Emergency in Phonological Acquisition

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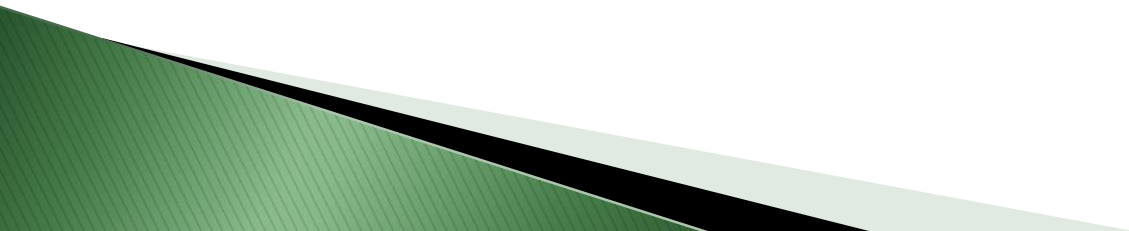
São Paulo School of Advanced Studies in Speech Dynamics
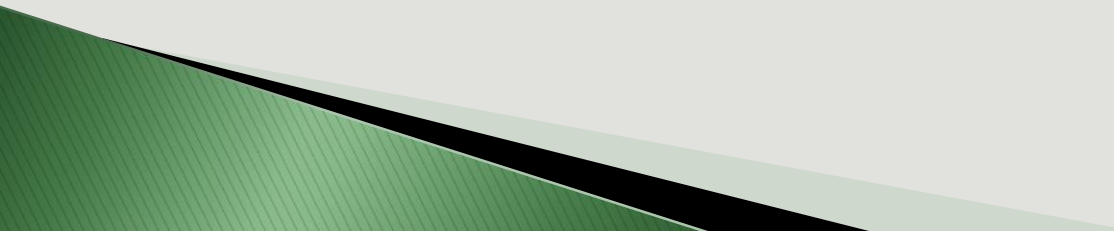http://dinafon.preface.com.br/eventos/spsassd/
June 2010

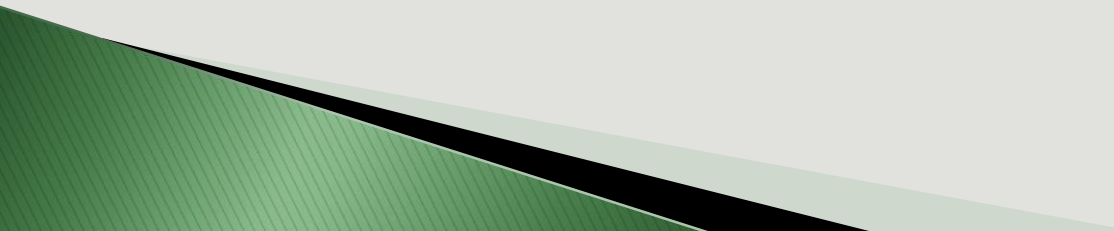# SPSASSD - São Paulo School of Advanced Studies in Speech Dynamics

Overview

- 1. Three case studies
- 2. Mental representations
- 3. Key issues
- 4. Final remarks

Aim of the talk

To consider some language acquisition case studies from Brazilian Portuguese in order to contribute towards the debate on the nature of mental representations.

Insights from discussions with:

Eleonora Albano
Giovana Ferreira Gonçalves
Larrisa Berti
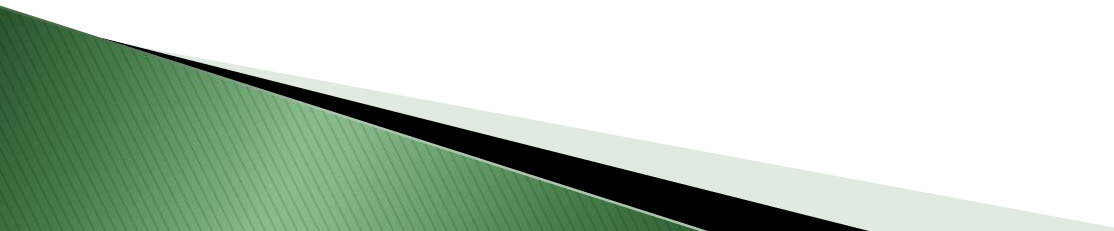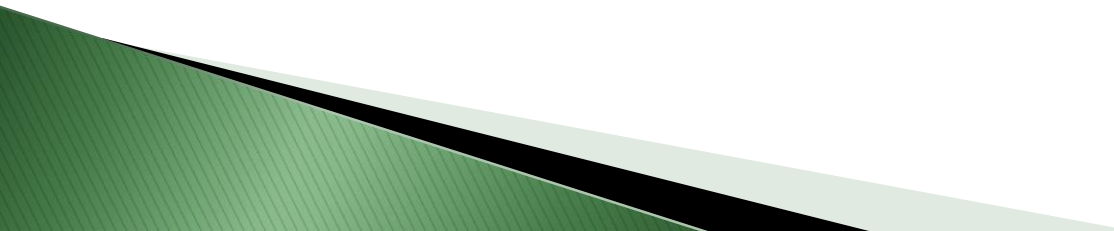Marcia Zimmer
Ubiratã Alves

Hani Camille Yehia

My students

All case studies involved children from Belo Horizonte (Minas Gerais).

These case studies also shared some theoretical proposals which are presented by Bybee (2001) and Pierrehumbert (2001, 2003).

- ✓ Phonetic detail

- ✓ Lexical diffusion patterns

- ✓ Frequency effects

Case Studies:

1. Miranda (2007)
2. Guimarães (2008)
3. Cristófaro Silva et al. (2005)

Case Study 1: Cluster reduction
Izabel Miranda (2007)

- Cluster reduction is observed during language acquisition: : p<u>r</u>ato> pato 'duck' or li<u>vr</u>o>li<u>v</u>o 'book'

- Cluster reduction is also observed amongst adult population, being more productive in unstressed position: li<u>vr</u>o>li<u>v</u>o 'book', p<u>r</u>ocura>pocura 'search'. (p<u>r</u>ato> pato 'duck')

Covert Contrast

Scobbie et al. 2000.
Albano's students

✓ Contrast: CC x C

adult: prato 'plate' *versus*   pato 'duck'
children: prato> pato   pato

✓ Covert contrast shown by children acquiring tautosyllabic clusters in BP indicates that cluster reduction is, in fact, cluster construction.

Methodology:

- Children aged 3:0 to 5:11
- 16 children: 14M and 2F
- 20 words tested in children who present CCV ~ CV alternation and also in a control group of children who had already acquired CCV.

Fig 1: Spectrogram of *"broa"* with CCV

Fig 1: Spectrogram of *"broa"* with CV (CCV>CV)

Words tested:

broa 'corn cake'	boa 'good'
prato 'plate'	pato 'duck'
prego 'nail'	pego 'get'
pressa 'hurry'	peça 'piece'
bruxa 'witch'	buch 'bath sponge'
branco 'white'	banco 'bench'
frita 'fried'	fita 'lace'
grato 'thankful'	gato 'cat'
troca 'exchange'	toca 'burrow'
troco 'change'	toco 'piece of wood'

Case Study 1: Cluster reduction
Izabel Miranda (2007)

Fig 3: Duration of the vowel in CV syllable and (CCV)>CV syllables for children that have not acquired CCV
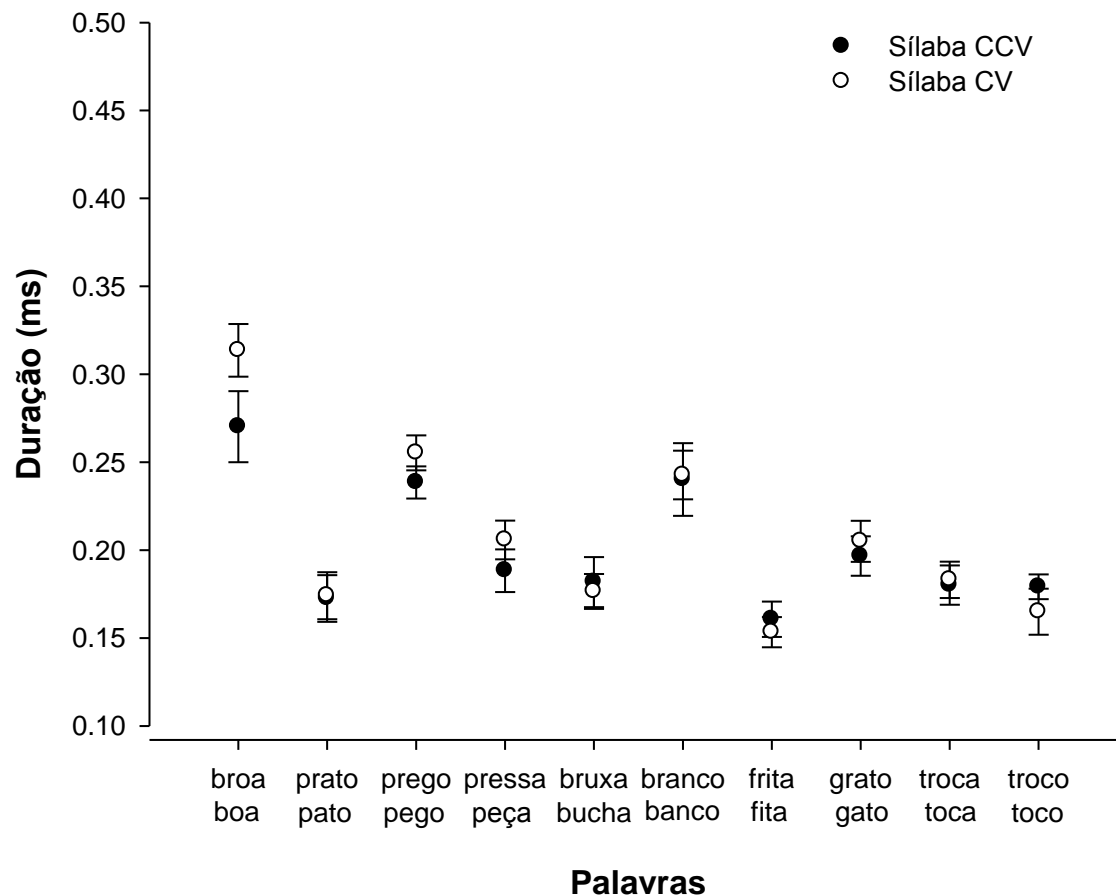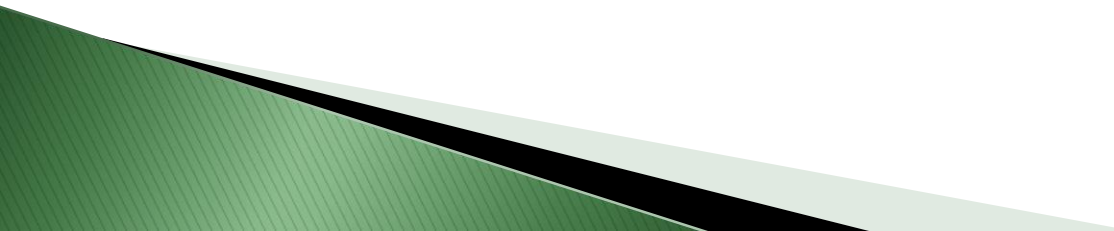
Fig 4: Duration of the vowel in CV syllable and CCV syllables for children that have acquired CCV

- ✓ **Phonetic detail is relevant in language acquisition.**

- ✓ **Covert contrast operates in production.**

- ✓ **What about covert contrast in perception?**

bruxa *"witch"* CCV

b®uxa *"witch"* CCV>CV

bucha *"sponge"*

✓ **Children seem to be able to discriminate lexical items with covert contrast involving (CCV)CV and CV**

✓ **More children will be examined**

✓ **Speech morphing will be used with the aim to identify the relationship between vowel duration and CCV discrimination**

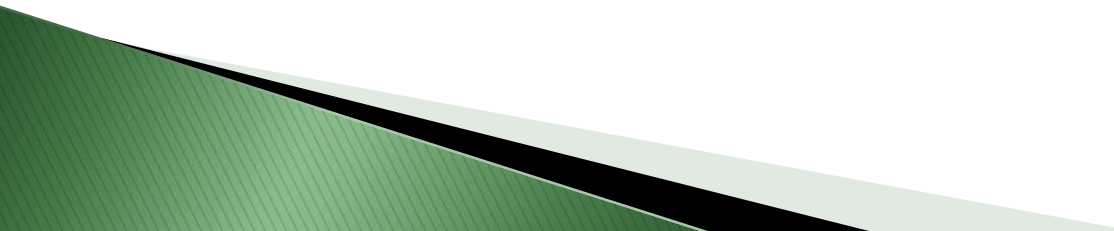# Phonetic detail is relevant in child language acquisition

Case Study 2: Allophones
Daniela Guimarães (2008)

Alveolar stops [t, d] become affricatte [tʃ,dʒ] when followed by a high front vowel.

tia	"aunt"	Scot
dia	"day"	England

- Guimarães (2008) considered the acquisition of affricates in a palatalizing dialect.

- She intended to evaluate phonetic detail during the acquisition of affricates.

- She also intended to consider the role of lexical knowledge during the acquisition of affricates.

- She spent 4 months at York University working with Marilyn Vihman.

Methodology

4 children:3 male and 1 female

Before 25words; no affricated reported

Longitudinal study for 12 months

- Great variability in segments in the production of a given word whose segmental target was the affricate

h, ts, k, t, ʃ, s

- Different words displayed different segmental variability
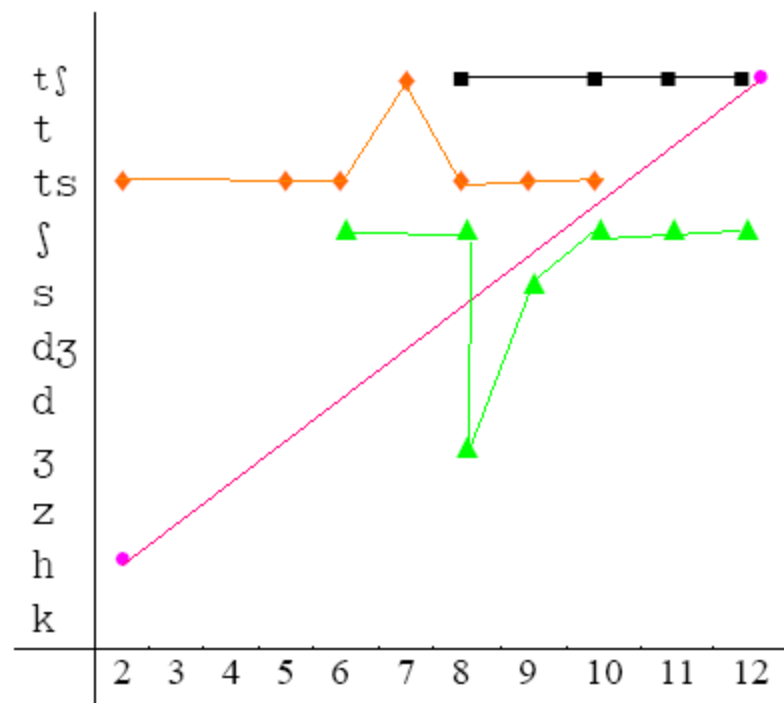
Fig 1: Four children – affricate production

Fig 4: dente

Fig 5: elefante

Different segments compete for different words at different stages of language acquisition
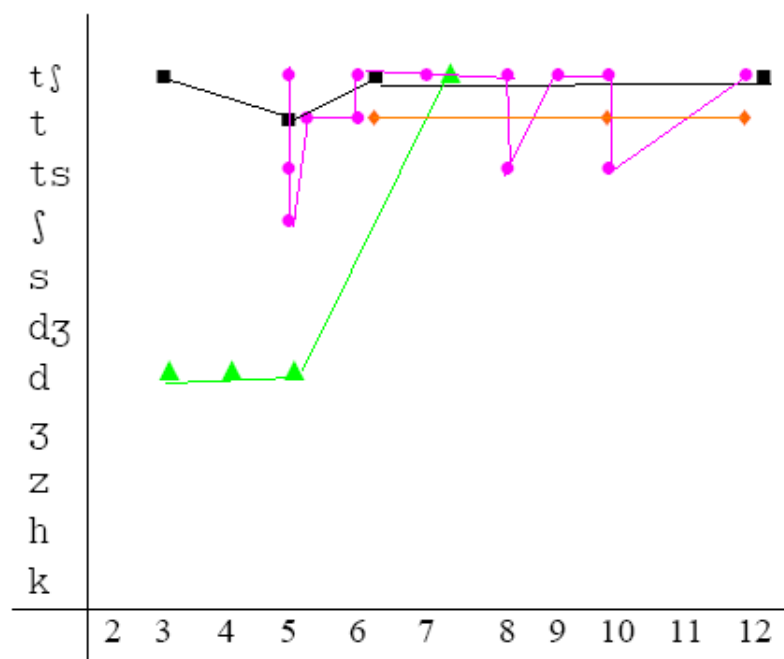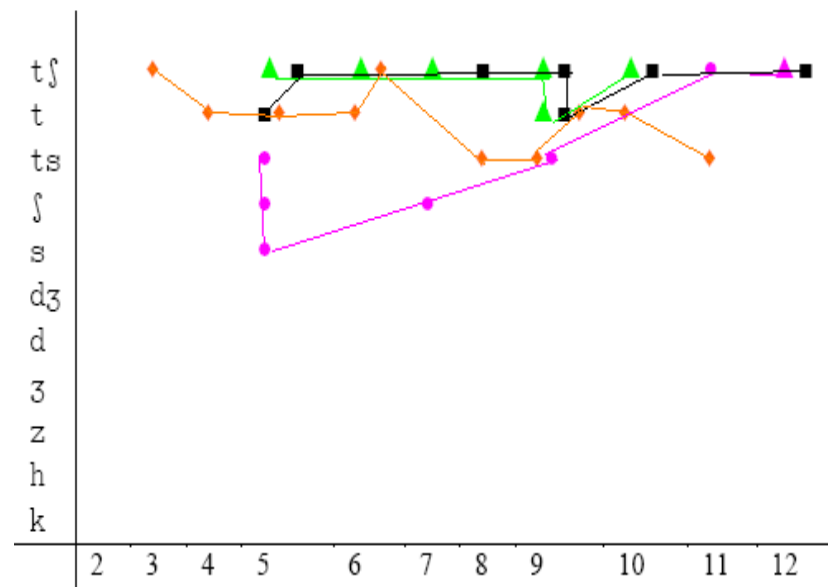
Fig 2: tira

Fig 3: tigre

Lexical knowledge contributes to shaping phonological knowledge in language acquisition
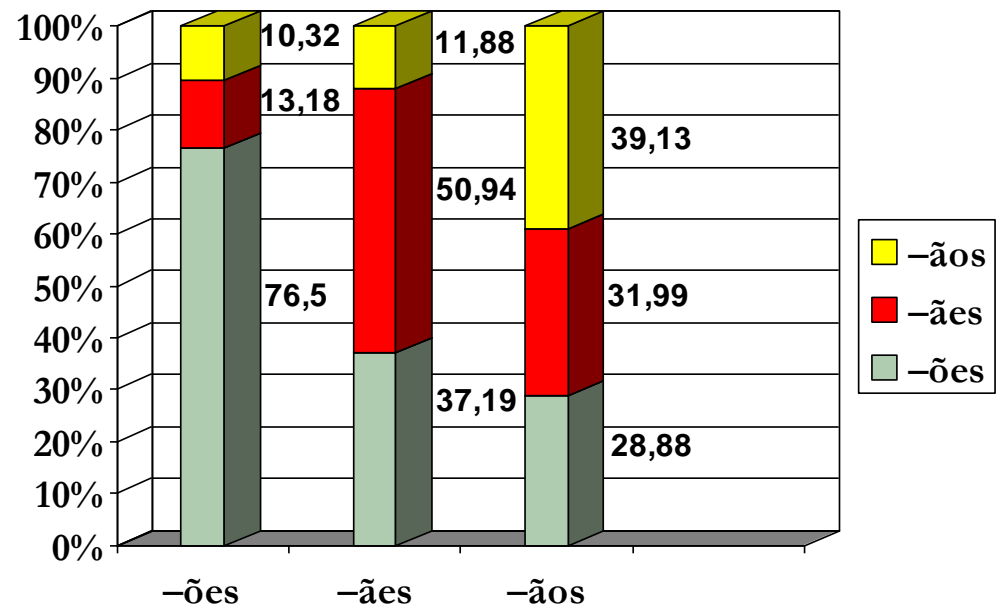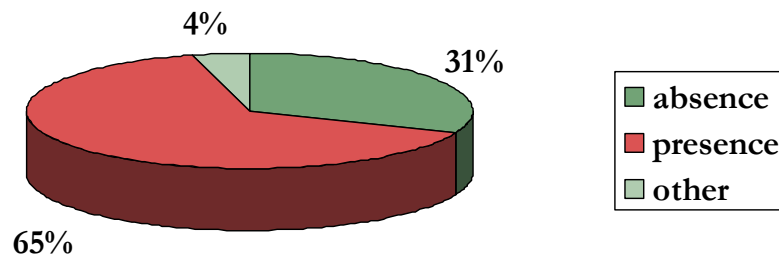
Case Study 3: plural of nouns in –ão
Cristófaro Silva et al. (2005)

Plural Type		Singular	Plural	Glossa	Observation
1. Regular		ˈkaza	ˈkazas	'Houses'	Add (s)
		muˈzew	muˈzews	'Museums'	
2. Methaphony		ˈovu	ˈɔvus	'Eggs'	Change in the stressed vowel and add (s)
3. Final –R		ˈkoh	ˈkoɾis	'Colors'	Add (is)
4. Final –S		ˈmes	ˈmezis	'Mouths'	Add(is)
5. Final –L which is vocalized		ˈsaw	ˈsajs	'Salt (pl.)'	Change in the lateral/w to (j) and add (s)
6. Final ãw	ãws	mãw	mãws	'Hands'	Add s (regular)
	ãjs	pãw	pãjs	'Bread (pl.)'	Change in the final diphthong (w) to (j) and add (s)
	õjs	liˈãu̯	liˈõjs	'Lions'	Change in the vowel ã to õ, the final diphthong (w) to (j) and add (s)

- 40 children aged 3 to 12

- Private and state schools

- 46 words tested

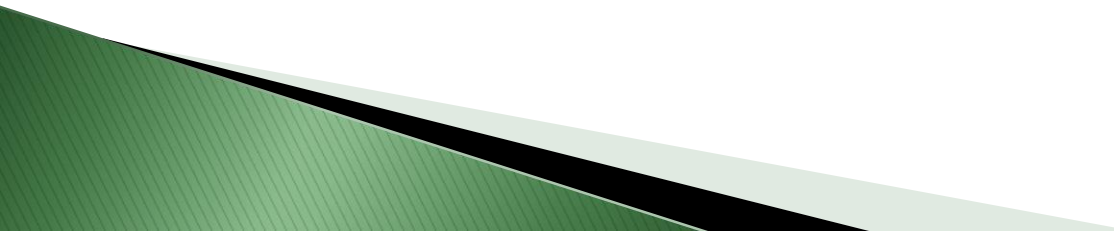# Case Study 3: Plural of nouns ão
Cristófaro Silva et al. (2005)

- –ões is the most frequent plural formation for –ão words. Its wide use indicates that frequency effects are relevant in language acquisition.

Frequency effects in language acquisition

Summary:

- **Miranda (2007):**
  phonetic detail

- **Guimarães (2008):**
  lexical knowledge

- **Cristófaro Silva et al. (2005):**
  frequency effects

On the nature of mental representations

What are the core properties of mental representations?

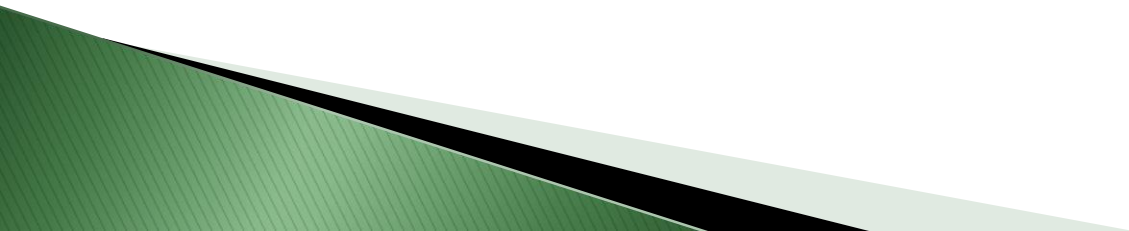# On the nature of mental representations

phonemes...
distinctive features...
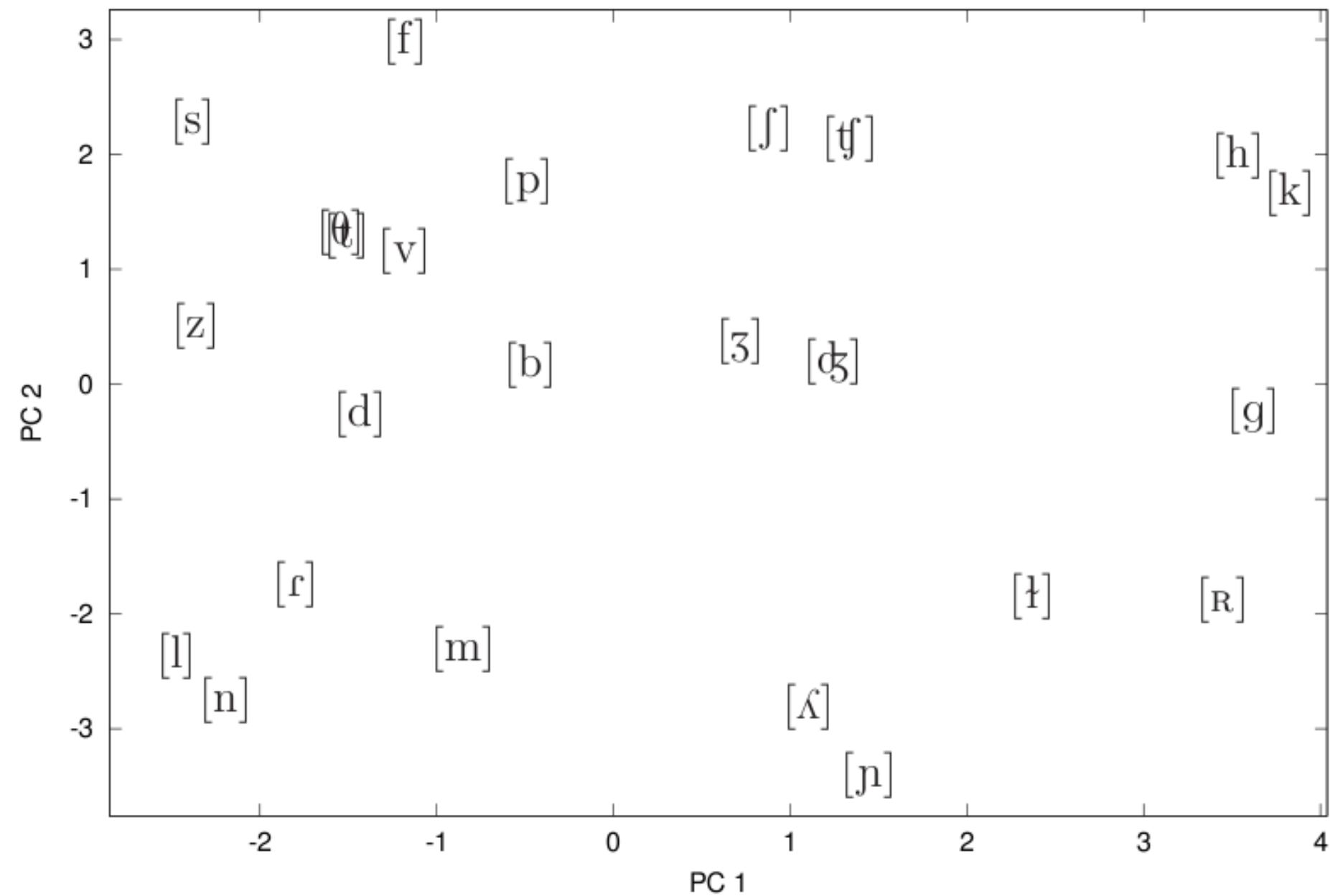elements...
acoustics parameters...
gestures...

2D Plot - the proportion of variation explained is 0.44

Você fala (You speak)
[se fala]
CEFALA

Center for Research on Speech, Acoustic, Language and Music
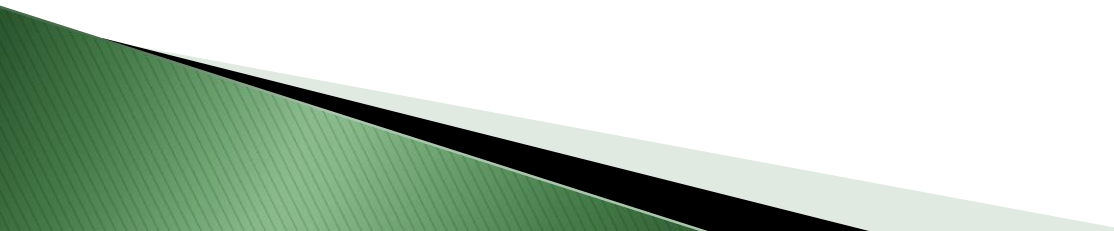

Você mexe (You move)
[se mɛʃi]
CEMECH

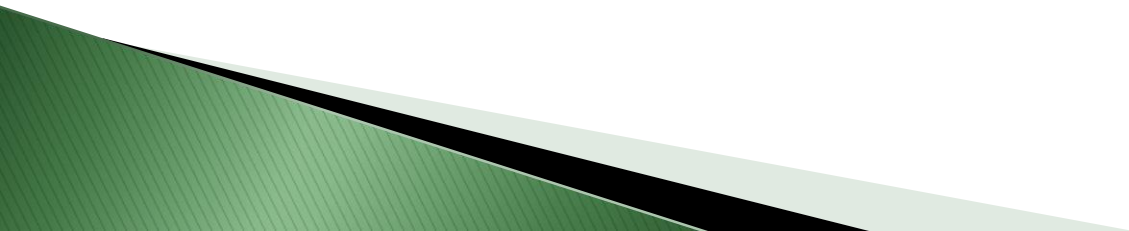**C**enter for Research on Human Motion, Expression and Behaviour

- Acoustic parameters and gestural configurations currently under investigation

- Perception and production to be addressed in combination

- Frequency effects yet to be better understood (corpora)

"Segments" are motor routines which form words.

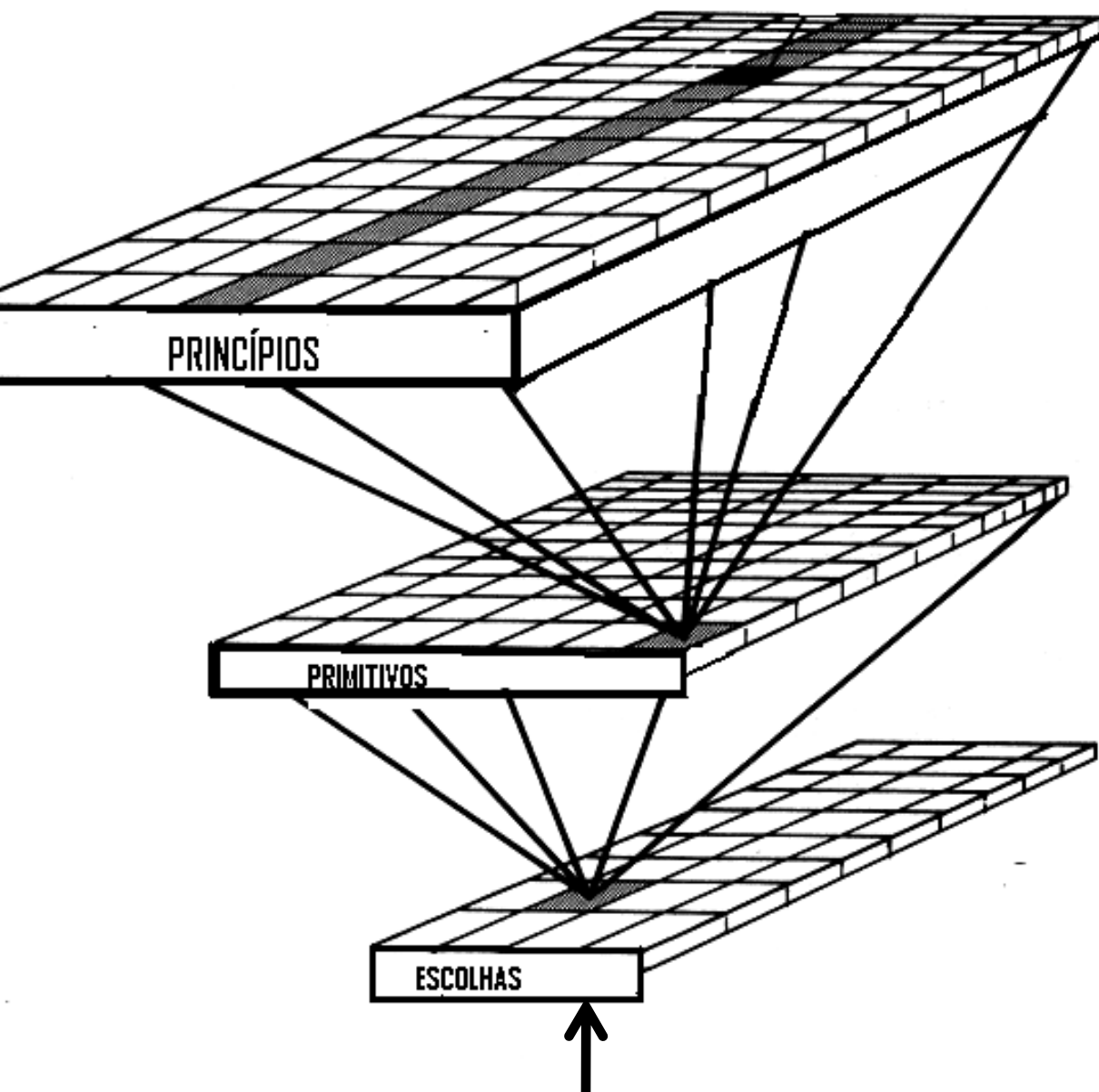Words as units of expression (meaning) and action (sounds).

Language use shapes representation.

Thanks for listening!

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PRINCÍPIOS

PRIMITIVOS

ESCOLHAS

[indivíduo-item léxico]

CONHECIMENTO GRAMATICAL

Gerenciados pelo sistema sensório-motor

Gerenciados pelo uso

DINÂMICO E EMERGENTE