

THE PHONOLOGY OF JAVANESE VOWELS

Colin Yallop

1. OUTLINE

There has been some disagreement about the description of standard Central Javanese vowels. This paper reviews the major complexities in the vowel system, namely

the relationship between *i* and *I* and between *u* and *U* (2.1.)

the relationship between *é* and *è* and between *ó* and *ò* (2.2.)

the lowering of *i* and *é* (to *è*) and of *u* and *ó* (to *ò*) in certain contexts (2.3.)

the relationship between unrounded *a* and rounded *â* (2.4.)

While it is possible to generalise – for example, *i*, *é*, *u*, *ó* are restricted to open syllables – the detailed facts are such that generalisations may be superficial and misleading. In fact observation of regional or non-standard dialects, which often turn out to be simplifications of the standard dialect, suggests that there is genuine tension or complexity in the vowel system of the standard language. It is therefore unwise to approach Javanese in a way that seeks to simplify or generalise too readily (as some models of phonology are inclined to). Instead it seems necessary to distinguish fairly clearly between phonological structure, morphological structure and the contrastive phonemic system.

Any language must in a sense integrate these different aspects (by, for example, allowing phonemes to be realised differently in different structural or morphological contexts). It may be argued that Javanese is rather unusual in its path of integration, particularly in the extent to which morphological considerations are allowed to constrain phonological structure and the realisation of phonemic contrasts: but this makes it all the more important to do descriptive justice to the ingredients of the solution.

(See Appendices 1 and 2 for sources and symbols.)

2. DISTRIBUTION AND ALTERNATIONS

2.1. The vowels *i*, *I*, *u* and *U*

2.1.1. General distribution

It is more or less true that *i* and *u* occur only in open syllables while *I* and *U* occur only in closed syllables, e.g.

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pi.pi 'cheek'
 pi.pIh 'rag'
 tu.ku 'buy'
 pUr.na 'restored, complete'

Where affixation alters syllabic structure, alternations occur, e.g.

gá.rIng 'dry' gá.ri.ngâ 'even if dry'
 ká.sUr 'mattress' ká.su.ré 'the mattress'

2.1.2. Syllabification

The definition of open and closed syllables in Javanese is not entirely straightforward, however. Only a few word-medial consonant clusters, notably r plus consonant, divide so as to close the preceding syllable, e.g.

sIr.nâ 'vanished'
 prIk.sâ 'examine'
 pIr.sâ 'see, perceive'
 gUs.ti 'lord, master'
 kUr.si 'chair'

Thus a considerable number of consonant sequences seem to count as syllable initial, including not only homorganic stop plus nasal but also consonant plus r or l and even the cluster ngs, e.g.

ti.mbUl 'emerge'
 dhi.ngklIq 'stool'
 pi.ntěr 'clever'
 lu.mrah 'usual'
 pu.trâ 'child'
 mu.ngsUh 'enemy'

Some authors (e.g. Robson 1976) agree with the syllable divisions given here. But Uhlenbeck (1949:38) rejects the idea that vowel variants can be explained purely in terms of syllabification. He suggests, for instance, that the syllable boundary does fall between a nasal and following stop, i.e. that pintěr is pin.těr. In this case it is obviously necessary to state that the 'open-syllable' variants i and u occur in open syllables and before certain consonant sequences. But in fact Uhlenbeck indicates that it is possible to describe Javanese phonology without necessarily referring to syllables at all.

A further complication is that clusters of consonant plus y have an ambiguous status: compare wIryâ 'brave' and dibyâ 'powerful, invulnerable'. If syllabic structure is what conditions the distribution of i, I, u and U, then these two words must be wIr.yâ and di.byâ. (But Uhlenbeck, 1949:35, comments that words containing consonant plus y are mostly archaic or literary.)

2.1.3. Effects of -áké

The 'causative' suffix -áké (see Appendix 3 for suffixes) does not affect preceding I or U, despite the fact that it would appear to create an open syllable. Compare forms in -áké with forms in -é, -i, -ânâ:

Root	-áké	-é	-i	-ânâ	Root meaning
sálIn	sálInáké	sáliné	sálini	sálinânâ	'change'
cáwIs	cáwIsáké	cáwisé	cáwisi	cáwisânâ	'prepare, provide'
gětUn	gětUnáké	gětuné	gětuni	gětunânâ	'regret, sorrow'
tulUng	tulUngáké	tulungé	tulungi	tulungânâ	'help'

This apparent anomaly may be due to paradigmatic uniformity. The Javanese verbal system reveals three 'causative' suffixes and three 'locative' suffixes (Appendix 3). In general the allomorphs of these suffixes are such that a root-final closed syllable remains closed before a causative suffix but becomes open before a locative suffix. -áké ought to break this pattern (as a causative suffix creating an open syllable) but it actually conforms to the causative paradigm:

Root	Causative Forms			
sálIn	sálInáké	sálinnâ	sálinné	I throughout
gětUn	gětUnáké	gětUnnâ	gětUnné	U throughout
Locative Forms				
sálIn	sálini	sálinânâ	sálinané	I i in locative
gětUn	gětuni	gětunânâ	gětunané	U u in locative

Dudas (1976:175) adopts a similar 'paradigmatic' explanation but it should be noted that this is expressed as a 'statement' and not incorporated within the rule system itself.

The only other suffixes which begin with a vowel but nevertheless do not trigger adjustment of I and U are the Krama equivalent of -áké, namely -ákĕn, and the Krama equivalent of -é, namely -ipUn (cf. Soepomo, 1969:168). If paradigmatic pressure is at work, it is not surprising that -ákĕn parallels -áké; why -ipUn is also irregular is not clear, unless its Krama status is a factor (Uhlenbeck 1949:209, mentions that I and U *may* change before -ipUn but that the unchanged form is regarded as more elegant). In any event, it does not seem possible to offer any explanation in terms of the phonological shape of the exceptional suffixes; it seems misleading, for example, to suggest that I and U become i and u only before monosyllabic suffixes, since they do change before -ânâ and -áné, as illustrated above.

2.1.4. Other apparent exceptions

There are some special instances in which i and u can appear in closed syllables, in particular in loan words (e.g. pit 'bicycle' from Dutch fiets) and in certain stressed or intensified words (e.g. ciliq 'tiny', but ciliq 'small', cf. Uhlenbeck 1949:31ff, 66ff., Horne 1974:xxvii). Such occurrences may be regarded as further evidence that the distribution of i, I, u and U is not determined solely by phonetic or phonological factors (such as whether a syllable is open or closed); rather, morphological and even lexical factors interact with what may seem at first sight to be a matter of simple phonetics.

2.2. The vowels é, è, ó and ò

2.2.1. General distribution

Again, the distribution of these vowels is partly but not entirely accounted for by distinguishing between open and closed syllables. To some extent é and ó occur in open syllables and è and ò in closed syllables, e.g.

ké.né	'here'
gó.lèq	'get'
ló.ró	'two'
wé.dòq	'female'
só.ré	'evening'

But è and ò do occur in open syllables if the vowel of the following syllable is ě or (word-final) i or u; è also occurs before è, and ò before ò. These conditions are not the same as for I and U, as exemplified by the following, where incorrect pronunciations are asterisked:

before ě	mèsĕm *mésĕm 'smile'	mbòtĕn *mbótĕn 'not'	*pĪrĕng pirĕng 'hear'	*sUkĕt sukĕt 'grass'
before i	dĕwi *dĕwi 'goddess'	kòri *kóri 'door'	*sĪji siji 'one'	*bUmi bumi 'earth'
before u	sĕwu *sĕwu 'thousand'	*wòlu *wólu 'eight'	*pĪtu pitu 'seven'	*lUcu lucu 'funny'
identical vowels	dĕrĕng *dĕrĕng 'not yet'	sòròt *sóròt 'beam, ray'	*pĪtĪq pitĪq 'chicken'	*jUpUq jupUq 'pick up'

2.2.2. Effects of affixation

The complementarity of é and è and of ó and ò holds only *within* a morpheme. Alternations do not arise even where affixation seems to invite them, e.g.

sáté-nĕn	=	sátĕnĕn	'make saté, let saté be made'	(cf. mèsĕm above)
sótó-nĕn	=	sótónĕn	'make soto, let soto be made'	(cf. mbòtĕn above)
wòng-é	=	wòngé	'the man'	(cf. sóré above)
lèmĕq-é	=	lèmĕqé	'the lining'	
sòròt-é	=	sòròté	'the beam'	

(But note also 2.3.3. below.)

2.2.3. Overlap with I and U

Since é and ó are confined to open syllables, and I and U to closed syllables (subject to exceptions mentioned in 2.1.3.), it is possible to identify I and U as allophones of é and ó. This is in effect the analysis

followed by Horne (1963), Soepomo (1969) and Sumukti (1971), and represented by Column D in Appendix 2. The phonetic justification is clear enough, since I and U are often closer in auditory quality to é and ó than to i and u. In an analysis which claims to be psychologically realistic, the question is how far native speakers' sensitivity to this auditory similarity is outweighed by their awareness of alternations (e.g. I can become i but not é; i.e. salIn-i is pronounced sálini not *sálèni or *sáléni). Authors who adopt what is here called Analysis D (Appendix 2) are of course obliged to introduce a process of raising, whereby, for example, salén + i → salini.

2.2.4. Contrast between é and è, and between ó and ò

Even if we do *not* take I and U to be allophones of é and ó, there is still a difficulty in grouping é and è together. We may in fact consider é and è as contrasting vowels — provided that we ignore morphological structure. Because of the facts mentioned in 2.2.2., it is possible to find both ..CéCé and ..CèCé in Javanese. But the second of these can occur only where the final é is the definite suffix (as in lèmèqé 'the lining').

A similar point can be made about ó and ò, where, for instance, ..CóCé occurs where there is no morpheme boundary before the é (e.g. sóré 'evening') but ..CòCé where -é is a suffix (e.g. sòròté 'the beam').

Minimal pairs are not very common. Potentially at least, there is a contrast between such pairs as bágéné (bágé-né) and bágèné (bágèn-é), both based on bágé 'share, distribute'. A minimal pair for ó and ò is kěbó-né 'the buffalo' and kěbòn-é 'the garden'. (But since â coincides with ò in the standard language, there are further examples of contrast, as in 2.4.2. below.)

2.3. Vowel lowering

2.3.1. General statement

Before the suffix -n and causative and locative suffixes (see Appendix 3), root-final vowels are lowered as follows

i and é become è
u and ó become ò

Examples:

Root	-n	Causative -qáké	Locative -ni	Root Meaning
isi	isèn	isèqáké	isèni	'contain'
bágé	bágèn	bágèqáké	bágèni	'distribute'
těmu	těmòn	těmòqáké	těmòni	'find, meet'
páro	páròn	pàròqáké	pàròni	'half'

The other causative and locative suffixes cause identical lowering, e.g.

isèni, isènanà, isènané, etc.

2.3.2. Morphological conditioning

Although partly constrained by pronounceability, lowering is not just a response to phonetic requirements. For example, the root-final vowel of *isi-n* must undergo some modification, since *i* ought not to appear in a closed syllable; but *isIn* is as readily pronounceable as *isèn* (and *isIn* does in fact exist as the word '*shy, embarrassed*'). Moreover, there are suffixes of comparable shape, such as *-nèn*, *-né* and *-mu*, which do not trigger lowering, e.g.

Root	With Lowering			Without Lowering		
	-n	-ni	-náné	-nèn	-né	-mu
<i>isi</i>	<i>isèn</i>	<i>isèni</i>	<i>isènané</i>	<i>isinèn</i>	<i>isiné</i>	<i>isimu</i>
<i>bágé</i>	<i>bágèn</i>	<i>bágèni</i>	<i>bágènané</i>	<i>bágénèn</i>	<i>bágéné</i>	<i>bágému</i>

Note in particular that some of the suffixes that do not require lowering actually create sequences that ought in a sense to be unpronounceable, such as *é* before *è*, or *é* before final *u* (cf. 2.2. above). Thus

- (i) lowering applies before a set of suffixes which cannot be defined in purely phonetic or phonological terms;
- (ii) lowering does more than make the minimal phonetic adjustment necessary to achieve an acceptable Javanese pronunciation;
- (iii) lowering does not apply in some contexts, where the resulting form appears to violate normal rules of pronunciation.

2.3.3. Interaction with constraints on *é*, *è*, *ó* and *ò*

Where a root-final *é* or *ó* is preceded by itself, both vowels must be lowered before the relevant suffixes, e.g.

<i>léndhé-ni</i>	=	<i>lèndhèni</i>	'lean on'
<i>ngéné-qáké</i>	=	<i>ngènéqáké</i>	'do/make in this way'
<i>bódhó-n</i>	=	<i>bòdhòn</i>	'ignorantly'
<i>ngónó-qáké</i>	=	<i>ngònòqáké</i>	'do/make in that way'

This is obviously a straightforward consequence of the constraint against having *é-è* or *ó-ò* within a morpheme (2.2.1.). If lowering applies to the second of two *é*'s or *ó*'s then the preceding vowel (which is within the same morpheme) must also be lowered.

2.4. The vowels *á*, *à* and *â*

2.4.1. General distribution

á and *à* are complementary, in open and closed syllables, e.g.

<i>gá.rIng</i>	'dry'
<i>ó.màh</i>	'house'
<i>má.ngàn</i>	'eat'
<i>mé.já.né</i>	'the table'

As with *é*, *è*, *ó* and *ò* (2.2.2.), the distribution of *á* and *à* is immune to affixation, e.g.

<i>ómàh</i>	'house'	<i>ómàhé</i>	'the house'
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But, in the standard language, *á* has undergone backing and rounding to *â* if it is word final or if it stands in an open syllable preceding *â*, creating alternations such as

mé.jâ	'table'	mé.jâ.né	'the table'
wâ.câ	'read'	wá.cá.něn	'read it, let it be read'
ně.gâ.râ	'country'	ně.gâ.râ.ku	'my country'

2.4.2. Contrastive status of *â*

Since the vowel *â* (in open syllables) coincides in quality with the *ò* vowel (mainly in closed syllables, 2.2.), a strictly phonemic analysis must take the historically enlarged phoneme *ò* to be in contrast with *ó*, e.g.

lóró	'two'	lârâ (= lòrò)	'sick'
puló	'island'	kulâ (= kulò)	'I'
ngónó	'thus'	ngânâ (= ngònò)	'thus'

(these two forms differ deictically)

póló	'head, brain'
pólâ (= pólò)	'pattern'
pâlâ (= pòlò)	'nutmeg'

2.4.3. Syllabification

If one insists that non-final *â* occurs only in an *open* syllable, any rule or predictive statement must take account of the way in which consonant clusters are allocated to syllables (as with *i*, *I*, *u* and *U*, 2.1.2.), e.g.

tâ.mpâ	'receive'
kâ.ncâ	'friend'
sâ.srâ	'thousand'
bâ.ngsâ	'nation'

BUT	tân.pâ	'without'
	wâr.nâ	'colour'
	sàs.trâ	'literature'
	jâl.mâ	'human being'

Uhlenbeck's remarks apropos *i* and *u* are relevant, however (2.1.2.). Soepomo (1969:167) also does not explain penultimate *â* entirely in terms of open syllables: he says that penultimate *â* occurs in an open syllable or in a syllable ending in a nasal. On his interpretation 'friend' is therefore *kân.câ*, 'nation' is *bâng.sâ*. On the other hand, Sumukti (1971) has syllable divisions such as *tâm.pâ* but *tâ.mbâ*.

2.4.4. Words of more than two syllables

Viewed as a rule, rounding of the vowel *a* is not iterative, i.e. it does not proceed indefinitely leftwards. Hence *câ.râ.kâ* 'messenger', not **câ.râ.kâ*; *tâ.ri.mâ* 'accept', not **tâ.ri.mâ*, etc.; although Uhlenbeck (1949:39) does give *nâyâkâ* as an alternative to the more usual *nâyâkâ* 'councillor, State official'.

But rounding does apply to both elements of a compound, e.g.

kâ.lâ.mâ.nggâ (i.e. kâlâ#mânggâ) 'spider (variety of)'
ku.lâ.wâr.gâ (i.e. kulâ#wârgâ) 'family'

It is doubtful whether all words of this type are felt to be compounds by native speakers; but root morphemes of three or more syllables are in any case rather rare in Javanese. There would be no principial objection, for example, to saying that any Javanese root of four syllables is treated as two bisyllabic constituents, whether or not native speakers are aware of its compound origin (cf. Kiliaan, 1919:41, Uhlenbeck, 1949:203). It is significant that if a root is reduplicated and carries a suffix, there is variation in pronunciation, as illustrated by Soepomo (1969:167) with the two possibilities bu.tâ.bu.tâ.né and bu.tâ.bu.tâ.né. The first alternative may be said to reflect the tendency to treat each half of the word independently, while the second overrides this tendency in recognition of the reduplicated character of the word.

2.4.5. Suffixes

Suffixes of appropriate form may contain â, i.e. -a is -â, -ana is -ânâ. But -â, which can follow a root-final vowel, does not block rounding of preceding a's, e.g.

bisâ	'can, be able'	bisââ	'even if possible'
pirâ	'how many'	pirââ	'however many'
lârâ	'sick'	lârââ	'even if sick'

(Compare 2.4.1. for the blocking effect of other suffixes such as -né, -něn, etc.)

-â is the only Javanese suffix which allows a vowel to follow a root-final vowel; other affixes have allomorphs with an intervening consonant (Appendix 3). Berg (1937:111) notes a further oddity, namely that â is raised to ó before the suffix -a, i.e. lârââ is pronounced lóróâ; Uhlenbeck (1949:208) mentions the same phenomenon with the example pírówâ for píráâ. Subsequent descriptions of Javanese do not take this up, and the present generation seem to regard the pronunciation with ó as archaic.

2.4.6. Summary

The occurrence of â is the result of a historical change whose phonetic motivation is, to say the least, obscure in the modern language. Note that where penultimate â precedes â, the rounding agreement is not a simple matter of phonetic vowel harmony, for there are actually two conditions under which an unrounded a can precede a low back rounded vowel:

- (i) where the second vowel is ò rather than final â, e.g. tá.wòn 'bee', pá.ròn 'half and half' and
- (ii) where à is suffixed to a root ending in ..àC (in which case -â apparently fails to create an open syllable) e.g.

kápàn	'when'	kápánâ	'no matter when'
nákàl	'naughty'	nákàlà	'even if naughty'

Moreover, if one pursues the idea of expressing rounding as a rule, the

structural conditions are quite difficult to state: within a single morpheme a sequence of three *â*'s is not possible (note **cârâkâ* in 2.4.4.) but both 'compounds' and affixation of *-â* do allow such a sequence (*kâlâmânggâ*, *lârââ*). Thus rounding might be expressed as a process which applies only to a sequence ...*(a.C)a#* within a morpheme, subject to the conditions that 'compounds' may contain two such sequences, both eligible to undergo the rule, and that the suffix *-â*, which itself undergoes the rule, does not prevent a preceding sequence from undergoing the rule. In fact Dudas resorts to two rules, one to account for rounding of final *-â*, the other to 'harmonise' a preceding *a*. Neither rule really deals with rounding before the suffix *-â*.

In this connection, it should be noted that there is no obvious formal device for marking the peculiarity of the suffix *-â*. It is not plausible, for instance, to suggest that *-â* is necessarily preceded by a # boundary (i.e. that *-â* is by nature less closely bound to a root than other suffixes). While this ploy might 'explain' why the suffix does not block rounding of preceding *a*'s, it overlooks the fact that *-â* is like other suffixes in creating open syllables in respect of allophones of *i* and *u*, e.g. *gârIng*, *gârIngâ* (2.1.1.).

3. REGIONAL AND NON-STANDARD VARIATION

There are versions of Javanese pronunciation, some already touched on above, which eliminate various complexities. These pronunciations can in general be characterised either as regional or as non-standard.

In East Java there are speakers who use *I* and *U* in all word-medial positions and restrict *i* and *u* to word-final position, e.g.

tImbUl 'emerge'
pIndó 'twice'
kUpIng 'ear'
 (cf. 2.1.1., 2.1.2.)

This pronunciation represents a simplification in a number of respects:

the ambivalent status of *I* and *U* is resolved, for in this dialect they are clearly in contrast with *é* and *ó* and must therefore be variants of *i* and *u*; secondly, the distribution of *I* and *U* is no longer constrained by syllabic organisation or internal word structure (cf. 2.1.2.); and forms in *-âké* such as *sáInáké* are no longer exceptional (cf. 2.1.3.).

Even speakers who do not follow this East Javanese pronunciation show some inclination to simplify the rules of syllabification. The cluster *ngs*, for example, which seems an unlikely sequence to begin a syllable (2.1.2., 2.4.3.), is in fact often eliminated: for the words *mu.ngsUh*, *mâ.ngsâ*, *má.nu.ngsâ* and *sò.ngsòng*, for instance, there are variants *mu.sUh*, *mâ.sâ*, *má.nu.sâ*, and *sò.sòng*.

A second important area of variation concerns *â*. In some western areas the historical change of *á* to *â* has not applied, while in eastern areas it has generally been carried through even where a suffix follows, e.g.

Western	Central	Eastern	Meaning
<i>méjá</i>	<i>méjá</i>	<i>méjá</i>	'table'
<i>méjáné</i>	<i>méjáné</i>	<i>méjáné</i>	'the table'
<i>négárá</i>	<i>négárâ</i>	<i>négârâ</i>	'country'
<i>négáráku</i>	<i>négáráku</i>	<i>négâráku</i>	'my country'

Even Central Javanese speakers tolerate increasing exceptions to the distribution of *á* and *â*. A long-standing exception is *órá* 'not', which is listed as an irregularity in most grammars and dictionaries. Uhlenbeck also mentions *bóyá* (noting that negatives are often irregular) and some other exceptions, albeit archaic words (1949:31ff.). Furthermore, words in -a taken over into modern Javanese do not undergo rounding. Words with an Indonesian (i.e. national or official) flavour, such as the name of the country itself or the word *sěpédhá* 'bicycle' (versus colloquial *pit*) are pronounced with -a. The evident willingness of Javanese speakers to write *â* as *o* rather than *a* also suggests that the historical connection with *a* is receding and that the *a/o* alternation is felt to be a more or less arbitrary morphological feature rather than as an automatic or productive phonological process.

There is a real sense in which the standard dialect is intermediate between two simpler dialects – and it seems fair to say that this provides a motive for maintaining the alternation as a signal of the distinctiveness of Central Javanese. Javanese speakers who move to Central Java from elsewhere seem to feel some social pressure to acquire the alternation. Distinctive compromises of this sort seem to occur elsewhere, sometimes as a virtually artificial standard, as in the case of the German suffix -ig, where the standard pronunciation (with e.g. *König* pronounced as *Könich*, but *Königreich* and *königlich* as *Könikreich* and *köniklich*) presupposes the existence of some dialects with consistent -ich and others with consistent -ik. But a similar phenomenon seems to be possible even when there is no pedagogical interference. In a group of Australian Aboriginal dialects known as Pitjantjatjara or Western Desert, there is a dialect in which dental sounds such as *t̪* and palatal sounds such as *tʲ* are in a rather complicated complementary distribution: roughly, the dental stands before *a* and *u* unless preceded by a non-dental consonant, while the palatal stands before *i*, and also before *a* or *u* if preceded by a non-dental consonant (Glass and Hackett 1970: 109f.). This somewhat puzzling distribution of allophones becomes less mysterious when one realises, firstly, that there is some evidence that dental and palatal consonants in Australian languages may have developed out of a single laminally articulated series, with lamino-palatal allophones appearing before *i* and lamino-dental allophones before other vowels (Dixon 1970), and, secondly, that in the particular case of Western Desert there are other dialects in which all laminals have become dentals and yet others in which all laminals have become palatals. Thus the dialect in which a dental and a palatal consonant are allophones of one phoneme is actually intermediate between two simpler or 'levelled' versions of the language.

It is of course proper that linguists should seek to explain linguistic phenomena and to look for regularity behind apparent complexity. Often a language does prove to have an underlying symmetry or regularity that is not apparent on a cursory examination. But the evidence of variation in Javanese is significant, since it suggests that native speakers themselves find the standard dialect complex, both in the sense that regional and non-standard dialects represent simplifications and in the sense that speakers of a distinctive or prestige dialect have reason to resist simplification.

4. ASPECTS OF PHONOLOGY

I am not of course claiming that standard or prestige dialects are necessarily complex, and non-standard dialects necessarily simple. In fact it seems more realistic to suppose that all phonological systems are in a state of tension or represent a particular resolution of a state of tension (cf. recent attempts by natural phonologists to explain phonological systems as the result of competition between distinctiveness and ease of articulation, e.g. Stampe 1979:69f). This makes it important to do justice to the ingredients of such tension. Possibly all that can be said about prestige dialects, especially those that are taught formally, is that they are more prone to delicate or even awkward compromises.

Even apart from this, the details reviewed in section 2 above should make us cautious about offering too simple a picture of Javanese. There is, for example, little descriptive or pedagogical advantage in pairing off as many vowels as possible as tense and lax counterparts (say as *i*, *I*; *u*, *U*; *é*, *è*; etc.). The terms 'tense' and 'lax' are phonetically vague to begin with, but the relationship of these pairs is in any case not uniform. To say that tense vowels occur only in open syllables and lax only in closed syllables, for example, is an oversimplified generalisation, a rough approximation which sweeps considerable detail under the carpet (especially the details mentioned in 2.1.3., 2.1.4., 2.2.1. and 2.2.2. above). Of course, oversimplifications have their place, for example in an elementary language course, but they do not qualify as descriptive truth.

Rather than engaging in a reductionist exercise, let us distinguish in Javanese among (i) phonological structure (including word patterns and syllabification), (ii) morphological structure (i.e. morphemic composition) and (iii) the contrastive or phonemic system (i.e. the 'auditory network' as recognised and maintained by native speakers). Javanese reveals various resolutions of potential conflict among these aspects. For example, the normal pattern of word and syllable structure requires that CVCV and CVCVCV words such as *kéné* 'here' and *képâlâ* 'head' be understood as sequences of CV syllables. Morphological structure sometimes accommodates to this phonological structure, so that e.g. *sálIn* plus the suffix *-i* is analysed as *sá.li.ni*, with a consequent adjustment of *I* to *i*. But in other instances morphological structure resists 'normal' phonological patterning, as with e.g. *sálInáké* (2.1.3.) or *nákâlâ* (2.4.6.). It seems legitimate to say that morphological structure triumphs over phonological structure to quite a degree in Javanese. Native speakers seem, for instance, to regard *wòngé* 'the man' as *wòng.é*, despite the fact that a CVCV word consisting of one morpheme would be felt as CV.CV. Thus the morpheme boundary in *wòng-é* demands a syllable boundary at the same point (cf. Uhlenbeck, 1949:225ff.). In the standard dialect the tendency is for morphological structure to yield only where *I* and *U* alternate with *i* and *u* (with some exceptions such as *sálInáké*); regional and non-standard dialects tend to make the morphological structure even more dominant (with e.g. pronunciations such as *pitIq*, *pitIqé* '(the) chicken' instead of standard *pitIq*, *pitiqé*).

Tension between phonological structure and the contrastive system arises where phonemes are realised in different ways (or even neutralised) in different structural positions. Indecision about whether to write *â* as *a* or *ò* may be taken to reflect a conflict between a native speaker's awareness of structural patterns (words can end in *i*, *é*, *u*, *ó* or *â*, but not in *á*) and his auditory perception (*â* sounds the same as *ò*). As the structural pattern is broken, by more and more exceptions ending in *-á*, so the auditory system is likely to determine the spelling.

There are dangers here in promoting too singlemindedly some of the recognised models of phonological description. If, for instance, one insists that a structuralist description of phonemes and allophones provides the key to understanding the phonological system, then one runs the risk that phonological and morphological structure become secondary. The fact that not all types of morpheme or morphological structure show the same distribution of allophones (2.1.4., 2.2.2.) may too easily be seen as an odd intrusion upon the basic system. On the other hand, to insist upon a set of rules as the proper descriptive method is open to others dangers. It is of course possible to rewrite a statement of phonemes and allophones as a set of rules realising phonemes as allophones, and equally possible to include in the set rules that cater for morphophonemic adjustments. Indeed, wherever there is a resolution of conflict between two aspects of the language – say where morphemes have different allomorphs to accommodate to a regular phonological structure – it must in principle be possible to state this in terms of rules. (Uhlenbeck, writing well before generative phonology, does not object to the use of the term 'rule', even though his approach is very much one of presenting structural patterns, 1949:31.) The objection is not to the notion of rules but to the fashion of talking of 'a set of rules' in a way that obscures the different purposes which these rules serve. But since even generative phonologists seem increasingly willing to distinguish among 'phonetic rules', 'syllabification rules', 'morphophonemic rules', etc., the point perhaps needs no further elaboration (cf. Sommerstein 1977:205ff.).

This is not to say that one needs no model of description at all, nor that one should adopt a vague amalgam of models in the name of eclecticism. Rather it is important to reject the reductionist implications of some models and to base one's description on a clear recognition of the different aspects or dimensions of an integrated system. One may then allow for the fact that integration may proceed differently in different languages. In some languages, for example, each phoneme may be pronounced in much the same way in every structural environment, i.e. the auditory contrast system is relatively uniform with respect to phonological structure. In a language that has complex strings of morphemes which are modified to accord with a regular phonological structure, one may speak of a relatively high number of allomorphs or a relatively rich morphophonemics. In Javanese, on the other hand, with as Uhlenbeck puts it, rather few *voegverschijselen*, morphological patterns tend to resist both phonological structuring and the uniformity of the contrast system. The Javanese solution is perhaps unusual: one can point to contrasts which are contrasts only if morphology is ignored (é versus è, 2.2.4.); to rules which are blocked by the presence of a morpheme boundary (2.2.2., cf. Sommerstein's remarks (1977:145) on the rarity of this and on the difficulty of coping with it in a formal generative description); and to syllable patterns which deny the common tendency (e.g. wòngé, structured as CVC.V rather than CV.CV, cf. Bell and Hooper 1978, especially p.9 apropos the favourite status of the CV syllable).

This makes it all the more regrettable that the sort of description and pedagogy of Javanese outlined by Uhlenbeck (1949:13ff., 225ff.) and to some extent taken up by Sumukti (1971) has not been more honoured. Appendix 4 illustrates the type of tables or charts that were foreshadowed by Uhlenbeck and that might profitably be used to shed light on the Javanese phonological system.

For pedagogical purposes, one might have reservations about the use of such charts, on the grounds that they are too complicated. Nevertheless, one possibility is to choose one's initial examples of vowel contrasts fairly carefully and to ensure that new vocabulary is always introduced in sets of structurally

parallel items. Even if this were impracticable it might be worth devoting some time during a language course to a systematic survey of the phonology; this at least would be preferable to allowing students to stumble on in ignorance of structures and patterns which, though complex, can be revealed to them.

APPENDIX 1: USE OF JAVANESE MATERIAL AND ACKNOWLEDGEMENTS

In addition to the written sources listed among the references, the following individuals have been of great personal assistance in preparing this paper: Bintoro (Universitas Kristen Satya Wacana), Soekemi (IKIP Surabaya), Sumaryono (University of Sydney) and Urip Sutyono (Universitas Kristen Satya Wacana). I have tried to ensure that words and features of Javanese which I mention are substantiated by written sources and acceptable to native speakers, but I must make it clear that the four Javanese-speaking linguists named above are not to be blamed for any inaccuracies on my part.

Except at one or two points where there are clear morphological differences, I have ignored the sociolinguistic distinction between Ngoko and Krama (etc.) and have used words of any type for illustration. In general the vowel phonology (as opposed to, say, speech tempo or the lexical system) is identical for all speech levels.

A further simplification, which likewise ought not to affect discussion of the vowels, is that I have quoted verb forms without prefixes. Thus where the root *těmu* takes the 'locative' suffix *-(n)i* I have listed the resulting form as *těmòni* rather than as one of the forms more likely to occur, such as *němòni* or *ditěmòni*. This is merely to avoid the additional, and for present purposes irrelevant, complexity of dealing with prefixes and 'nasalisation' of root-initial consonants. It should also be noted that not all members of verb paradigms quoted in the paper are equally common. The reader is asked to accept that some forms are quoted to show how they would be pronounced in comparison with other forms, not necessarily because they are in common use.

APPENDIX 2: SYMBOLS

In this paper I write the Javanese consonants as in modern orthography, i.e. as p b t d th dh c j k g s h m n ny ng l r w y, where th and dh are postalveolar or retroflex plosives, c and j palatal plosives, ny a palatal nasal and ng a velar nasal; but I write k as q wherever it represents a glottal stop (in morpheme-final position). Where it is necessary to clarify structure, I use a full stop to indicate a syllable boundary, a hyphen for a morpheme boundary and # for a word boundary.

For the vowels I use twelve symbols to represent eleven phonetically distinct vowel qualities. The eleven vowels are usually grouped as six to eight contrasting or underlying phonemes:

A	B	C	D	Phonetic Description and I.P.A. Symbol
i	i	i	i	close front unrounded vowel [i]
I			é	lowered i; [ɪ] approaching [e]
é	e	é		half-close front unrounded vowel [e]
è		è	è	(half-)open front unrounded vowel; [ɛ] approaching [æ]
u	u	u	u	close back rounded vowel [u]
U			ó	lowered u; [ɔ] approaching [o]
ó	o	ó		half-close back rounded vowel [o]
ò		ò	ò	(half-)open back rounded vowel; [ɔ] approaching [ɒ]
â	a	a	a	used for the same vowel as ò where conservative spelling has a
á				open central unrounded vowel [a]
à				half-open central unrounded vowel [ɐ] or [ʌ]
ě	ě	ě	ě	half-close central unrounded vowel [ə] or [ɨ]

Column A gives the symbols used in this paper. Column B represents a six-vowel analysis, more or less as put forward by Uhlenbeck (1949) and Robson (1976 especially p.4). Dudas (1976) is a generative treatment in which the six vowels of column B are regarded as the underlying vowels. An eight-vowel analysis is rather more common, either in the manner of column C (as suggested by the transcription used in Uhlenbeck 1975) or in the manner of column D (as in Horne 1963:xvi-xviii or Soepomo 1969:167-168 or Sumukti 1971). Other analyses are possible, for example a seven-vowel analysis with *é* distinct from *è*, but *ó* and *ò* treated as allophones of *o* and *â* treated as an allophone of *a* (implied by Horne 1974:xi-xii). Of the works mentioned here, however, only Uhlenbeck (1949) is at all comprehensive: the others concentrate on matters other than phonology.

APPENDIX 3: PRINCIPAL SUFFIXES

Allomorphs			see note 1	see note 2	see note 3	meanings (see note 4)
after C	after V					
-àn	-n		yes	yes	yes	various
-áké	-qáké	see note 5	no	yes	yes	causative
-ná	-qná		(no)	yes	yes	causative subjunctive
-né	-qné		(no)	yes	yes	causative optative
-i	-ni		yes	yes	yes	locative
-áná	-náná		yes	yes	yes	locative subjunctive
-áne	-náne		yes	yes	yes	locative optative
-ěn	-něn	see note 5	yes	no	yes	passive imperative
-é	-né		yes	no	yes	definite
-ku			(no)	no	yes	'my'
-mu			(no)	no	yes	'your'
-â			yes	no	no	subjunctive

Notes

1. Do root-final -iC and -uC become -iC and -uC before the suffix?
2. Are root-final i and é lowered to è (and u and ó to ò) before the suffix?
3. Does the suffix block rounding of root-final a to â?
4. The labels given to meanings are, with slight simplification, taken from Horne 1974. Many of the labels are scarcely informative on their own and should be interpreted in the light of a fuller description of the suffixes (e.g. Berg 1937; Uhlenbeck 1956; Horne 1974).
5. In Krama usage, -(q)áké is replaced by -(q)ákén, and -(n)é by -(n)ipUn. Other suffixes either follow the substitution of -ipUn for -é (e.g. locative optative Ngoko -áne, Krama -ánipUn) or, in principle, are available in both Ngoko and Krama. (In practice some suffixes, such as -něn and -mu, would be avoided in Krama usage.)

APPENDIX 4: SAMPLE TABLES AND CHARTS FOR TEACHING JAVANESE

A. Word patterns

A.1. CV.CV words

First vowel: i, é/è, u, ó/ò, á/â, ě (6)

Second vowel: i, é, u, ó, â (5)

é and è in complementary distribution

ó and ò in complementary distribution

á and â in complementary distribution

Combinations:

i - i	i - é	i - u	i - ó	i - â
è - i	é - é	è - u	é - ó	é - â
u - i	u - é	u - u	u - ó	u - â
ò - i	ó - é	ò - u	ó - ó	ó - â
á - i	á - é	á - u	á - ó	â - â
ě - i	ě - é	ě - u	ě - ó	ě - â

Examples:

siji 'one'	piré 'avoid'	pitu 'seven'	biró 'bureau'	gilâ 'loathe'
dèwi 'goddess'	kéné 'here'	sèwu 'thousand'	réwó 'untidy'	sédâ 'dead'
bumi 'earth'	supé 'forget'	susu 'milk'	puló 'island'	kulâ 'I'
kòri 'door'	kówé 'you'	wolu 'eight'	lóró 'two'	tóyâ 'water'
máti 'die'	sáré 'sleep'	rátu 'king'	káró 'with'	lârâ 'sick'
wědi 'afraid'	gědhé 'big'	lěbu 'enter'	jěró 'deep'	těkâ 'come'

A.2. CV.CVC words

First vowel: i, é/è, u, ó/ò, á, ě (6)

Second vowel: I, è, U, ò, à, ě (6)

é and è in complementary distribution

ó and ò in complementary distribution

Combinations:

i - I	i - è	i - U	i - ò	i - à	i - ě
é - I	è - è	é - U	é - ò	é - à	è - ě
u - I	u - è	u - U	u - ò	u - à	u - ě
ó - I	ó - è	ó - U	ò - ò	ó - à	ò - ě
á - I	á - è	á - U	á - ò	á - à	á - ě
ě - I	ě - è	ě - U	ě - ò	ě - à	ě - ě

Examples:

pirIng 'plate' kilèn 'west' pirěng 'hear' piràng 'how much' ..etc.
 dénIng 'by' lèmèq 'lining'
 kupIng 'ear'
 etc.

B. Morphologically complex words (see also Appendix 3)

B.1. CV.CV (cf. A.1.)

i-i i-èn i-èqáké i-èqnâ i-èqné i-èni i-ènânâ i-ènané etc.
 i-é i-èn i-èqáké i-èqnâ i-èqné
 i-u i-òn i-òqáké i-òqnâ i-òqné etc.

B.2. CV.CVC (cf. A.2.)

i-IC i-iCàn i-ICáké i-ICnâ etc.

C. Contrast system

C.1. First vowel in CVCV

i é/è u ó/ò á/â ě
 kiri kèri kòri kári kěri
 kére kóre káre kěré
 sóre sáre sěré
 etc.

C.2. Second vowel in CVCV

i	é	u	ó	â	
puli	pulé	pulu	puló		gilâ
gili			giló		
etc.					

C.3. Root-final vowel before suffix -n (CVCVn)

è	ò	à	
lěgèn			lěgàn
lákèn	lákòn		
etc.			

BIBLIOGRAPHY

BELL, A. and J.B. HOOPER, eds

1978 *Syllables and segments*. Amsterdam: North-Holland.

BERG, C.C.

1937 *Bijdrage tot de kennis der Javaansche werkwoordsvormen. Bijdragen tot de Taal-, Land- en Volkenkunde* 95.

DIXON, R.M.W.

1970 Proto-Australian laminals. *Oceanic Linguistics* 9/2:79-103.

DUDAS, K.M.

1976 The phonology and morphology of modern Javanese. Ph.D. dissertation, University of Illinois.

GLASS, Anee and D. HACKETT

1970 *Pitjantjatjara grammar: a tagmemic view of the Ngaanyatjara (Warburton Ranges) dialect*. Canberra: Australian Institute of Aboriginal Studies.

HORNE, Elinor C.

1963 *Intermediate Javanese*. New Haven: Yale University Press.

1974 *Javanese-English dictionary*. New Haven: Yale University Press.

KILIAAN, H.N.

1919 *Javaansche Spraakkunst*. The Hague: Martinus Nijhoff.

POEDJOSOEDARMO, Soepomo

1969 Wordlist of Javanese non-Ngoko vocabularies. *Indonesia* 7:165-190.

ROBSON, S.O.

1976 A simple Javanese grammar. Mimeo. University of Auckland.

SOMMERSTEIN, Alan H.

1977 *Modern phonology*. London: Edward Arnold.

STAMPE, D.

1979 A dissertation on natural phonology. Mimeo. Indiana University Linguistics Club. Revised edn.

SUMUKTI, R.H.

1971 Javanese morphology and morphophonemics. Ph.D. dissertation, Cornell University.

UHLENBECK, E.M.

1949 *De structuur van het Javaanse morpheem*. *Verhandelingen van het Koninklijk Bataviaasch Genootschap* 78. Bandung: Nix.

1956 Verb structure in Javanese. In: M. Halle et al., comps *For Roman Jakobson*, 567-573. The Hague: Mouton.

1975 Sentence segment and word group: basic concepts of Javanese syntax. In: J.W.M. Verhaar, ed. *Linguistic studies in Indonesian and languages in Indonesia* 1:6-10. Jakarta: NUSA.

