

ON EPENTHETIC VOWELS IN NEW GUINEA PIDGIN¹

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Sampela lain manmeri ol i bihainim nek bilong ol na ol i save tok olsem: simok, giraun, kilok, sikin, sukuru. Na narapela lain ol i save sotim tok na tok olsem: smok, graun, klok, skin, skru. Na mi laik askim bilong wanem sampela lain manmeri ol i save tok olsem: simok, giraun, kilok, sikin, sukuru, na narapela lain ol i save sotim. Na narapela mi laik askim. Yumi ken raitim dispela lain tok olsem wanem?

Bipo dipatmen ov edukesen ol i bin hamamas pinis long pasin bilong raitim Tok Pisin olsem: smok, graun, klok, skin, skru. Tasol sampela waitman ol i no bihainim dispela pasin, na planti manmeri bilong Papua Niugini ol i no bihainim.

Na long dispela tupela pasin bilong mekim long Tok Pisin, ol saveman i gat planti tingting:

- (1) Lain tok i longpela, olsem simok, giraun, kilok, sikin, sukuru, dispela lain tok i stret. Tasol long wanpela wanpela taim ol manmeri i save sotim na tok sotpela olsem smok, graun, klok, skin, skru, olsem.
- (2) Lain tok i sotpela, olsem smok, graun, klok, skin, skru, dispela lain tok i stret. Tasol long wanpela wanpela taim ol manmeri i save tok isi isi na tok i kamap longpela olsem simok, giraun, kilok, sikin, sukuru, olsem.
- (3) Yumi no ken makim wanpela lain tok i stret na narapela i kranki. Nogat. Em tupela nek bilong Tok Pisin tasol.
- (4) Tok i wanpela. Tasol ol i save tanim nek na sampela taim ol i tok giraun na simok na sampela taim ol i tok graun, smok olsem.
- (5) Yumi mas bungim tingting bilong namba 1-2-3-4 yumi kauntim pinis hia. Dispela pasin bilong toktok i no gat wanpela as tasol, i gat planti as.

Orait, mi bin skelim faipela tingting hia na mi tingim namba tu em i stret. As bilong tingting bilong mi olsem. Manmeri bilong planti tok ples bilong Papua Niugini ol i save skruim tok i go longpela. Manmeri bilong tok ples Kalam (klostu long Simbai), na Wahgi (klostu long Banz), na Wosera (long Sepik). Na olsem ating ol i bihainim dispela pasin tasol na mekim long Tok Pisin wantaim.

Taim manmeri ol i tok olsem sukuru, tang bilong ol i no save lusim dispela nek s na i go stret long nek k, na it go stret

long nek r, olsem skru. Nogat. Tang bilong ol i lusim nek s na pairap pastaim na tok u na go long nek k na pairap ken na tok u na go long nek r na pairap ken na tok u, olsem sukuru. Na taim ol i tok isi isi yumi harim u i pairap strongpela. Tasol taim ol i tok hariap yumi no harim gut dispela u, nogat. Ol i tok skru olsem tasol.

Introduction

There is a large group of words in New Guinea Pidgin (henceforth, Tok Pisin) for which spelling alternations such as the following are common:

(1)	A	B	
	<i>barata</i>	<i>brata</i>	'brother, sibling of same sex'
	<i>sarang</i>	<i>srang</i>	'cabinet, locker'
	<i>peles</i>	<i>ples</i>	'place'
	<i>olosem</i>	<i>olsem</i>	'like, same, thus, so'
	<i>ologeta</i>	<i>olgeta</i>	'all, completely'
	<i>spirit</i>	<i>sprit</i>	'methylated or alcoholic spirits'
	<i>kilin</i>	<i>klin</i>	'clean'
	<i>sikin</i>	<i>skin</i>	'skin, bark'
	<i>sukuru</i>	<i>skru</i>	'screw, joint'
	<i>kurukutim</i>	<i>krukutim</i>	'to bend, twist, ruin'
(2)	<i>giraun</i>	<i>graun</i>	'ground'
	<i>kilok</i>	<i>klok</i>	'clock'
	<i>sikirap</i>	<i>skrap</i>	'scraper, to scratch, scrape'
	<i>siton</i>	<i>ston</i>	'stone'
	<i>sipun</i>	<i>spun</i>	'spoon'
(3)	<i>sikis</i>	<i>siks</i>	'six'
	<i>takis</i>	<i>taks</i>	'tax'
	<i>senisim</i>	<i>sensim</i>	'to change'
	<i>danis</i>	<i>dans</i>	'dance'

This paper asks why such alternations exist and what their relationship is to the phonology of Tok Pisin. In particular, it asks whether the extra vowel present in Column A spellings represents a phonemic (or underlying) segment in the sound system of New Guinean speakers of Tok Pisin. Consideration of this question raises several problems of more general concern in the analysis of sound systems.

The Standard Orthography

Before World War II nothing approaching a standard orthography existed for Tok Pisin. Among the many variations the main differences were between the more or less Anglicised spellings preferred by some Europeans, and the more or less phonemic (or 'Melanesian') spellings preferred by some Europeans and most New Guineans.

During the last two decades pressures to develop a uniform orthography have mounted. An account of the largely successful efforts of the Department of Education to achieve and promote the use of a standard orthography is given in Mihalic (1971: 2-8). Proponents of an orthography which closely reflected Anglicised varieties of Tok Pisin were defeated; it was agreed that "spelling should be based on the

pronunciation of Melanesian and not European speakers" (Mihalic 1971: 2). The committee drafting the orthographic rules evidently felt that a sizeable group of New Guineans can be regarded as native speakers of Tok Pisin, for they wrote that "The dialects of Melanesian Pidgin spoken by non-native speakers have been excluded from the data serving as the basis for the orthography" (Mihalic 1971: 4). It was further agreed that spellings should be based primarily on the speech of "rather older Melanesian speakers at Madang" (Mihalic 1971: 4). This variety was chosen because it represented a Melanesian Pidgin as unaffected as possible by the introduction of English and because Madang has a central geographic position in the Tok Pisin area.

The orthography finally adopted followed fairly closely the recommendations of Robert A. Hall (1955). Some deviations from the principle of a fully phonemic orthography, however, exist in the present standard orthography: because of the preference of New Guinean writers, *ng* is used for both /ŋ/ and /ŋg/, and single *i* is used for geminate /ii/ in words like *baim* /baïim/.

The standard orthography has been adopted in many influential publications, including Mihalic's dictionary, Nupela Testamen and other publications of the Kristen Pres, Government documents, and, less consistently, by the newspapers.

It is apparent, however, that words of the type listed in (1)-(3) provide special problems. Hall's recommendations concerning these, cited without discussion by Mihalic, are as follows:

"Many Melanesians have difficulty pronouncing groups of consonant sounds, especially in the beginning of words, as in *st*, *sp*,.... In pronunciation they often insert an extra vowel between consonants: thus *stap* 'be located' will often sound like *sitap* or *satap*; *flai* 'fly' like *filai*; and will often be spelt accordingly. Such spellings are not recommended however, for three reasons:

This extra vowel is not phonemically significant since its presence or absence makes no difference to the meaning. Nor is it stressed.

It is not constant, varying...according to the region and the speaker...

An increasing number of speakers are learning to pronounce the consonant combinations without the extra vowel. To write the vowel under these circumstances is to use a naive phonetic transcription rather than a sound phonemically-based orthography" (Hall 1955: 4).

What Hall seems to be saying is that the phonemic structure of Tok Pisin--and so the orthography--must be determined by referring to the phonemic structure of *English*! The "extra vowels" are performance errors - the New Guinean speaker aims to pronounce the consonant cluster as in English but fails. With perseverance, however, he may succeed, and we should write *flai* rather than *filai* because more and more New Guineans are learning the Anglicised pronunciation. (Should we also write *frend* for *pren* because the Anglicised pronunciation is coming into use in the Tok Pisin of some English-speaking New Guineans?) All this begs the question of whether the historically epenthetic vowel

is now a phoneme for some speakers of Tok Pisin. And even if it is true that the epenthetic vowel is not information-bearing in any variety of the language, this fact alone does not require that it be eliminated from a phonemic orthography. Morpheme structure patterns, and morpho-phonemic relations, must also be considered.

Mihalic and other authors using the standard orthography are either not completely persuaded of the merits of Hall's recommendation, or are simply inconsistent, because they continue to write some "extra vowels" or, occasionally, to accept either spelling. The strong tendency is for such authors to prefer the spellings in Column A (with the "extra vowel") for certain words, namely those of the type represented in (3), and to prefer the spellings in Column B (without the vowel) for other words, namely those of the types represented in (1) and (2). But even careful writers sometimes vascillate. In Thomas' recent text, for instance, we find *skin* and *sikin*, and *klin* and *kilin* for 'skin' and 'clean', respectively, while Mihalic gives *sprit* and *spirit* for 'spirits' *srang* and *sarang* for 'cabinet', and *skrap* and *sikrap* for 'scrapper'.

A glance at the lists of forms in (1)-(3) will show that the "strong tendency" referred to above is based on structural principles. Type (1) words are those in which the epenthetic vowel is a copy of an adjacent vowel; type (2) words are those in which the epenthetic vowel is *i*, inserted between a velar stop and *l* or *r*, or between *s* and a stop; and type (3) words are those in which the epenthetic vowel is *i* inserted between *k* or *n* and word- or morpheme-final *s*. (Other conditions also in operation are not evident from the data given in (1)-(3).)

New Guinean writers in general appear to be less persuaded than many of their European counterparts of the need for complete standardisation in orthography. A systematic study of texts by New Guineans has not, to my knowledge, been made, but my impression is that such a study would show very considerable variation in the orthographic treatment of the so-called epenthetic vowels.

Possible Explanations of the Spelling Alternations

Given only the data in (1)-(3), it would probably be impossible to choose between the following competing hypotheses, each of which offers an explanation in terms of linguistic structure for the orthographic variations exemplified by (1)-(3).

I. *The Underlying Vowel Hypothesis.* Column A spellings correspond to the underlying representations (phonemic shapes) of New Guinean speakers. Column B spellings incorrectly leave out a vowel which must be considered present in the underlying form, but which may be deleted under certain conditions. The contracted forms perhaps occur in casual speech (compare English *gorilla* and *g'rilla*, *terrific* and *t'rific*) or in certain phonological or syntactic environments (compare English *was* and *w'z*, *able* and *abíl-ity*).

II. *The Consonant Cluster Hypothesis.* Column B spellings correspond to the underlying representations. Those in Column A incorrectly award phonemic status to a non-significant transitional segment, and excrescent vowel occurring between successive consonants under certain definable conditions.

III. *The Different Dialects Hypothesis.* Columns A and B represent the

distinct speech forms of two dialects. In dialect A the epenthetic vowel has been added, and interpreted as a phonemic segment. In dialect B no vowel has been added, or, if a phonetic vowel is sometimes present it is a non-significant transitional feature. Thus, the phonemic structure of cognate forms is different in the two dialects; compare the contrasts in the underlying forms for *horse*, or *hard*, in English *r-ful* and *r-less*, or *h-ful* and *h-less* dialects.

IV. *The Doublet or Competing Forms Hypothesis*. The pairs in Columns A and B represent speech forms that are phonemically distinct, but present as acceptable alternatives in the same dialect. Pronunciations both with and without the epenthetic vowel occur in the careful speech of members of the same speech community or even the same individual. The variations are not phonologically conditioned, but occur in isolated words. Compare the two acceptable careful-speech pronunciations of such English words as *either*, *neither*, *economics* and *controversy*.

V. *The Multiple Factors Hypothesis*. None of the above hypotheses, by itself, can account for all the alternations exemplified by (1)-(3). The Underlying Vowel analysis is true, but only for certain words, the Consonant Cluster analysis is true, but only for certain words, and so on.

Choosing Between the Alternatives

The remarks which follow are based largely on work with a single informant, Jerry Tetaga. Mr Tetaga's mother tongue is Kuanua, and he has spoken Tok Pisin since early childhood in the Rabaul area. He is also fluent in English and at the time of the study was attending the University of Hawaii. It is my impression that, in respect of his treatment of epenthetic vowels, Mr Tetaga's speech is representative of a very large group of Tok Pisin speakers, namely the mainstream urban speech communities of New Guinea. I will call his dialect the 'Variable Dialect' of Tok Pisin, because his treatment of the epenthetic vowel varies according to certain factors, chiefly rate of speech.

Now, there may be some speakers whose treatment of epenthetic vowels is constant. Such speakers could be of at least two kinds: those who *always* insert an epenthetic vowel in the words listed in (1)-(3), and those who *never* do. I have no systematic data attesting such speakers, but given the diversity of phonological systems among the languages of Papua New Guinea, it would not be surprising to find some groups of Tok Pisin speakers who approximate one or the other of these two ideal types of 'Constant Dialect'. For example, there are Tok Pisin speakers whose mother tongue is an Austronesian language which does not permit phonemic consonant clusters within words. It is conceivable that speakers of such a language might interpret the epenthetic vowels of other Tok Pisin speakers as part of the underlying form of words. And there are Tok Pisin speakers whose mother language is English, some of whom speak highly Anglicized varieties of Tok Pisin, with very few epenthetic vowels. It is likely that such speakers, and perhaps all those whose native language is English, interpret the epenthetic vowels of New Guineans as non-significant transitional features--as Hall does.

A further possibility, of some theoretical interest, is that there are speakers with similar habits of pronunciation but different phonemic systems. For example, I am a native speaker of English who has moderate fluency in Tok Pisin and who often inserts epenthetic vowels in

positions where they characteristically occur in the speech of New Guineans. In this respect my phonetic output may be similar to that of a Kuanua speaker of Tok Pisin. But are our phonemic systems the same?

Thus, without a systematic study of variation in the Tok Pisin community, we cannot rule out the possibility that Hypothesis III, which allows for different dialect forms (and co-existing phonemic systems), is correct. Hypothesis IV can, however, probably be ruled out. There are no grounds for believing that epenthetic vowels occur only in isolated words. On the contrary, our data indicates that they appear in a phonologically definable set of words.

A study was made of some 40 words in the speech of Mr Tetaga. His pronunciation of about 18 of these at four different rates of speech were recorded in phonetic transcription. The test was repeated two days later. The results of the two tests were very similar, and are collapsed in Table 1.

TABLE 1. ONE PERSON'S PRONUNCIATION OF SOME TOK PISIN WORDS AT FOUR DIFFERENT RATES OF SPEECH*

ENGLISH GLOSS	FAST (CONTEXT)	CASUAL (CONTEXT)	CITATION (CAREFUL)	CITATION (VERY SLOW)
bridge	bʀís	bʀís, biʀís	biʀís	bí.ʀis
brother	bʀʌ́tʌ	bəʀʌ́tʌ	bəʀʌ́tʌ	bəʀʌ́tʌ
strong	stʀóŋplə	stəʀóŋplə	stəʀóŋpele	stəʀóŋpele
ground	gʀáʊn	gʀáʊn	gʀáʊn	giʀáʊn
cloud	kláʊt	kláʊt, kəláʊt	kəláʊt	kflaʊt
club	klʌ́b**	klʌ́b	kəláʊt	kəláʊt
clock	klók	kilók	kilók	kflók
to bend	kʀúkutim	***	kúrukútim	kúrukútim
clean	klín	kilín	kilín	kílin
spirits	spíʀit	spíʀit	spíʀit	sipíʀit
scraper	síkiʀap	síkiʀap	síkiʀap	síkiʀap
screw	skʀú:	skʀú:, sukʀú:	sukuʀú:	sukuʀú:, síkuʀú:
spoon	spún	spún	sipún	sípun
stone	stón	stón	sitón	sítón
place	plés	pələs	pələs	pələs
like	ólsem	ólsem	ólsem	ólsem
all	ólgetʌ	ólgetʌ	ólgetʌ	ólgetʌ
six	síks	síks	síks	síks

*Mr Tetaga was asked to say each word four times, once in a sentence spoken fast, once in a sentence spoken at a slower, but natural speed, once in isolation at normal speed, and once very slowly.

**Mr Tetaga consistently said this word with final [b], although in other words he has a voiceless stop as the correspondence of English voiced stops in word-final position.

***Not recorded.

It can be seen that a range of pronunciations exists for each word, the "epenthetic" vowel being sometimes present, sometimes absent. Let

us assume that each word has only one phonemic structure for Mr Tetaga, and that the variations in pronunciation are simply matters of execution--non-significant performance variations conditioned by rate of speech and syntactic context. What sort of evidence is there for choosing between Hypotheses I and II - the Underlying Vowel analysis and the Consonant Cluster analysis?

First, it is evident that the presence or absence of the variable vowel in these words is not contrastive. Now, as Hall points out, phonemic analysis operates with the principle:

- (4) If a phonetic segment is not information-bearing it should not be analysed as realising a phoneme.

Taken by itself, this principle requires that the variable vowel be regarded as non-phonemic, i.e., that we adopt the Consonant Cluster Solution.

This principle is, however, sometimes overridden by another:

- (5) If the cost of eliminating a non-contrastive segment from the phonemicisation is to complicate the morpheme structure pattern, or the morphophonemic rules, then Principle (4) may be ignored, and the segment assigned phonemic status.

Are there distributional arguments favoring the Underlying Vowel analysis? Leaving aside the consonant clusters whose interpretation is in question here, no clearcut cases of consonant clusters within the syllable occur in the Variable Dialect. While certain speakers show phonetic clusters like [nd], and [ŋg], as in [ndáí] 'die' and [ŋgó:] 'go', such sequences always consist of an obstruent preceded by its homorganic nasal in syllable-initial position, and probably should be treated as unit phonemes. Even across syllable boundaries, within the morpheme, clearcut cases of consonant clusters are few, and consist almost exclusively of homorganic nasal plus obstruent clusters, as in *kanda* 'rattan cane', and *hanggre* 'hungry'.

On the face of it, then, morpheme structure patterns seem to support the Underlying Vowel analysis. The alternative solution would introduce a large number of otherwise unparalleled consonant clusters into the syllable structure.

Further evidence for the Underlying Vowel analysis would be provided by the discovery that in certain morphological environments a full vowel is always present in just that position in which elsewhere we find a weak vowel or nothing. In English, for example, the weak vowel in Column A forms corresponds to a full vowel in Column B forms, in (6):

(6)	<u>A</u>	<u>B</u>
	organ	organic
	idol	idolatry
	symbol	symbolic
	atom	atomic
	system	systemic
	visible	visibility

No such alternations have been observed in Tok Pisin, however.

Another possible argument for the Underlying Vowel analysis might be the discovery that in careful speech the variable vowel is always

present, and that only in casual or fast speech is it absent or extremely reduced. This argument presupposes a principle that seems to have wide acceptance, namely that:

- (7) The underlying or phonemic form of a word is reflected more closely by its phonetic realisation in careful speech than by its realisation in casual or fast speech.

If this principle is accepted, the evidence of Table 1 favours the Underlying Vowel analysis. A vowel is invariably present in the 'very slow' realisation, is present in almost all of the 'careful' realisations (the exceptions are the forms for 'ground', 'like' and 'spirits'), is present in about half of the 'casual' realisations, and in very few of the 'fast' realisations. Thus, we are required to assign the underlying shape /sikirap/ to the word for 'scraper' (which always has two "epenthetic" vowels), /peles/ to the word for 'place' (which has a full vowel [e] in careful speech, a reduced vowel in casual speech and none at all in fast speech), and so on.

But Principle (7) seems to me to be open to question. George Grace has suggested (pers. comm.) that linguists whose native tongues are West European tend to be linguocentric in their understanding of the term "consonant cluster". In English, and most West European languages, consonant clusters tend to be very "tight", with extremely rapid transition from one point of contoid obstruction to the next. Along with this close-knitness of adjacent consonants goes a good deal of allophonic assimilation.

In many languages, however, this is not the case. Instead, the norm is for a "loose" transition between adjacent consonants, and for less allophonic assimilation. (Characteristic exceptions are clusters of homorganic consonants, especially nasal plus obstruent sequences, where tightness may be the rule rather than the exception.) Loose execution of consonant clusters frequently results in the intervention of a weak vowel or vowel-like glide as the tongue moves from one point of obstruction to the next, or in the lengthening of the first consonant with vowel-like colouring. English shows such transitional phenomena in the final syllable of words like *button*, *person*, *rhythm*, *cycle* and *triple* (but not in *cyclic* or *rhythmic*), where the final segment is a nasal or a liquid. Note the various vowel-colourings which such syllabic consonants may have if the syllable is drawn out. They also appear when two continuant obstruents are juxtaposed, as in *churches*, *hedges*, *hisses*, *itches*, etc. But the set of contexts in which English requires or permits epenthetic vowel-insertion or consonant syllabification is small, and of course there are many contexts in which a weak vowel is phonemically contrastive, e.g. *rust:russet*, *tense:tennis*, *hatched:hatchet*, *plight:polite*, *blow:below*, and *skewer:secure*.

By contrast, loose execution of consonant clusters appears to be the general rule in many languages of the New Guinea area, and, indeed, elsewhere in Oceania. A well documented case is that of Kalam (Karam), a language of the Bismarck-Schrader Range in the Central Highlands of New Guinea. Biggs (1963) describes the predictable occurrence of a weak central vowel [ɨ] or [ə] between *all adjacent consonants* within the phonological word. Further study (Pawley 1966) showed that the excrement vowel is rather variable in form, and that some instances of what were first regarded as full vowels are in fact non-phonemic transitional features, each being an unstressed copy of the following

stressed vowel. Epenthetic vowels have been reported as extremely common in a number of other Papuan languages, e.g., Middle Wahgi (see Hamp's (1958) comments on Luzbetak (1956), and Wosera, a Sepik language described by Laycock (1965: 44)).

In his influential paper on Marshallese phonology, Bender (1968: 27) speaks of "excrecent vowel transition" between certain contiguous consonants. The details are quite complex (see Bender 1968: 34), but the general rule is that all contiguous consonants except non-initial identical and homorganic full consonants are separated by an excrecent vowel, the height of which is determined by neighbouring inherent vowels. Work in progress on other Nuclear Micronesian languages indicates that several of them may have similar rules.

A large proportion of the languages of Melanesia are of course Austronesian, and do not permit clusters of consonant phonemes within the syllable (in many cases within the morpheme, or phonological word). Unfortunately we lack good data on the phonetic treatment of consonant clusters across syllable or morpheme boundaries in these languages. It is, however, known that many Austronesian languages show a laminal *s*, articulated by lowering the tip of the tongue and bringing the blade into contact with the alveopalatal region,² and this feature may explain the fact that the epenthetic vowel in clusters consisting of *s* plus another consonant is usually [i], or that such clusters are executed with [i]-colouring of the *s*. Such an outcome is inevitable if the cluster is loosely executed.

We submit, then, that the execution of consonant clusters may be [+tight] and that it is likely that the dialect of Tok Pisin spoken by Mr Tetaga is characterised by [-tight] articulation.³ If this is the case, it no longer follows that the consistent presence of a segment in careful speech is conclusive evidence for regarding it as a phoneme. The slower the speech the slower the transition between consonants in a cluster, and the more likely it is that an epenthetic vowel will be heard.

Variability of the Epenthetic Vowel

There are some contexts in which the quality of the epenthetic vowel varies over at least two full vowel types (as well as over weak central vowel types). For example, some speakers pronounce the word conventionally spelt *bilong* as [bilɔŋ], [bolɔŋ], [bəlɔŋ] or [blɔŋ] (as well as [blɔ]) for *bilo* 'below' we find [bilɔ:] interchanging with [bolɔ:], [bəlɔ:] and [blɔ:]; *klok* 'clock' appears as [kilɔk], [kolɔk]; and *skrap* 'scraper' as [sikiráp], [sikráp], [skaráp], etc. (This kind of variation is less marked in Mr Tetaga's speech than in the speech of others, for whom systematic data are unfortunately not available. The only clear case of variation between two full vowels in Table 1 is [súkurú:] ~ [síkurú:] as realisations for 'screw' in very slow citation pronunciation; at more normal speech rates, the epenthetic vowel following *s* is always [u], in this item.)

Variations of this type present a problem to the Underlying Vowel analysis: we are forced either to posit two distinct underlying forms, or to arbitrarily choose one vowel as the underlying vowel, and derive the other by some assimilatory rule. (In addition, there must of course be vowel reduction and vowel deletion rules to handle those cases where

the underlying vowel is weakened or absent.)

Such variations are more naturally handled by the Consonant Cluster analysis. This analysis assumes that the variations are subphonemic, resulting from optional assimilatory rules which in some cases are disjunctive alternants.

The most general rule is probably that which inserts an unstressed copy of the stressed vowel between the word-initial consonants and subsequent consonants in the cluster, as:

(8) VOWEL COPYING (Optional)

$$\emptyset \text{ ---> } \check{V}_1 / \#C_ (C_)\check{V}_1(C)\#$$

This rule will generate such forms as [pěléš] 'place', [síkřáp] 'scraper', [bōlōŋ] 'belong, of' and [sōtōŋ] 'stone', from underlying *ples*, *skrap*, *bloŋ* and *ston*, respectively.⁴

It is probable that this form of the Vowel Copying rule is too general to predict correctly the speech forms of many speakers of the Variable Dialect, including Mr Tetaga. Most have other rules which either regularly apply in a subset of environments included in the Vowel Copying rule (8), or freely alternate with the Vowel Copying rule in a subset of these environments.

There appear to be two independent rules which can insert [i] between consonants. One of these has roughly the following form:

(9) i-INSERTION (Optional)

$$\emptyset \text{ ---> } \check{i} / \#C_ C^L\check{V}_1(C)(V_2)(C)\#$$

:C^S is any stop or f. C^L is l or r.

: V₁ may be a if immediately followed by i or u; otherwise V₁ is any vowel except a.

(9) predicts such forms as [pīléš], [bīlōŋ], [kīlōk], [fīlái] and [gīráun] from underlying *ples*, *bloŋ*, *klok*, *flai* and *graun*, respectively.

The phenomenon of i-insertion can result from another process which appears to be independent of (9). For want of a better name I will call this process "s-extension". It applies to clusters in which *s* is the initial or final element. The s-initial clusters behave a little different from the s-final clusters, but it seems likely that a single phonological process is in operation in both cases. For the present, however, this will be stated in two rules, 10(a) and 10(b):

(10) S-EXTENSION (Optional)

(a) $s \text{ ---> } \begin{cases} s: \\ s\check{i} \end{cases} / \#_C(C)\check{V}(V)(C)$

(b) $s \text{ ---> } \check{I}s / C\check{V}C(C)_$

(10a) predicts [s:pún] or [sĭpún] for *spun*, [s:kráp], [sĭkráp], [síkřáp], etc. for *skrap*, [s:mók] or [sĭmók] for *smok*, [s:lék] or [sĭlék] for *slek*, and [s:tón] or [sĭtón] for 'stone'.

(10b) predicts [síkĭs] for *siks*, [bánĭs] for *bans*, [sénĭšĭm] for *sensim*, and [wílĭs] for the English name *Wills*.

It was argued earlier that the *i*-colouring of the epenthetic vowel in *s*-clusters is connected with the laminal articulation of *s* in Tok Pisin (for some speakers). Thus, although the same epenthetic vowel often results, it appears that (9) and (10) are quite distinct processes. The *i*-epenthesis in (10) involves an extension of one feature of *s*, namely [+palatal], in the transition to the next consonant (in *s*-initial clusters) or in the transition from the preceding consonant (in *s*-final clusters). In *s*-initial clusters, the *s* is sometimes simply lengthened, *i*-colouring being more or less evident depending on the articulation of *s* as more or less laminal. If it is true that the epenthetic vowel in *s*-clusters is simply an extension of the feature [+palatal], we should expect the vowel to vary over the high front and high mid regions, from [i] to [e] and [ɨ]. It is my impression that this is the case, and that rule (10) is thus stated incorrectly. Until further study clarifies the point, however, I will continue to speak of *i*-insertion, [i] being the vowel most commonly heard in this context.

To account for the phonetic output of most speakers of Tok Pisin, at least three rules approximating to (8), (9) and (10) are needed. It is unlikely, however, that many speakers have the rules in exactly the forms stated here. It is probable that individual speakers of the Variable Dialect vary to some extent as to the form of these rules, and the way they interact. The data for Mr Tetaga indicate, first, that he has a restriction on (8) such that vowel copying cannot occur when the environment is as for (10a); that is, vowel copying does not occur when the initial consonant is *s*. In his speech we find [sitɔ̃n] and [stɔ̃n] for *ston*, but not [sotɔ̃n], and so on. Second, there is some evidence that vowel copying cannot apply in some of the environments where (9) applies. Thus, we find [kilɔ̃k] and [klɔ̃k] for *klok*, but not [kolɔ̃k], and [gráɔ̃n] and (in very slow speech) [gràɔ̃n] for *graun*, but not [garáɔ̃n]. The data are insufficient to determine the precise nature of the restriction. Third, there is some evidence that Mr Tetaga has a version of the *i*-insertion rule which is more restricted than that given in (9). It appears that, in his speech, *i*-insertion can occur when the cluster consists of a stop or *f* plus a liquid, provided that the stressed vowel is part of a diphthong *ai* or *au* (as in *graun* or *krai*), or when the cluster consists of a velar stop plus a liquid, provided that the stressed vowel is not *u* (so that we find [kilɔ̃k] for *klok*, but [pelés] instead of [pilés] for *ples*, [kúrukútim] instead of [kirukútim] for *krukutim*, and [berátʌ] instead of [birátʌ] for *brata*).

There appear to be a few environments where vowel copying is in free or stylistic variation with *i*-insertion or *s*-extension. Where the stressed vowel is *i*, of course, the same output may be generated by any of the rules. In Mr Tetaga's speech we find vowel copying preferred for *sk* when the following stressed vowel is *u*, but variation between this rule and *s*-extension in very slow speech; thus, while *skru* in casual and careful speech varies between [skrú:], [sukrú:] and [sukurú:], in very slow speech it may be [síkurú:]; *klaut* normally shows an epenthetic vowel which is a reduced copy of the stressed vowel, but in very slow speech we also find [kílaut].

All the epenthesis rules are optional for Mr Tetaga, or at least are no more than stylistically constrained. However, I believe that for some speakers there are some contexts in which an epenthetic vowel is always or nearly always present. In particular, rule (10b) may be obligatory for some, and this is perhaps reflected in the fact that the

standard spellings for words of type (3) include the epenthetic vowel, as *sikis* 'six', *banis* 'fence', *akis* 'axe', etc.

Some arguments have been given in favour of the Consonant Cluster analysis. Further support for this analysis comes from an examination of stress.

Stress

The general rule in Tok Pisin is that primary stress occurs on the first syllable of the word. There are some exceptions; Mihalic (1971: 10-11) gives a list--though some of his exceptions carry initial stress in the speech of my informants--and it remains to be seen whether all of them can be accounted for by phonetic or morphophonemic rules.

If the Underlying Vowel analysis is adopted, some bisyllabic words must be regarded as differentiated by stress alone. Furthermore, three contrasting degrees of stress need to be recognised in underlying forms--let us call them primary /ˈ/, secondary /ˌ/ and weak /˘/. Consider the following pairs of words which, under the Consonant Cluster analysis, we would write as:

- (11) *vilis* 'village' *kalap* 'jump' *bilum* 'net bag'
 bris 'bridge' *klap* 'club' *blong* 'of'

If the epenthetic vowel is written in each of the forms in the second row, we have a set of forms: *biris*, *kalap* and *blong*, which contrast with the forms in the top row in that they are stressed on the second syllable.

It would not be sufficient to mark only two degrees of stress in this analysis, however. In the Underlying Vowel solution, the optional rules of Vowel Reduction and Vowel Deletion apply only to epenthetic vowels and not to other unstressed vowels. Thus, in order for these rules to apply correctly, two kinds of weakly stressed vowels will have to be distinguished, presumably by assigning secondary stress to those vowels which cannot be reduced or deleted, and tertiary or weak stress to those which can be. I am not certain that such a distinction has any basis in the phonetics of Tok Pisin, but it must be introduced to avoid generating such forms as [kʌlp] instead of [kʌlɿp] for *kalap*, or [bɪlm] instead of [bɪlũm] for *bilum*.

In this analysis, the pairs in (11) would have the following underlying forms:

- | (12) | Underlying Form | Phonetic Realization |
|------|--------------------|------------------------|
| | kálap 'jump' | [kʌlɿp] |
| | kǎlap 'club' | [kǎlɿp ~ klɿp] |
| | vílís 'village' | [vɪlɪs] |
| | bírís 'bridge' | [bɪrɪs ~ brɪs] |
| | bílũm 'net bag' | [bɪlũm] |
| | bílóng 'of' | [bɪlɔŋ ~ blɔŋ ~ bǎlɔŋ] |

These complexities are avoided in the Consonant Cluster analysis, which has stress falling predictably on the first vowel phoneme in words containing one or two vowel phonemes. Other vowels, whether phonemic or epenthetic, receive weak stress.⁵

Summary and Conclusions

A vowel that is lacking in English cognates is sometimes present between consonants in certain words in Tok Pisin speech and writing. An investigation was made of the phonemic status of this variable vowel in the sound system of one New Guinean speaker, whose native language is Kuanua and who is also fluent in English. There are a few arguments for analysing the vowel as present in underlying forms, but the weight of the evidence favours treating it as a non-significant transitional feature, optionally inserted. This is particularly so if one accepts the thesis that some phonological systems are characterised by "loose" execution of consonant clusters and some by "tight" execution; speakers of Tok Pisin show considerable variation in this respect, as one would expect given the diversity of their native languages. However, the possibility was conceded that, for some speakers, vowels which are historically epenthetic are now present in underlying forms.

If the analysis given here for our main informant's dialect is correct, the present standard orthography departs from being a phonemic representation of his dialect in two respects: (1) in writing epenthetic *i* in final-*s* clusters (*sikis*, *danis*, etc.), (2) in sometimes writing a vowel which is phonemic in English but which has been reanalysed as epenthetic, e.g., the [i] in [bilón] and [biló:].⁶ But the present analysis is based on a small amount of data and is tentative. It is desirable that systematic study of the sound systems of a representative variety of Tok Pisin speakers be made, to determine the extent and kinds of variations which exist, and the kinds of changes that are in progress.

Notes

1. I have profited from discussions of the problem treated in this paper with George Grace, as well as from conversations with Byron Bender, Derek Bickerton, Irwin Howard, Robert Krohn, and members of Gillian Sankoff's Tok Pisin course at the Linguistic Institute, Ann Arbor, 1973. I am particularly indebted to Jerry Tetaga for giving freely of his time as informant and commentator. None of these people should be accused of necessarily agreeing with the views presented in the paper.
2. George Grace brought this point to my attention.
3. Robert Krohn (pers. comm.) suggests that vowel articulation may also be [+ tight], [- tight] articulation being associated with diphthongization or gliding.
4. We must also account for forms in which a central vowel appears, e.g. [stərón] 'strong'. In some cases the central vowel falls within the allophonic range of the stressed vowel, and so can be treated as a copy; for example, [ə] falls within the allophonic range of /a/. To account for other cases it may be necessary to posit an additional rule which inserts a central vowel, or reduces unstressed full vowels.
5. Very slow citation pronunciations (see Table 1) are a special case. If we wish to account for them, an optional rule must be introduced which will shift stress onto the epenthetic vowel if this is inserted before the inherently stressed vowel. The rule applies only in this unnatural style.

6. However, such spellings as *bilong* and *bilo* are correct for those who consistently pronounce them [bɪlɔŋ] and [bɪlo:] with stress on the first vowel in normal connected speech.

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