen (1965:289-93) reconstructs it as PA *N based on the Formosan evidence². However, there are discrepancies between the different groups of Formosan languages. For example, the reflexes in the Tsouic group indicate that the PA form for the item "right(side)" is *waNan, whereas the reflexes in the Paiwanic group for the same item would be *wanaN, and the latter is what Dyen has reconstructed as based on "the Formosan evidence".

2.3.5 Vowels

Of the five vowel correspondences, four PT vowels can be reconstructed: *i, *u, *a, *a. Both correspondences o-a-a and

1. Cf. some Australian languages which have the phonemic distinction between dentals and alveolars.

2. The reflexes in the other Formosan languages are /n/ in Kuvalan and Bunun, /l/ in Atayal, Saisiyat, Puyuma, Paiwan and Rukai, and /d/ in Ami and Thao.

a-a-a are derived from PA *a and in the statable conditions in the Tsouic group. PA *a generally changed into /o/ in Tsou proper, e.g. PA *Cau > cóu "person", *lima > eímo "five". If both vowels in a dissyllabic form are the low vowel *a, the first remains unchanged, e.g. *ama > amo "father", or gets lost and the second vowel compensated by lengthening, e.g. *maCa > mcó: "eye". (An exception to the general rule is attested in PA *panaq > póno or pná: "shoot"). That is to say, the low vowel *a split into the two vowels /o/ and /a/ in Tsou. Consequently, we get two different correspondences for the vowel. Some items with the low vowel may have come into existence at a later stage, e.g. "bark(of tree)", "cat" and "sky", so the vowel has not undergone the same change.

Echo vowels developed after the final consonants in PT, e.g. PA *buSuR > PT *vusuru "bow", PA *xapuy > PT *apuzu "fire", PA *bukeS > PT *vakusu "hair", PA *taliS > PT *talisi "rope", PA *CaRaQ > PT *cara?u "blood". The three high vowels /i, u, ʉ/ repeat the preceding vowels and the vowel /ʉ/ also follows the low vowel. These final vowels must have developed in PT or before, else they could not occur so uniformly in all the Tsouic languages.

Because the echo vowels developed in the Tsouic word-final position, the canonical form changed from PA *CV(C)CVC to PT *CVCVCV.

2.4 Sound Change

In addition to the change from one sound to another, both phonemic split and merger have operated in the sound systems of the three Tsouic languages. New phonemes have also evolved independently in the history of each language. In the following statements of sound change, we shall leave out the sounds that "remain unchanged", e.g. PA *p > p.

2.4.1 Tsou

Consonants: PA and PT *k > ʔ

PA *R > PT *r
PA *l > PT *l

e/r

On Comparative Tsou

PT *r and *l have completely coalesced in modern Tsou. The /l/ in modern Tsou does not appear in the cognates we have identified. Its source is not clear, but it is probably a late development, and it must not be confused with the *l.

PA *j > Ø in all the Tsouic languages

PA *C > PT *c

PA *Z > PT *j > c

PA *D > PT *j

PA *q > PT *ʔ > Ø

PA *N > PT *N > h/x in different dialects of Tsou

PA *b > PT *β > *v > f

PA *w > v

There is internal evidence for the sound change *w > v. The morphophonemic alternations show that back vowels (some can be reinterpreted as /w/) change to the labial /v/ before vowel suffixes -i, -a. For example,

maʔcohio	paʔcohiv-i	"to teach" (Tung 1964:177)
oeaso	oeasv-a	"to play" (Tung 1964:179)
sifkou	sifkov-a	"to flay" (Tung 1964:179)
eansou	eansov-i	"to breathe" (Tung 1964:179)

PA *y > PT *y/z > z

There is also internal evidence for the sound change PA *y > z in the morphophonemic alternation between /i/ (that can be reinterpreted as /y/) and /z/, as in:

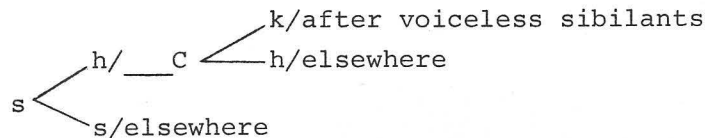
ahoi	ahoz-a	"to begin" (Tung 1964:180)
bufafeoi	huafeoz-i	"to peep" (Tung 1964:182)

In addition to the internal evidence, there is stress-dependent dialectal variation between Tapa₁u /i/ (that can be reinterpreted as /y/) and Tfuea and Duhtu /z/ (OA 1935:671; also Tung 1964:18).

Other morphophonemic alternations also deserve our attention. Unfortunately they are not all supported by comparative evidence. One of them is the change of /s/ to /h/ with loss of final vowels (Tung 1964:196), for example:

mosa moh-cu "aspect marker"

Another is the change of /h/ to /k/ (Tung 1964:210-13). Many compounds with the numerals as their members end in -ka, -ku, -ha, -hu. The two consonants /h/ and /k/ are in complementary distribution: /k/ occurs when there is a voiceless spirant such as /s/ preceding, /h/ elsewhere. In other words, there is change of /h/ to /k/ when the preceding consonant is a voiceless spirant, and that is a process of dissimilation (cf. §2.5.3). In short, there is a series of morphophonemic alternations of s~h~k (Tung 1964:92, 96, 197, 211; Starosta 1969:441). The whole process of changes can be summarized below:



There is some supporting evidence for the split of PT *h into /h/ and /k/ in Tsou in the comparative vocabulary items such as "snake" and "stone" (see §2.5.3 for explanation). As for the alternation s~h, we have no evidence of the sort.

Vowels: PT *a > ø/#(?) _____

After the loss of *a in a dissyllabic item, the second vowel is compensated by lengthening, e.g. PT *avu > fú: "ashes", PA *maCa > mcó: "eye", but items with trisyllables or more have no such compensation, e.g. PT *aviki > fi?i "betel nuts", PT *?aNuka > hú?o "claw/fingernail", and other examples such as "bird", "fire", "flea" and "tooth". There is only one example where both the initial consonant and vowel get lost: PT *vavuzu > fuzu "wild pig". There is also an example that the initial *a is kept: PT *aku > a?o "I".

PT *a > o Conditions are as stated in §2.3.5, e.g.
"mother" and "five"

PT *au > o e.g. PT *lukuNau > eu?ho "leopard"

Modern Tsou /o/ is derived from three different sources: PT *a and *au as stated above, and PT *a, e.g. *nama > nomu "six", which can be explained as a sporadic change of dissimilation.

PT *i > ø/# _____

Somewhat different from PT *a, PT *i in the initial position is lost in modern Tsou only in polysyllabic forms, e.g. PT *iNicu > hicu "soul", but keptⁱⁿ dissyllabic forms e.g. PT *ina > ino "mother".

2.4.3 Saaroa

Consonants: PA *C > PT *c > c
 PA *q > PT *ʔ > ʔ
 PA *Z > PT *j > s
 PA *D > PT *j > s
 PA *S > PT *s > ø
 PA *R > PT *r > r
 PA *N > PT *N
 PA *y > PT *z > ʔ
 PA *w > PT *w > ø

Vowels: The low vowel *a in the diphthong *ai is lost in the final syllable, but the glottal stop and a vowel similar to the final one get attached as a compensation. For example,

PT *cumai > cumiʔi "bear"
 PT *kulai > kuliʔi "worm"
 PT *vuNai > vuʔiʔi "snake"
 PT *ɲalai > ɲaliʔi "saliva"
 PT *macai > maciʔi "die"

Note that this applies only to dissyllables. Cf. PT *pa-pacai > pa-paci "kill" and PT *macai > maciʔi, ma-maci "die"

Later, some dissyllabic forms, particularly nouns, also get the glottal stop and echo vowel by analogy. For example,

PA *qabu > PT *ʔavu > ʔavuʔu "ash"
 PT *aNu > aʔuʔu "bee"
 PT *vara > varaʔa "charcoal"

Other items with the analogical change are "father", "grandfather", "foxtail", "intestine" and "pus".

2.4.4 From proto-Austronesian to the Individual Languages

Some proto-Austronesian vocabulary items have come down to only one of the Tsouic languages, so that they are not listed in the comparative vocabulary (§2.1). Now that we know how each phoneme has changed from PA through PT to the individual language, their PT forms are also determinable. These items include the following:

On Comparative Tsou

- PA *likuD > PT *likuju > Kanakanavu likusu "back"
PA *maCa > PT *maca > Tsou mco: "eye"
PA *Suŋu > PT *suŋu > Tsou suŋu "horn"
PA *quway > PT *ʔuwai > Kanakanavu ʔuai "rattan"
PA *taqiS > PT *taʔisi > Kanakanavu t/um/a-taʔisi "sew"

2.5 Sporadic Changes

2.5.1 Metathesis

Metathesis operates on some items such as Tsou cfuʔo, Kanakanavu yacuka, Saaroa civuka "belly". Since there is no way to determine which order is original, the variants *yacuka and *cavuka are reconstructed for proto-Tsou¹. As for the Tsou item *euʔho "leopard" listed in Tung, it is derived from PT *lukuNau, so the modern Tsou form *eʔuho* is expected for it; cf. the Duhtu dialect form rʔuxo given in Tsuchida (1971).

2.5.2 Assimilation

Although it is irregular, assimilation of vowels is a fairly frequent type of sound change in the Tsouic languages. The following are but some of the examples:

- PT *ʔijaru > Kanakanavu ʔicú:ru "egg"
PT *ʔaŋuka > Saaroa ʔaŋuku "claw/fingernail"
PT *tarukuka > Saaroa turuku:ka "chicken"
pre-Tsouic *likuNau > PT *lukuNau "leopard" (See §2.1, Note)

2.5.3 Dissimilation

This is occasionally observed in Tsou consonants. For example, PT *vuNai > Tsou fkói "snake", for which the form *fhói* would be expected by regular sound change. Similarly, PT *saNuzu > Tsou skúzu "stone" rather than the expected form *shúzu*; PT *siNuʔu > Tsou saku: "necklace" instead of the expected form *sihu*. In these items, /h/ is replaced by /k/ because of the voiceless spirant /s/ in the preceding syllable. This is a supporting evidence for the split of *h into /h/ and /k/ discussed in §2.4.1.

1. Cf. the proto-Rukai form *bicuka "stomach" (Tanan bicoka, Budai bicoka, Maga bcika, Tona bicoka, Mantauren vicoka).

2.5.4 Analogy

One such example is the addition of the glottal stop plus an echo vowel in the dissyllabic word-final position in Saaroa (See §2.4.3).

2.6 Loans

In connection with the regular sound correspondences and the regular and sporadic changes, we have excluded the items that are suspected of being borrowed from other languages that have been in contact with the Formosan languages under discussion.

2.6.1 Loans from Non-Austronesian Languages

<u>Gloss</u>	<u>Tsou</u>	<u>Kanakanavu</u>	<u>Saaroa</u>	<u>Source</u>
chief	--	kapitan	kapitan	Dutch <u>kapitān</u>
Chinese	paksia	paksia	paksia	Taiwanese /paksia/ "north village"
money	peísu	--	--	Spanish /peso/
monkey	ŋhóu	ŋkau	--	Taiwanese /kau/, Mandarin /xou/
sugar	kamčia	kamsia	kamsia	Taiwanese /kamcia/ "sugar cane"
tobacco	tamáku	tamaku	tamaku	Dutch <u>tabak</u>

2.6.2 Loan from Other Formosan Languages

Some lexical items in the Tsouic languages must have been borrowed from the other Formosan languages. For example, the Tsou form apáŋə "boat" is identical with Mantauran, a western Rukai dialect. The Saaroa form saviki "betel nut" is identical with Bunun as well as Paiwan. They are suspected of being loan words because (1) each of these forms in a Tsouic language does not appear to have regular correspondences with the other Tsouic languages and (2) Bunun and Mantauran Rukai are geographically close to the Tsouic group.

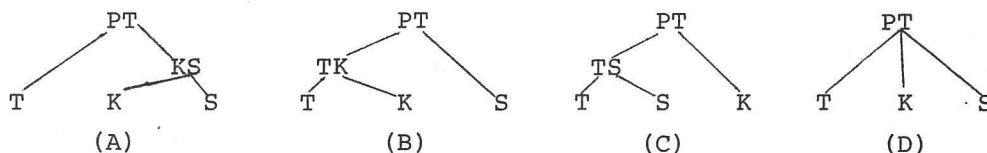
In the Tsouic group itself, mutual borrowing and influence between Kanakanavu and Saaroa are naturally expected since they are geographically very close to each other. We mentioned some loan words between them in §2.3. That both Kanakanavu and Saaroa have the same forms riŋái "trap" and camai "vegetable" indicates

On Comparative Tsou

that the latter must have borrowed them from the former at a fairly late stage because they have not undergone the general rule of losing the low vowel and adding the glottal stop plus echo vowel.

3. Language Classification

Based on the lexicostatistical and phonological comparisons, we may assume that Tsou, Kanakanavu and Saaroa are more closely related to each other than any of them is to any other Formosan language¹. There are the following four possible classifications of these three Tsouic languages, with regards to their inter-relationships:



The term Tsou is used (Tung, 1964: 1) in a broad sense to include Kanakanavu and Saaroa by anthropologists. According to anthropologists, the Tsou people of Mt. Ali are the "Northern Tsou", i.e. Tsou as used in a narrow sense, while Kanakanavu and Saaroa are referred to as the "Southern Tsou". If this is true; that is, if linguistic facts agree with anthropological, then the tree diagram (A) is the correct classification.

Linguists have also made attempts to classify the languages. Nikigawa (1953) lists six subgroups under the Tsou Group: (1) Tsou, (2) Saaroa and Kanakanavu, (3) Paiwan, (4) Puyuma, (5) Tsarisen, (6) Rukai. We shall not discuss the inappropriateness of grouping the three Tsouic languages with the Paiwanic languages. It is clear, however, that he recognizes the close relationship between Kanakanavu and Saaroa, i.e. the two form a sub-group of the Tsou Group.

1. Cf. Ferrell (1970): "From lexical considerations Kanakanavu and Saaroa have been considered to be Tsouic..... Although Tsouic structural complexities are not found in Kanakanavu and Saaroa, neither do they appear to have ordinary Paiwanic-type syntax; evidence is insufficient as yet to determine whether they may be basically Tsouic-type languages which have simply shed their heavy syntactic baggage, or what".

Loukotka and Lanyon-Orgill (1958) lists Tsou and Saaroa as two distinct groups. Under Saaroa he includes three dialects: (1) Saaroa, (2) Kanakanavu, (3) Sekhwan. The so-called Sekhwan refers to a civilized tribe, for which we have no linguistic references. One may object to their classification for two reasons: (1) It is questionable if Kanakanavu and Saaroa are "dialects", (2) Is Tsou a distinct group from Kanakanavu and Saaroa group? Again, they clearly recognize the closer relationship between Kanakanavu and Saaroa against Tsou proper.

Dyen (1969a) also states that Kanakanavu and Saaroa "seem" to be more closely related than either is to Tsou. Surprisingly enough, his percentages of cognates do not agree with his statement. Cf. the percentages he gives are K & S 37.2%, T & K 34.5%, T & S 39.7%. Notice that the percentage of cognates between K & S is lower than that between T & S! A careful comparison of their vocabularies, however, reveals the fact that K and S have a very high percentage of cognates, (see §3.2).

In doing language classification, we should not be satisfied with only one simple criterion. It seems the following four criteria can be used: (1) common innovations in sound change, (2) percentage of cognates, (3) common morphological structure, and (4) syntactic similarities. If all these four criteria agree in grouping K and S more closely together as against T, then we will be on a solid ground. Since little is available concerning the morphological and syntactic structures of K and S, we have to leave aside comparisons of the two languages with T in these two aspects of language.

3.1 Sound Changes and Language Classification

The general tendency of the sound changes as observed in the Tsouic is loss of voicing in several consonants. PT has lost the voiced and voiceless distinction in the dentals: PA *C and *Z have coalesced in both T and K, but kept distinct in S by the difference of the affricate /c/ and fricative /s/. In the case of the voiced bilabial, PA *b > PT *v > f, the devoicing has taken place only in T. As for the alveolar nasal, PA *N > PT *N > /x/

On Comparative Tsou

or /h/ in different dialects of T, /n/ in K, and /ɬ/ in S, so devoicing has taken place in two of the three languages.

We noticed in §2.3 that, aside from the same sound changes shared by the whole group, K and S have the common innovations in the voiced labial fricatives, velar and glottal stops, laterals and retroflexes. T and K have common innovations in the dental affricate and fricative, but there is no common innovation shared by T and S against K. Furthermore, T alone has developed the back mid vowel /o/ from the low vowel *a. For ease of reference, the sound correspondences are repeated below:

<u>PT</u>	<u>T</u>	<u>K</u>	<u>S</u>
*v/β	f	v	v
*w/v	v	∅	∅
*j	c	c	s
*k	ʔ	k	k
*ʔ	∅	ʔ	ʔ
*s	s	s	∅
*r	e/r	r	r
*l	e	l	l
*a	o	a	a

Now that K and S share six common innovations, while T and K share only two, and T and S share none against K, we have more than reason to believe that the tree diagram (A) is the most reasonable choice.

3.2 Percentages of Cognates and Language Classification

According to my personal calculation, of the 200 word-list constructed by Swadesh¹, T, K, and S all share approximately 29.6% cognates, K & S 41.9%, T & K 33.3%, T & S 36%. It is obvious that K and S share the highest percentage of cognates. So our second criterion agrees with the first one in grouping Kanakanabu and Saaroa together as opposed to Tsou.

1. The 14 items that are either unsuitable or not available in the word lists of the Formosan languages are excluded: at, because, brother, freeze, husband, ice, if, sister, snow, spit, swell, that, wife and with.

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中 文 摘 要

臺灣高山族語言反映出南島古音可能要區分舌尖清塞音 *t 跟塞擦音 *C，舌尖鼻音 *n 跟齒齶鼻音 *N。這兩種區別在別的南島語系的語言都沒有保存下來。我們就藉臺灣中南部的鄒語羣（包括鄒語，卡那卡那富語，沙阿魯阿語）來觀察這種現象。

本文的主要目的在擬測鄒語羣的原音系統（原鄒）。我們的主要興趣在於找出鄒語羣三個語言間的關係以及個別語音的演變現象。其中以鄒語的材料較多，因此有關這個語言的演變經過，我們也知道得多一點。在這個研究報告中，我們也追溯到原始南島語（原南）上去，討論臺灣高山族語言對原南的反映。換言之，我們搭建了原鄒的間架，往上追溯原南，往下看現代鄒語羣三個語言的個別演變以及它們相互間的關係。

從詞彙跟語音的對應關係，我們可以看出鄒、卡、沙三種語言自成一羣。它們彼此之間有密切的關係，並且它們之間也有親疏之分。從共同的語音演變規律跟共同字源百分比看來，卡、沙二種語言分裂時間較晚，而跟鄒語分裂的較早。