

The role of accommodation during parent-child interactions in the acquisition of sociophonetic competence

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Outline

- I. Role of **social context** and **social interaction** in phonological acquisition (but also in attrition)
 - **phonetic-switching** within one language variety (as opposed to code-switching between languages) as accommodation strategy
- II. Role of child's **early vocal practice** in the formation of internal representations
 - the child's **adaptation of input** to preferred prosodic shapes

Take home messages (I)

- Children, especially bilinguals, show **awareness of multiple varieties** of their languages and exhibit a high level of **socio-phonetic competence** in the way they accommodate to different interlocutors
- Bilingual/bi-dialectal **children do not filter out their parents' accent** in cases where it is different from the community accent(s)
- Implications for a) what counts as a community grammar
b) how socio-phonetic info is represented/stored

(Khattab, 2007, 2009, 2013)

Take home messages (II)

- In the early stages of acquisition children may show the **influence of internal representations** on their production (and possibly perception of adult input)
- This shapes their production patterns in ways which are parallel to what is normally described in the literature as regression in accuracy and is a true sign of the **emergence of phonology**

(Khattab & Al-Tamimi, 2013; 2014, Vihman & Croft, 2007)

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I. “Phonological acquisition”

Acquisition of a phonological system

phonemic contrasts; phonological
rules/processes/constraints

Accent/dialect acquisition

community grammar; sociolinguistic
variability; role of parents then peers

Acquisition of sociolinguistic competence

individual and community grammars;
variability in expression

Community grammar

- “Language is a social fact which exists outside the individual” (Labov, 2014)
- The individual has to perceive and reproduce such generalised patterns
- High degree of uniformity in aspects of lang. (Weinreich et al, 1968)

Individual grammar

- Individuals construct grammar on the basis of input they are exposed to
- Each individual ends up with a particular version of the grammar
- The speech community is a vague assembly of these idiolectal variants (Holmes, 1969)

I.1 What data does the child attend to in the process of becoming a native speaker?

- Detailed accent features are acquired very early and concurrently with the acquisition of phonemic contrasts (e.g. Foulkes et al, 1999; 2002; Roberts & Labov, 1995)
- Later stages: Labov (2014): “community grammar”

“**children reject the idiosyncratic features of their parents’ phonetic system** if they do not match the pattern of the larger community” (p.19)
- But what about style-shifting and accommodation in social interactions? Are these patterns transient and do they live outside “phonology”?

I.1 What data does the child attend to in the process of becoming a native speaker?

- **Bilingual situations?**
- What if both parents are speakers of a minority language and the L2 is mainly acquired outside the home?
- Chambers (2002): “**Ethan experience**”: assumption that 2nd generation immigrants learn the L2 in a native-like manner regardless of their parents’ accent and develop **accent filter** for parental second language features
- narrow view of **sociolinguistic competence**

I.2 Sociolinguistic competence in bilinguals

- **which language** to speak with whom and in which situational context, topic, register, activity, etc.

e.g. Ervin-Tripp & Reyes, 2005; Fantini, 1985; Fishman, 2000; Genesee, Boivin & Nicoladis, 1996; Goodz, 1994

- **little emphasis on** the bilingual's ability to switch between **varieties of the same language**

e.g. standard and non-standard varieties, or native and non-native varieties of the same language (cf. Zentella, 1997; Al Khatib, 2003; Purcell, 1984)

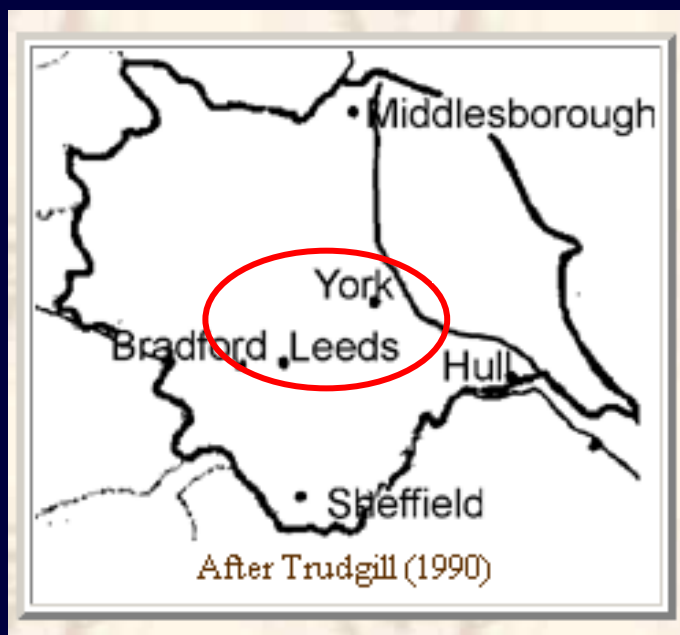
- **current study: phonetic-switching** within one language (as opposed to code-switching) as accommodation strategy

I.3 Research Questions

- What **language varieties** do English-Arabic bilinguals growing up in the UK acquire from a young age?
- What patterns of phonetic **convergence (and divergence)** are evident in their daily interactions?
- What do these tell us about the influence of **parental input** and child's **developing socio-phonetic competence**?

I.4 Data from English-Arabic bilinguals

- **English-Arabic** bilinguals
- Ages 5, 7 and 10
- Born and bred in **Yorkshire**, England
- English-dominant



Monolingual			Parental origin	
Subject	Age	Sex	Mother	Father
E5	5	F	Elsewhere	Elsewhere
E7	7	M	Elsewhere	Elsewhere
E10	10	M	Yorkshire	Elsewhere

Bilingual			Parental origin	
Subject	Age	Sex	Mother	Father
B5	5	F	Beirut	Beirut
B7	7	M	Beirut	Beirut
B10	10	M	Beirut	Beirut

IViE corpus			Origin: Leeds			total = 28 speakers
F1	F3	F5	M1	M2	M3	
F2	F4	F6	M4	M5	M6	

I.3.1 Data from English-Arabic bilinguals

- **Language exposure:**

- ❖ Yorkshire + other mainly **other native** English varieties outside the home
- ❖ mainly Arabic at home, but also **non-native** English

- **Language use:**

- ❖ English-only outside the home
- ❖ English and Arabic at home

I.3.2 Patterns of variation

(Grabe & Nolan, 2001; Petyt, 1985; Trudgill, 1978; Wells, 1982)

	RP	Yorkshire
BATH	ɑː	ɑ
PALM/ START		ɑː
STRUT	ʌ	ʊ
FOOT	ʊ	
FACE	eɪ	eː
GOAT	əʊ	oː (ɔʊ)

I.3.3 Consonantal variables (1)

(r)

➤ English: approximant [ɹ]; Arabic: tap or trill [ɾ]; [r]

– English *road* [ɹəʊd]

– Arabic *road* [tʰɑriːʔ]

➤ English: non-rhotic; Arabic: rhotic

– English *circus* [sɜːkəs]

– Arabic *circus* [sirk]

I.3.3 Consonantal variables (2)

(I)

➤ English: 'clear' / 'dark'

- initial: *leaf* [li:f] (or [t̪i:f] in Yorkshire)
- final: *feel* [fi:t̪] (or [fi:ʊ] by young speakers)

➤ Arabic: always 'clear'

- initial: *'sponge'* [li:fe]
- final: *'elephant'* [fi:l]

I.3.4 Procedure

- Audio-recordings
 - **children:**
 - picture-based word elicitation + story telling with mothers
 - free-play sessions with monolingual English friends
 - **Different interlocutors for each session**
 - **adults:** reading lists + stories + interviews
- **Analyses:** auditory and acoustic (5593 tokens)

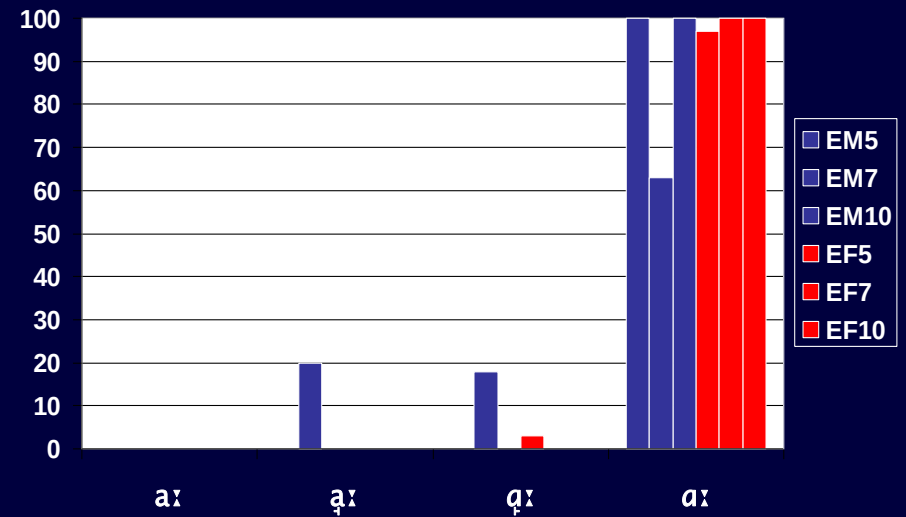
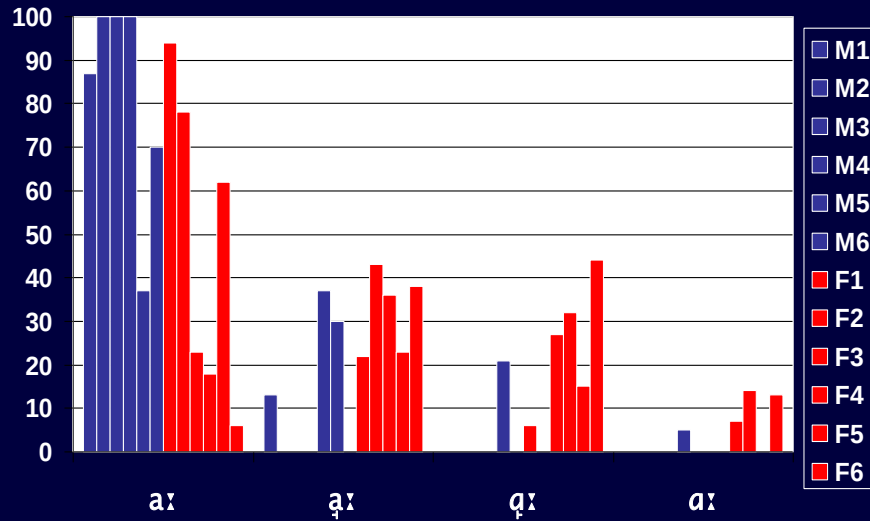
I.3.5 The challenge of identifying the community grammar:

wider vs immediate community

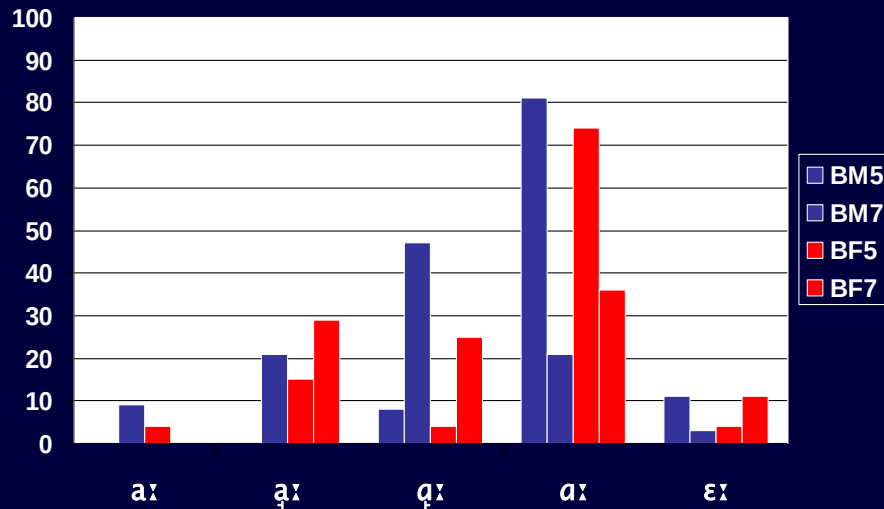
Leeds

START

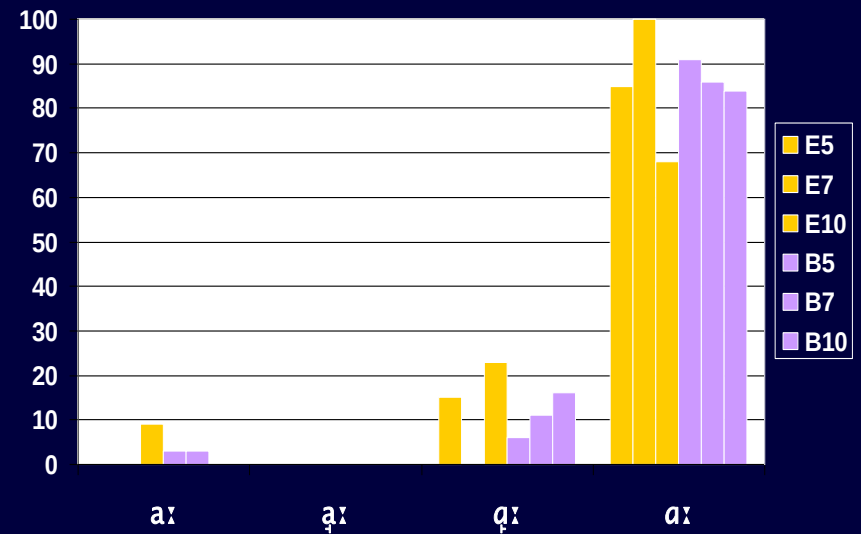
Monolinguals' parents



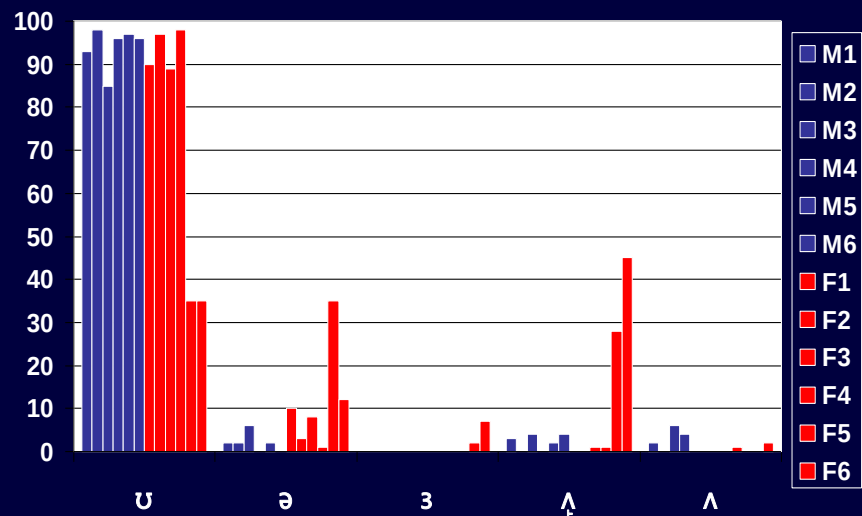
Bilinguals' parents



Children

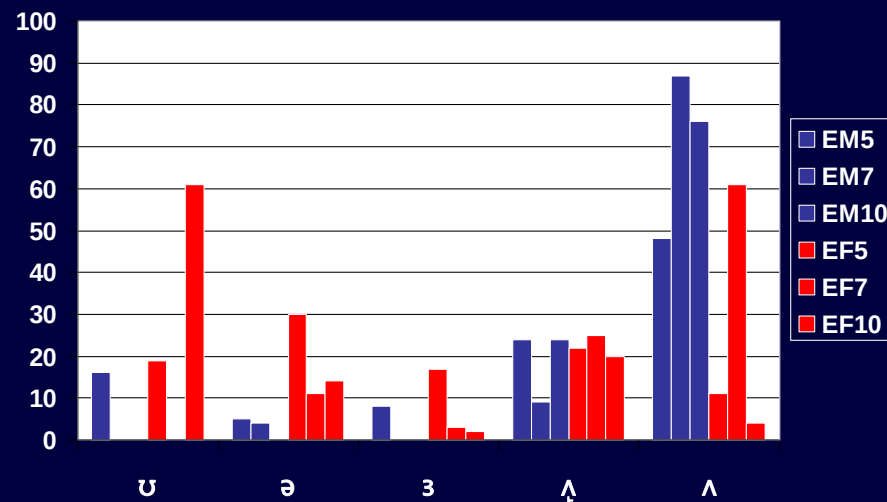


Leeds

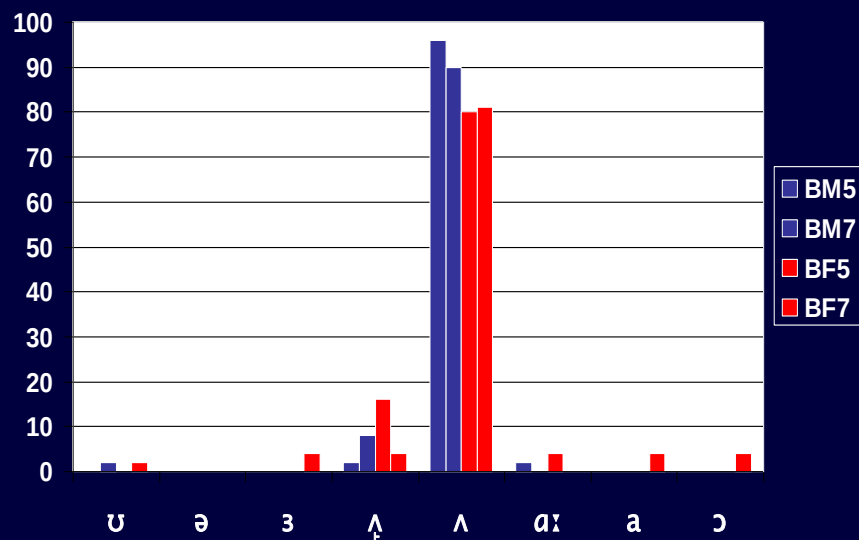


STRUT

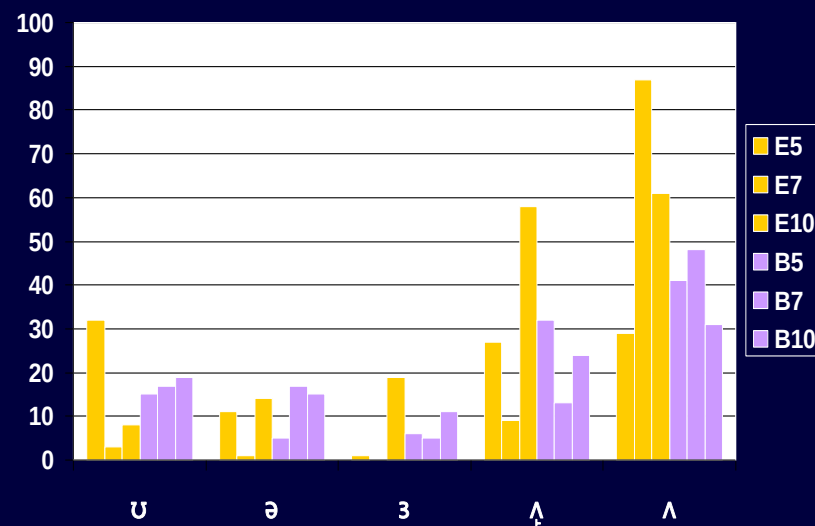
Monolinguals' parents



Bilinguals' parents



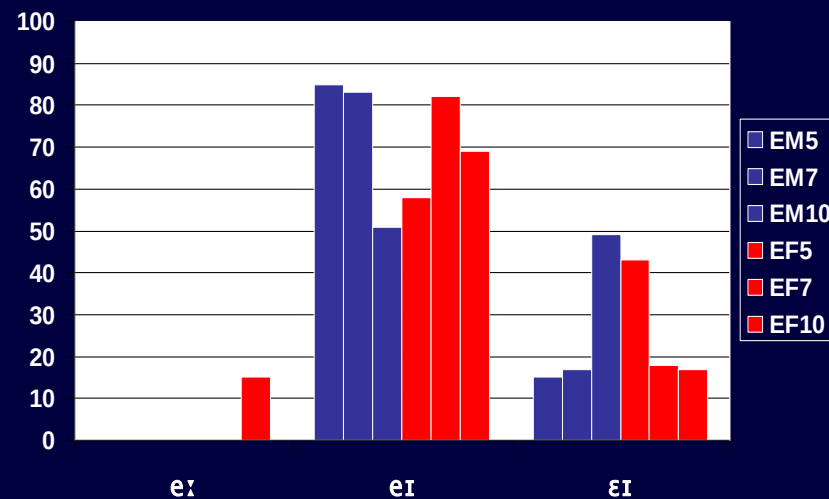
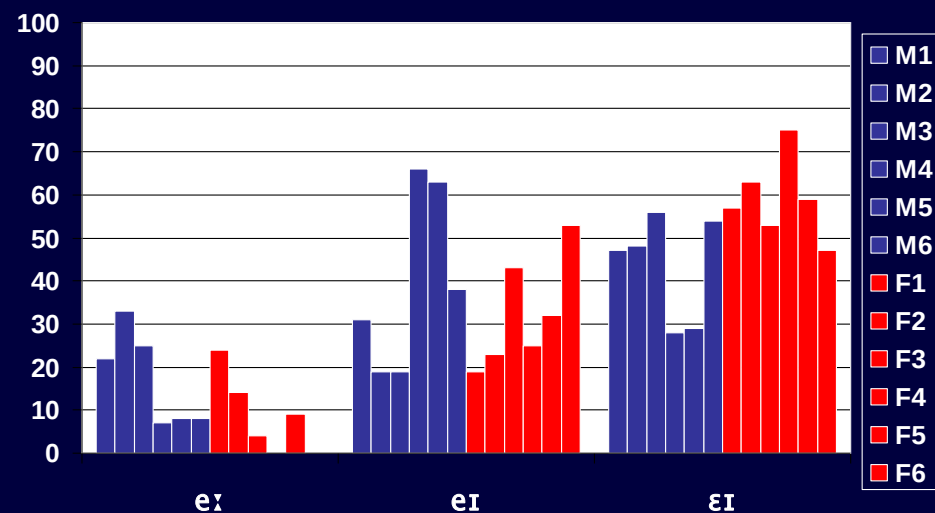
Children



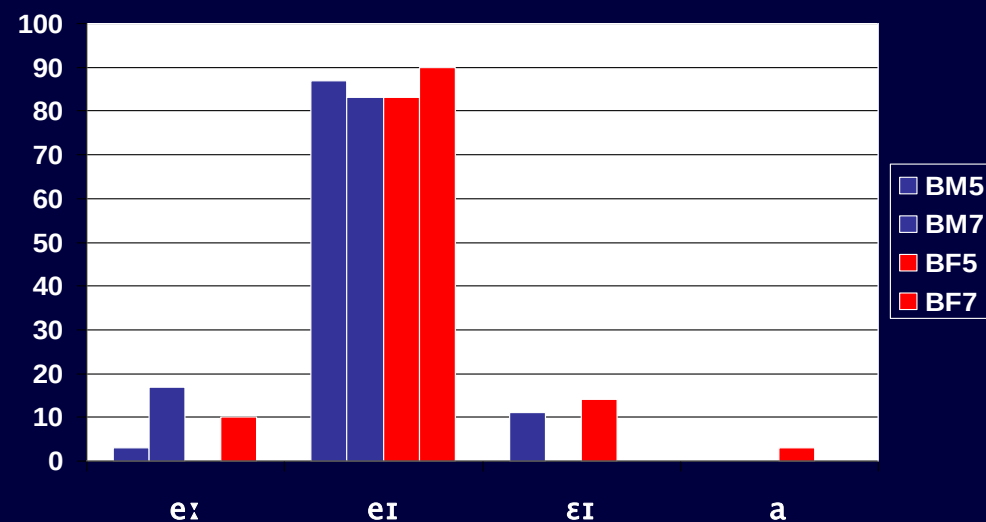
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FACE

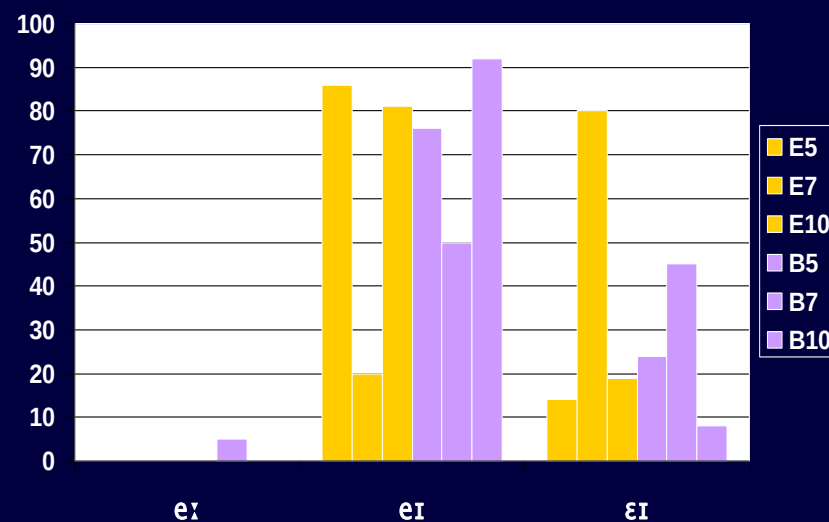
Monolinguals' parents



Bilinguals' parents



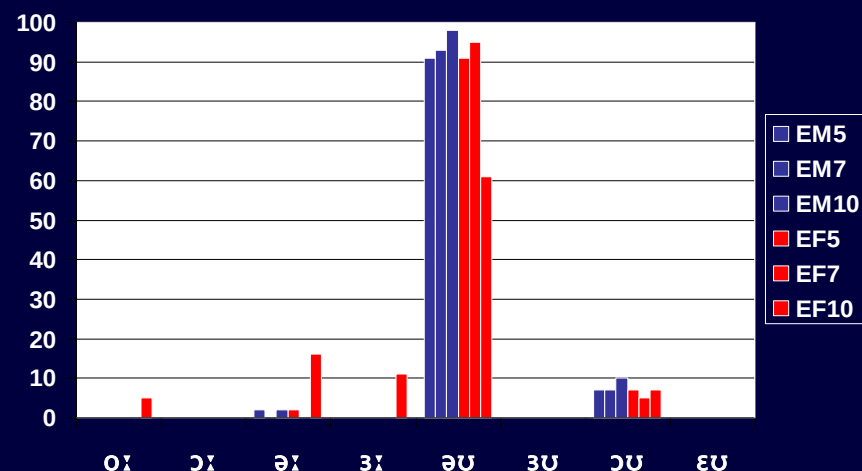
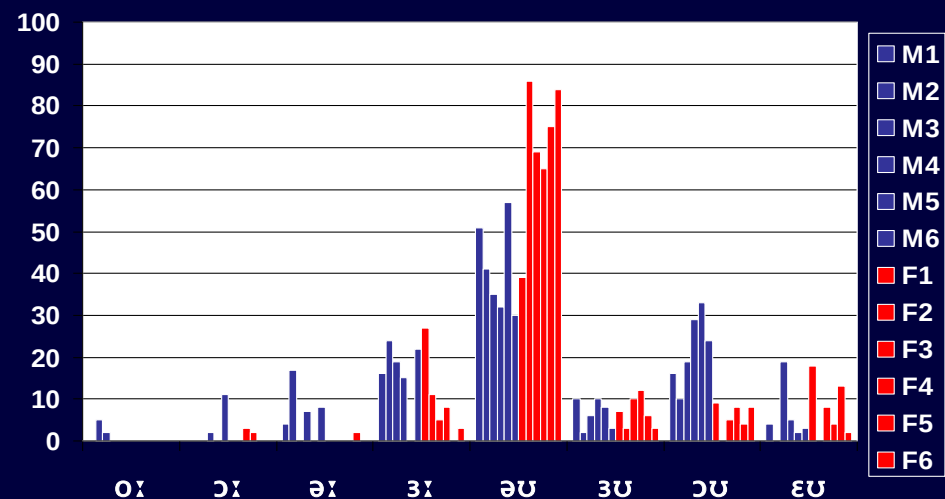
Children



Leeds

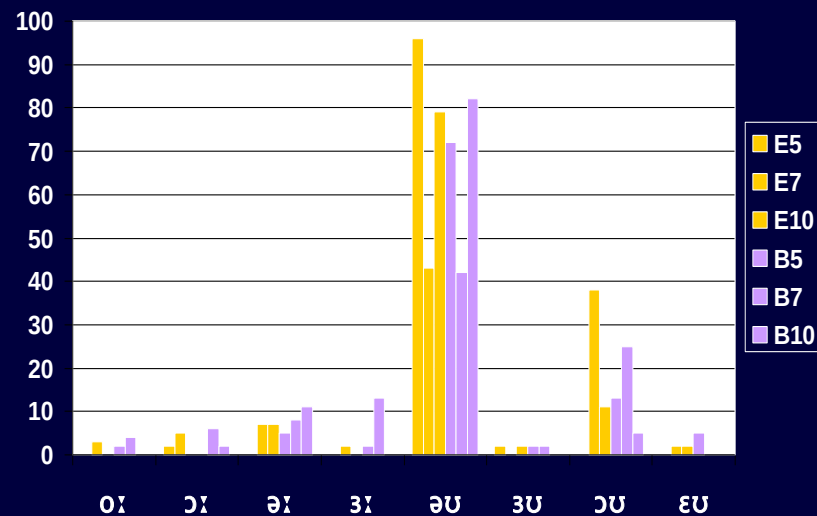
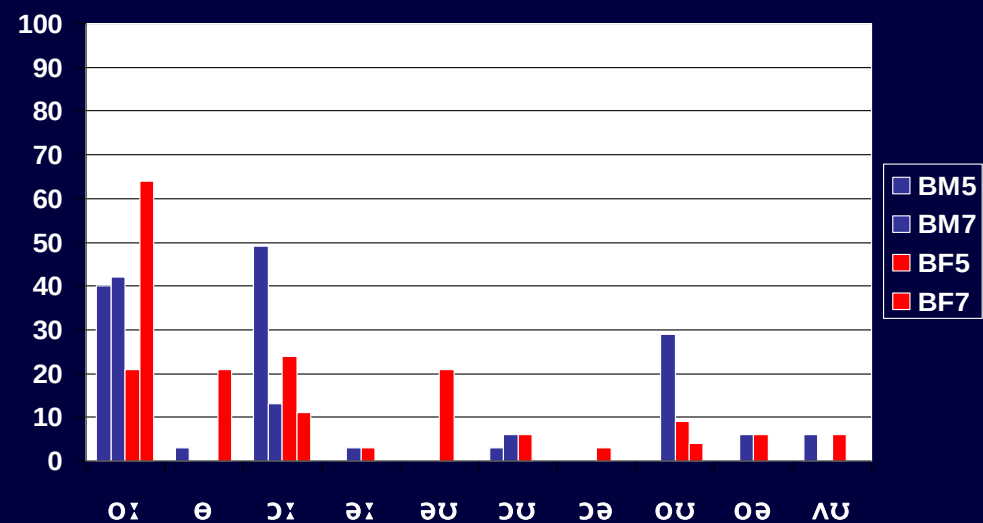
GOAT

Monolinguals' parents

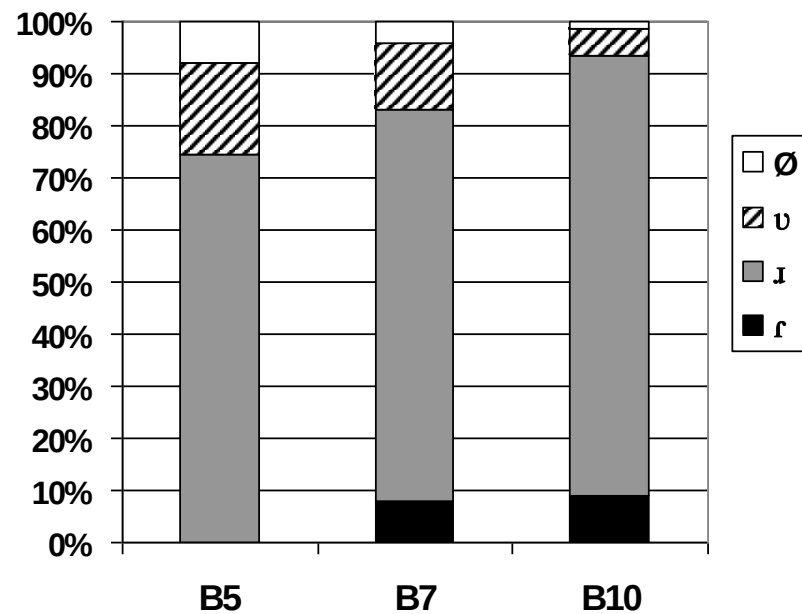


Bilinguals' parents

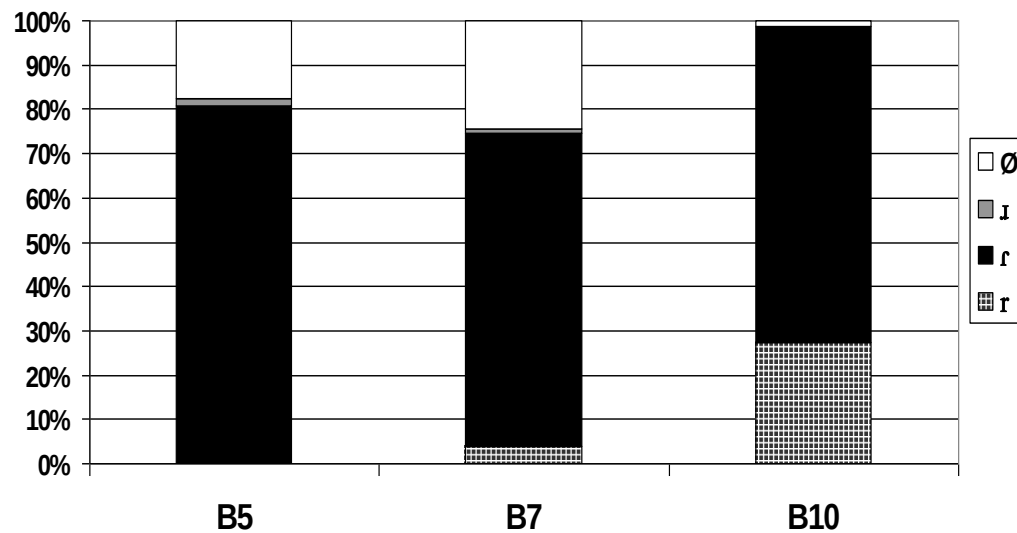
Children



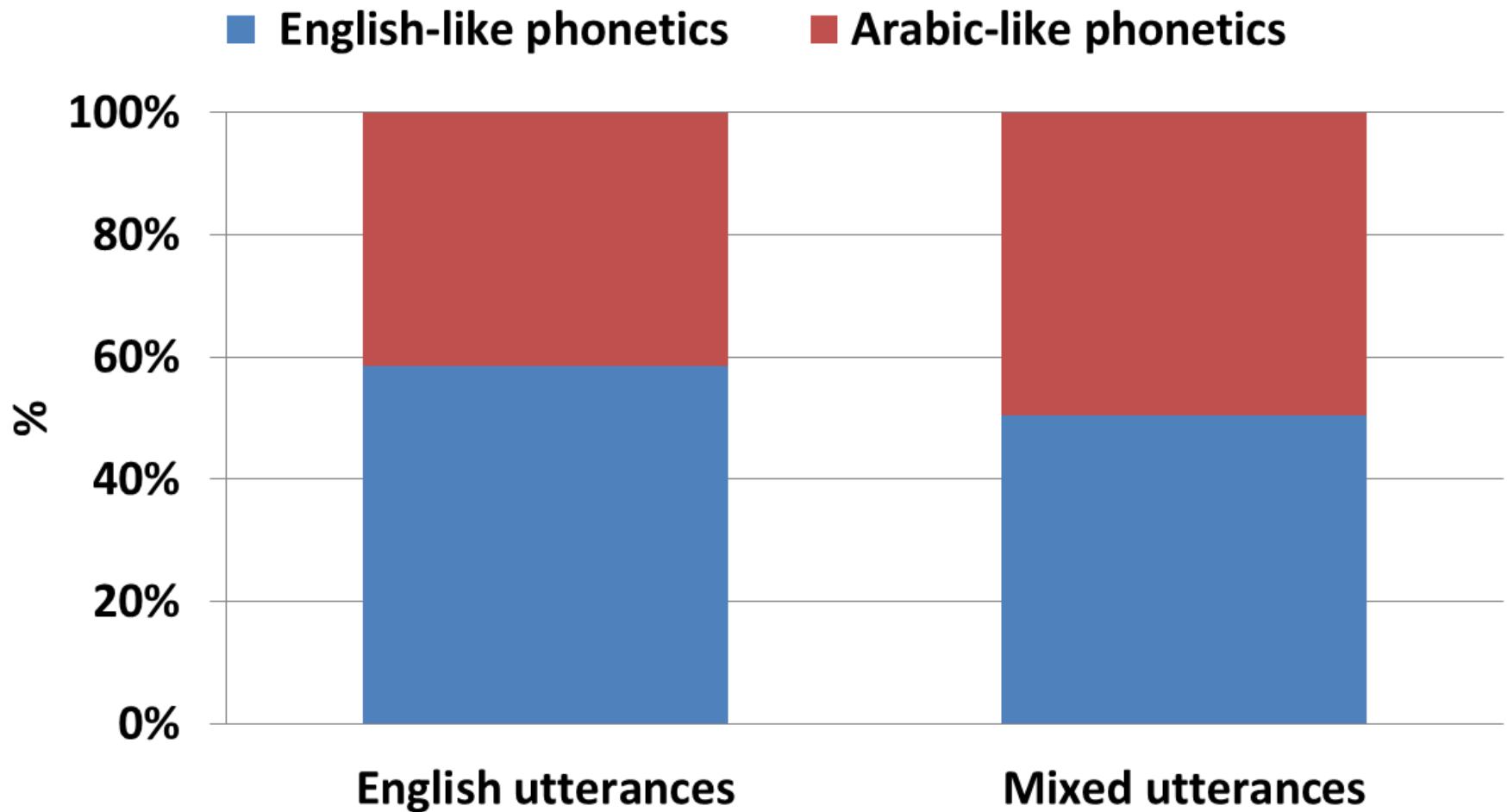
R results: bilingual children (English)



Arabic R results (bilingual children)



I.3.6 English code-switching in Arabic sessions



I.3.7 English CS in Arabic sessions

Gloss	Arabic sessions	English sessions
microphone	maɪkrəfɒn 	maɪkrɪfəʊn 
jumper	dʒʌmpər 	dʒʊmpəh 
scarf	skɑɪf 	skɑ:f 
castle	k ^h asəd 	k ^h astɫ 
(the) frog	f ^ə rɔ:g 	ðə frɔ:g 
rainbow	ˈreɪnbɔ: 	ɹeɪnbəʊ 
pepper	p ^h ɛpər 	p ^h ɛpə 

I.3.8 Role of code-switching to English during the Arabic sessions and relation to phonetic detail:

English-like phonetics

a. lexical gaps

Mother (pointing at a kettle):

[ʃu haɪda]?

What is that?

Child: [k^hɛtɪ]

kettle

(Mother moves on to the next picture)

c. negotiating meaning

(B7 describing a scene):

Child:

ʔɪ-sɪbe keɪn **ʃɒkt**

The boy was SHOCKED

Mother (trying to help):

keɪn zɪʃleɪn

(He) was sad

Child (protesting):

laʔ **hi wəz ʃɒkt**

No HE WAS SHOCKED

I.3.9 Role of code-switching to English during the Arabic sessions and relation to phonetic detail:

Arabic-like phonetics

a. English words treated like Arabic words

(B7, describing pictures)

Child:

noɣz

NOSE

Mother:

ʃu ʔismo bil ʕarabe

What is it called in Arabic?

Child (annoyed):

noɣz, ʔolet **noɣz**

NOSE, I said NOSE!

b. convergence and divergence (1)

(B7 during a story-telling activity):

Mother: ʃu eɪxdɪ-t-l-a?
 What is she taking for her?

Child: **ɡrosəriːz**
 GROCERIES

Mother: ʃu?
 What?

Child (annoyed): **ɡræʊsəriːz**
 GROCERIES!

b. convergence and divergence

Mother: jalɿa xabɿir-ne l-ʔʊsɿa

Come on, tell me the story

Child (B7): **lɿitəl rɛd raɪdɪŋ**... aɿ ma fiɿe

The LITTLE RED RIDING... ah, I can't!

Mother: mbala

Yes (you can)

Child: **hər mʌm kɒld ə**

HER MUM CALLED HER

Mother: **traɪ**

TRY

Child: ʔalɿ-t-l-a weɿn raɪħa...

She said to her 'where are you going'?

b. convergence and divergence (3)

Mother: ʔajɿa fiɿlm ʔazabak
Which film did you like?

Child (B10): dʒɔɿrdʒ əv ðə dʒʌŋgəl
GEORGE OF THE JUNGLE

Mother: ʃu sʰaɿr fi?
What happened in it?

Child : marɿa keɿn fi hal hʌntə keɿn ʃindo
litəl vilədz baʃdeɿn...
*Once there was this HUNTER who had
a LITTLE VILLAGE then...*

Child (after a while with no input from mother):

ðə hʌntə lɒst-ɪz waɪf ðen hi smaʃt ɪntə-ə tʃiː

*THE HUNTER LOST HIS WIFE THEN HE
SMASHED INTO A TREE*

Mother (catching up and interrupting):

ʔeː w ʃu sˈaɪr

yes, and what happened?

Child:

baɪdeɪn **dʒɔːrdʒ əv ðə dʒʌŋɡəl seɪvd hæ**

Then GEORGE OF THE JUNGLE SAVED HER

I.4 Interim summary: input for bilinguals

Wider
community

Immediate (monolingual)
community

L2 Parents

stɑ:t stɑ:t stɑ:t

stɹʊt stɹʊt stɹʊt

gəʊt gəʊt gəʊt

stɑ:t stɑ:t **stɑ:t**

stɹʊt stɹʊt **stɹʊt**

gəʊt gəʊt gəʊt

stɑ:rt stɑ:rt **stɑ:rt**

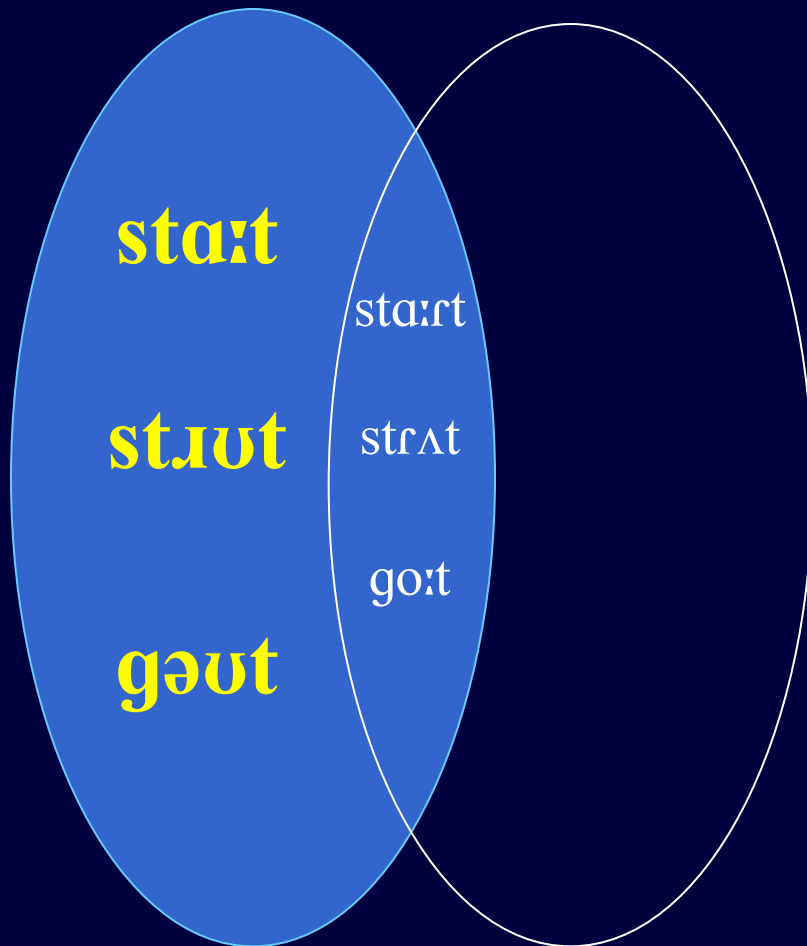
strʌt strʌt strʌt

go:t go:t go:t

I.4 Interim summary: output for bilinguals

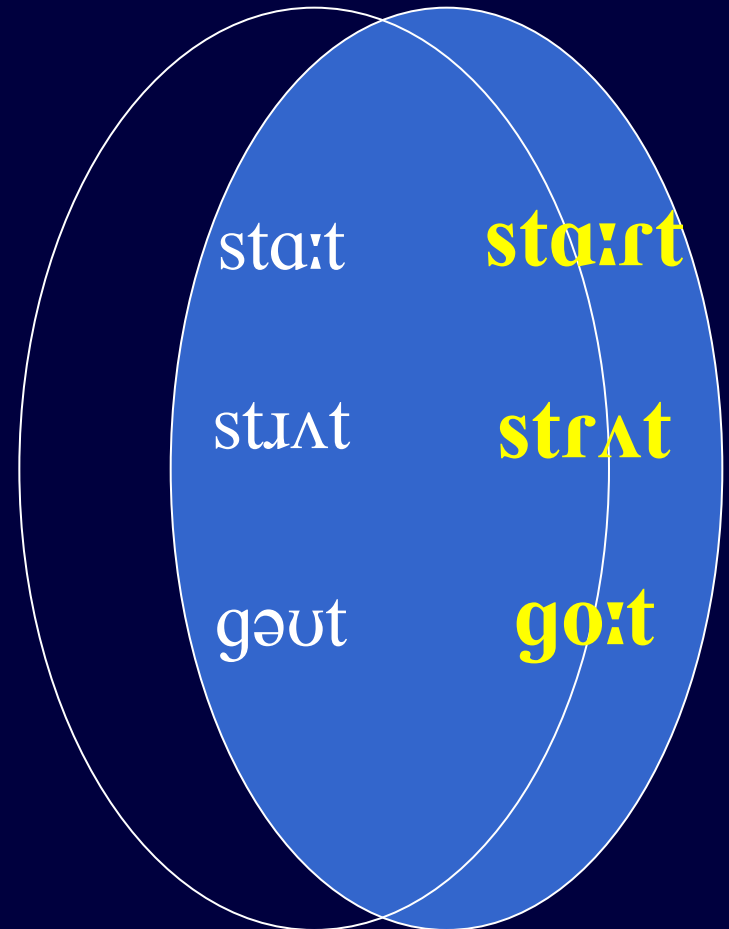
English Base

English



Arabic base

English code-switches



I.4 Interim Summary

- Children's production may exhibit **native-like phonology** in English-only and Arabic-only data, **BUT**:
- English produced during the Arabic sessions exhibits a **mixture of English- and Arabic-like patterns**
 - Effect of base language only explains part of the data
 - Conversation analysis shows signs of **convergence** and **divergence** to parental patterns in the remaining data (Khattab, 2013)

I.4 Interim Summary: challenges

- challenges the idea of '**accent filter**'
 - children have a wide repertoire of phonetic variants with interlocutor- and context-tags (compatible with usage-based models, e.g. Pierrehumbert, 2003)
 - detail does not get ignored but is rather stored and called upon for communicative purposes.
- **learning is embedded in social interaction** (Foulkes & Hay, 2014)
- What are the **linguistic consequences** of these socio-phonetic associations?
 - What is abstracted from these forms?
 - How are storage and activation affected? (clearly not just by frequency) → **role of attention and social meaning**

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II. When do children filter adult input?

- In the early stages of phonological development (ages 1-2):
 - **Speech planning and motor control** are difficult
 - Child initially relies on a small number of **well-practiced articulatory routines** (e.g. favoured syllable shapes, C, Vs), a.k.a templates (Vihman & Croft, 2007)
 - As their vocabulary rapidly expands towards the end of the 2nd year, **heavy demands** are placed on **memory**
 - One coping strategy is to both **select** words from the input that fit the child's templates and **adapt** others
 - **“Articulatory filter”** (Vihman, 2010) creates mismatch between adult input and child's production and leads to **temporary regression in accuracy**

II.1 Illustration from Lebanese Arabic

- Gemination is a salient phonological feature of LA, with lexical and morpho-syntactic role (Khattab & Al-Tamimi, 2014)

'CVCV(C)	'CVVCV(C)	'CVCCV(C)	'CVVCCV
'sabaʔ	'saabaʔ	'sabbāʔ	'saabbā
<i>race (noun)</i>	<i>(he) competed</i>	<i>(he) got ahead</i>	<i>sworn (3f.s)</i>

- All 26 Cs in Arabic can be geminated
- Proportion: 10% of Cs in child-directed-speech

- Adults and children also lengthen medial Cs in French and English words → increases phonetic CC freq.
- Adults variable in CDS

Examples: adults

Arabic	realisation	target C(C)	C(C) duration
te:ta	teˈtəːh 	C	88
ʒiddo	ʒiddəːh 	CC	158
te:ta	tɪˈttæːh 	C	193

French	realisation	C duration
bebe	bebe 	98
papa	pɛppæːh 	151

English	realisation	C duration
heloʊ	hæˌləh 	62
heloʊ	hæˌlloːh 	168

Examples: children

target	realisation	C(C) duration
ma:ma	mə:ma: 	100
ma:ma	məmma:h 	256
bebe	hɛbɛ 	117
moto	tɛ:tto'h 	521
beɪbi	pʰeɪpʰɪh 	118
kiti	kʰɪttʰi'h 	214
In Arabic target words: Mean C = 99; Mean CC = 168		

II.2 Acquisition of gemination

- Children initially produce **phonetically long sounds** regardless of target due to immature motor control → ample practice with phonetic lengthening (Vihman & Velleman, 2000)
- **Phonological lengthening** emerges with
 - ❖ greater motoric control
 - ❖ sensitivity to prosodic conditioning (relative length, speech rate, etc.)
 - ❖ acquisition of lexical contrast
- In the transition from phonetics to phonology, LA children use **C lengthening as bootstrapping for word learning**

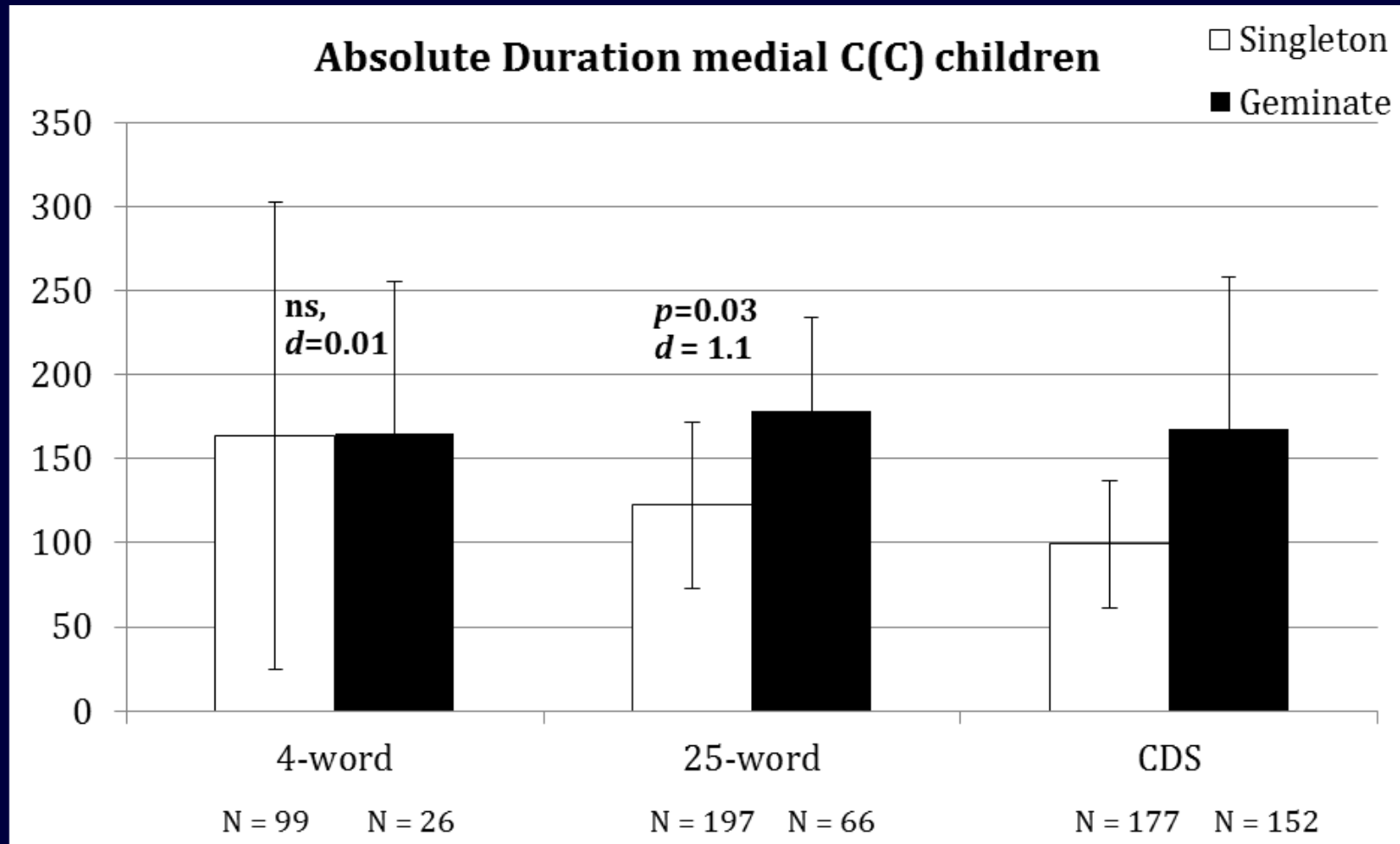
II.3 Data

- 10 children aged 1;1 – 2;2
- Longitudinal design: monthly 30min recordings of mother-child interactions at home
- Focus on 2 periods (Vihman & McCune, 1994)

	vocab size	age
4-word pt (onset of 1-word stage)	~12	1;0
25-word pt (end of 1-word stage)	~50	1;6

- Analysis: disyllables with medial short and long Cs
- Impressionistic and acoustic measures

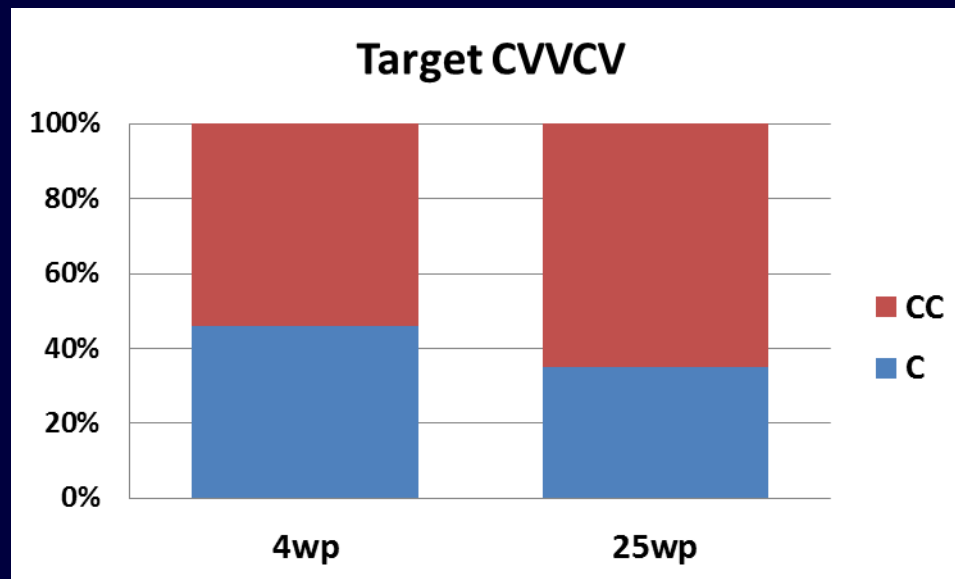
II.4 General results



Similar results for proportional durations

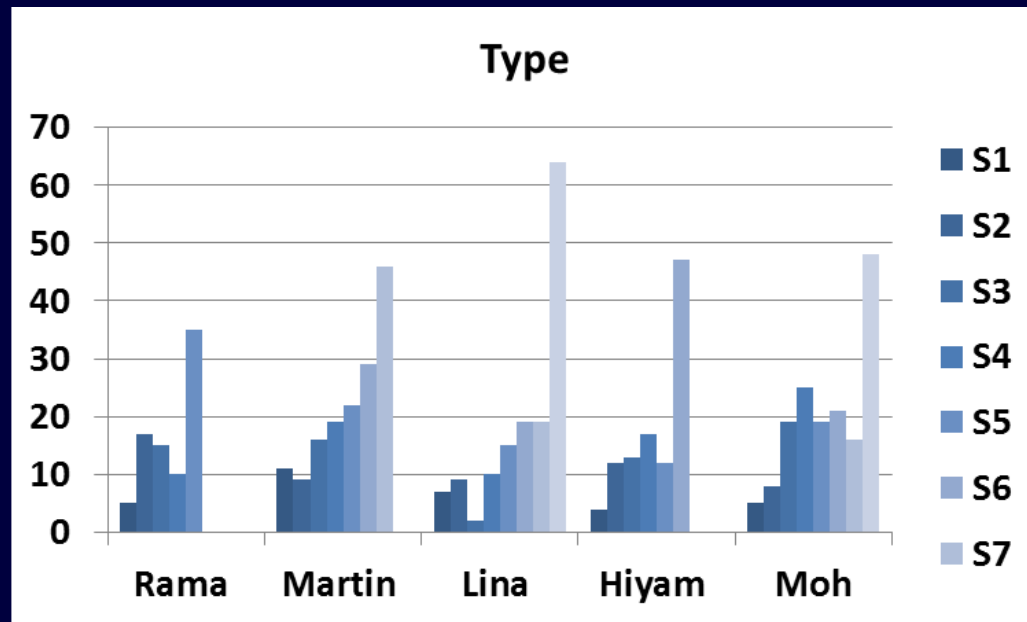
II.5 Phonetic or phonological lengthening?

- Despite apparent emergence of the singleton-geminate contrast at the end of the single-word stage, six of the children adapt input to a **CVC:V(C) templatic structure**
 - many of their words are less accurate at the 25wp

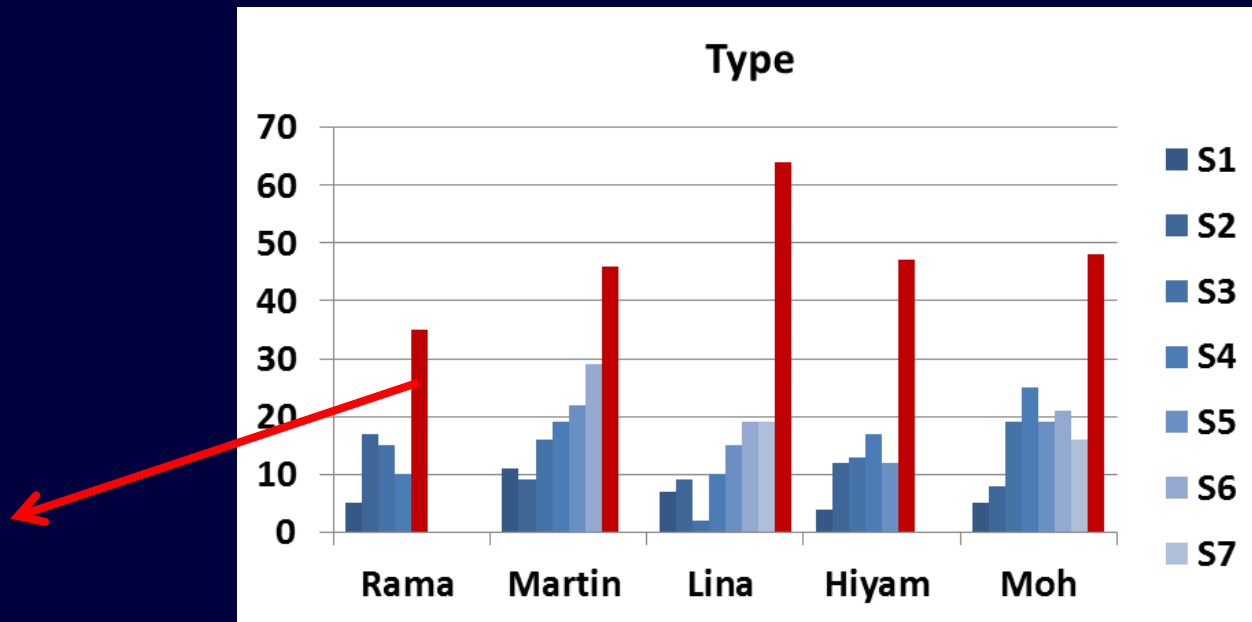


- This **coincides with** a period of **marked vocabulary increase**

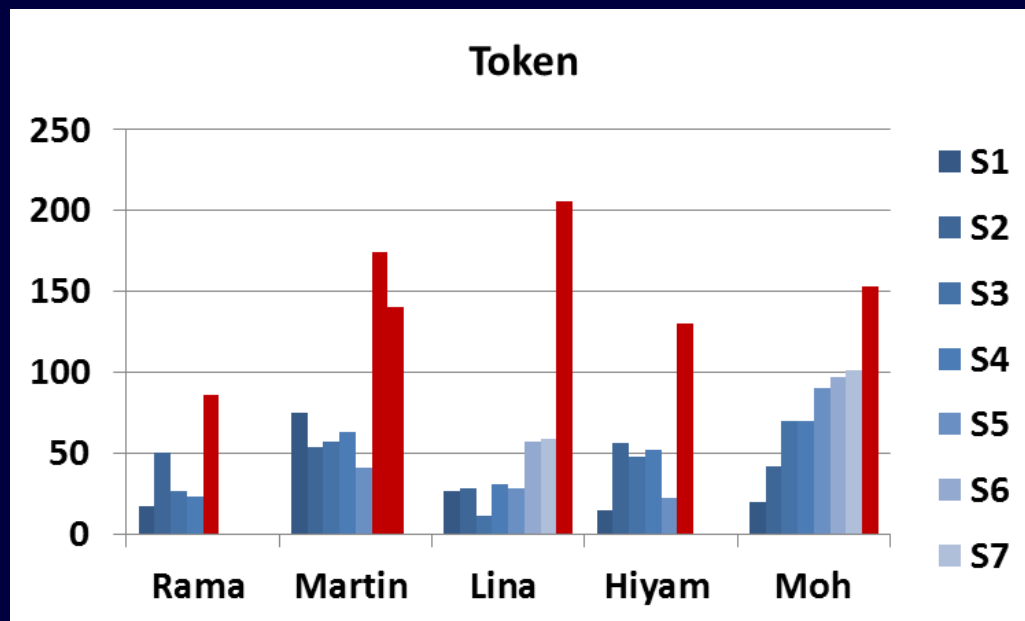
II.5 Lexical development over time



II.5 Lexical development over time



Point of
maximum
adaptation



II.6 Systematicity over time

Lina aged 1;3-1;5					
Pattern 1:	CVC:V(C)	46%			
Select			Adapt		
Target	Form	Gloss	Target	Form	Gloss
ʔijjaʔo:	ʔijjæ:h	song	wiwi	ʔiwwih	Oui Oui
			θaŋk#ju	ʔ ^h ættu	thank you
			mamã	mæ:ʔ ^h mmæ:	maman
			pepa	bəppæh	Peppa
Pattern 2:	CV(:)CV	34%			
ʔalam	ʔeðæ:h	flag			
ʔalo	ʔævæ:	hello			
Papa	θɐtæ ^h	papa			
Pattern 3:	CV(:)(C)	20%			
ʔe:	ʔe: ^j	letter A	wabat	bæ:t	stayed still
di	di: ^j	letter D	ʔaʔt ^f i	ʔe:ts	give him

Lina aged 1;6-1;7

Pattern 1:	CVC:V(C)	34%			
Select			Adapt		
Target	Form	Gloss	Target	Form	Gloss
lallo	ʔɪlæʔlləʔh	Lallo	hæti	hætti	give me
tʰajja:ra	dɛʔllɛ:ʔh	plane	tne:n	ʔɪnnɛ'n	two
ʔijjaʔijjaʔo:	ʔijjæ:i:ʔh	song	trwa	tɤʔjjeh	trois
			ʃokola	kollɛʔʔ	chocolat
Pattern 2:	CV(:)C	53%			
laʔʔ	ʔɪlæʔ	no			
ʔɛ	ʔɛ	un			
fɪʃ	pɪs	fish			
no	nʔoʔ	no			
dø	ɖoah	deux			
Pattern 3:	CVCV	14%			
do:ra	tʰæʔhɔ̃ɛʔh	Dora	katr	hʔtæʔji:ʔh	quatre
li:na	ʔhɪnɛ̃	Lina	dø	nɖoɾi:ʔh	deux

II.6 Systematicity over time

Lina aged 1;9

Pattern 1:	CVC:V(C)	79%			
Select			Adapt		
Target	Form	Gloss	Target	Form	Gloss
nanna	næ̃· nn ĩ·	food	ba:ba	pæ̃· bb ʉ·	daddy
			apəl	hæ̃· pp ʊl	apple
			mazbu:tʰ	mʰə· dd ʉ·tʰ	right
			bajdʰa	bʰʊ· dd æ̃·	egg
			ha:ti	ʔæ̃· tti ·	give me
			te:ta	tæ̃·ʰ· tt æ̃·ʰ	grandma
			kompjutər	tʉ̃· tt æ̃·ʰ·h	computer
			mamã	mæ̃· mm æ̃·ʰ	maman
			majj	mæ̃· jj æ̃·ʰ·h	water
			la:la	ɔ̃¹· ll æ̃·ʰ·h	Lala
			fɪʃ	pʰ· ss ʉ·	fish

➤ Consonant lengthening as an active process

II.7 Discussion

- **No straightforward move from phonetic, item-based learning to adult-like phonological acquisition**
- The frequency and salience of a particular phonological feature, coupled with variability in the implementation of its contrastive function in the input, leads to **overgeneralisation** of its representation and use by the infant.
- **consonant lengthening as an active process** peaks just as the children experience a drastic increase in their vocabulary, and is later applied in the production of longer multisyllabic words even when disylls become accurate
- With every new challenge, the child returns to fit her needs
→ **ongoing learning and re-analysis**

II.8 Challenges

- If own output is used as input, how are adult and own productions stored in perception? (see perception-production loop, Masapollo et al, this conf.)
- How does the child come out of their internal templatic representations?
- As certain forms become accurate, are earlier internal representations still active?
- Interplay between **attention, selection and retention** (but also later decay?)

11.8 Challenges (cont.)

- Data from study 1 suggests that **children attend to and store phonetic detail from the input** that they receive
- While this is compatible with exemplar models of learning:
 - frequency alone does not explain the patterns found but rather **attention and selection**
 - while some sort of abstraction takes place, it does not take the form of averaging over experienced exemplars but is rather contextually determined
- Data from study 2 suggests that the child's own output may become part of their representation, and that adult input may be temporarily filtered through the child's articulatory routines.
 - role of **attention and selection** again, but how do adult and child representations interact?

thank you / shukran!