Noun Phrases in Koda Bimodal Bilingual Acquisition

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Overview

- Background
  - Our approach to questions about bilingual effects
  - Bimodal bilinguals as a way to address these questions
  - Today's area of interest: the nominal domain
- Previous studies on the nominal domain
  - monolingual and bilingual acquisition
- Our current study

BACKGROUND

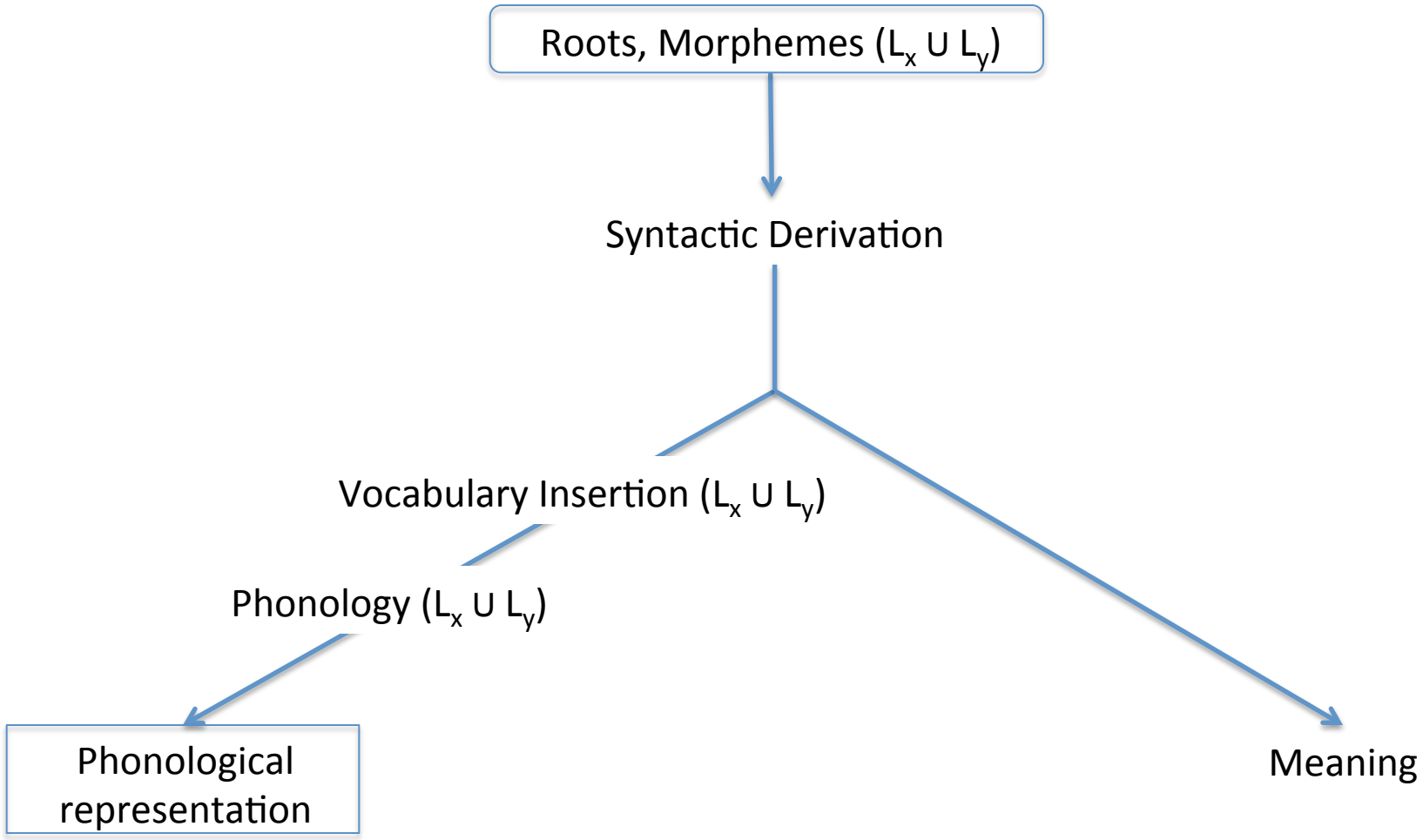
Research Questions

- How do the languages of a bilingual interact?
- How do children develop as bilinguals?
- How is this process different for bimodal bilinguals?

Here:

- Longitudinal data from children ages 2-3 acquiring ENGLISH and AMERICAN SIGN LANGUAGE (ASL); or BRAZILIAN PORTUGUESE (BP) and BRAZILIAN SIGN LANGUAGE (Libras).
- Model of *Bilingual Language Synthesis*, using concepts of *Minimalism* and *Distributed Morphology*.
- **Conclusion: Both languages are active and interact in multiple ways.**

Model – Language Synthesis



Consequences of the model

- Roots and morphemes from both languages can contribute to a single output
  ➔ 'Transfer'

- At Vocabulary Insertion, elements from either language can be inserted, as long as all featural requirements are satisfied
  ➔ Code-switching

- When two independent sets of articulators are available, lexical items from ***both*** languages are possible
  ➔ Code-blending

Language Synthesis

Articles in four languages

Target Language	Articles
English	overt article required in many contexts
ASL	no overt article required
BP	overt article required in many contexts
Libras	no overt article required

PREVIOUS STUDIES

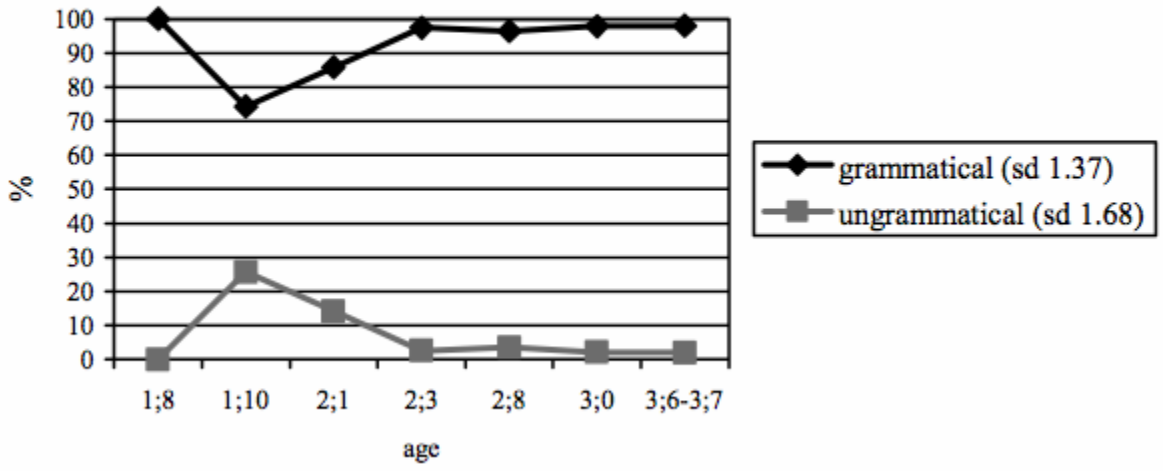
Article use in English

- Early emergence of first uses (as young as 1;04), but well-known omission of articles in required contexts (Brown 1973; Demuth & McCullough 2009; Kupisch et. al 2009)
  - Considerable variability, but use of articles in ≥80% of required contexts by 2;06
- Continuing problems with pragmatically appropriate use of definite vs. indefinite articles (Ionin et al. 2004; Schaeffer & Matthewson 2005)

Article use in BP

- Adult BP permits bare singular count nouns (generic / existential)
- Children produce both bare Ns and DPs with an article from as young as 1;08 (Lopes 2006)
- Ungrammatical uses disappear by 2;03

Figure 2: Mean percentagem of (un)grammatical DPs and BNs for both children



Article use by bilingual children

- Some evidence that the contrast between Romance and Germanic patterns can be seen in bilinguals, with some facilitative effects of cross-language influence (Kupisch 2007)

- What if one language lacks a morphological realization of articles?
  - One Serbo-Croatian / English bilingual child showed high rates of article omission in elicited production at 4;02 (Mede & Gürel 2010)
  - 4-year-old Turkish / English bilingual children show high rates of article omission in English (Geckin 2012)

CURRENT STUDIES

Research questions

- Is the acquisition of the nominal domain different for bimodal bilinguals as compared with monolinguals?
- Do bimodal bilinguals show bilingual effects similar to unimodal bilinguals?
- Are children's productions as expected given the possibilities for language synthesis?

Potential synthesis wrt articles

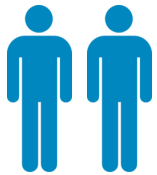
- The sign languages do not have overt articles; the spoken languages do.
- Possible synthesis: The use of the sign language structures in the spoken languages could lead to:

lack of overt articles in speech

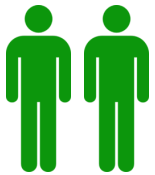
mismatch in article number/gender

use of an incorrect article (pragmatically inappropriate)

Current study: Article suppliance



BEN and TOM
ASL/English
2;00-3;03



IGOR and EDU
Libras/BP
2;00-3;03

JOY
Monoling. Eng
2;00-3;00

Lopes (2006)
Monoling. BP
1;08-3;07

Darren
Biling. Cantonese/Eng
2;00-3;00

Analysis of longitudinal spontaneous production data from selected speech and sign target sessions

All files were hand-coded for each NP:

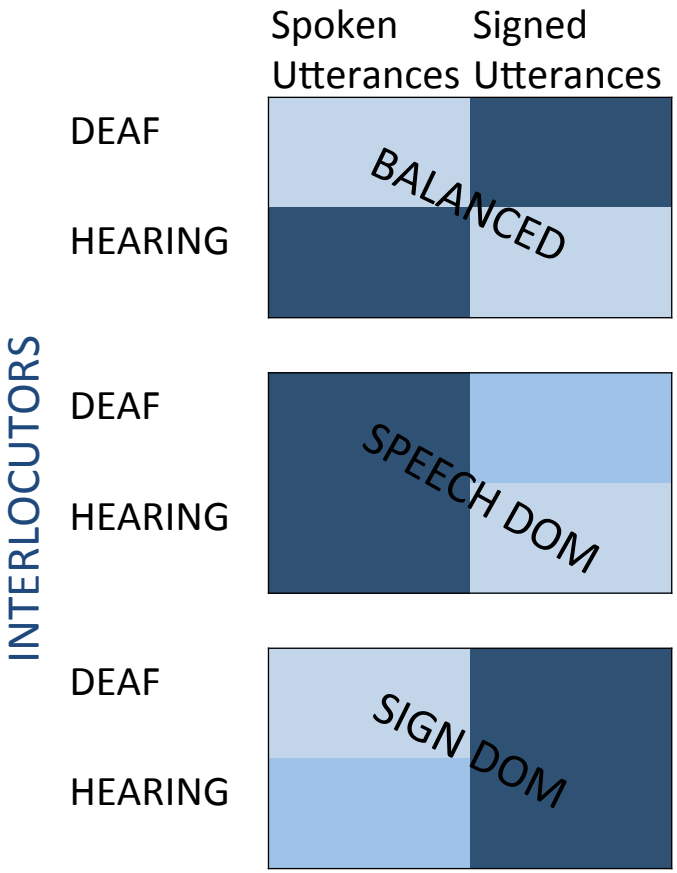
- Completely Adult-Like (CAL) or
- Not Adult-Like (NAL)
  - article omission, inappropriate article, gender/number mismatch, other

Total utterances produced / proportion bimodal

Speech target sessions | **Sign target sessions**

Age		Monol. Engl. *JOY*	KODA US *BEN, TOM*	KODA BR *EDU, IGOR*	Canton./ Engl. Biling. *DARREN*	KODA US *BEN, TOM*	KODA BR *EDU, IGOR*
2;00	Total	196	477	1637	128	233	630
	Bimod.		.45	.15		.17	.21
2;06	Total	303	682	1157	114	240	488
	Bimod.		.11	.20		.20	.23
3;00	Total	69	597	849	118	409	391
	Bimod.		.06	.08		.44	.23

Bimodal Bilingual Profiles



		Spoken utterances	Signed utterances	Bimodal utterances
BEN	MOT - D	0.14	0.49	0.37
	KW - D	0.01	0.78	0.21
	LF - H	0.63	0.02	0.35
	AG - H	0.89	0.01	0.10
TOM	PAR - D	0.42	0.26	0.32
	KW - D	0.76	0.05	0.19
	DCP - H	0.80	0.05	0.15
EDU	FAT - D	0.58	0.20	0.22
	PAR - D	0.57	0.30	0.13
	MOT - D	0.82	0.05	0.14
	EXP - H	0.65	0.18	0.17
IGOR	FAT - D	0.45	0.27	0.28
	MOT - H	0.71	0.05	0.24

Proportion NPs to total utterances

Speech target sessions | **Sign target sessions**

Age		Monol. Engl. *JOY*	KODA US *BEN, TOM*	KODA BR *EDU, IGOR*	Canton./ Engl. Biling. *DARREN*	KODA US *BEN, TOM*	KODA BR *EDU, IGOR*
2;00	Speech	1.06	0.73	0.50	.91	0.60	0.89
	Sign		0.87	0.09		0.71	0.63
2;06	Speech	1.29	0.91	0.66	1.10	0.90	0.92
	Sign		0.45	0.22		0.67	0.45
3;00	Speech	1.45	0.90	0.82	1.08	0.76	0.37
	Sign		0.84	0.35		0.85	0.32

NP in sign language - Examples

IX	IX(revista) CARRO IX(magazine) car	IGOR 3;01
	IX(picture) HORSE	BEN 2;00
N	EDIFÍCIO+ building	EDU 2;07
	HAT	TOM 2;03
Mod+N	QUATRO PORCO four pigs	EDU 2;07
	YELLOW BALLOON	BEN 2;00
N+Mod	CASA CACHORRO house dog	EDU 2;07

Speech NPs

Predominant types

- Pronoun
- (Art)+N
- (Art)+Mod+N OR (Art)+N+Mod

Predominant errors

- Missing required article
- Pragmatically inappropriate article
- Gender/Number mismatch

Speech NPs – error examples

Missing Article	I want [a/the] truck. TRUCK IX(truck-book)	BEN 2;00
	I want [a] different doggy.	TOM 2;08
	The rooster stays on [the] airplane.	BEN 3;00
	Não pode botar [a] mão [n]o sorvete No can put [the] hand [on]-the ice cream '(One) can't put (one's) hand on the ice cream'	IGOR 2;07
Inappropriate Article	A cracker is over there	TOM 2;03
	He's not the friend	BEN 2;06
Gender Error	É o carne (target: É a carne) it-is the[masc] meat it-is the[fem] meat 'It's the meat.'	IGOR 3;01
	um televisão (target: uma televisão) the[masc] television the[fem] television	IGOR 2;11

Proportion NAL NPs in speech

Speech target sessions **Sign target sessions**

Age		Monol. Engl. *JOY*	KODA US *BEN, TOM*	KODA BR *EDU, IGOR*	Canton./ Engl. Biling. *DARREN*	KODA US *BEN, TOM*	KODA BR *EDU, IGOR*
2;00	Speech	.19	.49	.34	.16	.45	.25
2;06	Speech	.05	.24	.19	.13	.21	.30
3;00	Speech	.07	.18	.22	.11	.25	.17

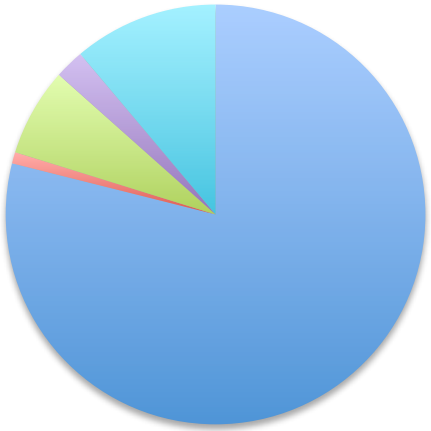
Proportion Missing Required Articles in Speech

Speech target sessions | **Sign target sessions**

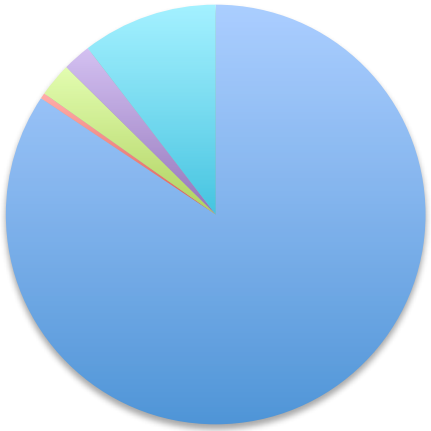
Age	English Monol.	Koda US	~BP Monol.	Koda BR	Can/En Biling.	Koda US	Koda BR
2;00	0.53	0.77	0.15	0.51	0.47	0.83	0.40
2;06	0.19	0.42	0.02	0.37	0.37	0.77	0.44
3;00	0.13	0.25	0	0.33	0.23	0.52	0.24

Distribution of Error Types

BP



Libras



Missing Required Art

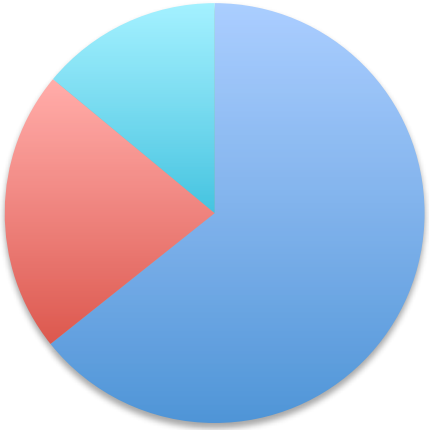
Pragmatically inappropriate

Gender error

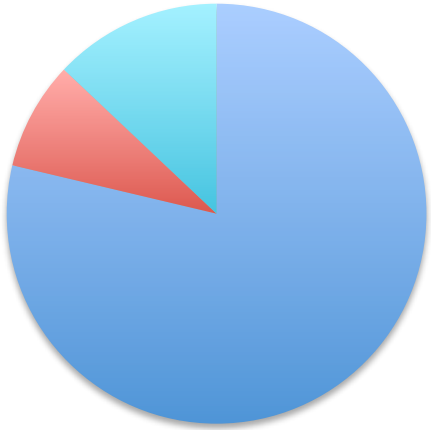
Order

Other

English



ASL



Articles – Summary

- **Monolingual English** shows decreasing article omission across ages; **Monolingual BP** has very few article omission errors
- **Koda children** show high levels of article errors at 2;00, and continue to produce more omissions than monolingual comparisons through 3;00
- Higher proportion of missing articles in the sign target sessions for US kodas (not for BR)

Conclusion

Bilingual effect:

– possibility of null article from the sign languages in the spoken languages -> missing article; inappropriate article; gender/number errors

- The nominal domain is a fruitful source of information about bilingualism effects
- We see areas of potential effects (and in separate work, areas of no effects)
- Such studies will help to constrain theories of language synthesis

Thank you