

Phonetics: The Scientific Study of Speech

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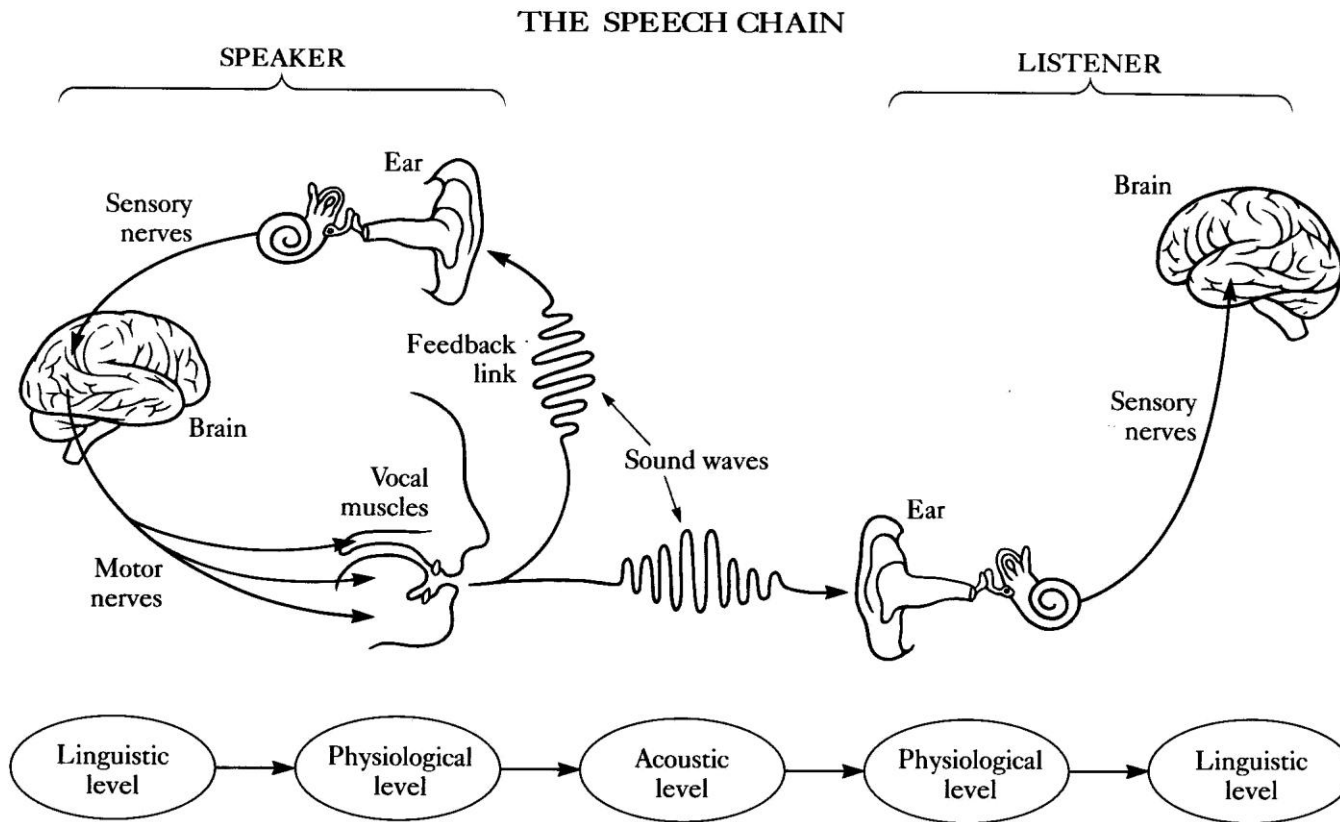


FIGURE 1.1 The speech chain: the different forms of a spoken message in its progress from the brain of the speaker to the brain of the listener.

Denes, P. B. & Pinson, E. N. 1993. *The Speech Chain: The physics and biology of spoken language* (2nd edn.). New York: W. H., Freeman & Co, p. 5.

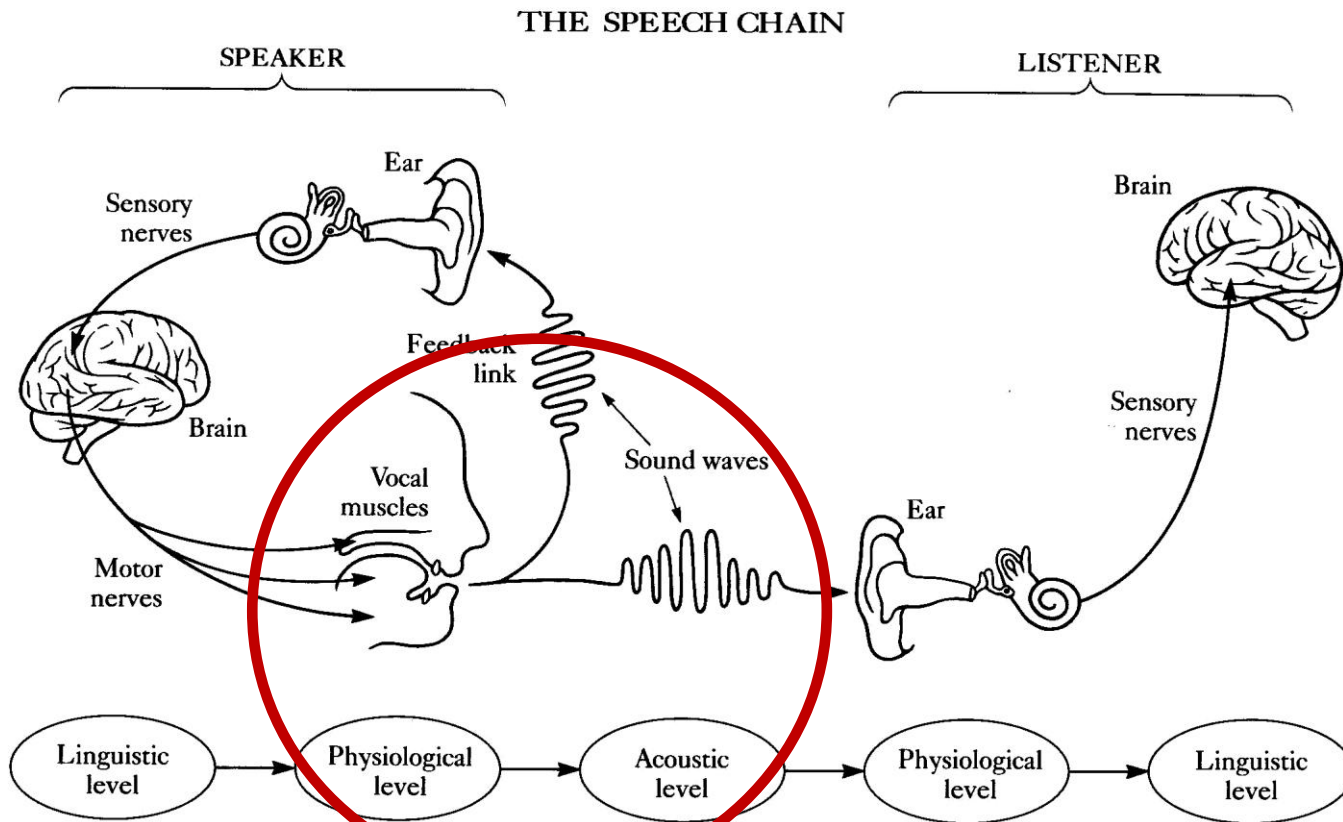
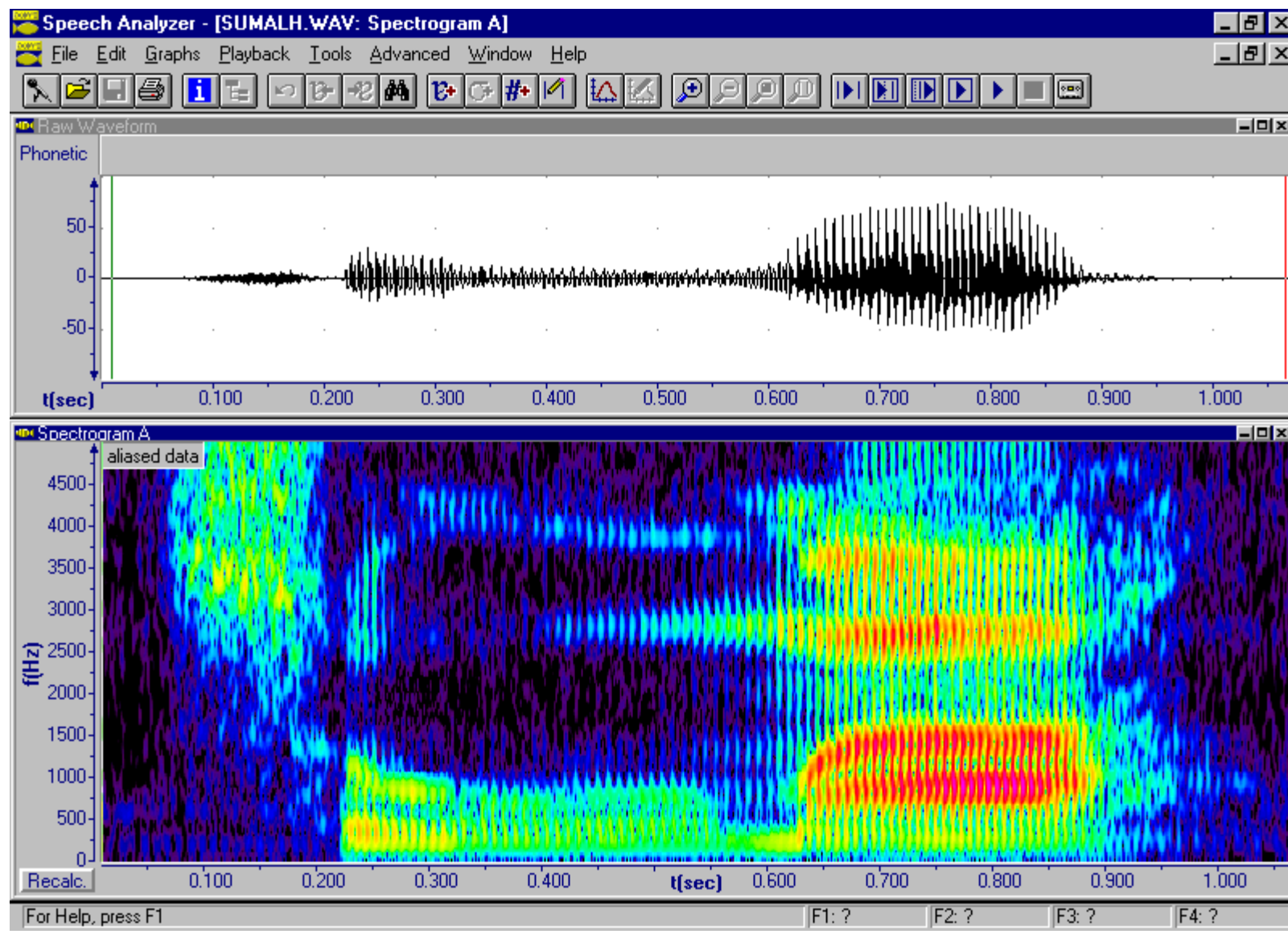


FIGURE 1.1 The speech chain: the different levels of a spoken message in its progress from the brain of the speaker to the brain of the listener.

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- Segments
- Consonants: voice, place, manner

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	Bilabial	Labiodental	Dental	Alveolar	Post alveolar	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			

CONSONANTS (NON-PULMONIC)

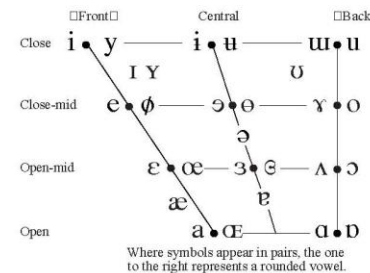
Clicks		Voiced implosives		Ejectives	
◌	Bilabial	ɓ	Bilabial	ʼ	Examples:
◌	Dental	ɗ	Dental/alveolar	ɸ	Bilabial
◌	(Post)alveolar	ɟ	Palatal	ɸ	Dental/alveolar
◌	Palatoalveolar	ɠ	Velar	ɸ	Velar
◌	Alveolar lateral	ɠ	Uvular	ɸ	Alveolar fricative

ʌ	Voiceless labial-velar fricative	ʑ ʒ	Alveolo-palatal fricatives
ʋ	Voiced labial-velar approximant	ɭ	Voiced alveolar lateral flap
ɥ	Voiced labial-palatal approximant	ɥ	Simultaneous \int and X
ħ	Voiceless epiglottal fricative		
ʕ	Voiced epiglottal fricative		Affricates and double articulations
ʡ	Epiglottal plosive		can be represented by two symbols
			joined by a tie bar if necessary.

DIACRITICS Diacritics may be placed above a symbol with a descender, e.g. $\overset{\circ}{\eta}$

o	Voiceless	n̥ d̥	..	Breathily voiced	b̥ ḁ	u	Dental	t̪ d̪
	Voiced	ŋ t̚	~	Creaky voiced	b̰ a̰	u	Apical	t̟ d̟
h	Aspirated	tʰ dʰ	~	Linguolabial	ɮ ɽ	u	Labial	t̠ d̠
ɔ	More rounded	ɔ̞	W	Labialized	tʷ dʷ	~	Nasalized	ẽ
ɛ	Less rounded	ɛ̞	J	Palatalized	tʲ dʲ	n	Nasal release	d̠n̠
+	Advanced	u̟	Y	Velarized	tʷ dʷ	l	Lateral release	d̠l̠
..	Retracted	e̠	ʕ	Pharyngealized	t̠ d̠	ʔ	No audible release	d̠ʔ
	Centralized	ẽ	~	Velarized or pharyngealized	ɮ̠			
×	Mid-centralized	ẽ̞	+	Raised	e̟	(I = voiced alveolar fricative)		
ɪ	Syllabic	n̩	ɾ	Lowered	e̠	(β = voiced bilabial approximant)		
~	Non-syllabic	n̩̥	+	Advanced Tongue Root	e̟			
~	Rhoticity	ɾ̥ ɾ̰	+	Retracted Tongue Root	e̠			

VOWELS



SUPRASEGMENTALS

- | | |
|---|------------------------------|
| | Primary stress |
| | Secondary stress |
| : | Long e: |
| ' | Half-long e' |
| ˘ | Extra-short ɛ |
| | Minor (foot) group |
| | Major (intonation) group |
| . | Syllable break ˌi.ækt |
| ˌ | Linking (absence of a break) |

TONES AND WORD ACCENTS
LEVEL CONTOUR

- | | | | | | |
|-----------------|---|------------|-----------------|---|----------------|
| é _{or} | ↗ | Extra high | ě _{or} | ↗ | Rising |
| é | ↗ | High | ê | ↘ | Falling |
| ē | ↔ | Mid | ē | ↗ | High rising |
| è | ↘ | Low | ē | ↘ | Low rising |
| ẽ | ↘ | Extra low | ẽ | ↗ | Rising-falling |
| ↓ | | Downstep | ↗ | | Global rise |
| ↑ | | Upstep | ↘ | | Global fall |

The International
Phonetic
Alphabet
<http://www.langsci.ucl.ac.uk/ipa/fullchart.html>



THE INTERNATIONAL PHONETIC ALPHABET (revised to 2005)

CONSONANTS (PULMONIC)

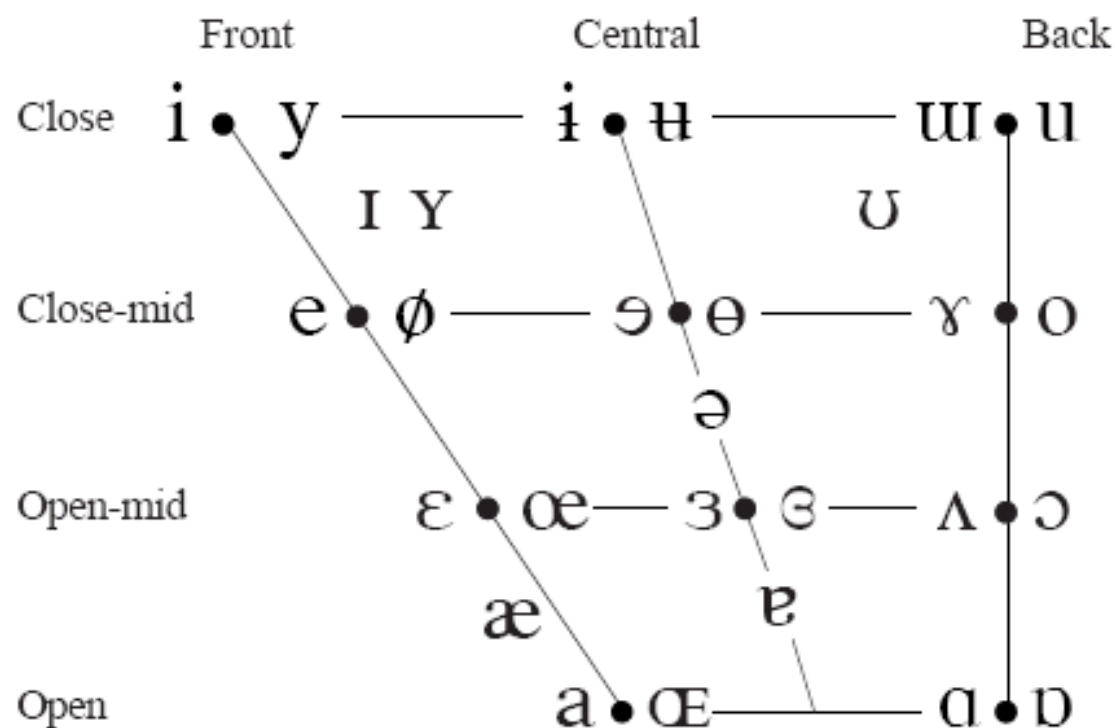
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	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b		t d			ʈ ɖ	c ɟ	k ɡ	q ɢ		ʔ
Nasal	m	ɱ	n			ɳ	ɲ	ŋ	ɴ		
Trill	ʙ		r						ʀ		
Tap or Flap		ⱱ	ɾ			ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x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

Where symbols appear in pairs, the one to the right represents a voiced consonant. Shaded areas denote articulations judged impossible.

- Segments
- Vowels: Front/back, close/open, rounded/unrounded

VOWELS



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

- English vowels
- /ɪ e æ ʌ ɒ ʊ/ as in *pit pet pat putt pot put*
- /iː aː ɜː ɔː uː/ as in *key car cur core coo*
- /eɪ aɪ ɔɪ/ as in *bay buy boy*
- /əʊ aʊ/ as in *hoe how*
- /ɪə eə ʊə/ as in *peer pear poor*
- /ə/ as in *father, about*

- In Summer In London

**Imagine /i:/ and /u:/ - I do
I've tried to get them sounding right
The whole fortnight
In backness, roundness and in height
Like tutors do
In summer in London**

**If I should not vibrate
My vocal folds
In consonants at ends of words
Like I was told
You'll understand the reason is
It gets too cold
In summer in London**

CHORUS

I can't see me speaking the way that I do

For all my life

**Now you told me I should be speaking
like you**

To change my life

There's /i:/ and /u:/ and /ɜ:/ and /aɪ/

And /əʊ/ and /ɑ:/ and /aʊ/ and /eɪ/

I wonder why

A language needs so many vowels

To try to say

The things that we all say

CHORUS

I can't see me speaking the way that I do

For all my life

**Now you told me I should be speaking
like you**

To change my life

**Imagine /i:/ and /u:/ - I do
I've tried to get them sounding right
The whole fortnight
In backness, roundness and in height
Like tutors do
In summer in London
In summer in London**

(I'll never speak the same again)

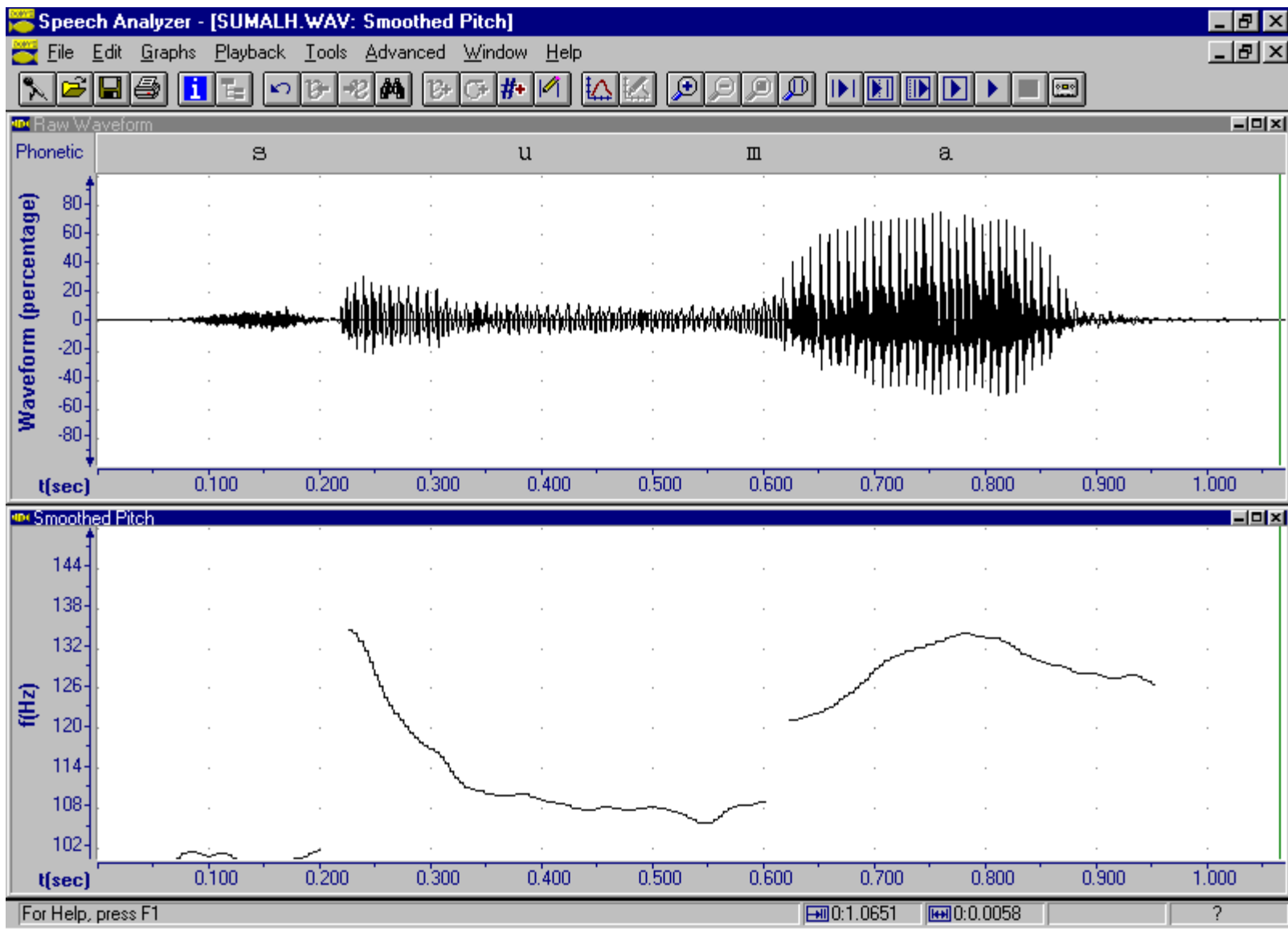
In summer in London

(I'll never speak the same again)

In summer in London

..... repeat to end

- Suprasegmentals
- Intonation
- Tonality, tonicity and tone



- Interlinear diagrams
- Diacritics

A: Hi!

B: Hello!

A: How are you?

B: Well, thanks. You?

A: Yes, good.

Really looking forward to Science Showoff.

A: `hi



B: Hello!

A: How are you?

B: Well, thanks. You?

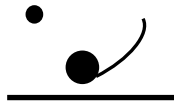
A: Yes, good.

Really looking forward to Science Showoff.

A: `hi



B: `hel/lo!



A: How are you?

B: Well, thanks. You?

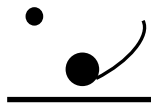
A: Yes, good.

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A: hi



B: hel/lo



A: /how are you



B: Well, thanks. You?

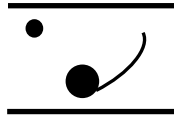
A: Yes, good.

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A: hi



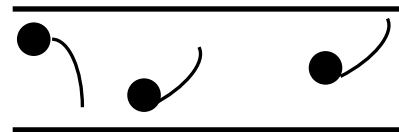
B: hel/lo



A: /how are you



B: 'well ,thanks | 'you



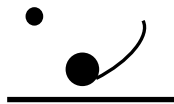
A: Yes, good.

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A: hi



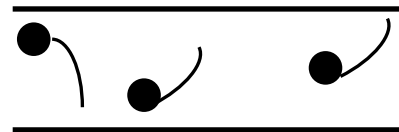
B: hel/lo



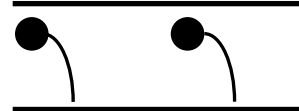
A: /how are you



B: 'well ,thanks | 'you



A: 'yes | 'good

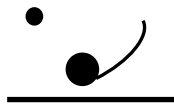


Really looking forward to Science Showoff.

A: `hi



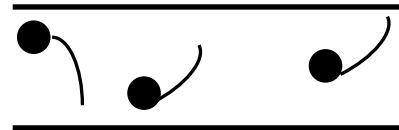
B: ˊhel/lo



A: /how are `you



B: `well ,thanks | 'you



A: `yes | `good



`really looking ˊforward | to ˊscience ˊshowoff



■ Doing Intonation

Everybody's learning to do intonation

(Come on baby, doing intonation)

You know that it can really help your
pronunciation

(Come on baby, doing intonation)

They say that intonation isn't that
hard to do

And a high fall makes you happy
when you're feeling blue

So come on, come on

Doing intonation with me

You've got a falling head now

C'mon baby

High dive, switch back

Well I think you've got the knack

Woh-woh

So that we have mastered it let's
practice again now

(Come on baby, doing intonation)

Proper intonation stops you
sounding insane now

(Come on baby, doing intonation)

Inter-linear diagrams are easy to
read

I love the blobs and squiggles and
know where they lead

So come on, come on – doing
intonation with me

You've got a falling head now

C'mon baby

High dive, switch back

Well I think you've got the knack

Woh-woh

Climbing climbing head can cause a
commotion

(Come on baby, doing intonation)

Do it with a sliding head if you've got
the notion

(Come on baby, doing intonation)

Don't forget tonality, tonicity, tone
And pre-head, head and tail will mean
they're not alone
So come on, come on
Doing intonation

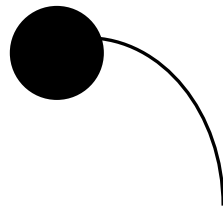
Come on, come on

Doing intonation

Come on, come on

Doing intonation with me

/ ˈ θ æ ɪ k j u /



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