

Technical Report

November 2022

Negro versus *Newsday*: Comparative Articulatory and Acoustic Phonetic Analyses of These Two Words as Used in Trinidadian Speech

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Statement

This document was prepared in response to controversial articles and comments made on a speech recording circulating in social media. This document is intended to serve as expert analysis of the recording.¹

Introduction

Using the recording as noted above, an acoustic analysis is provided to identify the word used by THE CALLER on 26 October 2022, as noted in the conclusion. Also included is an analysis of recordings of other speakers using the (other) word that THE CALLER claimed to have used, as noted in an online article published by Loop TT² and other social media on 1 November 2022.

These recordings are compared for the purposes of deciding the likelihood of which of two word forms, *Negro* or *Newsday*, were used by THE CALLER.

What follows is a forensic phonetic analysis and explanation of the pronunciations of the two words *Negro* and *Newsday* in Trinidadian speech³ with reference to already existing research, to four recent recordings of Trinidadian speakers, and to an analysis of the recording under query.

The appendix provides references as well as recognised standard resources for phonetic transcriptions and articulatory descriptions used in the field of Linguistics and in Language Sciences.

¹ This technical analysis of language used in the recordings and of the supporting analysis is intended for public information and does not constitute a legal document, though this document, specifically an updated version of it, might be useful for that purpose with our consent.

² <https://tt.loopnews.com/content/contractor-denies-being-racist-sue-reporter-and-daily-libel> (see original article published by *Newsday* on 28 October 2022: <https://newsday.co.tt/2022/10/28/company-mum-tha-defends-road-contract-for-trinidad-roofing-contractor/>)

³ Trinidadian speech (see Solomon 1993) is a cover term for both Trinidadian English and Trinidadian English-lexicon Creole (also known as Dialect or Trini Talk) since the two language varieties share phonological/accent similarities at both the segmental and prosodic levels.

Background

The transcriptions provided here use the International Phonetic Association (IPA) alphabet, the standard international form of transcribing speech in Linguistics. In a transparent alphabet, letters and sounds match. However, because of the origin of the Roman alphabet and because of the history of English, English spelling is less than transparent, and is often described as *opaque*. Written Modern or Present-Day English has well-known apparent spelling irregularities, including under-representation and over-representation of sounds. In some cases, one letter can stand for one sound or can stand for two sounds, or none at all. For example, *-ough* can stand for a range of divergent pronunciations, such as in *bough*, *cough*, *hiccough*, *lough*, *thorough*, *though*, *through*, and *tough*, among others.

In 1888, therefore, the IPA developed a phonetic alphabet that eliminates intra-linguistic writing discrepancies, and that can be used across 7,000+ languages and language varieties spoken across the globe. For example, the *-ough* words above are phonetically transcribed as /bʊ/, /kʊf/, /'hɪkəl/, /lʊk/, /'θʌl/, /ðo:/, /'θu:/ and /tʌf/, consistently matching only one symbol to one sound, or having only one grapheme correspond to one phoneme.

Here we quote the phonetician John C. Wells:

“When we transcribe a word or an utterance, we give a direct specification of its pronunciation. If ordinary spelling reliably indicated actual pronunciation, phonetic transcription might be unnecessary; but often it does not” (1986).

Walter J. Ong put it this way:

“Sound exists only when it is going out of existence. It is not simply perishable but essentially evanescent, and it is sensed as evanescent. When I pronounce the word ‘permanence’, by the time I get to the ‘-nence’, the ‘perma-’ is gone, and has to be gone. There is no way to stop sound and have sound” (2012: 32).

Therefore to analyse speech, we reduce it to writing (capture it in transcription) and use visual spectrographics.

We note that the terms *consonant* and *vowel* here specifically refer to human speech sounds, **not to consonant or vowel letters or graphemes** that attempt to represent speech sounds, for the reasons outlined above. All technical terms used here are amply and accessibly defined by introductory level texts, and dictionaries such as those by Crystal 2008 and Trask 1995, and a glossary by Roach 1992.

We further note that vowel sounds are the most audible (or sonorant or intense) high points in any word and are the nucleus and the core or essence of syllables. When words are confused or “misheard”, usually consonants are confused, because of shared characteristics or features and particular frequencies, not vowels.

Analysis of Two Words

Three types of data analysis are presented below, that cover several properties of speech sound from different perspectives, namely, articulatory phonetics (that covers the physical changes in the oral cavity that are then realised as these productions) and acoustic phonetics (that covers the physical properties of the sounds):

- (A) transcriptions (articulatory phonetics),
- (B) schematized representations of how the sounds are physically produced in the mouth (articulation) via parametric diagrams, and
- (C) graphical measurements and representations of the speech sounds on sound spectrograms and waveforms (acoustic phonetics).

(A) Phonetic transcriptions

Phonetic transcriptions in IPA as shown in Table 1 below are used by speech scientists to carefully detail differences in speech sounds and utterances.

The following describes pronunciations of the words *Negro* and *Newsday* in several English language varieties, using phonetic transcriptions. The aim is to illustrate and demonstrate the phonetic (physical properties of speech sounds) differences in how these two words are pronounced. The focus here is on the transcriptions for the first two to three (2-3) sounds in each word.

Five accents of English are presented below in Table 1, namely:

1. Trinidad & Tobago speech (both English and the two English Creoles)
2. Jamaican English Creole
3. Received Pronunciation (or RP, a well known accent of standardised British English)
4. General (standardised) American English (GA)
5. Southern US English⁴

Spanish is also included, as that is the etymological⁵ origin of the word in English (also Portuguese, and ultimately Latin). The purpose is firstly to give the origin of the word, but mainly to show that even if a word is borrowed from another language, with the spelling intact, these words almost always undergo phonological adaptation to fit into the borrowing language.

This also shows that spelling cannot be expected to be a benchmark of pronunciation within languages that have a long history of both writing and linguistic change, and even less cross-linguistically.

Winford (a Trinidadian professor of linguistics at Ohio State University) explains how loanwords from a source language (SL) are integrated into a recipient language (RL):

Lexical borrowings are usually adapted to the phonology and morphology of the RL, and eventually become indistinguishable from native items. Thus, English loanwords in Japanese are adapted to Japanese phonetics and phonotactics, particularly its preferred CV syllable structure, through various processes, including epenthesis (e.g. *baseball* > *besuboru*), syllabification of glides (e.g. *quiz* > *kuizu*), and cluster simplification (e.g. *sweater* > *seta*) (2010: 173).

⁴ This is for the sake of comparison and is often heard on US television in programmes pertaining to the US south.

⁵ See Harper 2022.

Language Variety	Word: <i>Negro</i>		Language Variety	Word: <i>Newsday</i>
1. Trinidad & Tobago speech	[ˈnɪ̃ː.gwɪwo:]		Trinidad & Tobago speech	[ˈnɪ̃wũːz.dɛː]
2. One Jamaican pronunciation	[ˈnɪ̃ː.gwɪwɔ]		One Jamaican pronunciation	[ˈnɪ̃wũːz.dɛɪ]
3. Received Pronunciation (British)	[ˈnɪ̃ː.gwɪwəʊ]		Received Pronunciation (British)	[ˈnɪ̃wũːz.dɛɪ]
4. General American pronunciation	[ˈnɪ̃ː.gwɪwoʊ]		General American pronunciation	[ˈnɪ̃wũːz.dɛɪ]
5. One American southern pronunciation	[ˈnɪ̃ː.gwɪwoʊ]			
Spanish, a word meaning "black"	[ˈne.gro]		Not applicable for Spanish	

Table 1: Narrow (detailed) phonetic transcriptions of the words *Negro* and *Newsday* in five (5) different English and English-lexicon Creole varieties and one transcription of Spanish *Negro*

Negro in the speech of Trinidadians and Tobagonians is transcribed broadly as /ˈni:ɡɔ:/ and can be realised as [ˈnɪ̃ː.gwɪwo:]. The differences here show that the [i] vowel is actually nasalised due to effects from the [n], which is a nasal sound and the [ɪ] sound, usually involving lip protrusion, is actually more rounded here due to effects of the [o]. This word consists of five segments or phonemes in two syllables that end in a vowel (i.e., open syllables). In this word, what is written alphabetically as <e> stands for the so-called <ee> sound, phonetically transcribed as [i:], as in *machine*, *casino* and other words fairly recently borrowed into the wider English language, and which we will refer to below as the FLEECE⁶ vowel.

⁶ The words that are capitalised are standard keywords used in the vowel lexical sets of English developed by phonetician John C. Wells in 1982.

Newsday in the speech of Trinidadians and Tobagonians is transcribed broadly as /'nju:zde:/ and can be realised as ['ŋwũ:z̥de:]. Again, the second transcription shows more fine-grained details of the pronunciation, namely, nasalisation and lip rounding. This consists of six segments or phonemes across one closed syllable and one open syllable. In this word, the alphabetic digraph <ew> stands for the so-called <oo> sound, phonetically transcribed as [u:], as in *blew*, *grew*, *threw*, and other words, which we will refer to below as the GOOSE vowel.

Each of the words being analysed has two vowel sounds each (and therefore two syllables, so each is disyllabic), and the phonetic descriptions follow.

Negro has two vowels, namely, [i:] the long close front unrounded tense vowel (spelt <e> in this word), as in FLEECE plus [o:] the long close-mid back rounded tense vowel (spelt <o> in this word), as in GOAT, and is broadly transcribed as /'ni:ɡɔ:/ in Trinidadian speech, and narrowly transcribed (with articulatory details) as ['ŋĩ:ɡwɔ:] (see Table 1 above).

Newsday has two vowels, namely, [u:] the long close back rounded tense vowel⁷ (spelt <ew> in this word), as in GOOSE plus [e:] the long close-mid front unrounded tense vowel (spelt <ay> in this word) as in FACE, and is broadly transcribed as /'nju:zde:/ in Trinidadian speech, and narrowly transcribed (with articulatory details) as ['ŋwũ:z̥de:] (see Table 1 above).

In the words under consideration, the spelling sequence <ne> in *Negro* is **not** pronounced the same as the <ne> in *Newsday*, even though they have identical alphabetic representation. In *Negro*, the <e> represents the vowel sound in the FLEECE vowel. In *Newsday*, <e> does not stand alone and is combined with <w> to make <ew>. This causes it to be actually produced with the tongue up against the palate and is in addition rounded due to the vowel sound in the GOOSE vowel⁸. In short, the alphabetic vowel letter <e> can represent several different sounds, can combine with other vowel letters and consonants, and can be silent.

Although both words have the vowel letter <e>, that letter <e> can also represent the sounds in *egg*, *English*, *here*, *the*, *eye*, inter alia, and is also found in several combinations to represent a range of vowel sounds. Thus, in the two words, the alphabetic letter <e> does not represent the same vowel sound, but rather the vowels [i:] and [u:] which are not confused by any listener and speaker in any language where the sounds create a difference in meaning (i.e., phonemic). These sounds are mostly phonetically opposed to each other with only vowel height in common—one is front, one is back; one is unrounded, the other is rounded, as in FLEECE and BEAT [i:] versus GOOSE and BOOT [u:].

What follows is a brief description of how and where these primary cardinal vowels are physically articulated), showing their differentiation in the phonetic space. In Figure 1, *tongue front* refers to the front of the body/dorsum of the tongue, while *tongue back* refers to tongue back or back of the body/dorsum of the tongue. *Tongue height or closeness* refers to the proximity of the tongue to the hard palate. Figure 2 shows the vowels (monophthongs (e.g., in 'bat') and diphthongs (e.g., in 'bite') of Trinidadian speech.

⁷ Trinidad and Tobago English and English-lexicon Creoles give a <y> sound (represented by [j] after [n] (and other coronal sounds such as [t d] but not always [s z l]), but this <y> sound may also be analysed as part of a rising diphthong [ju:] or [ɪu]).

⁸ Note that the final <e> in both *geese* and *goose* is silent.

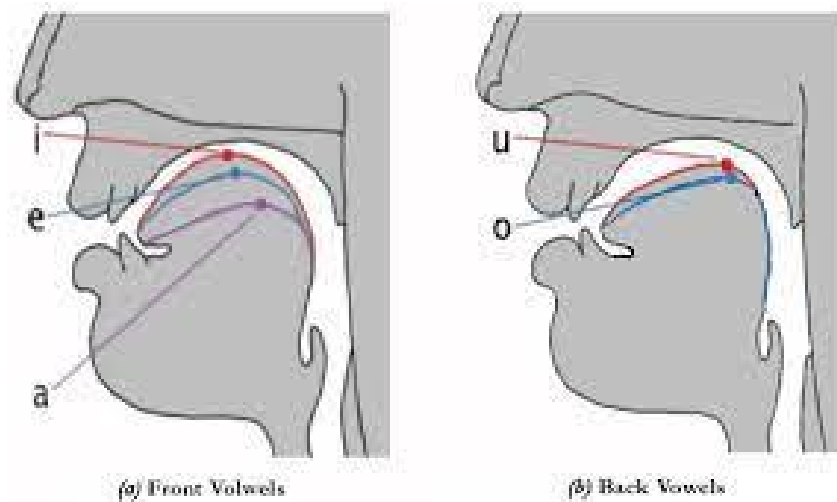


Figure 1: Sagittal sections showing where the vowel sounds [i e a] and [u o] are articulated (Mirachi et al 2017)⁹

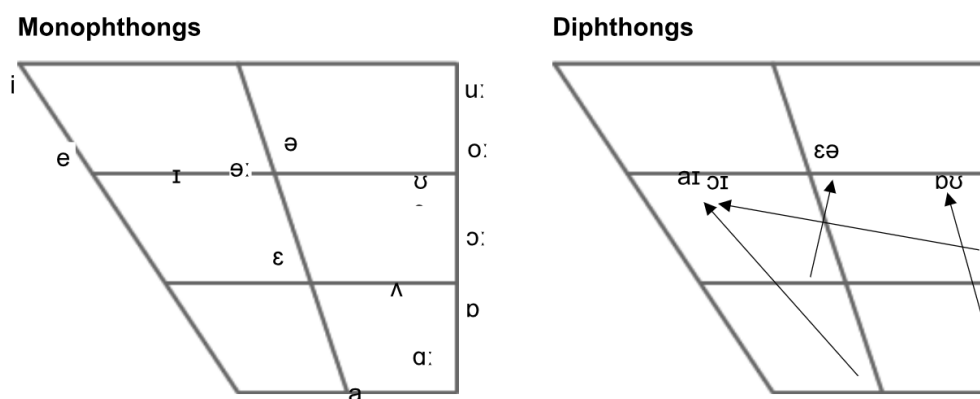


Figure 2: Vowel phonemes of the Trinidadian English vowel space (Ferreira and Heitmeier 2021)¹⁰

⁹ D. Mirarchi, P. Vizza, G. Tradigo, N. Lombardo, G. Arabia and P. Veltri, "Signal Analysis for Voice Evaluation in Parkinson's Disease," 2017 IEEE International Conference on Healthcare Informatics (ICHI), 2017, pp. 530-535, doi: 10.1109/ICHI.2017.72.

¹⁰ J.S. Ferreira and K. Heitmeier, "A Description of Trinidadian English Pronunciation", *Society for Caribbean Linguistics Occasional Paper*, 42, June 2021, pp. 4–32 (<https://hdl.handle.net/2139/56299>). See also S. Gooden and K. Drayton 2017.

(C) Spectrograms

A sound spectrogram is a graphical representation of sounds and involves acoustic signal processing. Digital recordings of the sounds here have been analysed by the computer-based software Praat¹¹ which separates the frequencies and amplitudes of the component sound waves of each sound.

The results are displayed visually showing degrees of amplitude at varying frequencies, and show sound similarities and differences from an acoustic perspective.

Comparisons

For the sake of comparison, what follows are two recordings of each word, by a female Trinidadian speaker and by a male Trinidadian speaker. Compare 4a to 4b and 4c.

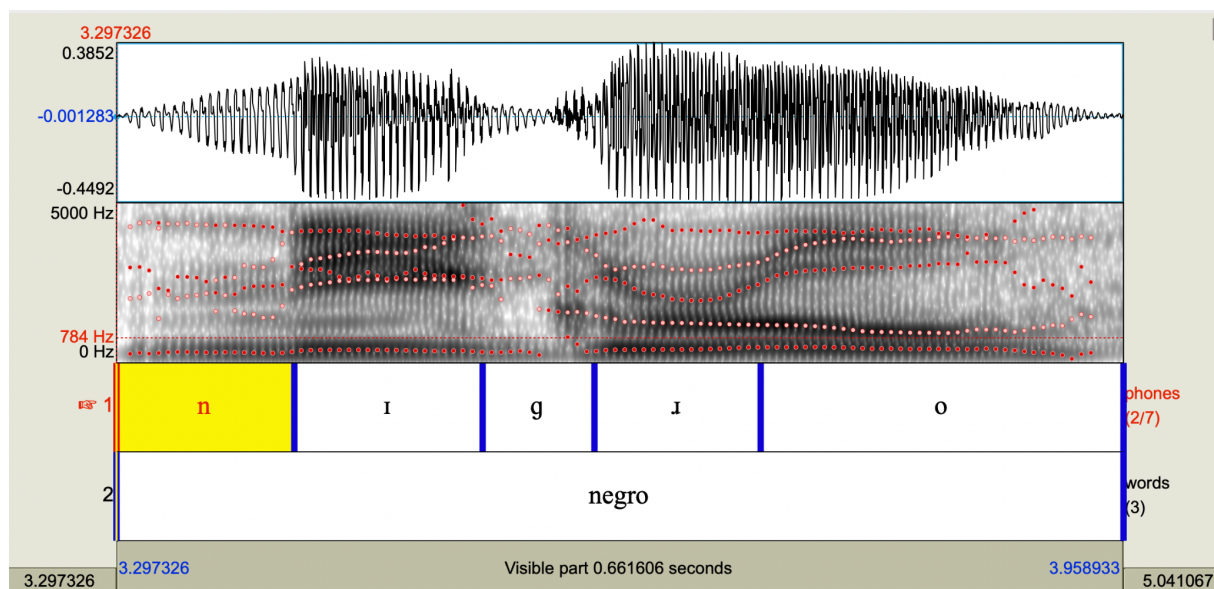


Figure 4a: Spectrogram and waveform showing phonetic transcription and sound-by-sound segmentation of the word 'Negro' as pronounced by a female Trinidadian speaker in citation form (in isolation) from southern Trinidad.

¹¹ <https://www.fon.hum.uva.nl/praat/>

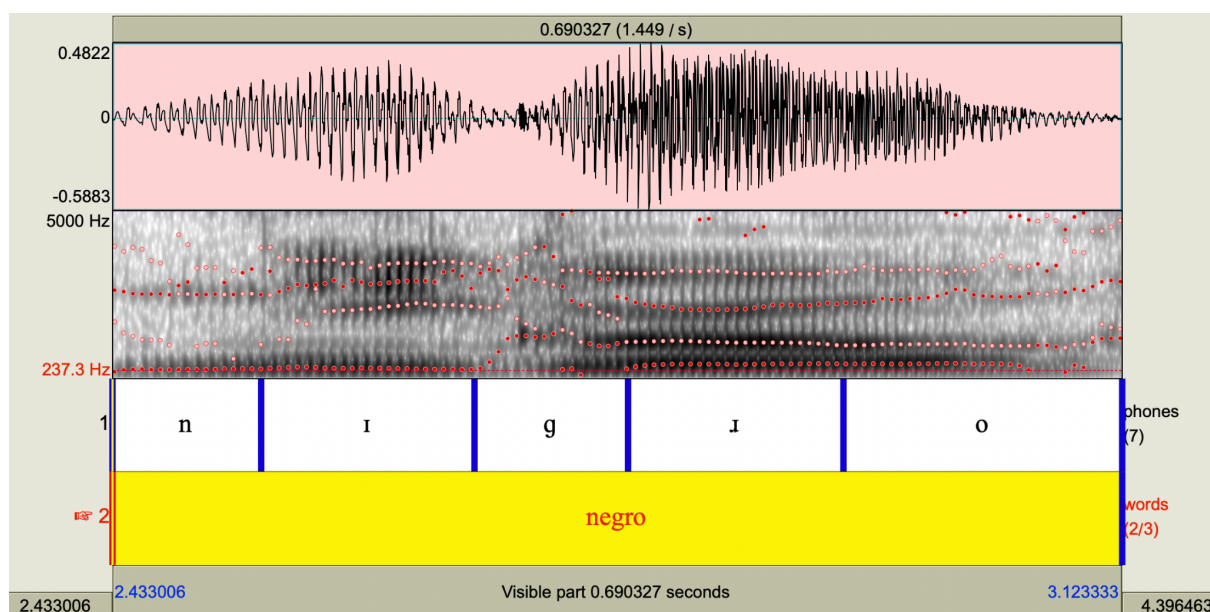


Figure 4b: Spectrogram and waveform showing phonetic transcription and sound-by-sound segmentation of the word 'Negro' as pronounced by a male Trinidadian speaker in citation form (in isolation) from northern Trinidad.

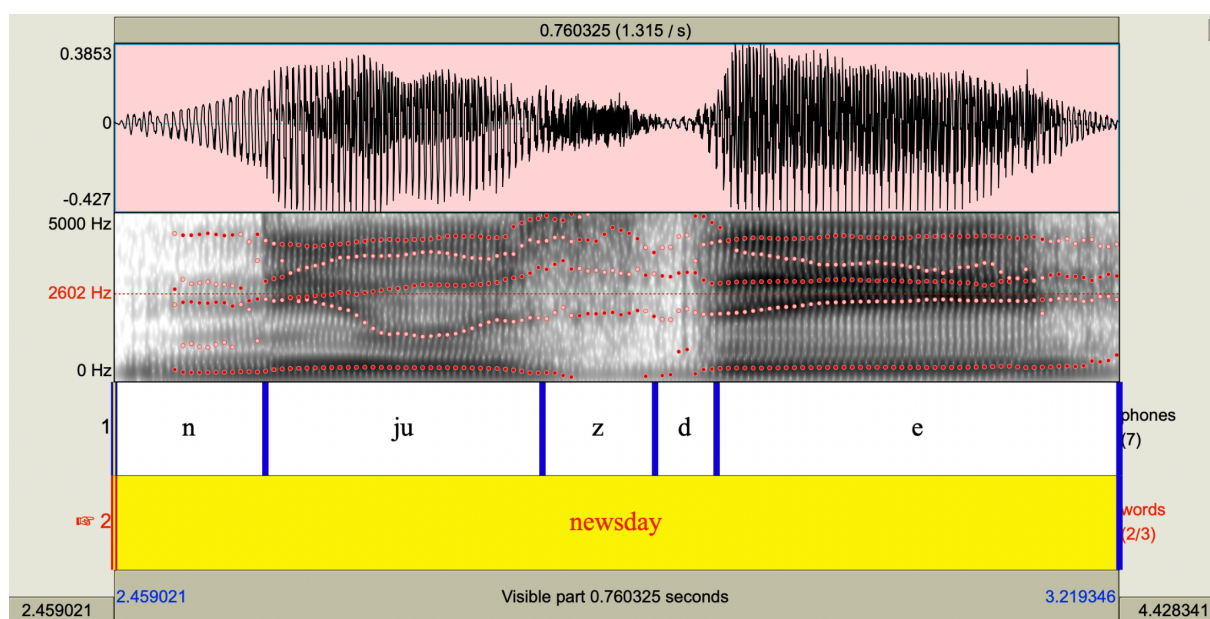


Figure 4c: Spectrogram and waveform showing phonetic transcription and sound-by-sound segmentation of the word 'Newsday' as pronounced by a female Trinidadian speaker in citation form (in isolation) from southern Trinidad.

In the above figures, note that the spectrograms for *Negro* and *Newsday*, regardless of the speaker, are different. For example, the ‘gaps’ for the corresponding [g] in *Negro* and the corresponding [d] in *Newsday* are different.

Table 2 shows measurements from one speaker of the first and second resonant frequencies (F1, F2) for vowels as pronounced in the words FLEECE, GOAT, GOOSE and FACE. The vowels of concern for *Negro* and *Newsday* are the FLEECE vowel in *Negro* and the GOOSE vowel in *Newsday*.

Vowels pronounced as in these keywords	TrE Vowels	F1 (Hz)	F2 (Hz)
FLEECE	/i:/	453	2427
GOAT	/o:/	454	857
GOOSE	/u:/	390	920
FACE	/e:/	432	2385

Table 2: Four Trinidadian English vowels found in the words *Negro* (/i:/ and /o:/) and *Newsday* (/u:/ and /e:/) (Ferreira and Heitmeier 2021)

Conclusion

Spelling is irrelevant, as one letter can and does represent different sounds, including in these two words.

Given the evidence, and following the preceding articulatory and acoustic analysis, we conclude that the recording under analysis has but one word before *reporters* and that is the word *Negro*. We further conclude that the word in question is not and cannot be mistaken for the word *Newsday*. The vowels are different, the medial/middle consonants are different, the number of phonetic segments (sounds or phonemes) is different, the syllable templates are different, and the spectrograms are clearly different.

Mini-Bios of Linguistics Experts

Dr Jo-Anne S. Ferreira holds a PhD in Linguistics from UWI, St Augustine (1999), is Senior Lecturer in Linguistics at The University of the West Indies (UWI), St. Augustine campus, and a member of SIL International. She has almost 3 decades of experience in articulatory phonetics, and is trained in English, French and Brazilian Portuguese phonetics. She is the holder of the IPA Certificate of Proficiency in the Phonetics of English from the International Phonetic Association (IPA), London (First Class Honours, 2005), and holds 3 certificates in Field Linguistics from SIL International France and UK (1995–1996). She teaches Phonetics and Phonology at The UWI, St Augustine and in regional Wycliffe Caribbean workshops, and has taught at the Mona campus, and at SIL in the UK, USA and Brazil. She has also developed pedagogical materials, including an undergraduate resource manual for teaching Phonetics, and has served as consultant to McGill-Queen's University Press for the phonetic transcriptions in the *Dictionary of the English/Creole of Trinidad & Tobago* (Winer 2009).

Professor Shelome Gooden holds a PhD in Linguistics from Ohio State University (2003) and is Professor of Linguistics and Assistant Vice Chancellor for Research in the Humanities, Arts, Social Sciences and Related Fields at the University of Pittsburgh. She is a Creolist and Sociolinguist and the main thrust of her research is the prosody of Caribbean Creoles varieties. She teaches Phonetics and Phonemics, Phonology, Language Contact, Pidgins and Creoles and Sociolinguistics and researches Field Methods, Language Contact, Sociophonetics, Prosody and Intonation, and Language Variation and Change. Her dissertation research included acoustic-phonetic analyses of Jamaican Creole. She is currently focusing on higher level phonological structure in these varieties of intonational melodies. This aspect of her research focuses primarily on synchronic descriptions of the phonology of Caribbean English-lexified Creoles and secondarily on putative West-African substratum influences on these systems. She is currently involved in a collaborative project with Kathy-Ann Drayton Heitmeier considering cross-Creole comparisons between Jamaican Creole and Trinidadian English Creole.

Both authors are currently Executives of the Society for Caribbean Linguistics (SCL).

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APPENDIX

RESOURCES FOR PHONETIC TRANSCRIPTIONS
AND ARTICULATORY DESCRIPTIONS

THE INTERNATIONAL PHONETIC ALPHABET (revised to 2020)

CONSONANTS (PULMONIC)

© 2020 IPA

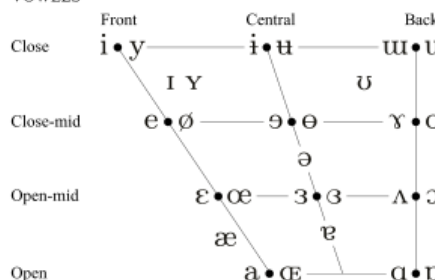
	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d		ʈ ɖ	c ɟ	k ɡ	q ɢ		ʔ
Nasal	m	ɱ		n		ɳ	ɲ	ŋ	ɴ		
Trill	ʙ			r					ʀ		
Tap or Flap		ⱱ		ɾ		ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative				ɬ ɮ							
Approximant		ʋ		ɹ		ɻ	j	ɰ			
Lateral approximant				l		ɭ	ʎ	ʟ			

Symbols to the right in a cell are voiced, to the left are voiceless. Shaded areas denote articulations judged impossible.

CONSONANTS (NON-PULMONIC)

Clicks	Voiced implosives	Ejectives
◌ Bilabial	ɓ Bilabial	ʼ Examples:
◌ Dental	ɗ Dental/alveolar	pʼ Bilabial
◌ (Post)alveolar	ɟ Palatal	tʼ Dental/alveolar
◌ Palatoalveolar	ɡ Velar	kʼ Velar
◌ Alveolar lateral	ɠ Uvular	sʼ Alveolar fricative

VOWELS



Where symbols appear in pairs, the one to the right represents a rounded vowel.

OTHER SYMBOLS

ɱ Voiceless labial-velar fricative	ɕ ʑ Alveolo-palatal fricatives
ɰ Voiced labial-velar approximant	ɭ Voiced alveolar lateral flap
ɥ Voiced labial-palatal approximant	ɧ Simultaneous ʃ and x
ħ Voiceless epiglottal fricative	Affricates and double articulations can be represented by two symbols joined by a tie bar if necessary.
ʕ Voiced epiglottal fricative	
ʡ Epiglottal plosive	

ts kp

SUPRASEGMENTALS

ˈ Primary stress	ˌ Secondary stress
ː Long	ˑ Half-long
˚ Extra-short	˘ Minor (foot) group
˙ Major (intonation) group	˙ Syllable break
˘ Linking (absence of a break)	

TONES AND WORD ACCENTS

LEVEL	CONTOUR
é or ˥ Extra high	ě or ˩ Rising
é High	ê Falling
ē Mid	ẽ High rising
è Low	ẽ Low rising
ë Extra low	ẽ Rising-falling
↓ Downstep	↗ Global rise
↑ Upstep	↘ Global fall

DIACRITICS

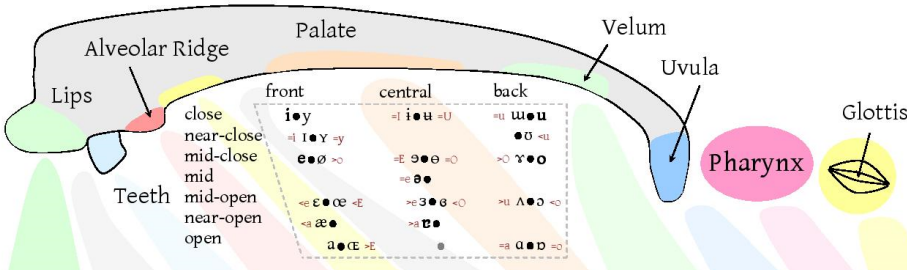
◌ Voiceless	◌ Breathy voiced	◌ Dental
◌ Voiced	◌ Creaky voiced	◌ Apical
◌ Aspirated	◌ Linguolabial	◌ Laminal
◌ More rounded	◌ Labialized	◌ Nasalized
◌ Less rounded	◌ Palatalized	◌ Nasal release
◌ Advanced	◌ Velarized	◌ Lateral release
◌ Retracted	◌ Pharyngealized	◌ No audible release
◌ Centralized	◌ Velarized or pharyngealized	
◌ Mid-centralized	◌ Raised	
◌ Syllabic	◌ Lowered	
◌ Non-syllabic	◌ Advanced Tongue Root	
◌ Rhoticity	◌ Retracted Tongue Root	

Some diacritics may be placed above a symbol with a descender, e.g. ɲ̥̄

Typefaces: Doulos SIL (metatext); unifiipa (symbols)

Chart 1: The International Phonetic Alphabet (revised to 2020)
by the International Phonetic Association

Partial reproduction of the International Phonetic Alphabet ©2005



CONSONANTS	Bilabial	Labiodental	Dental	Alveolar	Post-alveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p	b	t̪	d	t̠	ʈ	c	k	q	ʕ	ʔ
Nasal	m	ɱ	n̪	ɲ	ɳ	ɽ	ɲ	ŋ	ɴ		
Trill				r					ʀ		
Flap				ɾ							
Fricative	ɸ	f	v	θ	ð	s	z	ʃ	ʒ	χ	ħ
Lateral Fric.				ɬ							
Lateral Appr.				ɬ̺							
Approximant	ʍ	w	ʋ	ɹ			j	ɰ	ʁ		
Vowel (above)											
Implosive	ɓ			ɗ							
Click	ǀ			ǃ							

Lateral flap: ɺ. Other symbols: ʼ pʰ pʰh ˀ c ʔ nc p̰ p̰] t̰ t̰' ḛ ḛ] m̰ m̰] ŋ̰ t̰

Visual chart by Jonathan Coombs (sil.org). Use any unicode font that supports IPA, e.g. Doulos SIL, Charis SIL, or Gentium. IPA MSKLC Keyboard (scripts.sil.org/UnlIPAKeyboard)

Chart 2: Visual Chart by Jonathan Coombs (sil.org), 2005

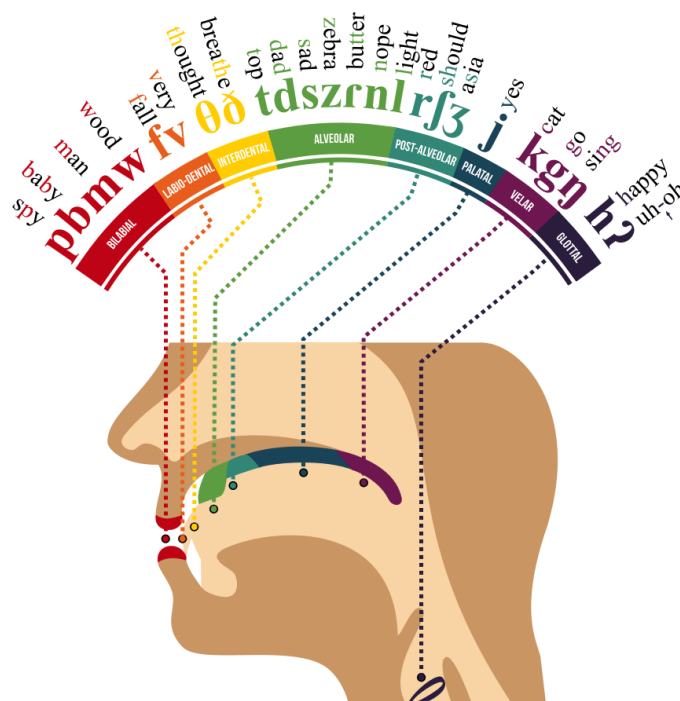


Figure 5. Infographic by Language Base Camp showing the International Phonetic Association (IPA) alphabet symbols, the places of articulation, and a corresponding word in English
Language Base Camp (2019)

**EXAMPLE OF AN ARTICULATORY DESCRIPTION
CORRESPONDING TO THE PARAMETRIC DIAGRAM
OF THE WORD *NEGRO* IN FIGURE 3A**

Before the utterance begins, the articulators are in the rest position with the jaw lightly clenched, the lips closed, the tongue relaxed and filling most of the oral cavity (the tip down behind the lower front teeth), the velum in the open position and the glottis open enabling normal quiet breathing. In anticipation of speech, the speaker inhales, filling the lungs with air. The utterance is produced on a pulmonic egressive airstream.

In anticipation of the forthcoming [n] sound, the velum remains in the open position. The jaw opens to a narrow aperture, and the lips assume a fairly neutral position. The coronal part of the tongue (tip/apex and blade/lamina) rises to contact the alveolar ridge while the side rims make contact with the upper molars.

Air now flows only through the nasal cavity. The controlled expulsion of lung air begins and at the same time the vocal folds come together and start to vibrate for normal voice.

The front part of the tongue dorsum rises to a height just below the hard palate. This becomes the highest point of the tongue. The side rims rise and make light contact with the edges of the upper molars. The tongue tip remains low, behind the lower front teeth and the back remains low. Air flows simultaneously through the oral and nasal cavities, adding a nasalized resonance to the long close front unrounded tense vowel, [i:]. The resonance is shown on the vowel diagram in Figure 2 above. The vowel is long in duration in this stressed position.

After a short interval of this nasalised vocalic resonance, the velum rises and forms velic closure. (It will remain in this position throughout the rest of the utterance.) The tongue back touches the velum and a voiced velar plosive [g] is heard.

The egressive pulmonic air continues to flow into the oral cavity where it is trapped and where air-pressure builds up. There is momentary silence. During this silent interval of compression or the hold phase, the tongue blade rises and assumes a position of wide approximation to the back of the alveolar ridge. The rear rims retain their previous contact with the upper molars and the body of the tongue assumes a concave posture with the front lower than the back.

The hold-phase of [g] coincides with anticipatory lingual coarticulation of the postalveolar approximant [ɹ^w] and lip rounding. Audible plosion is heard as the articulators first separate as the compressed air is released. See Figure 6 below.

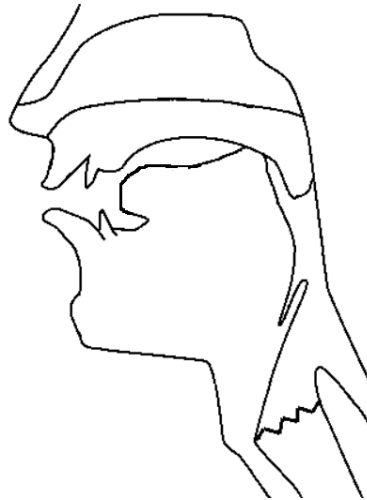


Figure 6. Vocal tract diagram showing the hold-phase of [g] with anticipatory lingual coarticulation of [ɹ] and lip rounding

The lips assume a rounded position for the postalveolar approximant, and maintain that position for a fairly long close-mid back rounded tense vowel [o:].

The velum opens and all the articulators relax as the speaker returns to the rest position and resumes normal breathing.