

**THE PHONEMES OF ZIA**

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## **1. TABLE OF CONTENTS**

<b>1. Table of Contents</b>	<b>1</b>
<b>2. Introduction</b>	<b>2</b>
<b>3. Outline of Phonemes</b>	<b>4</b>
3.1 Chart of phonemes	
3.2 Description of contrastive features	
<b>4. Interpretation</b>	<b>5</b>
4.1 Consonant or vowel	
4.2 Sequence or unit	
<b>5. Description of Phonemes</b>	<b>7</b>
5.1 Consonants	
5.1.1 Work Chart	7
5.1.2 Description	7
5.1.3 Contrasts	9
5.2 Vowels	16
5.2.1 Work Chart	16
5.2.2 Description	16
5.2.3 Contrasts	16
5.3 Supra-segmental items	18
5.3.1 Nasalization	18
5.3.2 Tone	21
5.3.3 Length	22
5.3.4 Stress	22
5.3.5 Intonation	23
<b>6. Distribution</b>	<b>24</b>
<b>7. Orthography</b>	<b>26</b>
7.1 Proposed orthography	26
7.2 Previous orthography	28
7.3 Pronunciation of English words	29
7.4 Sample text	31
<b>8. Unresolved Issues</b>	<b>33</b>
8.1 Medial /d/	33
8.2 Nasalization	34
8.3 Morphophonemics	35
8.4 Lengthened /i/	36
8.5 Lengthened vowels	36
<b>9. Non-Contrastive Features</b>	<b>37</b>
9.1 Prenasalized stops	37

## 2. INTRODUCTION

The Zia language is a member of the non-Austronesian Binandere family. Zia proper is spoken in eleven villages centering around the lower Waria river in the Lae Sub-Province, Morobe Province, Papua New Guinea.

The villages and their populations are: Ainse 334, Auno, 32, Bau 181, Dona 201, Gomena 188, Kobo 214, Popoi 288, Siu 317, Wainsoduna 73, Wuwu 190, and Zare 440. In addition there are approximately 900 speakers of the Mawae dialect in four villages in the lower Waria: Pema, Agotame, M Gobe, and Yema. A further 378 Yekora people living in Sapa village near the mouth of the Waria also speak Zia, bringing the total number of Zia speakers to approximately 3,700. Zia is also understood by some Suenas and Binanderes whose villages border the Zia area.

This phonemic statement is based on a dictionary of approximately 2,000 words, translated from Suena into Zia by Mr. Phanuel Oida, Zia National Translator. In addition, the paper is the result of two weeks of concentrated study of the Zia phonemes at Ukarumpa, February 9-20, 1976, by the four authors.

It is interesting to note that the conclusions presented in this paper and the proposed orthography are identical to the conclusions reached for Suena

and the Established orthography now in use in Suena,  
except that Zie has the added supra-segmental feature  
of nasalization.

Ukerumpa, E.H.P.

February 21, 1976

### 3. OUTLINE OF PHONEMES

#### 3.1 Chart of phonemes \*

Consonants:		bilabial	alveolar	velar
Stops	voiceless	p	t	k
	voiced	b	d	g
vibrant			r	
nasals		m	n	
Fricatives	voiceless		s	
	voiced	w	dz	
semi-vowel			y	

#### Vowels:

	front	central	back
high	i		u
low	a	a	o

---

\* For the sake of simplicity in symbolization throughout this paper the phones  $p^h$ ,  $t^h$ ,  $k^h$ , and  $\check{r}$  have been symbolized as p, t, k, and r respectively, except in the technical descriptions.

### 3.2 Description of contrastive features.

There is contrast in manner of articulation between stops, fricatives, nasals, semi-vowels and vibrant.

Stops and fricatives show contrast as to voiced and voiceless.

Stops contrast as to voiced and voiceless as well as bilabial, alveolar, and velar points of articulation. Nasals contrast as to bilabial and alveolar points of articulation.

Vowels contrast as to front, central and back as well as high and low tongue positions.

## 4. INTERPRETATION

### 4.1 Consonant or vowel

Those suspect: i, u, w, y

i is i in syllable nucleus. gi 'spear'

u is u in syllable nucleus. pu 'pig'

w is w in syllable margin. wa 'rain'

y is y in syllable margin. yu 'blood'

Reasons: 1. /w/ and /y/ parallel the occurrence of other consonants both initially and medially.

Initial	Medial
wari 'wing'	awa 'swordfish'
keri 'space'	aba 'var. of shellfish'
yeko 'kunal'	aya 'mother'
saka 'new'	aba 'var. of shellfish'

2. /w/ and /y/ are never a unit of stress placement.
3. /w/ and /y/ are never a unit of nasalization.
4. /w/ has (ɰ) as one allophone.

#### 4.2 Sequence or unit.

Those suspect: ai, au, oi, ei, ou, ay, ei

4.2.1 Interpreted as two units, V plus V, not a glide, on the basis of:

a) non-suspect VV pattern:

ao        gaɔ    'to see' (all infinitives)  
 oo        baboo 'turtle'  
 aa        baɛ    'make a hole!'

b) VV often occurs across morpheme boundaries:

toto-i    'Is it a hole?'  
 aba-i    'Is it an aba shell fish?'

c) Nasalization of only one unit (as seen in slow speech):

bezaɔ    'to break'    contrasts with bezaɔ̃ 'snail'  
 ademaɪ 'young girl' contrasts with  
 a dema-i    'this too?'

d) Nasalization of only one unit (as seen in contractions):

baɪ yaɪ gaɪ yaɪ    'they went to the hospital'  
 contracts to:

ba    yaɪ gaɪ yaɪ    'they went to the hospital'

If ay were one nasalized unit, then dropping the y  
 should leave baɪ, but it leaves ba.


#### 4.2.2 Interpreted as V plus V, not VC on basis of:

- a) no closed syllables
- b) consonant clusters not permitted

### 5. DESCRIPTION OF PHONEMES

#### 5.1 Consonants

##### 5.1.1 Work Chart

p	t	k
b	d	g
	r	
m	n	
	s	
w	dz	
h	y	

##### 5.1.2 Description

/p/ (p<sup>h</sup>) voiceless bilabial aspirated stop.

/peperi/ 'lightning'

/t/ (t<sup>h</sup>) voiceless interdental aspirated stop.

/tata/ 'bark'

/k/ (k<sup>h</sup>) voiceless velar aspirated stop.

/kakawa/ 'waves'

/b/ (b) voiced bilabial stop.

/baboe/ 'land turtle'

/d/ (d) voiced alveolar stop.

/didinia/ 'he ties'



**/r/ (r) voiced alveolar flapped vibrant. Occurs word medial only. /wari/ 'sun'**

**/g/ (g) voiced velar stop.  
/ganuga/ 'var. of pandanus'**

**/m/ (m) voiced bilabial nasal.  
/mame/ 'father'**

**/n/ (n) voiced alveolar nasal.  
/nana/ 'things'**

**/s/ (s) voiceless alveolar fricative.  
/sasa/ 'waterfall'**

**/dz/ (dz) voiced alveolar affricate.  
/dzadzo/ 'barricade'**

**/w/ (w)\*voiced bilabial non-syllabic vocoid, occurs before u, o, a.  
/wawa sso/ 'to call'**

**(b) voiced bilabial flat fricative, occurs before i and e.**

**/weno/ (bena) 'nose'  
/wiri/ (biri) 'sweat'**

**/y/ (y)\*voiced palatal non-syllabic vocoid.  
/yaya/ 'sick'**

**\* alternate description:**

**(w) High close back rounded voiced non-syllabic vocoid.**

**(y) High close front unrounded voiced non-syllabic vocoid.**

### 5.1.3 Contrasts.

Suspect pairs: p--b, t--d, k--q, t--r, d--r,  
b--w, s--dz, d--dz, b--e, t--s, y--s, m--n.

p--b: Initial

- 1 {pu} /pu/ 'take!'  
    {bu} /bu/ 'come!'  
    {buka} /buka/ 'mud'  
    {puka} /puka/ 'pig call (sound)'
- 2 {puro} /puro/ 'taking'  
    {buro} /buro/ 'coming'
- 3       Medial  
    {apa} /apa/ 'chair'  
    {aba} /aba/ 'var. of shellfish'  
    {gapo} /gapo/ 'shoulder'  
    {gabu} /gabu/ 'boundary marker'

t--d: Initial

- 4 {te} /te/ 'leg'  
    {de} /de/ 'hit!'
- 5 {ti} /ti/ 'shell'  
    {di} /di/ 'tooth'  
    {to} /to/ 'conch shell'  
    {do} /do/ 'stop!'  
    {ta} /ta/ 'nest'  
    {da} /da/ 'holy'  
    {ti} /ti/ 'dibble stick'  
    {di} /di/ 'heavy'  
    {tu} /tu/ 'walking stick'  
    {du} /du/ 'anger'
- 6       Medial  
    {ditinia} /ditinia/ 'he kXMXX waits'  
    {didinia} /didinia/ 'he ties.'  
    {atoo} /atoo/ 'father-in-law'  
    {adoo yao} /adoo yao/ 'to fry'

**k--g Initial**

7 (kese) /kese/ 'cut a path!'  
 (gese) /gese/ 'look!'

8 (kese) /kese/ 'peanut' (loanword)  
 (gese) /gese/ 'yam'

**ᑭᑭᑭᑭ**

(kobe) /kowe/ 'peel!'  
 (gobe) /gowe/ 'pine tree'

**Medial**

9 (dige) /dige/ 'uninformed'  
 (dikəɪ) /dikəɪ/ 'relative'

**b--b Initial**

(bi) /bi/ 'dead'  
 (bi) /wi/ 'penis'

10 (be) /be/ 'mouth'  
 (be) /we/ 'seeds'

11 (beo) /beo/ 'stem'  
 (beo) /weo/ 'flying squirrel'

**b--b      Medial**

12 (obi) /owi/ 'that'

(obi) /obi/ 'var. of greens'

**t--r      Medial (only)**

13 (puto) /puto/ 'pig net'

(puro) /puro/ 'taking'

(oto) /oto/ 'axe'

(oro) /oro/ 'lime'

14 (diti) /diti/ 'eye'

(diri) /diri/ 'mountain'

15 (wati) /wati/ 'wing'

(wari) /wari/ 'sun'

(uro) /uro/ 'vein'

(uto) /uto/ 'var. of fish'

(atoo) /atoo/ 'father-in-law'

(adoo yao) /adoo yao/ 'to fry'

**d--r Medial (only) (See Section 8.1)**

- 16 (arugao) /arugao/ 'to greet'  
 (adumao) /adumao/ 'to sit'
- 17 (diri) /diri/ 'mountain'  
 (emo didi) /emo didi/ 'boys'  
 (emo diri) /emo diri/ 'boys' (variant pronunciation)
- 18 (didikəi) /didikəi/ 'relatives'  
 (diriegao) /diriegao/ 'to transfer ownership'  
 (didiégao) /didiégao/ 'to transfer ownership' (alternate)

**m--n Initial**

- 19 (mə) /mə/ 'taro'  
 (nə) /nə/ 'I'
- 20 (mə) /mə/ 'cloth'  
 (no) /no/ 'wait!' (exclamation)
- (mɥ) /mɥ/ 'juice'  
 (nɥ) /nɥ/ 'he, she, it'

**Medial**

- (emo) /emo/ 'man'  
 (eno) /eno/ 'for'
- 21 (dema) /dema/ 'also'  
 (dene) /dene/ 'he hit'

**s--dz Initial**

(si) /si/ 'hey!

(xdzi) /dzi/ 'cry'

23 (sy) /sy/ 'run!'

(dzy) /dzy/ 'pull!'

22 (se) /se/ 'say!'

(dze) /dze/ 'manure'

24 (soo) /soo/ 'cheek'

(dzoo) /dzoo/ 'cousin'

(sa) /sa/ 'jump'

(dza) /dza/ 'nibble'

**Medial**

(besao) /besao/ 'to untie'

(bedzao) /bedzao/ 'to break'

**d--dz Initial**

25 (di) /di/ 'tooth'

(dzi) /dzi/ 'cry'

(dy) /dy/ 'anger'

(dzy) /dzy/ 'pull!'

26 (de) /de/ 'hit!'

(dze) /dze/ 'manure'

(dɛ) /dɛ/ 'holy'

(dzɛ) /dzɛ/ 'betelnut'

27 (do) /do/ 'stop!'

(dzo) /dzo/ 'another'

(disao) /disao/ 'to rub out'

(dzi sa) /dzi sa/ 'to cry'

(doo) /doo/ 'magic'

(dzoo) /dzoo/ 'cousin'

**Medial**

(edoo yao) /edoo yao/ 'to fry'

(edzo yao) /edzo yao/ 'brothers-in-law'

28	(dudunia)	/dudunia/	'he digs up'
	(dzudzwinia)	/dzudzwinia/	'he plugs up'
	(adumao)	/adumao/	'to sit'
	<del>adzua yao</del> (adzua yao)	/adzua yao/	'to play in water'
	(didinena)	/didinena/	'I tie'
	(bidzinena)	/bidzinena/	'I fold back', 'I push back'
	(ademaɿ)	/ademaɿ/	'young girl'
	(adzeq)	/adzeq/	'ver. of tree'

**t--s Initial**

29	(ti)	/ti/	'shell'	(ty)	/ty/	'walking stick'
	(si)	/si/	'hey!'	(sy)	/sy/	'run!'
	(te)	/te/	'leg'	(too)	/too/	'tail of reptil'
	(se)	/se/	'say!'	(soo)	/soo/	'cheek'
30	(tu)	/tu/	'bottom'			
	(su)	/su/	'soup'			

**Medial**

(ati)	/ati/	'bilum'	3/	(gate)	/gate/	'split!'
(asi)	/asi/	'rope'		(gase)	/gase/	'look!'
(pasi)	/pasi/	'coconut strainer'				
(pati)	/pati/	'step on it!'				

**y--s Initial**

32 (yɪ) /yɪ/ 'snake' (su) /su/ 'soup'  
 (sɪ) /sɪ/ 'hey!' (yu) /yu/ 'blood'

33 (yə) /yə/ 'do it!'  
 (sə) /sə/ 'say!'

(yə) /yə/ 'fish jump'  
 (sə) /sə/ 'jump across'

**Medial**

(yaya) /yaya/ 'sick'  
 (yasa) /yasa/ 'you did'

34 (naya) /naya/ 'you plural work'  
 (nasa) /nasa/ 'you singular work'

(gosa) /gosa/ 'tail of shark'  
 (goya) /goya/ 'frog'

(gayao) /gayao/ 'to spear'  
 (gosao) /gosao/ 'to break off'



## 5.2 Vowels

### 5.2.1 Vowel Chart

i          u  
e      e      o

### 5.2.2 Description

/i/ (i) High close front unrounded voiced vowel.

/di/ 'tooth'

/e/ (e) Mid close front unrounded voiced vowel.

/be/ 'mouth'

/æ/ (æ) Low open central ~~unrounded~~ unrounded voiced vowel.

/me/ 'taro'

/o/ (o) Mid close back rounded voiced vowel.

/wo/ 'fish'

/u/ (u) High close back rounded voiced vowel.

/pu/ 'pig'

### 5.2.3 Contrasts

Suspect pairs: u--o, i--e, e--o, e--æ

~~~~~

Five-way Contrast:

|    |        |        |          |    |      |      |             |
|----|--------|--------|----------|----|------|------|-------------|
| 35 | (we)   | /we/   | 'rain'   | 36 | (ye) | /ye/ | 'jump'      |
|    | (be)   | /we/   | 'seeds'  |    | (ye) | /ye/ | 'testicles' |
|    | (bi)   | /wi/   | 'penis'  |    | (yi) | /yi/ | 'snake'     |
|    | (wo)   | /we/   | 'fish'   |    | (yo) | /yo/ | 'liver'     |
|    | (wuru) | /wuru/ | 'corner' |    | (yu) | /yu/ | 'blood'     |

# Four-way Contrasts:

|                       |                         |
|-----------------------|-------------------------|
| (te) /te/ 'leg'       | (na) /na/ 'I'           |
| (ti) /ti/ 'shell'     | (ni) /ni/ 'you sg.'     |
| (to) /to/ 'conch'     | (no) /no/ 'wait!'       |
| (tu) /tu/ 'bottom'    | (nu) /nu/ 'sister'      |
|                       |                         |
| (dza) /dza/ 'nibble'  | (da) /da/ 'tender leaf' |
| (dze) /dze/ 'manure'  | (de) /de/ 'hit!'        |
| (dzi) /dzi/ 'cry'     | (di) /di/ 'tooth'       |
| (dzo) /dzo/ 'another' | (do) /do/ 'stop!'       |

# Three-way Contrasts:

|                               |                  |
|-------------------------------|------------------|
| (atu) /atu/ 'here close'      | (se) /se/ 'say!' |
| (etu) /etu/ 'here very close' | (si) /si/ 'hey!' |
| (otu) /otu/ 'there'           | (su) /su/ 'soup' |

# Additional Contrasts:

## i--e

|                      |                   |
|----------------------|-------------------|
| (ami) /ami/ 'breast' | (gi) /gi/ 'spear' |
| (ame) /ame/ 'sago'   | (ge) /ge/ 'talk'  |
|                      |                   |
| (ibi) /iwi/ 'knife'  |                   |
| (ibe) /iwe/ 'weeds'  |                   |

## o--u

|                      |                        |
|----------------------|------------------------|
| (dao) /dao/ 'half'   | (nona) /nona/ 'things' |
| (dau) /dau/ 'senile' | (nuna) /nuna/ 'his'    |
|                      |                        |
| (oro) /oro/ 'lime'   |                        |
| (uro) /uro/ 'vein'   |                        |

a--o

(ma) /ma/ 'taro'

(mo) /mo/ 'cloth'

a--e

(au) /au/ 'pot'

(ma) /ma/ 'taro'

(eu) /eu/ 'bush'

(me) /me/ 'true'

(emora) /emora/ 'of the man'

(emore) /emore/ 'to the man'

### 5.3 Supra-segmental items

#### 5.3.1 Nasalization

Each of the five vowels may be a unit of nasalization. There are clear contrasts both between the nasalized vowels themselves, and also between nasalized and non-nasalized vowels.

a) Contrast between the nasalized vowels:

Five-way Contrast:

37 (ta) /ta/ 'nest'

(te) /te/ 'enough'

(ti) /ti/ 'dibble stick'

(to) /to/ 'sound; hammer'

(tu) /tu/ 'walking stick'

# Four-way Contrast:

38 (d<sub>i</sub>) /di/ 'heavy'  
 (d<sub>ə</sub>) /də/ 'holy'  
 (d<sub>o</sub>) /do/ 'prop'  
 (d<sub>u</sub>) /du/ 'anger'

## Three-way Contrast:

(p<sub>i</sub>) /pi/ 'night'  
 (p<sub>o</sub>) /po/ 'side'  
 (p<sub>u</sub>) /pu/ 'take!'

(s<sub>i</sub>) /si/ 'smoke'  
 (s<sub>o</sub>) /so/ 'bait'  
 (s<sub>u</sub>) /su/ 'run!'

(m<sub>e</sub>) /me/ 'shame'  
 (m<sub>a</sub>) /ma/ 'haze'  
 (m<sub>u</sub>) /mu/ 'juice'

## Additional contrasts:

#####

i--e

(p<sub>i</sub>) /pi/ 'night'  
 (p<sub>e</sub>) /pe/ 'sound: slap'

a--o

(a<sub>wa</sub>) /awa/ 'fear'  
 (a<sub>wo</sub>) /awo/ 'they'

b) Contrast between nasalized and non-nasalized vowels:

i--i

- 39 (ti) /ti/ 'shell'  
 (ti) /ti/ 'dibble stick'  
 (di) /di/ 'tooth'  
 (di) /di/ 'heavy'

e--e

- (te) /te/ 'leg'  
 (te) /te/ 'enough'

- 40 (ewa) /ewa/ 'mango'  
 (ewa) /ewa/ 'raft'

a--a

- (dza) /dza/ 'nibble'  
 (dza) /dza/ 'betelnut'

- 41 (wa) /wa/ 'rain'  
 (wa) /wa/ 'canoe'  
 (awa) /awa/ 'var. of fish--swordfish'  
 (awa) /awa/ 'fear'

o--o

- |                      |                              |
|----------------------|------------------------------|
| 42 (do) /do/ 'stop!' | (bedzao) /bedzao/ 'to break' |
| (do) /do/ 'prop'     | (bedzao) /bedzao/ 'snail'    |



u--u<sub>1</sub>

43 (pu) /pu/ 'pig'

(pu) /pu/ 'take!'

(nu) /nu/ 'sister'

(nu) /nu/ 'he, she, it'

(su) /su/ 'soup'

(su) /su/ 'run!'

44 (u) /u/ x 'coconut'

(u) /u/ 'net it!'

There are certain words whose nasalization is uncertain, leading to a hypothesis of fortis and lenis nasalization, see Section 8.2. Nasalization also is the cause of certain morphophonemics, see Section 8.3.

### 5.3.2 Tone

It is uncertain whether there are any minimal pairs of tone in Zia. A check of the 50 Suena tone pairs into Zia, several of which are identical in segmental phonemes, revealed no tone pairs in Zia.

Only two suspect pairs have been found to date.

(da) /da/ 'tender leaf'

(da) /da/ 'holy'

These could be a difference of fortis and lenis nasalization, as the 'tender leaf' appears to be nasalized a bit, but not as heavily as 'holy'.

(be) /be/ 'mouth'

(be) /be/ 'time'

These two words are "felt" to be different by Zia speakers, yet in a Healey-test performed using two informants and pictures, the error rate was 66%.

### 5.3.3 Length

See Section 8.4 and 8.5, Unresolved Issues.

### 5.3.4 Stress

The following observations of stress need further substantiation:

- a) Ultima: Stress is on the ultima in questions which are marked by either /i/ 'question morpheme' or /-ta/ 'question morpheme'. (e mo'ta) /emote/ 'Is it a man?'  
b) Penult: Normally the stress of nouns and verbs is on the penult.

(be'sa o) /besao/ 'to untie'

(du'wa n) /duwao/ 'to dig up'

(a'to o) /atoo/ 'father-in-law'

~~XXXX~~

(mi na'ne ne) /minanene/ 'let us eat'

- c) Antepenult: Medial verbs ending in /-ro/ 'having done' have their stress on the antepenult, though the stress is rather weak: ~~XX~~

('da we ro) /dawero/ 'having rowed'

(ko ro 'ga i ro) /korogairo/ 'having gone downstream'

## 6. DISTRIBUTION

### 6.1 General Distribution

#### 6.1.1 Distribution as Matrix

|                | bilabial | alveolar | velar |
|----------------|----------|----------|-------|
| vl. stops      | p        | t        | k     |
| vd. stops      | b        | d        | g     |
| nasals         | m        | n        |       |
| vd. fricatives | w        | dz       |       |
| vl. fricatives |          | s        |       |
| semi-vowel     |          | y        |       |
| vibrant        |          | r        |       |

|      | Front | Central | Back |
|------|-------|---------|------|
| High | i     |         | u    |
| Low  | e     | a       | o    |

#### 6.1.2 Syllables

There are two CV patterns, V and CV.

| Initial                            | Medial                              | Final                                 |
|------------------------------------|-------------------------------------|---------------------------------------|
| /v <u>r</u> o/ 'vein'              | /a <u>g</u> ro/ 'butchering'        | /b <u>o</u> a/ 'limb'                 |
| /b <u>o</u> ne <u>n</u> e/ 'feast' | /d <u>a</u> we <u>r</u> o/ 'rowing' | /mi <u>n</u> i <u>w</u> a/ 'they ate' |

Definition of syllable in Zia: A Zia syllable is composed of one vowel with optional consonant onset.

Distribution in word. (Note: "Word" refers to phonological word, tentatively defined as the minimal unit which can occur in isolation.) Both V and CV syllables may occur word initial, word medial, or word final. See examples above.



## 6.2 Specific distribution of phonemes

### Initial syllable:

|    | a | o | i | o | u |
|----|---|---|---|---|---|
| p  | ✓ | ✓ | ✓ | ✓ | ✓ |
| t  | ✓ | ✓ | ✓ | ✓ | ✓ |
| k  | ✓ | ✓ | ✓ | ✓ | ✓ |
| b  | ✓ | ✓ | ✓ | ✓ | ✓ |
| d  | ✓ | ✓ | ✓ | ✓ | ✓ |
| g  | ✓ | ✓ | ✓ | ✓ | ✓ |
| m  | ✓ | ✓ | ✓ | ✓ | ✓ |
| n  | ✓ | ✓ | ✓ | ✓ | ✓ |
| r  |   |   |   |   |   |
| s  | ✓ | ✓ | ✓ | ✓ | ✓ |
| dz | ✓ | ✓ | ✓ | ✓ | ✓ |
| w  | ✓ | ✓ | ✓ | ✓ | ✓ |
| y  | ✓ | ✓ | ✓ | ✓ | ✓ |

### Medial syllable:

|    | a | e | i | o | u |
|----|---|---|---|---|---|
| p  | ✓ | ✓ | ✓ | ✓ | ✓ |
| t  | ✓ | ✓ | ✓ | ✓ | ✓ |
| k  | ✓ | ✓ | ✓ | ✓ | ✓ |
| b  | ✓ | ✓ | ✓ | ✓ | ✓ |
| d  | ✓ | ✓ | ✓ | ✓ | ✓ |
| g  | ✓ | ✓ | ✓ | ✓ | ✓ |
| m  | ✓ | ✓ | ✓ | ✓ | ✓ |
| n  | ✓ | ✓ | ✓ | ✓ | ✓ |
| r  | ✓ | ✓ | ✓ | ✓ | ✓ |
| s  | ✓ | ✓ | ✓ | ✓ | ✓ |
| dz | ✓ | ✓ | ✓ | ✓ | ✓ |
| w  | ✓ | ✓ | ✓ | ✓ | ✓ |
| y  | ✓ | ✓ |   | ✓ | ✓ |

### Final syllable:

|    | a | e | i | o | u |
|----|---|---|---|---|---|
| p  | ✓ | ✓ | ✓ | ✓ | ✓ |
| t  | ✓ | ✓ | ✓ | ✓ | ✓ |
| k  | ✓ | ✓ | ✓ | ✓ | ✓ |
| b  | ✓ | ✓ | ✓ | ✓ | ✓ |
| d  |   |   |   |   |   |
| g  | ✓ | ✓ | ✓ | ✓ | ✓ |
| m  | ✓ | ✓ | ✓ | ✓ | ✓ |
| n  | ✓ | ✓ | ✓ | ✓ | ✓ |
| r  | ✓ | ✓ | ✓ | ✓ | ✓ |
| s  | ✓ | ✓ | ✓ | ✓ | ✓ |
| dz | ✓ | ✓ | ✓ | ✓ | ✓ |
| w  | ✓ | ✓ | ✓ | ✓ | ✓ |
| y  | ✓ | ✓ | ✓ | ✓ | ✓ |

## 7. ORTHOGRAPHY

### 7.1 Proposed orthography

|                   |                   |   |
|-------------------|-------------------|---|
| /p <sup>h</sup> / | (p <sup>h</sup> ) | p |
| /t <sup>h</sup> / | (t <sup>h</sup> ) | t |
| /k <sup>h</sup> / | (k <sup>h</sup> ) | k |
| /b/               | (b)               | b |
| /d/               | (d)               | d |
| /g/               | (g)               | g |
| /m/               | (m)               | m |
| /n/               | (n)               | n |
| /ɾ/               | (ɾ)               | ɾ |
| /w/               | (w)               | w |
|                   | (b)               |   |
| /ə/               | (ə)               | ə |
| /dz/              | (dz)              | z |
| /y/               | (y)               | y |
| /ə/               | (ə)               | ə |
| /ə/               | (ə)               | ə |
| /i/               | (i)               | i |
| /o/               | (o)               | o |
| /u/               | (u)               | u |

/Nasalization/ ng following the vowel. e.g.

|   |       |       |       |         |
|---|-------|-------|-------|---------|
| ɣ | (dɣ)  | /dɣ/  | dong  | 'prop'  |
|   | (pɣ)  | /pɣ/  | pung  | 'take!' |
|   | (ɣɣ)  | /ɣɣ/  | aung  | 'none'  |
|   | (ɣwa) | /ɣwa/ | engwa | 'raft'  |

**Comments on the proposed orthography:**

**1. Although ng is not perhaps the happiest choice for symbolizing nasalization, it has two points in its favor:**

- a) it is currently in widespread use among the Zia**
- b) it avoids potential ambiguity of spellings, such as:**
  - (bauno) /bauno/ bauno 'woman'**
  - (bayno) /bayno/ baungno 'going'**

**2. As there is insufficient evidence for the existence of phonemic tone, stress, and length, we suggest these not be symbolized. Lengthened vowels in onomatopoeic words may be symbolized by a double vowel even though this is the same as the symbolization for two syllables having a tone glide. e.g.**

- (pu) /pu-/ puu 'sound of a conch shell horn'**
- (doo) /doo/ doo 'magic'**

**Note: To date all onomatopoeic words are lengthened /u/, except /koŋ/ 'sound of a cassowary' whereas all two syllable glides are always ~~du~~ /oo/.**

**3. ~~Due~~ Drawing on our previous experience with the Suena orthography, we are not trying to symbolize medial /r/ as d, even though the proof of contrast is weak. From our testing we find that all those tested are consistent in writing medial /r/ as r, not d.**

4. Further, in testing the proposed alphabet there seems to be almost instantaneous transfer from the German-influenced j to y, and l to r, especially since the younger generation have already learned these symbols in Pidgin and English.

5. As previously mentioned in the Introduction, the proposed Zia orthography is identical to the current Established orthography for Suena, except that the Zia has the additional nasalization marker ng. This seems only logical, since all of the consonant and vowel phonemes of Zia are identical to the Suena phonemes.

## 7.2 Previous orthography

The Zia language has never been reduced to writing by any scientific means, though the first Lutheran missionary, Rev. Meilander, who entered the area in 1911, did produce a book of Bible stories of which only a few copies remain. Apparently through Meilander's influence and also perhaps on their own initiative the people have learned to read and write their own language by using originally the symbols for Kate, and more recently Pidgin. Their alphabet is phonemic, and is the same as we are proposing, except that the older generation write j for y and l for r as a result of the earlier German influence on the spelling of Kate words.

As a result of the work of the Lutheran schools and the more recent Government schools, approximately 80% of

the Zia people are literate.

We have tested 50 literate adults, ranging in age from 18 to 70, on the spelling of certain difficult words, the ability to read a story in the proposed orthography and answer questions on it, and on dictation. These 50 people's education ranged from Standard 2 to Form 1.

We are currently in the process of testing the alphabet on 75 High School and University graduates, focusing primarily on the supra-segmental items. We have proposed an alternative orthography to them which symbolizes nasalization by an n, rather than the ng which is in common use.

### 7.3 List of English words as pronounced by Zias.

Almost all of the Zias are fluent in Pidgin. In addition many have been educated in English. The older generation have learned Kato in varying degrees.

| <u>English</u> | <u>as pronounced by Zias</u> |
|----------------|------------------------------|
|----------------|------------------------------|

|          |              |
|----------|--------------|
| wire     | ways         |
| shoes    | to su        |
| glass    | garasi       |
| chair    | sia          |
| soap     | sobu         |
| matches  | masisi       |
| lamp     | damu, damana |
| kerosene | karaseni     |

| <u>English</u> | <u>as pronounced by Zias</u> |
|----------------|------------------------------|
| photo          | poto                         |
| ship           | sipi                         |
| sick           | siki                         |
| file           | peiri                        |
| bell           | beri                         |
| hammer         | ama                          |
| bell           | bero                         |
| hot            | ati                          |
| cold           | koli                         |
| nail           | niri                         |
| radio          | redio                        |
| table          | towo                         |
| horse          | osi                          |
| car            | kare                         |
| bus            | busi                         |
| barge          | bazi                         |

#### 7.4 Sample text

Note: Because the proposed orthography is, with three exceptions, phonetic as well as phonemic, we have taken the liberty to omit a full typing of the phonetics, and have included ~~XXXX~~ after each non-phonetic word the phonetic rendering in brackets. As can be seen from this text, the three exceptions to this being a phonetic alphabet are: 1) the affricate dz is symbolized by z 2) the (b) allophone of /w/ 3) nasalization

Gitau oune emo baina zo (dzo) mitaungna (mitsuna).  
Before then man big one was/he.

Emo auna yazo (yadzo) nuna Abura Bewaro.  
man this/of name his Abura Bewaro.

Nu awia (abia) angai (asi) etama atiro nauna.  
he that wives three marrying lived/he

Mani awiso (mani abiso) nuna awia (abia) wawong (wawo)  
children his that hand

etobe aune te zo(dzo) aune te zore(dzore) gitau arauna.  
two plus leg one plus leg one's head S.M.

Nu be zore(dzore) baung (bay) nuna ma bure  
he time one go his taro garden

yari bauna. Nu bautu nasani aune pu zo (dzo)  
to/arrive went/he he was/going then pig one

mene i susuwera atu mumu dudunenu nu gigina.  
sub. tree base/at there was/rooting/it he saw/he

Nu pu awia(abia) giro gi mene pu awia(abia)  
he pig that seeing spear inst. pig that

gayari sere nete aune zuene(dzuena).  
to/spear thinking did then fell/he

Be awia(abia) wa bere were some ou mene  
time that rain time rain place water subj.

buka tarara yenu aune zuena (dzuena). Ayenu  
filled/up/it then fell/he that/did/he

pu awia(abia) nu giro nu asero buro gauna.  
pig that him seeing him chasing coming bit/it

Ayenu atu mani nuna zo(dzo) mene  
that/did/he from/there child his one subj.

ai suno nape yenu aune emo mene  
message running to/village came/he then men subj.

baung(bau) eu yero nu diuno puro baung(bau)  
went bush arriving him carrying taking went

nape yero aune puro dawero(dawero) baung(bau)  
to/village coming then taking rowing went

yaya gare yero atu pugaiwa. Atu  
sick house/at coming there put/they there

siwo pupu nasani mitawe(mitawe) iwaing(iwai)  
medicine taking staying well

yero aune kapete nape gaina.  
becoming then turning to/village came/he

Ge ungueng(ue) karawa.  
talk story end

#### Free translation:

Long ago there was a big man. This man's name was Abura Bewaro. He married three wives. He had 16 children.

One day he went to go to his taro garden. As he was going he saw a pig which was rooting at the base of a tree. Seeing that pig, he tried to spear it, and he fell down. That time was the rain time, the place was filled with water, and he fell.

When he did that the pig saw him and chased him and came and bit him. When it did that, one of his children ran to the village with the message and the men went to the bush, carried him to the village, then rowed him to the hospital and put him there. There he remained, taking medicine, and when he was well again he returned to the village. The end.



## 8. UNRESOLVED ISSUES

### 8.1 Medial /d/

Apparently the Zia language is in the process of losing all medial /d/'s, as is Suena. Hence the occurrence of alternate forms, such as:

(diriegao) / (didiégao) 'to transfer, to will to'

(emo didi) / (emo diri) 'boys' (see below also)

Other medial /d/'s are the result of reduplication:

Singular/Infinitive

Plural/Present tense

/dikai/ 'relative'

/didikai/ 'relatives'

/diao/ 'to tie'

/didinena/ 'I am tying'

/duwao/ 'to dig up'

/dudunena/ 'I am digging up'

/emo di/ 'boy'

/emo didi/ 'boys'

Still others cannot be accounted for:

/adoo yao/ 'to fry'

/ademai/ 'young girl'

/adumao/ 'to sit'

Because of the few occurrences which cannot be accounted for, and because of previous experience with the Suena orthography, we have decided to make /d/ and /r/ separate phonemes, with limited distribution.

## 8.2 Nasalization

There are three interconnected problems with nasalization: a) fortis versus lenis b) nasal harmony, c) morphophonemics, which is a type of nasal harmony.

At the present time we can only outline the problems and make tentative hypotheses. Further data is needed to resolve the issues.

Hypothesis #1: There is fortis and lenis nasalization.

(d<sub>3</sub>) /d<sub>3</sub>/ 'tender leaf'

(d<sub>4</sub>) /d<sub>4</sub>/ 'holy'

(s<sub>3</sub>i) /s<sub>3</sub>i/ 'rope'

(s<sub>3</sub>i) /s<sub>3</sub>i/ 'wives'

(t<sub>4</sub>wi) /t<sub>4</sub>wi/ 'land'

Hypothesis #2: Certain nasal vowels (fortis?) cause nasalization of following syllables, whereas certain other nasal vowels (lenis?) do not.

Hypothesis #3: Certain nasal vowels cause morphophonemic changes when suffixes are added, and this is true even of vowels which were historically nasalized, but no longer are.

Hypothesis #4: Nasal consonants have no effect on vowels as to whether they are nasalized or non-nasalized.

### 8.3 Morphophonemics

The medial verb, same subject, ending is /-ro/, and the possessive and indirect object markers are respectively: /-ra/ and /-re/. These three suffixes have allomorphs of /-no/, /-na/, and /-ne/ respectively. These allomorphs are conditioned by a previous nasalized vowel, but are dependent on the conditions outlined in Section 8.2 above. A few examples are included here for the reader's interest.

/puro/ 'taking' (-ro after non-nasalized vowels)

/buro/ 'coming'

/bauno/ 'going' (-ro becomes -no)

/adema<sub>i</sub>/ 'young girl' (fortis nasalization)

/adema<sub>i</sub>na/ 'of the young girl' (-ra becomes -na)

/aune/ 'then' (whereas after oral vowels one would expect (aure))

/emo/ 'man'

/emore/ 'of the man' (nasal consonant does not affect the re)

#### 8.4 Lengthened /i/

To date two words have been found which appear to have a lengthened /i/. They are:

(bi') /wi/ 'sexual intercourse'

which seemingly contrasts with:

(bi) /wi/ 'penis'

and (mi') /mi'/ 'tambu female relatives'

but because of inadequate evidence, plus the nature of the evidence available, I leave it for further study.

There is apparently no meaning for the shortened form (mi) /mi/.

#### 8.5 Lengthened vowels in onomatopoeic words.

As was mentioned earlier in Section 7.1, comment number 2, to date all onomatopoeic words ~~XXXXXX~~ which contain lengthened vowels are composed of lengthened /u/, except /ko'/ 'sound which a cassowary makes' We are suggesting that these onomatopoeic words be written with two vowels.

## 9. NON-CONTRASTIVE FEATURES

### 9.1 Prenasalized stops

Within the Binandere family there seem to be varying degrees in the frequency of occurrence of prenasalized stops. Suena, the northernmost member, has very a few. Binandere itself, in the central area, has many. Zie falls geographically between Suena and Binandere, and linguistically, too, it seems somewhere between the two in the number and frequency of prenasalized stops.

To date the following have been noted:

|      |             |            |                                |
|------|-------------|------------|--------------------------------|
| (ŋg) | (menge yao) | /mage yao/ | 'to die'                       |
|      | (nuggu)     | /nugu/     | 'close'                        |
|      | (menge)     | /mage/     | 'gums'                         |
|      | (nengere)   | /nengere/  | 'var. of banana'               |
|      | (menguro)   | /meguro/   | 'box'                          |
| (mb) | (timbe)     | /tibe/     | 'cockroach'                    |
|      | (nembu)     | /nebu/     | 'friend'                       |
|      | (nambinena) | /nabinena/ | 'I row up'                     |
| (nd) | (enda)      | /ada/      | 'fish's tail'                  |
|      | (monde)     | /mada/     | 'plural of /de/ tender leaves' |

Under the proposed orthography there would be no problem in writing the (mb) and (nd) as mb and nd. However, if the (ŋg) were written as ng, it would be ambiguous with the nasalization symbol ng. From our experience in Suena it would seem that prenasalized stops need not be symbolized.