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The Sounds of Brunei English – 14 Years on

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Abstract

Mossop (1996a) is an early work offering a concise description of the sounds of Brunei English. His study concluded that speakers of Brunei English tend to reduce final consonant clusters by plosive deletion, realise the TH sounds as alveolar plosives, conflate the TRAP and DRESS vowels, and pronounce FACE, SQUARE and GOAT as monophthongs. In the current study, the features of Brunei English identified in Mossop's paper are explored further. Whereas Mossop relied on impressionistic analysis, this study analyses the data using both perceptual and acoustic means. This has indeed been one of the biggest shifts in investigations on pronunciations since 1996 given that acoustic software such as Praat are now easily available. Other features not reported in Mossop's paper are also examined in the present study, including L-vocalisation, rhoticity, and the Voice Onset Time (VOT) of plosives. The current findings confirm many of the findings of the previous research, but there are also some developments, such as the tendency to discriminate between TRAP and DRESS, and the occurrence of rhoticity among many speakers.

Introduction

About fourteen years ago, Mossop (1996a) published an overview of the pronunciation of the English spoken in Brunei based on impressionistic analysis. His findings were drawn from three sources:

- secondary school students, collected and analysed by Noraini (1991) and Nor Aziah (1991) in their final-year research projects
- university students, obtained from video-taped recordings of student teachers conducting sessions with their peers
- three Bruneian newscasters reading the news

Mossop therefore investigated a range of English varieties in Brunei, assuming that the secondary school data represents lower mesolectal speech, the university data is upper mesolectal/lower acrolectal speech, and the television data upper acrolectal speech; and he compared his findings for Brunei English with Standard British English, which he assumed to be the exonormative model taught in schools in Brunei.

Among the features which Mossop identified as common in the speech of the Bruneians were the tendencies listed below. Here, for consistency with the rest of this paper, we follow the suggestions of Wells (1982) and use small caps such as DRESS and FACE to represent the vowel phonemes, and upper case letters such as TH to refer to some of the consonant phonemes, even though Mossop himself did not adopt these conventions. The actual realisation of these phonemes will, of course, be presented using phonetic symbols.

- reduction of final consonant clusters by means of plosive deletion, so *first* is [fɜs]
- use of alveolar plosives for initial TH sounds, so *three* is [triː] and *the* is [də]
- omission of final stops /t, d/ and use of a glottal stop in place of final /k/, so *took* is [tʊʔ]

- use of [æ] for DRESS, so *bat* and *bet* are homophones
- shortening of long vowels, so *shirt* is [ʃɜt] and *cream* is [krim]
- realisation of the FACE, SQUARE and GOAT vowels with a monophthongal quality, so *pay*, *care* and *show* are [pe], [ke] and [ʃo] respectively

Surprisingly, there was no mention of rhoticity in Mossop's paper, which raises the question of whether this feature was overlooked in his study or it was not evident in the speech of his Brunei subjects at that time. In a recent study, Salbrina and Deterding (2010) found that their Bruneian subjects showed a high tendency to have /r/ in non-prevocalic positions with about half of them identified as having a rhotic accent.

Mossop noted that many of the pronunciation features of Brunei English are similar to those of other Southeast Asian varieties, especially those of Singapore and Malaysia. Examples include final consonant cluster reduction (Tongue, 1979, p. 27; Bao, 1998; Cruz-Ferreira, 2005; Gut, 2005), conflation of DRESS and TRAP (Tay, 1982, p. 141; Bao, 1998; Brown, 1991; Suzana & Brown, 2000; Rajadurai, 2006, p. 50); having a glottal stop in place of a final /k/ (Rajadurai, 2006, p. 50; Deterding 2007, p. 19); producing FACE with a vowel of monophthongal quality (Deterding, 2000; Lee & Lim, p. 2000; Baskaran, 2004, p. 1040), and realisation of voiceless and voiced TH as [t] and [d] respectively (Bao 1998, p. 154; Moorthy and Deterding, 2000; Baskaran, 2004, p. 1042, Rajadurai, 2006, p. 49), though we might note that use of plosives for the TH sounds is also common in a wide range of English varieties, including those of Ireland and New York (Wells, 1982, pp. 429, 515).

The similarities in the pronunciation of the Englishes of Brunei, Singapore and Malaysia, and the suggestion that these features have not hindered intelligibility and communication among speakers in Southeast Asia, have led Deterding and Kirkpatrick (2005) to suggest that an English lingua franca is developing in the region.

In the fourteeen years since Mossop's work was published, research on pronunciation has been transformed. The rapid development and widespread availability of acoustic software such as Praat (Boersma & Weenink, 2010) have made speech analysis easier and more reliable. This paper attempts to explore further most of the features reported in Mossop by means of acoustic analysis. The features which will be investigated are the final consonant clusters, the TH sounds, the TRAP and DRESS vowels, and also the diphthongal quality of the FACE and GOAT vowels. Other features not mentioned in Mossop's paper will also be investigated, including rhoticity, L-vocalisation, and the voice onset time (VOT) of plosives.

Method

The method adopted in this study is to investigate each phonetic feature in two ways: perceptually and acoustically. It is not always feasible or desirable to carry out acoustic investigation without engaging in some kind of listening. Therefore, the analysis will rely on a combination of examining spectrograms, making acoustic measurements where practical, and listening.

Materials

Data for the study was collected by asking subjects to read The Boy Who Cried Wolf (the Wolf passage):

> There was once a poor shepherd boy who watched his flocks in the fields next to a dark forest near the foot of a mountain. One hot afternoon, he thought up a good plan to get some company for himself and also have a little fun. Raising his fist in the air, he ran down to the village shouting "Wolf, Wolf." As soon as they heard him, the villagers all rushed from their homes, full of concern for his safety, and two of them stayed with him for a while. This gave the boy so much pleasure that a few days later he tried exactly the same trick again, and once more he was successful. However, not long after, a wolf was looking for some change in its usual diet of chicken and duck, so it actually did come out from the forest and began to threaten the sheep. Racing down to the village, the boy of course cried out even louder than before, but as the villagers were convinced that he was trying to fool them a third time, nobody bothered to come and help him, and so the wolf had a feast.

This passage is based on the one described in Deterding (2006). It is especially designed to facilitate the description of the pronunciation of English, with tokens of all the vowels and consonants of English as well as a number of minimal pairs such as *fist~feast* and *dark~duck*.

Since the data for the current study is obtained from reading a passage, the speech represents careful pronunciation rather than conversational speech. According to Labov (1972, pp. 80–81), reading a passage elicits speech that is rather self-conscious, as the subjects pay careful attention to their pronunciation. Hence, in the present study, the speech investigated will be that of a careful, formal style.

Subjects

The subjects were eighteen Brunei Malays (labelled B1 to B18). They were aged between 20 and 23 with a mean age of 21 (SD: 0.9). All eighteen were undergraduates at Universiti Brunei Darussalam (UBD) doing a degree in the English medium. Eleven of them were training to be English teachers. In addition to recording the passage, they also filled a brief biodata questionnaire.

Feedback from the questionnaire revealed that all have Brunei Malay as their first language, but all use English on a daily basis. The majority (13 out of 18) indicated English as their most important language. All had been studying and speaking English for more than ten years. Table 1 provides some background information on each subject.

Seven of the undergraduates were former students of the researcher and they volunteered to be recorded when the researcher approached them. They were B2, B4, B5, B6, B7, B12 and B13. As the initial number was not large enough, these students recruited their friends, some of whom were from other programmes of study.

	Age	Age first learnt English	Most important language	Programme of Study
B1	20	6	Eng	BA Geo/SEA Studies
B2	21	3	Eng	BA Ed TESL Major
B3	21	3	Eng + Mal	BA Economics
B4	22	2	Eng	BA Ed TESL Major
B5	22	4	Eng	BA Ed TESL Major
B6	22	2+	Eng	BA Ed TESL Major
B7	22	3	Eng	BA Ed TESL Major
B8	21	4	Eng	BA Eng Lang. Studies
B9	21	3	Mal	BA Ed TESL Major
B10	21	3	Eng	BA Eng Lang. Studies
B11	21	5	Mal	BA Ed TESL Major
B12	20	2	Eng	BA Ed TESL Major
B13	23	3	Mal	BA Ed TESL Major
B14	21	4	Eng	BA Ed TESL Major
B15	23	5	Eng	BA Economics
B16	20	2+	Eng + Mal	BA Ed TESL Major
B17	21	3	Eng	BA Economics
B18	21	3	Eng	BA Geo/SEA Studies

Table 1. Background information on the subjects

Procedure

The recordings were made in a quiet office using a high-quality microphone placed about 5 inches away from the mouth of the subjects, and the speech was directly digitised onto a computer at a sampling rate of 22,050 Hz. All the acoustic analysis was performed using the Praat software (Boersma & Weenink, 2010).

Results

The results for the different sounds will be presented here: final consonant cluster, the TH sounds, the TRAP and DRESS vowels, the FACE and GOAT vowels, rhoticity, L-vocalisaton, and VOT on initial plosives.

Final consonant clusters

As stated earlier, Mossop (1996a) observed that Bruneians tend to reduce final consonant clusters, so *hand* is pronounced as [hæn] and *next* is [neks], as the plosives [d] and [t] are deleted respectively.

Salbrina (2005) claimed that apart from reduction, the final consonant cluster may also be modified, so the number of consonants in the cluster is maintained but the plosives undergo some changes. Firstly, the plosives may become devoiced such that *logged* becomes [lɒkt], though further research is needed to find out how widespread this kind of final devoicing is, and whether, for example, it extends to voiced fricatives. Secondly, a plosive may be devoiced and substituted with an affricate so *begged* is pronounced as [bektʃ]. And thirdly, voicing is maintained but the plosive is substituted with an affricate sound, so *gagged* is [gægdʒ]. However, the above observations were made about the speech of Bruneians who were categorised as

basilectal, that is, subjects who have minimal exposure to English and who seldom use English in their daily interactions. Mossop (1996b) pointed out that certain consonant clusters are more prone to reduction than others, and final clusters consisting of plosive + plosive such as in *except* and *correct* are apparently the most difficult to produce, so in all instances in his data, the final plosive is dropped. Other clusters are less problematic, with clusters of plosive + fricative (e.g. *six, box*) being the least troublesome.

Table 2 shows the list of words chosen from the passage, all of which include final clusters of two consonants. Some (e.g. *rushed, watched*) involve a final suffix, while others (e.g. *forest, fist*) are single morphemes.

Type of cluster	Tokens
fricative + plosive	*forest* (x2), *fist, feast, rushed*
affricate + plosive	*watched*
nasal + fricative	*once* (x2), *homes*
plosive + fricative	*flocks*

Table 2. Tokens with final consonant clusters analysed

The results show that the clusters involving a final /s/ or /z/ (*once, homes, flocks*) are never reduced. For the clusters involving a final /t/, the findings confirm those of Mossop (1996a) and Salbrina (2005), that simplification of final consonant clusters is common in Brunei English, and it is the final plosive that is omitted from the cluster. Out of 108 tokens, 67 (62%) were reduced.

The TH sounds

The tokens chosen for this investigation are shown in Table 3. Three words each with initial voiceless and voiced TH were chosen as well as one voiced TH in medial position.

Voiceless TH	Voiced TH
thought	*there*
threaten	*this*
third	*than*
	bothered

Table 3. Tokens with TH analysed

Mossop (1996a) noted that Bruneians have a tendency to realise the TH sounds as plosives, giving rise to pronunciations such as [tɔːt] for *thought* and [dæt] for *that*. Similar observations were made in the present study and the results for both voiceless and voiced dental fricatives are summarised in Table 4, while Tables 5 and 6 show each subject's realisations of the TH sounds.

For voiceless TH, more than half of the tokens (28 out of 54, 51.9%) were realised with [t] and 6 of the 18 subjects were consistent in their usage of the plosive for all three tokens, whereas another 6 had [θ] for all three. The remaining 6 varied between [t] and [θ] in their pronunciations of *thought, threaten* and *third.*

	Voiceless TH			Voiced TH	
	[θ]	[t]		[ð]	[d]
thought	9	9	*there*	11	7
threaten	8	10	*this*	8	10
third	9	9	*than*	3	15
			bothered	9	9
Total	26 (48.1%)	28 (51.9%)		31 (43.1%)	41 (56.9%)

Table 4. Realisations of voiceless and voiced TH

As with the voiceless TH, more than half of the voiced TH tokens (41 out of 54, 56.9%) were realised with [d] and only two Bruneians were consistent in using [ð] for all four tokens whereas six consistently used [d]. Others switched between the two. A closer inspection of the performance of these switching speakers reveals that when the voiced TH is at word initial position, that is, in *there*, *this* and *than*, the tendency is to use [ð] for the first or the first two tokens before eventually switching to [d] for the third one. For instance, B2 used [ð] for *there* and *this* but had [d] for *than,* as did B4, B11, B13 and B18. The others (B6, B10, and B16) had [ð] only for the first token but [d] for the later two. This finding suggests that the subjects tend to be more careful of their speech at the start of the reading but, as reading progresses and the subjects become more comfortable, they are less aware of their speech and thus produce a more naturalistic pronunciation (though we did not find this pattern for voiceless TH). The only exception to this observation is B14 who had [d] for *there* and *this* but switched to [ð] for *than.* For medial voiced TH, the numbers are split evenly between [ð] and [d].

	thought	*threaten*	*third*	[θ]	[t]
B1	[θ]	[θ]	[θ]	3	
B2	[θ]	[t]	[t]	1	2
B3	[t]	[t]	[t]		3
B4	[θ]	[t]	[θ]	2	1
B5	[t]	[t]	[t]		3
B6	[t]	[t]	[t]		3
B7	[θ]	[θ]	[θ]	3	
B8	[t]	[θ]	[θ]	2	1
B9	[t]	[t]	[t]		3
B10	[θ]	[θ]	[θ]	3	
B11	[θ]	[θ]	[θ]	3	
B12	[t]	[t]	[t]		3
B13	[θ]	[θ]	[θ]	3	
B14	[t]	[t]	[t]		3
B15	[t]	[θ]	[t]	1	2
B16	[θ]	[θ]	[θ]	3	
B17	[t]	[t]	[t]		3
B18	[θ]	[t]	[θ]	2	1
Total [θ]	9 (50.0%)	8 (44.4%)	9 (50.0%)	26 (48.2%)	28 (51.9%)

Table 5. Results for voiceless TH for the individual speakers

	there	*this*	*than*	*bothered*	[ð]	[d]
B1	[ð]	[ð]	[ð]	[ð]	4	
B2	[ð]	[ð]	[d]	[ð]	3	1
B3	[d]	[d]	[d]	[d]		4
B4	[ð]	[ð]	[d]	[d]	2	2
B5	[d]	[d]	[d]	[d]		4
B6	[ð]	[d]	[d]	[d]	1	3
B7	[ð]	[ð]	[ð]	[ð]	4	
B8	[ð]	[ð]	[d]	[ð]	3	1
B9	[d]	[d]	[d]	[d]		4
B10	[ð]	[d]	[d]	[ð]	2	2
B11	[ð]	[ð]	[d]	[ð]	3	1
B12	[d]	[d]	[d]	[d]		4
B13	[ð]	[ð]	[d]	[d]	2	2
B14	[d]	[d]	[ð]	[ð]	2	2
B15	[d]	[d]	[d]	[d]		4
B16	[ð]	[d]	[d]	[ð]	2	2
B17	[d]	[d]	[d]	[d]		4
B18	[ð]	[ð]	[d]	[ð]	3	1
Total [ð]	11 (61.1%)	8 (44.4%)	3 (16.7%)	8 (44.4%)	31 (43.1%)	41 (56.9%)

Table 6. Results for voiced TH for the individual speakers

The TRAP and DRESS vowels

A notable feature of Brunei English, as pointed out by Mossop (1996a), is the tendency of Bruneians not to differentiate between the TRAP and DRESS, vowels, so words such as *bat* and *mat* are often pronounced like *bet* and *met* respectively. Similar findings were reported by Nor Aziah (1991, p. 32) who claimed that TRAP is often produced as a mid vowel, the same as DRESS. She noted that the inability to discriminate between the two vowels may be a result of the absence of [æ] in the phoneme inventory of Brunei Malay which only has three vowels [a], [i], [u]. Both Mossop and Nor Aziah further reported that KIT regularly occurs in place of DRESS and that this substitution occurred in Mossop's Secondary School data and in the pronunciation of the word *pet*. However, this suggests a problem with this analysis: if there is a merger between DRESS and KIT and also a merger between TRAP and DRESS, this would imply that there is only one short front monophthong in Brunei English. A possible explanation might involve a chain shift, with TRAP becoming more close and this in turn affecting the quality of DRESS which also becomes more close, though it is not entirely clear that this is what is happening. An alternative explanation is that in the case of DRESS and KIT, a small number of tokens of DRESS in the earlier data were unexpectedly produced with the KIT vowel by some subjects, but there is no general merger between DRESS and KIT.

The words chosen for investigation of TRAP and DRESS are the same as those used in Deterding (2006) and are shown in Table 7.

DRESS	TRAP
shepherd	*plan*
next	*exactly*
get	*actually*
pleasure	*began*
successful	

Table 7. The words of DRESS and TRAP that were measured

Impressionistic analysis of the tokens suggests that two words, *began* and *plan*, were pronounced with a vowel that is intermediate between DRESS and KIT. However, the other tokens of TRAP (*exactly, actually*) do not display a similar pattern. A possible explanation for why there seems to be a relatively close quality for the TRAP vowel in *began* and *plan* may be the phonetic environment. In these two words, the vowel is followed by a nasal, and the quality of the vowel may be influenced by anticipatory nasalisation, lowering the frequency of the first formant.

The effect of nasalisation on vowel quality has been reported in Beddor (1982, cited in Hayward 2000, p. 162) as there is typically a shift in the vowel height as reflected by the acoustic measurements, with close vowels becoming more open and open vowels becoming closer. In other words, vowels which are normally close will have a higher F1 whereas vowels which are normally open will have a lower F1.It is possible that this is what happens with the vowels in *began* and *plan* in the current data. Figure 1 shows an acoustic plot of the first two formants for all tokens of TRAP.

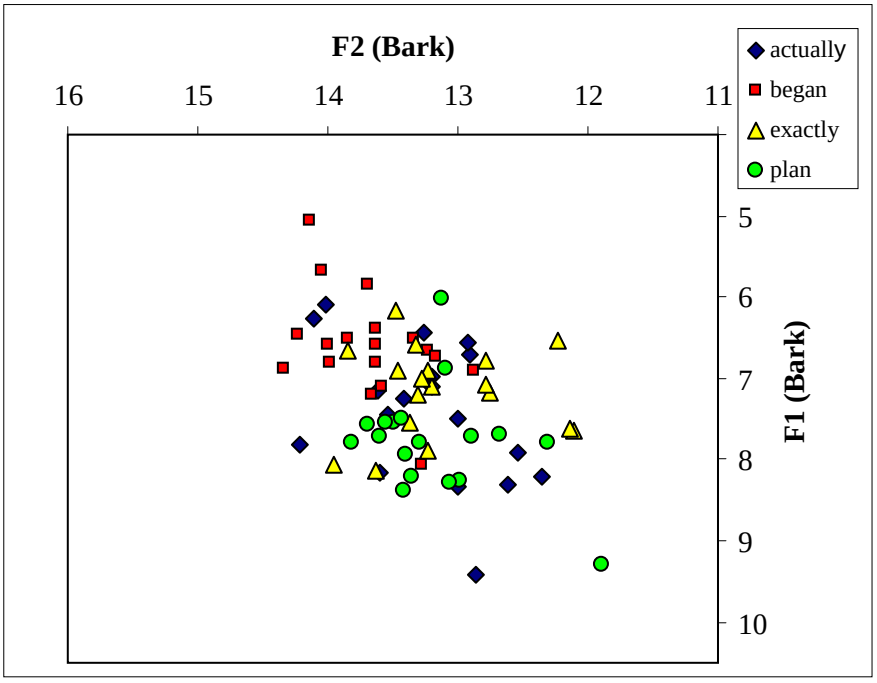

Figure 1. TRAP vowel plot for BrunE

The plot suggests that there is indeed evidence of a closing effect for the TRAP vowel in *began*, as there is a clustering of the *began* points in a region of the vowel space that is higher than for the other tokens. However, the same cannot be said of *plan*, in which the tokens for *plan* are intermingled with the tokens for *actually* and *exactly*. It seems that the auditory impression that there is a closing effect of the TRAP

vowel when followed by a nasal is only true for *began* but there is no acoustic evidence of a closer quality for *plan*. Further research is needed to determine whether the raised quality of the TRAP vowel in *began* might be a result of the nasality of the final consonant, though it is not clear why this should affect *began* and not *plan*.

Figure 2 is the scatter plot for the DRESS and TRAP vowels. Contrary to previous reports of a lack of discrimination between these two vowels in Brunei English, this plot suggests that they are distinguished on the open/close dimension, as most tokens of TRAP are in a lower position on the plot, and a t-test shows that there is a significant difference in the value of F1 for DRESS and TRAP ($t = 7.99$, $df = 160$, $p < 0.0001$).

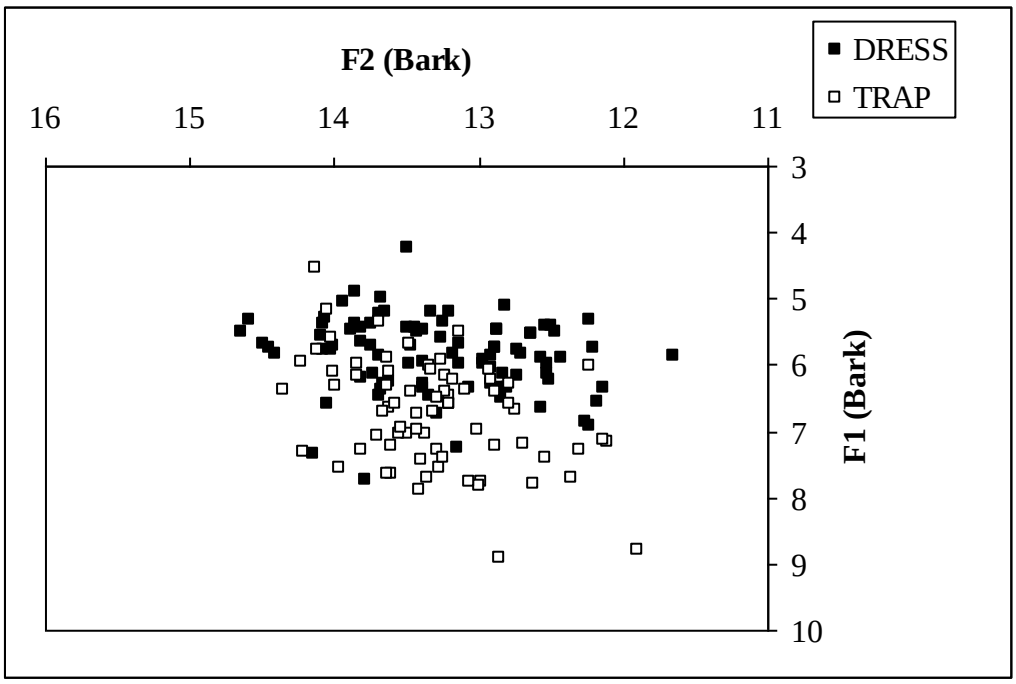

Figure 2. Scatter plot of DRESS and TRAP

In conclusion, even though some tokens of *began* have a relatively close vowel, on the whole the TRAP vowel is more open than DRESS for these Bruneian speakers.

The FACE and GOAT vowels

Mossop (1996a) reported that his Secondary School and University subjects showed a tendency to 'shorten' the diphthongs. Here, we will consider the quality of the vowels, specifically whether they have a changing or relatively constant quality, rather than trying to determine whether they are shortened or not.

Salbrina (2006) compared acoustic measurements of the FACE vowel of Brunei English and with the same vowel in British and Singapore English and reported that there was no significant difference between Brunei and Singapore, but the vowel is less diphthongal in both varieties than in British English.

In the present study, measurements were done for GOAT as well as for the FACE vowel. The words analysed are shown in Table 8.

FACE	GOAT
safety	*homes*
stayed	*so* (x2)
gave	
same	

Table 8. The words with FACE and GOAT that were measured

We can assess the diphthongal quality of a vowel by measuring the formants at the beginning and end of the glide (Ladefoged, 2003, p. 104). In the case of closing diphthongs, it seems appropriate to focus on measurement of the first formant (F1) because this reflects movement in the open/close dimension. While this does not capture the full quality of the vowel, as it excludes movements in the front/back dimension, measurements of changes in F1 offer a crude but effective estimate of the degree of diphthongisation of the vowel.

Deterding (2000) noted that we have to take into account of the speaking rate, as vowels spoken quickly are likely to exhibit less movement than those spoken more slowly. We therefore obtain estimates of the *rate of change* (ROC), in which the difference in the F1 at the beginning and end of the vowel is divided by its duration. The ROC therefore represents the gradient of the trajectory of F1 during the vowel and is a rough indication of whether a vowel is monophthongal or diphthongal.

If FACE and GOAT are realised as diphthongs, they are likely to be closing diphthongs, so the F1 is expected to decrease in value. As a result, the ROC usually has a negative value. In some instances, a positive value is obtained, but this is to be expected with random variation when the vowel is a long monophthong. Similarly, a small negative ROC need not necessarily mean that the token in question is a diphthong, because all vowels, including monophthongs, exhibit some change in quality. A vowel that is realised as a closing diphthong normally yields a large negative value for ROC as seen in Deterding (2000) in which the ROC for FACE for the British speakers lies between -681 to -2273 Hz/sec, whereas the values for the Malays, who were judged to have monophthongal FACE are between -114 and -436 Hz/sec. Similar values were reported in Salbrina (2006) in which the average ROC for her Brunei subjects was -501 Hz/sec whereas for the British it was -1817 Hz/sec. Using values from the previous two studies as benchmarks, a ROC value of -600 Hz/sec will be used as a threshold, so if the value for a vowel falls below this value, then the vowel will be regarded as being monophthongal. We must acknowledge, however, that the measurement of only F1 which is based on just two points means that the results do not fully represent changes in the quality of the vowel, and the placement of ROC the threshold of -600 Hz/sec can be regarded as just a rough indication of whether each token is a monophthong or a diphthong.

The average ROC for the FACE and GOAT vowels of each speaker is presented in Table 9. For FACE, the average value of ROC in the present study is considerably less negative than the values for Brunei English reported in Salbrina (2006) and also for Singapore English reported in Deterding (2000). The average ROC for GOAT is positive, which confirms that the Bruneians tend to realise this vowel as a long monophthong.

Although the results for ROC reported here are less negative than those reported in previous studies, they confirm earlier observations that Bruneians tend to have monophthongal realisations of the FACE and GOAT vowels.

Speaker	FACE (Hz/sec)	GOAT (Hz/sec)
B1	–473	+120
B2	–165	–115
B3	–106	+541
B4	+29	–658
B5	–268	+50
B6	+336	+44
B7	+109	–504
B8	–609	+379
B9	+812	+797
B10	–323	+451
B11	+73	+811
B12	–57	+33
B13	–6	+271
B14	–516	–189
B15	+697	–183
B16	–484	+223
B17	+846	+637
B18	–85	–306
Average	–11	+133

Table 9. Average Rate of Change (ROC) for FACE and GOAT

Rhoticity

Rhoticity was not mentioned in Mossop (1996a). It is not clear if this is because rhoticity was not felt to be an important feature of Brunei English pronunciation at that time, or because the speakers he investigated all had non-rhotic speech. However, the clear occurrence of rhoticity is a striking feature of present-day Brunei English, and it seems to be becoming the norm for young Bruneians to realise an [r] in non-prevocalic positions such as in words such as *far* and *whatever.* The incidence of rhoticity in Brunei English has been discussed in some detail in Salbrina and Deterding (2010).

In the current study, seven tokens were chosen for this investigation: *dark, heard, concern, more, course, before,* and *third.* Half of the speakers (9 out of 18, or 50%) were perceptually judged to be rhotic speakers as they realised [r] in at least four of the seven tokens. These 8 rhotic speakers are: B2, B3, B4, B5, B8, B10, B11, B12 and B13.

A rhoticised vowel is characterised acoustically by a lowered third formant (F3) (Hayward, 2000, p. 167). In the current study, values of the F3 at the mid-point of the vowel were measured. Table 10 shows the average F3 values and the standard deviation for each speaker, grouped into rhotic or non-rhotic categories based on the perceptual judgements described above.

Non-rhotic			Rhotic		
	F3 (Hz)	s.d.		F3 (Hz)	s.d.
B1	3081	(214)	B2	2217	(189)
B6	2867	(329)	B3	2811	(356)
B7	3029	(288)	B4	2711	(467)
B9	2891	(418)	B5	2696	(283)
B14	3292	(216)	B8	2413	(425)
B15	3099	(180)	B10	2344	(233)
B16	2984	(259)	B11	2445	(319)
B17	2718	(444)	B12	2397	(198)
B18	3010	(148)	B13	2629	(249)
Average	2997	(277)	Average	2518	(302)

Table 10. Average F3 frequency (Hz) and standard deviation (s.d.)

The overall average value of F3 for the rhotic speakers is lower than that of the non-rhotic ones, and a t-test on the data revealed that there is a significant difference in the average values of the F3 between the rhotic and non-rhotic speakers ($t = 3.89$, two-tailed, $df = 16$, $p<0.001$). However, we should note that there is some overlap, as non-rhotic B17 has a lower average F3 than B3 who was classified as rhotic. It seems that the values of F3 cannot be absolute guides to the rhoticity of a speaker.

Two plausible reasons for the widespread occurrence of rhoticity in Brunei English were suggested in Salbrina and Deterding (2010): influence from American English, especially from music and films, and the influence of Brunei Malay, which itself is rhotic (Clynes, 2001).

L-vocalisation

L-vocalisation is a phenomenon in which the lateral is realised with a back vowel quality such as *sell* is [seo] or [seɤ] (Cruttenden, 2001, p. 203). The notion of L-vocalisation has not previously been studied for Brunei English. However, for Singapore English, there are several reports of L-vocalisation, or maybe it would be better to describe some instances as L-deletion, something that might be regarded as the extreme case of L-vocalisation. Tay (1993: 30) observes that [ɬ] is lost leaving a vocoid when it occurs at the start of a consonant cluster such as in *revolving* [rɪvɒvɪŋ]. Low and Brown (2005, p. 135) find that final [ɬ] is omitted when it occurs syllabically, so that *parcel* is [pɑːsə] and little is [lɪtə], an observation also made by Deterding (2007, p. 21) who gives the example of *functional* as [fʌŋʃənə]. L-vocalisation in Singapore English can also occur word-finally such as in *school* [skuː] (Deterding 2007, p. 20). In all these examples, there is deletion of the lateral. Deterding and Poedjosoedarmo (1998, p. 157) further note that the tendency for L-vocalisation is especially high among Singaporeans of Chinese ethnicity.

In this paper, we will investigate L-vocalisation in the pronunciation of the words shown in Table 11.

Syllabic	Preceding sound		
	front vowel	central vowel	back vowel
*litt**le** fun*	*whi**le*** *he**l**p him*	*usua**l** diet*	*wo**l**f* (x4) *fu**ll** of* *foo**l** them*

Table 11. Tokens with dark L investigated

Auditory analysis of the syllabic /l/ in *little* and of /l/ following the non-back vowels (*usual, while, help*) yielded no instances of L-vocalisation. However, there were instances of vocalisation of the /l/ following back vowels. One token which is susceptible to this L-vocalisation is *wolf* which in some cases is pronounced as [wʊf] with complete deletion of the /l/, resulting in the word sounding like *woof*. Four of the eighteen Bruneians (22.2%) were found to omit the /l/ in this manner. In total, out of 108 tokens, 39 (36.1%) were vocalised. This compares with about 65% reported for Singapore English (Tan, 2005), which suggests that L-vocalisation may not be such a widespread phenomenon in Brunei. However, one should note that the Singapore data was conversational speech, so this may not be directly comparable with the read data investigated here.

Voice Onset Time (VOT)

Initial voiceless plosives in English are normally aspirated (Gussman, 2002, p. 4), though the degree of aspiration depends to a certain degree on the place of articulation, with /k/ being aspirated more than /t/, which in turn is aspirated more than /p/ (Docherty, 1992, p. 25). Aspiration is characterised by a burst of high frequency energy and phonetically it is represented as [^{h}], so an aspirated bilabial plosive is shown as [p^{h}]. A common definition of aspiration is a period of voicelessness after the release of the plosive in which a puff of air rushes out just before the vowel starts (Hayward, 2000, p. 108; Ladefoged 2001, p. 120). The gap between the release of the stop consonant and the start of the voicing for the following vowel is referred to as the Voice Onset Time or VOT (Ladefoged 2006, p. 146).

Initial voiceless plosives are sometimes unaspirated in outer circle English varieties such as those of Malaysia, India, and the Philippines (Jenkins, 2009, p. 27; Trudgill & Hannah, 2008, p. 133). Rajadurai (2006) reported that aspiration on voiceless plosives in stressed syllables does occur in Malaysian English, but it is only observed in the more standard variety and the aspiration is at times weak. Non-aspiration of initial voiceless plosives has also been reported for Singapore English (Deterding 2007, p. 20). Deterding and Poedjosoedarmo (1998, p. 157) attributed the lack of aspiration to influence from Malay because the plosives of Malay are not aspirated in any position.

For Brunei English, there has been no detailed study on the aspiration of initial plosives although Poedjosoedarmo (2004) observed that there is a reduction in the degree of aspiration on initial voiceless plosives. Mossop (1996a) briefly mentioned the confusion between /t/ and /d/ for one subject in his data who uttered [dæp] instead of [tæp], which suggests non-aspiration of the initial plosive. However, since there was no further evidence in his data, Mossop concluded that this pronunciation was a "momentary backsliding ... to a more basilectal form of pronunciation" (1996a, p. 199).

Measurement of VOT requires the identification of two points: the end of the closure for the plosive and the start of voicing. The former is identifiable from an amplitude spike or a spectrographic burst (Hardcastle & Laver, 1997, p. 74) whereas the latter can be determined by examining the start of the voice bar at the bottom of the spectrogram and consequently, the onset of the following vowel (Hayward 2000, p. 108). In this study, the VOT of two words are analysed: *two* and *time.* Although just two tokens per speaker represent rather a small data set, it should provide a reasonable indication into the nature of aspiration on initial /t/ in stressed syllables.

Perceptual judgment involves deciding whether the plosives in the two words are aspirated, mildly aspirated, or unaspirated. The second of these indicates that there is some aspiration, but the degree is less intense than for a fully aspirated plosive. Typically, a fully aspirated plosive has aspiration lasting 50 ms or more, a mildly aspirated one has aspiration lasting between 20 and 50 ms, while an unaspirated plosive has less than 20 ms of aspiration, though the exact durations depend partly on the place of articulation of the consonant (bilabial, alveolar or velar).

Table 12 shows a summary of the results for perceived aspiration, and average VOT measurements for each speaker are shown in Table 13. From Table 12, it can be seen that there is a tendency to have aspiration on initial /t/ in Brunei English, although in many cases, the degree of aspiration was judged to be mild (47.2%).

	No. and percentage of tokens
Aspirated	8 (22.2%)
Mildly Aspirated	17 (47.2%)
Unaspirated	11 (30.6%)

Table 12. Perceptual findings on aspiration of initial /t/

From Table 13, it can be seen that the VOT values of individual subjects show a wide variation, ranging from 30.2 ms (B2) to 101.6 ms (B10). Comparison between perceptual judgements and acoustic measurements reveals a strong correlation between the two. Perceptually, it was noted that B6 and B10 have full aspiration of /t/ in *two* and *time*, and measurements show that these two subjects have the longest duration of the release burst (94.3 ms and 101.6 ms respectively); and the five speakers who were judged to have no aspiration in either of the two tokens also have the shortest VOT values (B2: 30.2 ms, B9: 35.1 ms, B11: 38.9 ms, B15: 47.1 ms, B17: 31.7 ms).

Speaker	VOT (ms)	Speaker	VOT (ms)
B1	45.9	B10	101.6
B2	30.2	B11	38.9
B3	53.7	B12	64.4
B4	75.7	B13	68.8
B5	59.9	B14	74.3
B6	94.3	B15	47.1
B7	59.1	B16	59.1
B8	67.4	B17	31.7
B9	35.1	B18	87.0
Average VOT = 60.8 ms			

Table 13. Average duration of VOT (in ms) for /t/.

The average VOT for these speakers is 60.8 ms, which is similar to the value obtained for British English (64.0 ms) by Docherty (1992) though it is less than the value of 80.4 ms obtained by Deterding and Nolan (2007). This is not surprising as the latter study measured aspiration at 2000 Hz, on the basis that sometimes aspiration may overlap with voicing, while both Docherty and the current study are measuring the onset of voicing by considering the voice bar. The fact that the values obtained here are similar to those of Docherty is unexpected given that the plosives of Malay are not aspirated, so one might expect first language influence to result in reduced VOT for Bruneian speakers of English. However, as seen from the auditory analysis, aspiration is actually variable. In some instances, one token is heavily aspirated

whereas the other is only mildly so (e.g. B3, B4), and there are also instances in which one token has mild aspiration and the other is unaspirated (e.g. B1). Perhaps we can conclude that Brunei English is somewhat unstable in this respect.

Discussion

This study confirms previous findings by Mossop (1996a) that initial TH sounds can be realised as plosives, that final consonant clusters are often simplified by deletion of a final plosive, and that the vowels in GOAT and FACE are pronounced as monophthongs in Brunei English. However, this study does not confirm the suggestion of Mossop (1996a) that the DRESS and TRAP vowels are merged.

Rhoticity was not discussed in Mossop (1996a), and the current study shows that there is a tendency for many English-speaking Bruneians to exhibit rhoticity in their English speech..

The other two features which have only now been investigated are L-vocalisation and VOT on initial plosives. For the former, it was found that although there is evidence of the Bruneians vocalising their laterals particularly when they are preceded by a back vowel, the rate of incidence is lower than for Singapore English. For VOT, it was observed that aspiration in Brunei English is a variable feature. Some speakers have substantial have aspiration on their initial plosives, others do not, and many vary.

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