THE INFLUENCE OF PROSODIC PATTERNS UPON THE MUTUAL INTELLIGIBILITY OF ABORIGINAL AND GENERAL AUSTRALIAN ENGLISH

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0.0 ABSTRACT

Representative samples of conversational discourse in Aboriginal English, General Australian English, and an Aboriginal vernacular are compared by auditory and acoustic analysis. Lack of complete mutual intelligibility between Aboriginal and General Australian English is found to be due to differences in their repertory of prosodic signal contrasts, and in the ways in which this repertory is exploited in communication. The similarities and differences in prosodic patterns between these two varieties of English are explained by comparison with the Aboriginal vernacular. Rate of articulation and duration are shown to have an important effect upon the perception of pitch and intensity variation patterns.

1.0 THE AIM OF THIS ARTICLE IS:

(a) To study the relationship of prosodic to grammatical and lexical features in the L (familiar) form of Aboriginal English and in the familiar style of General Australian English, to discover why these two speech varieties are partially lacking in mutual intelligibility.

(b) To compare the prosodic features of the L form of Aboriginal English with those of a selected Aboriginal vernacular.

2.0 Previous studies, using mainly auditory analysis, have described separately the salient phonological, grammatical, and lexical features of the Aboriginal English L form spoken in different localities.[1] Though they have agreed in assigning the primary cause of its lack of intelligibility to special characteristics of its prosodic patterns,

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they have not shown how these are interrelated with its grammatical and lexical system.

The present study uses both instrumental and auditory analysis to investigate the problem of intelligibility in relation to the total linguistic system of the Aboriginal English L form.

2.1 Representative samples (henceforward referred to as **AbAE**, **GAE**, and **AbV**) of recorded conversations in Aboriginal Australian English, General Australian English,[2] and an Aboriginal vernacular, similar in length, content, and style were selected from a corpus. **AbAE** and **GAE** were each spoken by a group of four informants (14-16 years), **AbV** by two informants (60+ and 30+ years). The conversations, consisting mainly of spontaneous anecdotes and reminiscences, took place in the absence of the linguist. The speech of the informants, who were chosen at random from a larger group, showed idiolectal variation.

2.2 **AbV** was in Idindji, which belongs to the Atherton Pama Sub-group of the Pama-Maric Group, in the Pama-Nyungan family of languages.[3] Capell (1956) noted the general phonological homogeneity, despite variations, of the Australian Aboriginal vernaculars.[4] The phonology of **AbV** may be taken as sufficiently representative of other vernaculars in the area from which the **AbAE** informants were chosen.

2.3 **AbAE** belongs to the middle of the continuum of "Aboriginal English," a term which designates a range of local and stylistic varieties in communities throughout Queensland.[5] The local varieties are mutually intelligible. They are most alike in phonology, but exhibit minor grammatical and lexical differences. The stylistic varieties exist in a 'diglossia' situation in each community.[6] They form a continuum between an **L** form phonologically more influenced by Aboriginal vernacular contact and an **H** form closer to the familiar form of General Australian English. The range of variation is smaller with older informants from remote areas than with younger informants, but it does still exist.

This is shown by material collected in a far north-western Queensland community in 1968, from informants aged over 60, who are all immigrants from the Northern Territory and are bilingual speakers of Karawa or Janjula. Their **L** form (which they themselves call "broken English") has distinctive local grammatical characteristics, and is furthest, of all the Aboriginal **L** forms, from **GAE**: it possesses

pronominal forms, e.g., yupela (*you all*, multiple plural), and yu tupela (*you two*, dual plural), which are not found in other Queensland Aboriginal L forms. They are however found in the texts and vocabulary of New Guinea Highlands Pidgin recorded by Wurm.[7] The north-western Aboriginal English L form is however otherwise very different grammatically and lexically from the New Guinea Highlands Pidgin, and also from the Sepik variety recorded by Laycock.[8]

Despite these grammatical differences, this older group of Aboriginal informants can so adjust stylistically towards an English H form as to be able to communicate intelligibly enough with non-Aboriginal listeners. They are mutually intelligible to younger Aboriginal speakers in the same community. Phonologically their speech is very similar to **AbAE**.

3.0 The procedure adopted in studying the data was to make an auditory analysis of length, pitch, and stress (relative contrastive syllable loudness); an acoustic analysis of rate of articulation, syllable duration, fundamental frequency, and intensity, using a machine giving a simultaneous display of these,[9] and a grammatical and lexical analysis of relevant features (this last for **AbAE** and **GAE** only).

These analyses sought to discover what variations in the acoustic signals produce contrastive auditory prosodic signals, and which, out of this repertory of contrastive signals, are communicatively important, in being related to the grammatical and lexical pattern and thus to intelligibility. Not all variations in the acoustic signals produce contrastive auditory signals: some produce non-contrastive signals, and some are so small that they produce signals which are not perceived in the fast continuous stream of speech in actual communication, though they may be discriminated by careful repetitive listening.

3.1 The following acoustic features were observed:

(a) Syllable duration; range of variation in this; average syllable duration for each sample and each speaker.

(b) Rate of articulation (in syllables per second, pauses being omitted from the time span); range of variation in this; average rate, for each sample and each speaker.

(c) Fundamental frequency occurring at each syllable; number of intersyllabic frequency changes; percentage of syllables in each sample between which frequency changes occur, in order to determine to what extent frequency variation forms the basis of

the auditory signal repertory;[10] the percentages of frequency changes effecting contrastive pitch variations (determined by comparison with the auditory analysis as 2+ semitones), of those effecting non-contrastive variations (1-2 semitones), and of those effecting non-perceived variations (1- semitone); maximum speaking pitch range; and intrasyllabic frequency variation (where this occurs, in longer syllables).

(d) Intensity level of each syllable; number of intersyllabic intensity changes; percentage of syllables in each sample between which intensity changes occur, in order to determine to what extent intensity variation forms the basis of the auditory signal repertory; the percentages of intensity changes effecting contrastive differences in stress, and of those (3- db) effecting non-contrastive differences; and the percentages of syllables in each sample between which variations between three intensity ranges occur: R1-R3 (effecting strong-weak auditory stress contrasts); R1-R2 (effecting strong-medium stress contrasts); and R2-R3 (effecting medium-weak stress contrasts).

The data thus obtained provided a basis for quantitative[11] comparative statements concerning the signal repertories of AbAE, GAE, and AbV.

4.0 The following is a description of the acoustic basis of the prosodic signals in the three samples:

4.1.1 Average rate of articulation and average syllable duration

	GAE	AbV	AbAE
Av. rate (syllables per sec.)	5.6	6.5	7.6
Av. duration (sec.)	.18	.15	.13

Thus GAE has a comparatively slow and AbAE a comparatively fast rate of articulation, while AbV is intermediate between the two. Consequently GAE syllables have relatively long, and AbAE syllables relatively short, average duration, with AbV intermediate between the two.

4.1.2 Rate of articulation varies continually according to the characteristics of the segmental phones, syllable patterning, discourse style (e.g., narrative or discussion), the emotional attitude of the speakers, and their idiolectal characteristics:

Comparative ranges of variation in rate of articulation: utterance to utterance

		Syllables per sec.
GAE	Speaker B (male) Speaker D (female)	2.9-6.3 4.0-8.3
AbAE	Speaker A (male) Speaker D (male)	6.2-7.6 6.8-10.6
AbV	Speaker A (male)	3.1-9.2

4.1.3 Comparative ranges of variation in syllable duration, and distribution of long and short syllables within these ranges

	Longest syllable	Shortest syllable	Ranges of variation: duration of syllables, % of total occurrences		
			.25+ sec.	.10-.24 sec.	.09- sec.
GAE	.56 sec.	.05 sec.	16.3%	76.5%	7.2%
AbV	.40 sec.	.05 sec.	16.3%	75.2%	8.5%
AbAE	.37 sec.	.04 sec.	8.6%	76.4%	15%

AbAE differs from GAE in having fewer long syllables (.25+ sec.) and more very short syllables (.09- sec.). AbV is not significantly different from GAE in the distribution of long and short syllables.

AbAE and AbV differ from GAE in having shorter maximum syllable duration. All three however do not differ significantly in the percentage of their syllables which fall in the medium range (.10-.24 sec.) or in the duration of their shortest syllable.[12]

4.2.1 Intersyllabic frequency changes:

The following chart shows the percentage of syllables in each sample between which frequency changes (FC) occur; the percentage of frequency changes effecting contrastive pitch variation (CFC), of those effecting non-constrastive variations (Non-CFC), and of those effecting non-perceived variations (Non-PFC); and maximum speaking pitch ranges.

	FC/total no. of syllables %	% of total FC			Maximum speaking pitch ranges (semitones)
		CFC	Non-CFC	Non-PFC	
GAE	88.8	56.8	27.4	15.8	Speaker A (male) 15.9 s.t. Speaker B (male) 12.9 s.t. Speaker C (female) 17.1 s.t. Speaker D (female) 10.9 s.t.
AbAE	96.8	71.2	9.6	19.2	Speaker A (male) 11.7 s.t. Speaker C (male) 17.4 s.t.
AbV	87.9	75.4 (F 47.2 R 28.2)	23.2	1.4	Speaker A (male) 21.7 s.t. Speaker B (male) 6.6 s.t.

4.2.2 The above analysis shows that:

(a) Intersyllabic frequency changes occur more often in **AbAE** than in **GAE** and **AbV**.

(b) (i) The percentage of intersyllabic frequency changes effecting contrastive pitch variations is significantly greater in **AbV** and **AbAE** than in **GAE**.

(ii) The percentage of those effecting non-contrastive variations is least in **AbAE**, greatest in **GAE**, with **AbV** intermediate between the two.

(iii) The percentage of those effecting non-perceived variations is greatest in **AbAE**, less in **GAE**, and negligible in **AbV**.

These facts, taken together, indicate that intersyllabic frequency changes are more important in the acoustic basis of the prosodic signal repertory of **AbAE**, and also of **AbV**, than in that of **GAE**.

(c) Maximum speaking pitch range is greatest in **AbV**, and less in **AbAE** and **GAE**.

(d) **AbV** differs from **AbAE** and **GAE** in three ways:

(i) The very small percentage of frequency changes effecting non-perceived pitch variations (1.4%). Frequency rises and falls are sharp: the instrumental display shows frequency curves with steep slopes.

(ii) The predominance of intersyllabic frequency falls over rises. This is related to the characteristic pitch movement contour of declarative AbV utterances: a pitch peak usually occurs near the beginning, followed by a generally falling contour. It may also be related to the grammatical word structure of AbV: a pitch peak co-occurs with the root syllable, with a progressive fall on the suffixes.

(iii) The wide speaking pitch range, with a characteristic intrasyllabic, as well as intersyllabic, pitch movement: within key syllables of emphatic or emotive utterances, sharp rises from high to very high pitch levels occur. The instrumental display here shows perpendicular rises and falls of perceptible duration at the peaks of the frequency curves.

AbAE does not resemble AbV in the above characteristics, but rather resembles GAE. The percentage of frequency changes effecting non-perceived pitch variations is comparable with that of GAE. Both AbAE and GAE show no significant predominance of frequency falls over rises, or rises over falls. Frequency changes in both are more gradual than in AbV. One reason for this is that AbAE resembles GAE rather than AbV in its syntax and word structure. Fewer bound morpheme suffixes occur in AbAE even than in GAE.

However, AbAE resembles AbV and differs from GAE in the importance of frequency changes in the acoustic basis of its signal repertory.

These similarities and differences illustrate one aspect of the influence of AbV on AbAE.

(e) Speaking pitch range varies greatly. It is influenced by discourse style, the nature of the content and the requirements of logical emphasis, and the emotional attitude of the speakers.

4.3.1 Intersyllabic intensity changes

The following chart shows the percentage of syllables in each sample between which intensity changes (IC) occur, including those effecting contrastive differences (CIC) and those effecting non-contrastive differences (Non-CIC) in stress; and the percentages of syllables in each sample between which R1-R3, R1-R2, and R2-R3 intensity variations occur.

	% of total number of syllables					
	Total IC	CIC	Non-CIC	CIC		
				R1-R3	R1-R2	R2-R3
GAE	86.5	56.3	30.2	14.5	28.6	13.2
AbAE	78.9	48.5	30.4	13.6	20.7	14.2
AbV	82.4 Falls 60.4 Rises 22	41.4	41	7.2	22.4	11.8

4.3.2 The above analysis shows that:

(a) Intensity changes occur more often in GAE than in AbAE and AbV.

(b) The percentage of intensity changes effecting contrastive differences in stress is significantly greater in GAE than in AbAE and AbV.

(c) The percentages of R1-R3 and R1-R2 intensity changes is greater in GAE than in AbAE and AbV. R1-R3 (corresponding to strong-weak auditory stress) and R1-R2 (corresponding to strong-medium auditory stress contrast) intensity variations are communicatively more important than R2-R3 variations, in communicative utterances generally.

These facts, taken together, indicate that intersyllabic intensity changes are more important in the acoustic basis of the GAE prosodic signal repertory than in that of AbAE or of AbV.

4.4.0 Prosodic patterns accompany and help to mark grammatical-lexical patterns in spoken communication, and are therefore partly determined by them. The following is a statement of grammatical similarities and differences between AbAE and GAE which are relevant to the study of their prosodic patterns.[13]

4.4.1 Relative frequency of occurrence of grammatical units in utterance structure:

(a) *Sentence and sentence groups*

	Sentences (% of total sentence occurrences)				Sentence groups (% of total sentence and sentence group occurrences)
	Clausal			Non-clausal	
	Simple	Complex	Co-ordinate		
AbAE	76.6	13.4	10	0	31.8
GAE	47.2	19.4	8.4	25	12.2

The above analysis shows that:

(i) Simple clausal sentences occur much more frequently, but complex sentences less frequently in **AbAE** than in **GAE**. The occurrence of co-ordinate sentences is approximately the same.

(ii) Sentence groups occur more frequently in **AbAE** than in **GAE**. The predominance of simple sentences and the rarity of complex sentences in **AbAE** help to explain this. The utterance structure of **AbAE** is similar to that of an Aboriginal vernacular described by Capell.[14]

(iii) Non-clausal sentences do not occur in **AbAE**.[15]

Differences in utterance prosodic patterns result from these notable differences in utterance grammatical structure.

(b) *Group and phrase units*

(i) **AbAE** differs from **GAE** in the relative frequency of occurrence of the three structural types of group units - premodifier-head-postmodifier (**MHQ**), premodifier-head (**MH**), and head-postmodifier (**HQ**):

	% of total group structures		
	MHQ	MH	HQ
AbAE	0	96.6	3.4
GAE	20.6	70.5	8.9

The predominance of MH and the absence of MHQ structures in AbAE means a notable difference from GAE in accompanying prosodic patterns. Moreover, the exponent of the M element of MH structures in AbAE is most frequently a short deictic or article, adjectives being rare; whereas both deictics and adjectives occur as exponents of secondary elements of premodifier structure in GAE group units.

(ii) AbAE differs from GAE in a greater frequency of occurrence of phrase units, and in a different distribution of nominal, adjectival, adverbial, and verbal grammatical classes of group and phrase units:

	% of total occurrences of group and phrase units		% of total occurrences of group units				% of total occurrences of phrase units	
	G	P	G^{nom}	G^{adj}	G^{adv}	G^{v}	P^{adv}	P^{adj}
AbAE	55.6	44.4	72	0	4	24	88.8	11.2
GAE	77.7	22.3	60.7	12.5	5.4	21.4	43.8	56.2

These grammatical differences all have a bearing upon the prosodic patterns accompanying clause and sentence.

(c) *Word units*

AbAE differs from GAE in word-structure and in the distribution of grammatical word-classes. It does not differ significantly from it in the distribution of monosyllabic, dissyllabic, and trisyllabic words.

(i) *Word-Structure*

	% of total number of word occurrences		
	Simple Words	Complex Words	Compound Words
AbAE	91.3	7.3	1.4
GAE	83.3	12.3	4.4

Though simple words predominate in both **AbAE** and **GAE**, the frequency of occurrence of simple words is significantly higher, and that of complex and compound words siginficantly lower in **AbAE** than in **GAE**.

(ii) *Distribution of grammatical word-classes*

	% of total word-class occurrences			
	Nominal	Verbal	Adjectival	Adverbial
AbAE	31.2	47.3	4.3	17.2
GAE	39.1	39.1	13.3	8.5

The rarity of adjectives affects group premodifier structure, and therefore group prosodic patterns.[16]

(iii) *Distribution of one-, two-, three-, and four-syllable words*

	% of total word occurrences			
	1-syllable	2-syllable	3-syllable	4-syllable
AbAE	80	15.9	4.1	0
GAE	82.4	14.4	2.1	1.1

4.4.2 The relative frequency of occurrence of function words and 'lexical' words does not differ significantly in **AbAE** and **GAE**.[17] Bound morphemes occur much less frequently in **AbAE** than in **GAE**, because simple words occur more frequently.

	% of total word occurrences		% of lexical words having bound morphemes
	Function words	Lexical words	
AbAE	56.6	43.4	11.6
GAE	57.9	42.1	33

5.1 Two generalizations emerge from the above analysis:

(a) **AbAE** and **GAE** both resemble and differ from one another in their prosodic signal repertory. **AbAE** sometimes resembles **GAE** where it differs from **AbV**, e.g., in exploiting contrastive pitch rises as well as falls. On the other hand, **AbAE** sometimes resembles **AbV** where it differs from **GAE**, e.g., in the greater functional load carried by pitch contrasts.

(b) The prosodic patterns of both **AbAE** and **GAE** are influenced by certain of their grammatical and lexical characteristics.

5.2 **AbAE** and **GAE** also resemble and differ from one another in the ways in which the prosodic signal repertory of each is exploited communicatively, in co-ordination with grammatical-lexical patterning, in helping to mark sentence, clause, group/phrase, and word grammatical units; in signalling logical emphasis or modal contrasts; and in carrying part of the relationship signalling load carried in the sentences of written language by grammatical signals (e.g., function words and bound morphemes):

(a) *Prosodic markings of grammatical units: acoustic basis of prominence patterns*

(i) Declarative utterance-medial sentences in continuous speech in **AbAE** normally have a general falling-rising subject-predicate prominence pattern:[18] a fall occurs from the exponent of the subject to that of the predicator (verbal) element, and a rise occurs thence to the exponent of the final structural element of the sentence. In **GAE** utterance-medial sentences, however, the normal pattern is a

general subject-predicate rise (with minor fluctuations) from the exponent of the subject to that of the predicator, and thence to the exponent of the final structural element of the sentence.

The following examples show intersyllabic and intrasyllabic pitch rises and falls (Prf), in semitones; intensity range variations (IRV); and syllable duration (SD), in seconds.

Simple sentences

AbAE /wi kam daun da il/

Prf	f2.8	r2.8	f2.8	r1.9	r1.9(f1.9 terminal)
IRV	R1	R3	R1	R2	R1
SD	.09	.13	.10	.05	.15

The example shows a contrastive pitch and intensity fall from subject to verb, and a sentence pattern with initial and final pitch and intensity peaks.

The fall-rise pattern accompanying **AbAE** sentence and clause units seems to to represent a compromise between the general falling pattern of **AbV**, and the general rising pattern of **GAE**, sentences. The difference of pattern from **GAE**, and the fast rate of articulation, hinder the intelligibility of **AbAE** sentences for the **GAE** listener.

GAE /wi wɒtʃt ə ʃou lɑst nait/

Prf	r5	f1.8	f3.1	r8.8	f4.8	r.9	f1.8 (terminal)
IRV	R3	R1	R2	R1	R2	R1	(falling)
SD	.07	.30	.13	.23	.17	.23	

The sentence finishes on a higher pitch than it began, although there are intermediate falls as well as rises. Intensity and duration variations here correspond with pitch variations.

(ii) *Subordinate clauses in complex sentences*

AbAE	/wen	ai	ad	mai	lesanz	ei	ai gana	go	plei	geim/
Prf	f1.8	f1.2	f.9	f1.8	f2	r7.7	f3.9f6.2	level	r1.2	r3.2 f4.4
IRV	R1	R1	R1	R1	R1	R3	R2	R3	R3	R3	R3	R2
SD	.10	.07	.20	.07	.20	.13	.10	.20	.13	.15	.17	.17

This example shows a fall-rise pattern in the subordinate clause, with a rise at the end, and a subject-predicate fall in both clauses. Prominence peaks are marked by pitch contrasts. Intensity contrasts, and duration contrasts (except for the very short /ai/ and /mai/), are generally lacking.

GAE	/wen	ðei	pʊt	ðə	neim	əv	ðə	film	ɒn	wi	kʊdnt	si	it/
Prf	r1.2	r4.1	f1.9	r8.3	f10.5	level	r13.8	f7.7	f3.9	r1	f4.1	r7.1	f8.2
IRV	R3	R2	R3	R3	R1	R3	R3	R1	R3	R3	R2	R1	R2
SD	.14	.16	.15	.07	.33	.08	.10	.32	.17	.07	.27	.12	.12

Generally rising subject-predicate prominence patterns are evident here, but terminal falls mark the end of each. The definitive contrastive signal is pitch variation, but intensity and duration changes sometimes support pitch contrasts.

(iii) *Group units*

AbAE groups resemble GAE groups in prosodic pattern where, as rarely happens, they have adjective premodifiers:

AbAE	/da	iali	dei/	
Prf	r7	f7 r2.2	f2.2	(terminal)
IRV	R3	R1R2	R2	
SD	.17	.13.12	.12	

GAE	/ðə	ræʊndəd	kɔnəz/	
Prf	r1.2	level r5	f1.8	
IRV	R2	R1 R3	R1	R3
SD	.08	.15 .12	.17	.10

MHQ groups in GAE usually show a decrease of prominence from head to postmodifier, unless the latter carries a sequence signal. MHQ groups do not occur in AbAE.

(iv) *Phrase units*

AbAE utterance-medial phrases usually have a falling-rising, or falling, prosodic pattern, whereas GAE utterance-medial phrases usually have a rising pattern:

AbAE /daun da il/

Prf	$\overline{f2.8}$	$\overline{r1.9}$	$\overline{r1.9(f1.9}$ terminal)
IRV	R1	R2	R1
SD	.10	.05	.15

AbAE /laik dat/

Prf	$\overline{f2.8}$	
IRV	R1	R2
SD	.23	.10

GAE /ɒn mai ʃouldə /

Prf	$\overline{r.9}$	$\overline{r2}$		$\overline{f2}$
IRV	R2	R1	R1	R1
SD	.13	.20	.30	.10

This difference of phrase pattern particularly hinders mutual intelligibility at fast rate of articulation.

(v) *Word units*

AbAE resembles GAE in the relative prominence pattern of dissylabic words:

AbAE /dina/

Prf	$\overline{f3.9}$
IRV	R1R2
SD	.08.13

GAE /ouvəl/

Prf	$\overline{f10.4}$
IRV	R1R2
SD	.15.12

AbAE differs from GAE in the pattern of trisyllabic compound words:

AbAE /lambarum/

Prf	r1.8f.9r.9f.9(terminal)
	f.9
IRV	R1 R3 R1
SD	.20.13.18

This word differs from the normal GAE pattern in the rising-falling (1.8-.9) pitch pattern of the prominent syllable /lam-/. This is followed by a further fall on the second syllable /-ba-/. The rising-falling pattern does not occur on similar syllables in GAE words:

GAE /tivitaimz/

Prf	f3.2 r5 f3.9
IRV	R1R2 R1-R2
SD	.10.20 .28

(b) *Emphasis and modal signals*

Emphasis at phrase level is normally signalled in AbAE by a rising-falling, rising-falling pattern, intersyllabic in dissyllabic words, intrasyllabic in monosyllabic words:

AbAE /veri ad/

Prf	r2f4.9 r2.8r2f3.9
IRV	R1 R2 R1-R2
SD	.13.05 .27

Emphasis at phrase level in GAE is normally signalled by a falling-rising pitch pattern:

GAE [/it wəz] soʊ fʌni/

Prf	f6.4	r3.9
IRV	R1R2	R1R1
SD	.28	.23.17

Intrasyllabic pitch variation often signals modal contrasts in non-clausal sentences in **GAE**. The frequent occurrence of non-clausal sentences, and of long and very long syllables necessary for the perception of intrasyllabic pitch contrasts, helps to explain this. The importance of considering duration in relation to pitch is here apparent. Long and very long syllables are rarer in **AbAE**, and non-clausal sentences do not occur; hence similar signalling of modal contrasts is not found:

GAE /ɔ jes/ (declarative, assent)

Prf	r2	f2.4
IRV	R2Rl	Rl
SD	.23	.37

contrasts with:

GAE /ɔ jes/ (dubitative, disagreement)

Prf	f7	r7	f7.9	r5.2
IRV	R2Rl		Rl	
SD	.49		.56	

The pitch range signalling the modal contrast is greater than that which marks the declarative utterance.

(c) *Prosodic relationship signals*

In **GAE**, function word and bound morpheme signals normally occur in the 'troughs' of the auditory prominence waves and are therefore not clearly audible, whereas the 'lexical' words, signalling the referents to be related, normally occur at the peaks. These peaks are heard in close temporal succession, and serve as a series of auditory cues: key referential words which are exponents of subject and predicate elements of sentence structure are meaningfully related by being heard in the same auditory prominence pattern, and not through the unclear grammatical relationship lexical signals. They are therefore associated by the listener with the observed relevant features of the situation and referred to his stored memory of language patterns.

This may be illustrated by reference to the **GAE** complex sentence example in 5.2 (a) (ii) above. The words /pʊt/, /neim/, /film/, /kʊdnt/, /si/ occur at the auditory prominence peaks, the other words (function words such as pronouns, conjunctions, and

articles) in the 'troughs' of the successive prominence 'waves.' The acoustic basis of auditory prominence is contrastive variation in pitch (/pʊt/); in pitch, intensity, and duration together (/neim/, /film/); in pitch and intensity (/si/); or in intensity and duration (/kʊdnt/).

Pitch variation, it may be noted, is the only factor present in all these contrasts, except the last.

The prominent words are separated by duration intervals of only .07, .18, and .24 sec.

In **AbAE**, temporal collocation of prominence peaks occurs, but this results in a sound signal pattern unfamiliar to the **GAE** listener, since the prosodic patterns accompanying the grammatical units are sometimes different. The rate of articulation is also generally faster. This affects the perceived patterns, since auditory perception depends, not only on pitch and intensity values, but also on temporal proximity.

AbAE	/wen	ai	go	om	ai	gana	raid	da	lidl	kau/
Prf	f2.9	f1.9	r1r1.8	f1.8r5.7f8.8		r7	f7	r8.8f8.8r4.1f1.9		
IRV	R1	R1	R1	R3	R2	R2	R1	R3	R1	R1 (falling)
SD	.10	.18	.20	.13	.10	.10	.22	.08	.20	.37

The future auxiliary function word /gana/ has contrastively lower pitch than the subject /ai/, and short duration. It is separated by only .10 sec. from the preceding /go om/ and the following /raid/, each of these being marked by a prosodic prominence peak. The temporal conjunction /wen/ preceding /go om/ also has a pitch and intensity peak.

The quick temporal succession of these peaks provides sufficient auditory cues for perceiving the grammatical relationship of the lexical items, in association with the observed situational context. The prosodic relationship patterns however differ from those of **GAE**. The intrasyllabic pitch rise on /go/, followed by a fall on /om/, forms the exact reverse of the normal pattern of **GAE**. The fall from conjunction to pronominal subject (/wen ai/) differs from the normal **GAE** pattern. The total communicative effect of the utterance is therefore different.

6.1 The results of the above analysis, when considered together, point to differences in total communicative pattern between **AbAE**, **GAE**, and **AbV**.

Contrastive intersyllabic pitch variations occur more frequently in **AbAE** than contrastive intensity changes. The way in which pitch contrasts function communicatively in **AbAE** is related to its duration pattern and to its grammatical structure. **AbAE** has comparatively few long syllables and comparatively many very short syllables, these features being influenced by its fast rate of articulation. Intrasyllabic pitch contrasts, which require long syllables for their realization, are therefore comparatively rare. Pitch contrasts tend to function within larger segmental groupings than the syllable. This is also true of intensity variations: strong-weak loudness contrasts are rather between groupings of syllables, as in the **AbAE** sentence example in 5.2 (a) (ii), than between syllable and syllable. At the same time, grammatical word and group structure is comparatively simple, and signalling of relationships is predominantly through simple sentences in which class nominal and verbal units occur most frequently.

All this serves to constitute a total pattern in **AbAE** in which the larger components of the utterances are communicatively more important, and the sub-components, which tend to lose their identity in the larger components, are communicatively less important.

In **GAE**, however, the sub-components of the utterances are more clearly distinguishable in the signal pattern. Intrasyllabic pitch contrasts occur more frequently, since more long syllables occur and rate of articulation is slower. Contrastive variations in intensity occur more frequently than in **AbAE** and function communicatively in support of pitch contrasts: an auditory prominence peak is often marked by stress as well as pitch contrast. Communicative differences do not appear to be effected by length contrasts by themselves, but length has an important bearing on the perception of pitch contrasts. Word and group structure is more elaborate than in **AbAE**, and these units do not lose their identity in the larger patterns.

These differences in total communicative pattern serve to explain the partial lack of mutual intelligibility between **AbAE** and **GAE**.

AbV is again different. Long syllables and intrasyllabic pitch contrasts occur in **AbV** as in **GAE**, but the range of pitch variation is much greater and pitch contrasts consequently sharper. The predominantly falling pitch pattern of **AbV** utterances appears to be related to its grammatical structure.

6.2 Three points of general theoretical interest have emerged from the above description of the differences between **AbAE** and **GAE**, and of

the effect of these differences on mutual intelligibility. They are the effect of rate of articulation on the perception of the temporally successive contrastive rises and falls of pitch and intensity; the fact that duration variations combine with pitch and intensity rises and falls in the acoustic basis of the prosodic signalling system; and the relation of prosodic to grammatical and lexical patterns in the integrated signalling system of spoken language.

NOTES

1. Previous studies are discussed in my "Aboriginal English,", *English in Australia*, No.6 (March 1968), p.6 and fn.8.

2. "General Australian English," as described by Mitchell, is the variety spoken by the majority of Australians, intermediate in a continuum of variation between the extremes of 'Cultivated' and 'Broad' Australian: A.G. Mitchell, "The Australian Accent," Australian Humanities Research Council, *Annual Report*, No.5, 1960-61 (Canberra: The Griffin Press, 1961), pp.19-29.

3. G.N. O'Grady, C.F. and F.M. Voegelin, "Languages of the World - Indo-Pacific Fascicule Six, *Anthropological Linguistics*, 8, 2 (February 1966), p.53.

4. A. Capell, "A New Approach to Australian Linguistics," in *Oceania*, Linguistic Monograph No.1, 2nd impression (Sydney: University of Sydney, 1956), p.4.

5. Specified in "Aboriginal English" (see fn.1, above), 6, 14-6, and 20, n.9.

6. Similar stylistic variation observed in India has been described by B.J. Kachru, "The *Indianness* in Indian English," *Word*, 21, 3 (December 1965), pp.393-4. The extreme popular form spoken there is not intelligible to the users of the educated form of English.

7. S.A. Wurm, *Course in New Guinea Highlands Pidgin* (Canberra: The Australian National University, n.d.), pp.4,39,47 (with accompanying tapes).

8. D.C. Laycock, *Course in New Guinea (Sepik) Pidgin* (Canberra: The Australian National University, n.d.).

The identity of forms between this AbAE L form of Highlands Pidgin in New Guinea could have resulted from parallel independent developments in similar language contact conditions (numerous examples of this could be quoted), between English and different native vernaculars possessing dual plural forms; from contact between speakers of the L form and of the Pidgin; or from a genetic connection between the two, one form being derived from the other.

Historical evidence is inadequate to establish a genetic connection. An Aboriginal pidgin, the *lingua franca* of Aboriginals and white settlers, existed from 1788 onwards and spread northwards with white settlement: W.S. Ramson, *Australian English: An Historical Study of the Vocabulary, 1788-1898* (Canberra: A.N.U. Press, 1966), pp.108-12, 130.

That this extreme L form was acquired from Pacific Islander ('Kanaka') labourer immigrants to Queensland is unlikely, from well-documented historical evidence (J.P.C. Sheppard, "The Pacific Islander in Queensland, 1863-1883," unpub. M.A. thesis, University of Queensland, 1966, pp.1-142, *passim*). The following facts are relevant:

(a) The Islanders arrived late in Queensland (from 1863 onwards). An earlier arrival in New South Wales in 1847, was abortive, the small band soon either dying or returning home (Sheppard, pp.1-6).

(b) The Islanders despised the local Aborigines, were mostly hostile to them, and even fought them on occasions (Sheppard, pp.131-2). Extensive language contact is therefore unlikely.

(c) Initially the Islanders were recruited from the New Hebrides and the Solomons, and only later from the New Guinea area between 1876 and 1884. They spoke "Pidgin English." (Sheppard, pp.108-9, 142).

(d) The Islanders initially were not numerous: by 1868, 1,539; by 1871, 2,107. Later, they increased: by June, 1883, 13,697 had arrived. (Sheppard, pp.20, 107-9).

That Pidgin was introduced to the New Guinea area by labourers returning from Queensland, and is therefore essentially the same form as that used by Pacific Islanders there, is discounted on historical evidence by R.F. Salisbury. He argues that Pidgin developed in New Guinea from 1875-1877 onwards from a widespread Pacific trade language: "Pidgin's Respectable Past," *New Guinea, and Australia, the Pacific, and South-East Asia*, 2 (June-July 1967), pp.44-8.

From all this evidence, a direct genetic connection between the far north-western Queensland L form and New Guinea Highlands Pidgin is

unlikely. That some modification of the older Aboriginal Pidgin was effected by contact between Pacific Islanders and Aboriginals is possible. The Islanders were employed in Queensland coastal agriculture, especially later on sugar plantations; but early some were also employed as 'shepherds' on outback stations (Sheppard, pp.20,32-3). Contact with some variety of the widespread Pacific trade language through intercourse with the East Indies is also possible. Further careful historical and linguistic research on this problem is needed.

9. Described in my "Differentiation of Homonyms in Communicative Japanese Utterances," *Zeitschrift für Phonetik* (Berlin), 20, 3 (1967), pp.223-4.

The need to apply instrumental techniques to the study of the intonation of free speech was emphasized by Professor D.B. Fry, in the Round Table Discussion (forthcoming in the *Proceedings*) at the Sixth International Congress of Phonetic Sciences, Prague, 1967.

10. Statements of frequency variation are not useful for linguistic comparison of the utterances of speakers with different voice ranges, because frequency does not vary directly with pitch. Therefore, for comparative purposes, intersyllabic frequency variations are expressed in terms of corresponding semitones of pitch, determined by a logarithmic formula based upon the mathematical relation of frequency to pitch intervals (stated, e.g., in Sir James Jeans, *Science and Music*, Cambridge, CUP, 1938, p.21; C.A. Culver, *Musical Acoustics*, N.Y., McGraw-Hill, 1956, p.135). Cf. M.S. Han, *Japanese Phonology*, Ph.D. diss., Texas, 1961, repr. University Microfilms, Ann Arbor, Michigan, 61-4694, pp.98-100.

11. Quantitative, "i.e., concerned with the frequency, relative importance, functional burden etc. of a linguistic unit, process etc., *versus* mere presence, occurring in the inventory...:" O.S. Akhmanova, "Linguistics and the Quantitative Approach," Preprint, 10th International Congress of Linguists, Bucharest, 1967, pp.2-3 (forthcoming in the *Proceedings*).

12. It is doubtful whether syllables below .07 sec. duration are perceived, except as part of the word pattern in which they occur. Syllables of .07 or less are on the threshold of human perception.

13. The correspondence was described by R. Quirk *et al.*, "Studies in the Correspondence of Prosodic to Grammatical Features in English," *Proceedings of the 9th International Congress of Linguists* (The Hague: Mouton, 1964), pp.679-91.

14. A. Capell, "Myths and Tales of the Nunggubuyu," *Oceania*, 31, 1 (September 1960), pp.60-1.

15. These dependent non-clausal units occurring in conversational discourse as exponents of elements of utterance structure were earlier called 'minor' sentences by Bloomfield and 'nonprincipal' sentence types by Nida (L. Bloomfield, *Language*, N.Y., Henry Holt, 1933, p.171; E.A. Nida, *Syntax*, Glendale, Summer Institute of Linguistics, 1946, p.26).

16. The psycholinguistic reasons for this would make an interesting study.

17. Pronouns and pronominal adjectives are here counted as function ('grammatical', 'structural') words.

18. Space forbids exemplification of other sentence types.

Flint, E.H. "The Influence of Prosodic Patterns upon the Mutual Intelligibility of Aboriginal and General Australian English". In Wurm, S.A. and Laycock, D.C. editors, *Pacific linguistic studies in honour of Arthur Capell.* **C-13:717-740**. Pacific Linguistics, The Australian National University, 1970. DOI:*10.15144/PL-C13.717*