The LAD on the edge

Learnability and variability in children's syntax

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Es de mommy's

Mi solito

How can the case systems interact?

Goals

- To contextualize the problem of learner's variability in current framework of grammar

- To explore variability in a population of children with inherently variable exposure growing up in a heritage language context.

Plan

- The characters: Heritage children
- The stage: reevaluating acquisition in a minimalist framework
- The facts:
  - Feature reassembly: gender
  - Omissions of determiner and transfer
  - Linearization and transfer: clitics; interrogative inversion
- Summary remarks

The characters

HERITAGE LANGUAGE CHILDREN

Heritage speakers

- Bilingual speakers of an ethnic or immigrant minority language that has been transmitted primarily through the home or family context

- Heritage children are vulnerable to abrupt shifts in language exposure which may affect linguistic competence in the minority language (Montrul & Potowski 2007)

- Typically, their first language does not reach native-like attainment in adulthood (Benmamoun, Montrul & Polinsky 2010)

- At the extreme of asymmetric bilingualism, they may lose the ability to speak, while retain comprehension and morphosyntax. Labrador receptive bilinguals: demonstrated clear intuitions about core structure, and some morphosemantic knowledge: (Sherkina-Lieber 2011; Sherkina-Lieber, Pérez-Leroux & Johns 2011)

Consequently:

All generalizations about what heritage speakers and heritage children can or cannot do should inherently should contain an implicit domain restrictor ("at this level of attainment...")

In children

- A complex picture of developmental interactions between L1 – L2. One might expect:
  - Negative correlations because exposure is complementary (in a temporal sense)
  - Positive cross modular correlations because of individual differences (good learners would be good in both languages) (Castilla, Pérez-Leroux & Restrepo 2009)
  - Alterations in the timetable (bootstrapping & delay effects)
  - Qualitative effects or transfer

- Heritage children have been studied primarily for
  - applied purposes;
  - within the context of current explorations on population comparisons as evidence on critical periods and age of effects
- New goal: to evaluate how partitioning exposure, and the consequent input reduction, shapes the course and outcomes of grammar acquisition.

The stage

IS UG A BLUEPRINT, OR A RECIPE?

[Classical] Parameter setting

- Learning consist of parameter-setting: discrete decisions with multiple consequences, some into domains of grammar not well supported by experience

- Roeper & Yang (2012): Parameters are anchor points for dividing up the linguistic space; complex interactions would provide coverage for the vast array of linguistic data

- Some good cases of parameter-setting behavior: Snyder 2006.BUT: Most grammatical development does not fit the parametric model.

Variational learning model (Yang 2002)

- A solution to the problem of gradual development
- Introduces probabilistic distribution over domain specific grammatical hypothesis
- Model:
  - Population of grammars w/associated p values
  - Grammar selection is random
  - Parsing rewards the probability of a grammar if successful, decreases it if unsuccessful
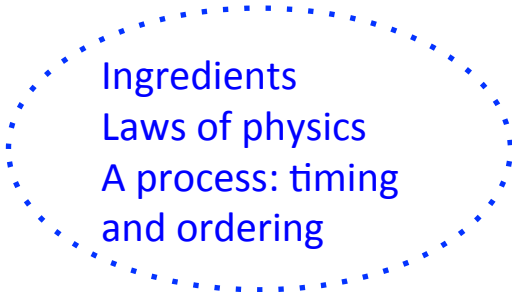
Consequences of VL

- VL is superior to a triggering model, but there is no general result that unaccompanied probabilistic learning is inherently superior (Yang 2008; 2011).

  "The plausibility of the learning model depends more on the structure of the grammar space and less on the algorithmic aspects of learning" (Y & R)

- Parameters for which the target value is expressed more frequently are learned faster; for a bilingual it might be extented to predict delays.

Parameter summary

- Developmental variability and gradualness can be reconciled within a parametric model; but the algorithm is an add-on that operates over parametric space, not specific to theory *per se*. (Yang in press)

- A better way to describe UG than as a blueprint?

A recipe

Ingredients
Laws of physics
A process: timing and ordering

Minimalism

- Language provides an optimal solution to the problem of reconciling the interface between two systems (perceptual; logical)

- Very minimal syntax: fundamental operations select; merge & label

- No variation in <u>core syntax</u>: the operations are invariant, non teleological; improper derivations crash or fail the conditions of the interfaces

- A much "smaller" UG

Variation in the features and their assembly

- Feature space is itself constrained, as language exploits only certain (linguistically relevant) conceptual ontologies;

- Language formats these categories into a system of measurement; Features are operations on lattices (Harbour 2012);

- Languages vary as to which features are represented; how they combine to make lexical items, and the set of forms that map onto these.

Combinatorial variability (Adger (2006)

- An evaluation metric for the acquisition of uninterpretable features and their mapping onto forms combined with standard (min) feature architecture & operations
  - LIs express feature bundles
  - Insertion consists of random choice of form that match a feature of the LI (capable of representing stable optionality)
  - The learning algorithm tries to reject optionality, synonymy; and minimize the size of the lexicon

As a recipe, UG…

- Contains only minimal ingredients; connected by basic processes

- These ingredients are important: all pieces of lexicon, functional and encyclopedic;

- They are acquired by lexical means: distributional learning and mapping

- More variability in outcomes

- Highly sensitive to timing & process

φ-features: gender in bilinguals

Omissions

Linearization

SOME PUZZLES OF HERITAGE BILINGUALS

1. φ features

Spanish gender: ± feminine

- All nouns are lexically marked for gender (assignment):
  - Canonical marking –o = masc; -a=fem

  gata/gato (cat-fem/masc)

  - Noncanonical: words ending in other vowels, or consonant.

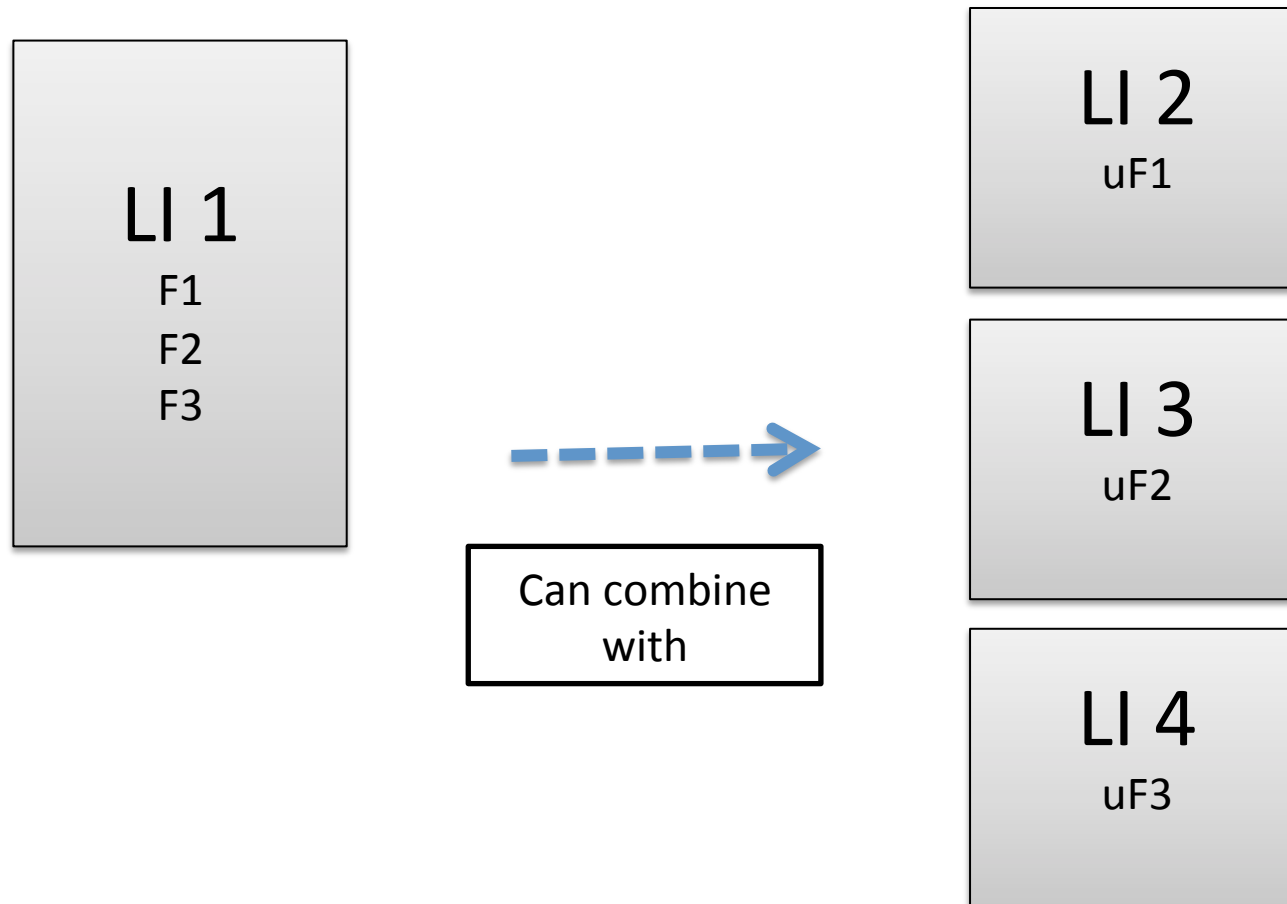- Agreement/concord spreads it through the DP

  L**a** cas**a** blanc**a**

How do bilingual children learn it?

Mechanism for DP internal agreement

- Multiple probes checked by single goal

D
*u*Gen
*u*Num

A
*u*Gen
*u*Num

N
Gen
Num
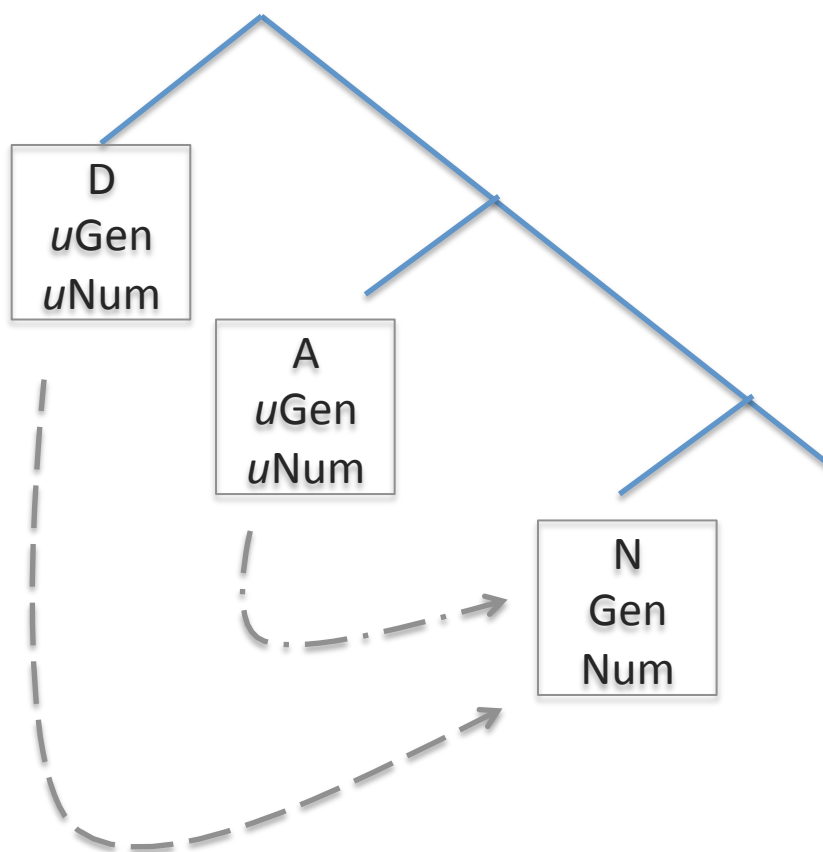
Parenthesis: The agree framework & Adger's combinatorial variability

LI 1
F1
F2
F3

Can combine with

LI 2
uF1

LI 3
uF2

LI 4
uF3

Buckie English:

[*u*singular:+] *were*

[*u*participant:+] *was*

[*u*author:-] *were*

[*u*author:+] *was*

LI 1

Singular-
Author+
Participant+
We

- - - ➤

LI 2

*u*Singular-
were

LI 3

*u*Participant +
was

LI 4

*u*Author+
was

Predicts 2/3 was
Actual: 69%

Basic CV frequencies can
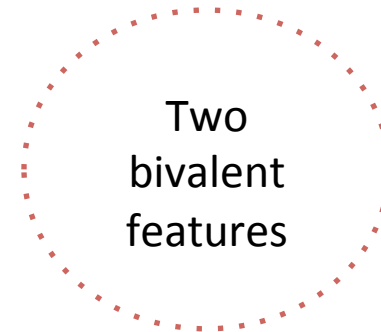be altered by lexical
access effect
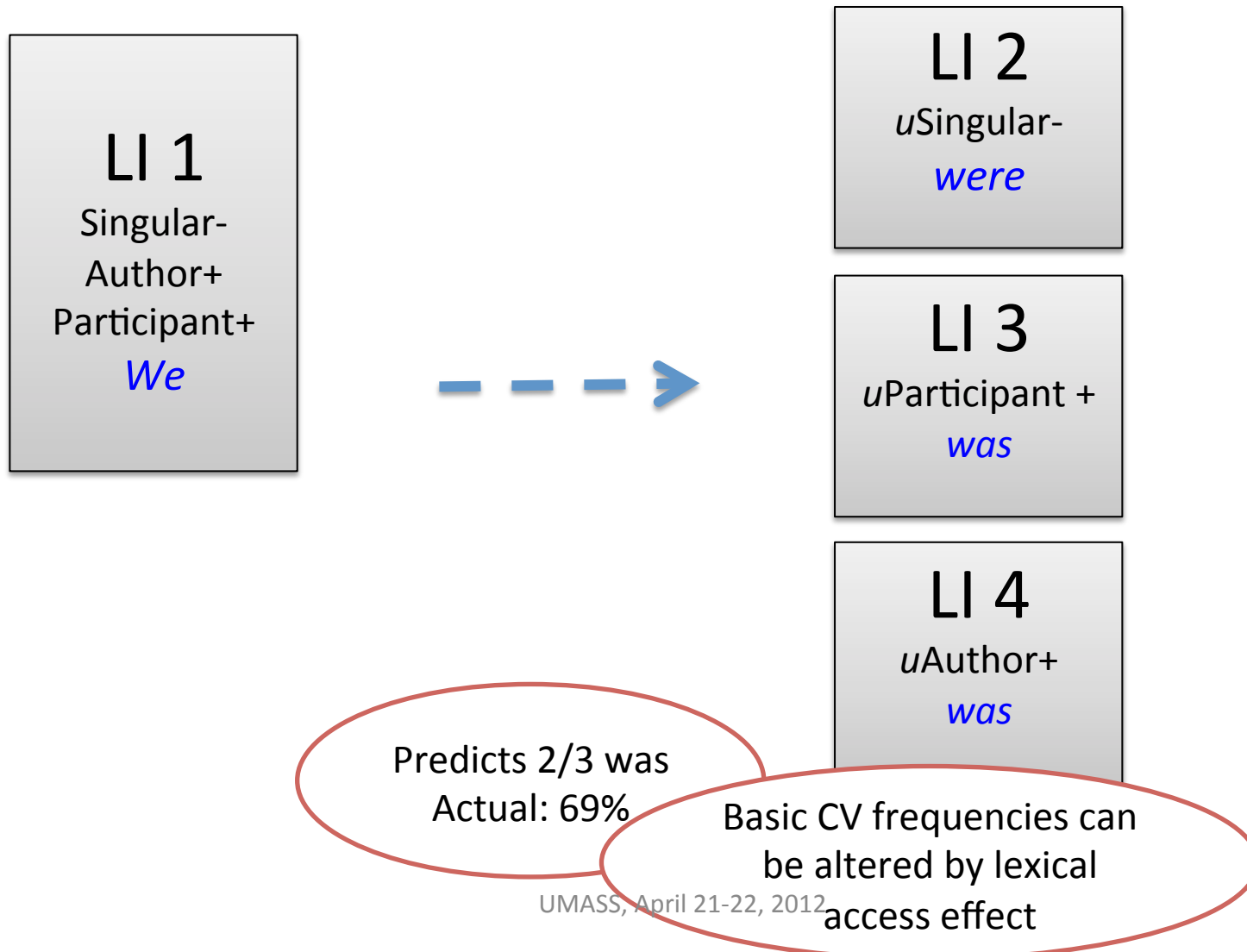
Vocabulary insertion for determiners

[Gen:+, Num:-]→la

[Gen:-, Num:-]→el

[Gen:+, Num:+]→las

[Gen:-, Num:+]→los

Two bivalent features

- Plural masculine as default:

  La niña (girl) + el niño (boy)= los niños (children)

 [Num:+]→los

- *Los* can be inserted by [Gen:-] or the absence of gender.

Kuchebrand (2005)

- Study of agreement emergence at first syntax (1;07-2;03); 3 heritage Spanish and 3 monolinguals from the Hamburg corpus

- No overall language delay (MLU, cumulative N types) in these monolinguals:

- No error type differences; no drift towards canonical forms in the bilinguals

- Differences in the proto articles (less pre-vowels overall, no ±low harmony)

- Small initial delay in Adj or D agreement; resolved by 2;01

- Kuchebrandt's data suggest that young bilinguals arriving at gender correctly, may do so by a different route.
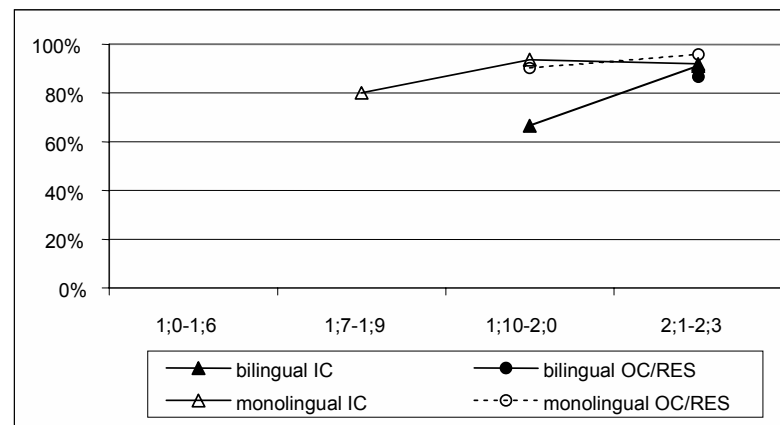
Figure 5. Article agreement
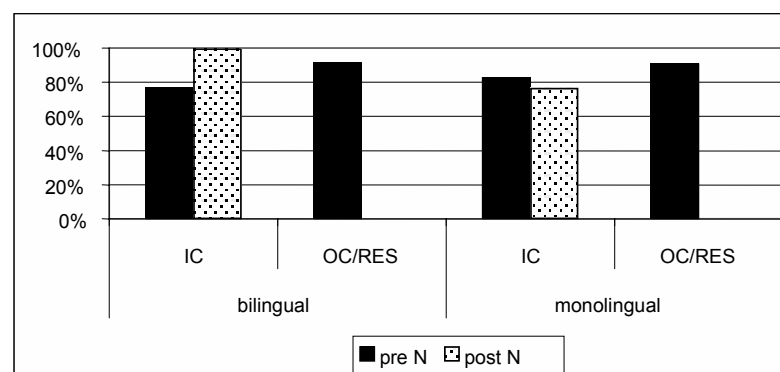
Figure 6. Adjective agreement

- Some bilingual children show more errors at first syntax: Guijarro-Fuentes & Larrañaga (in press) show that contrary to the monolingual child, 2 Basque-Spanish bilingual children showed no sensitivity to vowel, and overgeneralized the masc Dets.

- Mismatches:

A la caballos 'to the horses'   (M 02;07;01) (Mon)

la amarillo [*] quiero 'want the yellow'   (M 2;03,10) (Mon)

Un sajala 'an apple'   (P 02;09;30) (Bil)

Montrul & Potowski (2007)

- Narrative data: High accuracy on D (92%+);

- Elicited production data shows substantial agreement lag on adjectives for feminine nouns; High accuracy w/masculine; particularly for the younger heritage speakers (38%)

- Data reported is on N-Adj agreement

Nicoladis & Marchak (2011)

- 3- 5 year olds French Canadian children living in Edmonton

- Supportive environment: French day cares

- Bilinguals have less exposure; so they may be specifically delayed in domains related to input frequency

Une abeille grande
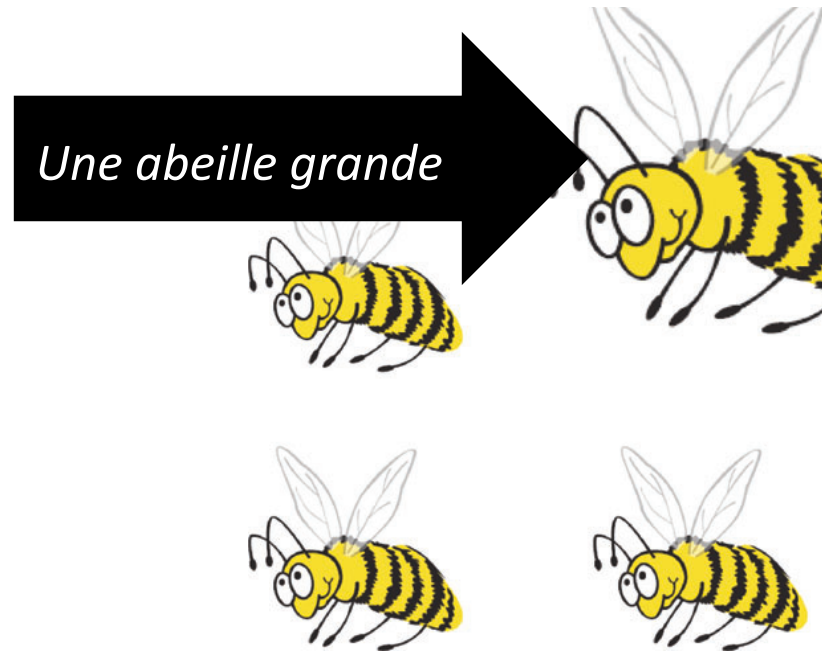
Gender effects: masc is the default

- **N Adj:** bil delay disappears when controlling vocab covariance

- **D N:** group diffs remain, interaction disappears

D Adj: Higher accuracy

No significant differences

From Nicoladis & Marchak 2011
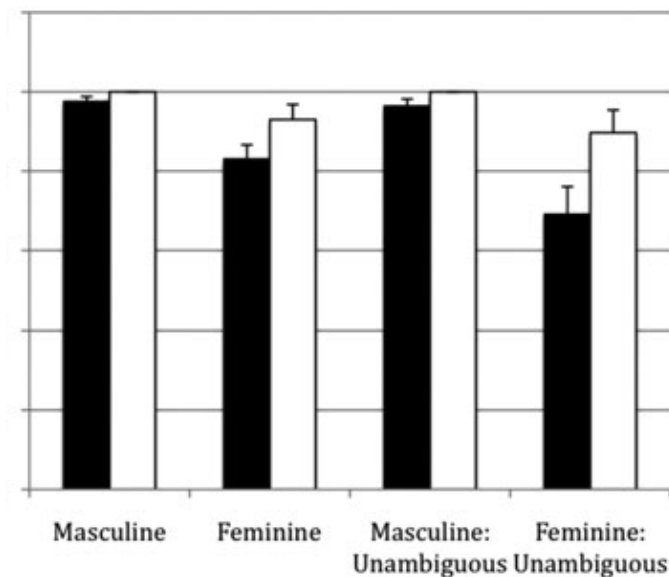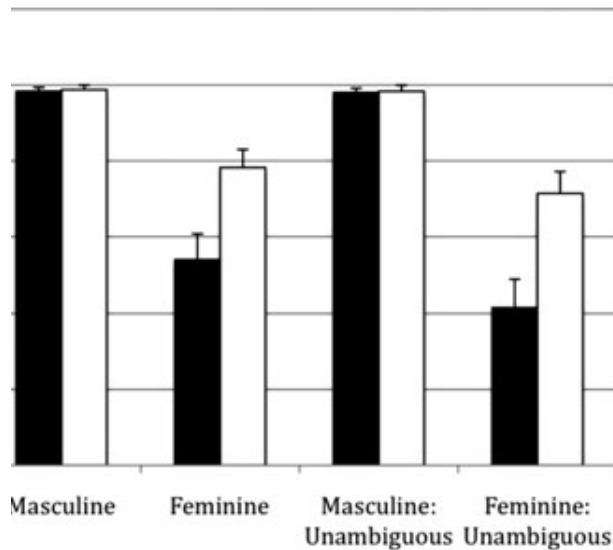
Interim summary

- Difficulty with knowledge of nouns (lexical knowledge); and whether adjectives are marked by Feminine. Not problematic: monolinguals know adjectival gender is not productive.

- <u>Little difficulty with concord</u>

In bilingual grammars

- A similar default is attributed for for the masculine singular

  [Num:-]$\rightarrow$lo

- This predicts 100% accuracy on Masc. agreement; ~50% on the feminine;

- Concord, on the other hand; should be fairly stable, even including noise from lexical variability;

From Cuza et al. 2012 documents what seems to be ongoing attrition

21 sim bil children
US hispanics
English only school

Det N Adj
- Non canonical nouns
- Canonical adjectives

picture 2

Investigator: ¿Y esto? ¿Qué es?
Child: una nube roja ✓/ *un nube roja/
           una *roja nube/una nube *rojo

- Loss of assignment (D); towards a masc default
- Adj concord appears at chance

Table 1: Proportion of target gender assignment (determiner)

Group	Assignment FEM	Assignment MASC
Group 1: 4-5	0.69	0.70
Group 2: 6-7	0.41	0.58
Group 3: 8-9	0.29	0.86

Table 2: Proportion of target gender agreement (adjective)

Group	Agreement FEM	Agreement MASC
Group 1: 4-5	0.43	0.65
Group 2: 6-7	0.50	0.62
Group 3: 8-9	0.52	0.81

Table 3: Proportion of target word order per group and noun type

Group	Directionality FEM	Directionality MASC
Group 1: 4-5	0.42	0.50
Group 2: 6-7	0.38	0.40
Group 3: 8-9	0.45	0.35

D-Adj Concord rates

- Cuza et al. assignment rates are low & get lower, specially for feminine but concord seems stable; actually: (assignment,concord)

Ages	Fem	MAS
4-5	.72	.83
6-7	.81	.86
7-8	.86	.96

Una amarilla cohete   (*,√)

Un nave amarillo   (*,√)

Una cruz amarilla   (*, √)

Summary: bilingual gender

- Differences in the automaticity of lexical encoding of gender (Kuchebrandt's results on reduction of proto determiner stage)

- Differences in the features assigned to vocabulary items; resulting in Masc. overgeneration (all studies)

- Lexical knowledge is affected

- An invariant agree (Nicoladis' & Cuza's results)

- Overall frequencies predictable from CV + noise from lexical processing

2. Changes to the timetable: omissions

- Bilingual children can show alterations in the timetable of development, in both directions (accelerations and delays in resolving developmental omissions of functional categories)

- Can we predict when?

- How do languages vary, and how is the lexicon and features implicated?

- Let's consider the case of <u>determiners</u> and <u>pronouns</u>

Determiner & Pronouns

- Similar discourse-pragmatic functions. Both exhibit omission stages. The timing of development past the variable omission stage is language-specific.

    – Determiners: early in Romance languages, later in Germanic Languages (Chierchia 1998, Guasti et al 2008, etc.)

    – Object pronouns omissions: early in some languages (Spanish/English); later in others (French, Catalan). (Castilla et al 2010; Pérez-Leroux et al 2008; Wexler et al 2011, etc.)

Role of lexicon in omissions

- Languages w/ clitic pronouns and discourse-linked object drop coexist (Portuguese); thus featural analysis of clitics are likely to come up short in explaining developmental omissions;

- Learnability-wise, blocking discourse licensing of null objects requires substantial knowledge of lexicon, as lexical identification becomes entrenched.

- Determiner/bare noun distribution also sensitive to lexical features (±count) but this plays no specific role in acquiring the typology of BNs.

- Differential role of lexicon in developmental omissions can be predicted for these domains;

lexicon in syntax

Commonsense scenario

```
Lexicon  →  MLU  →  Pronouns
                 →  Det
```
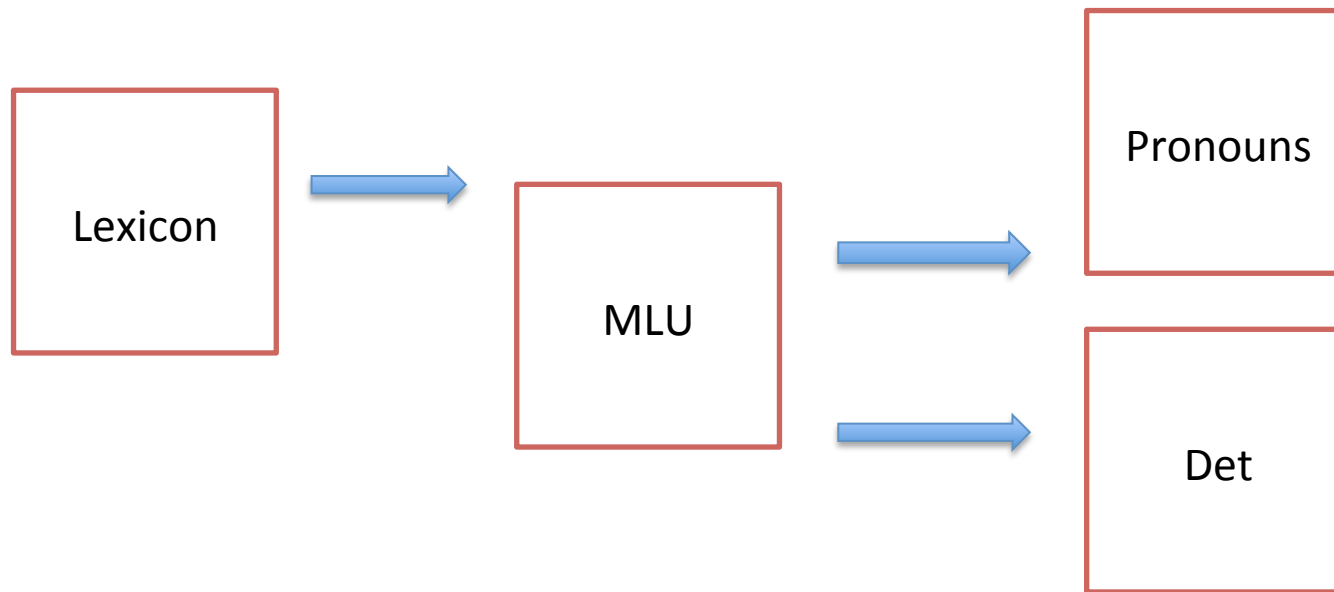
- Pérez-Leroux, Castilla & Brunner 2012 predicted an additional effect of lexicon and elimination of pronoun optionality; tested in Spanish, where the categories are similar and have comparable timing.

Pérez-Leroux, Castilla & Brunner (2012)
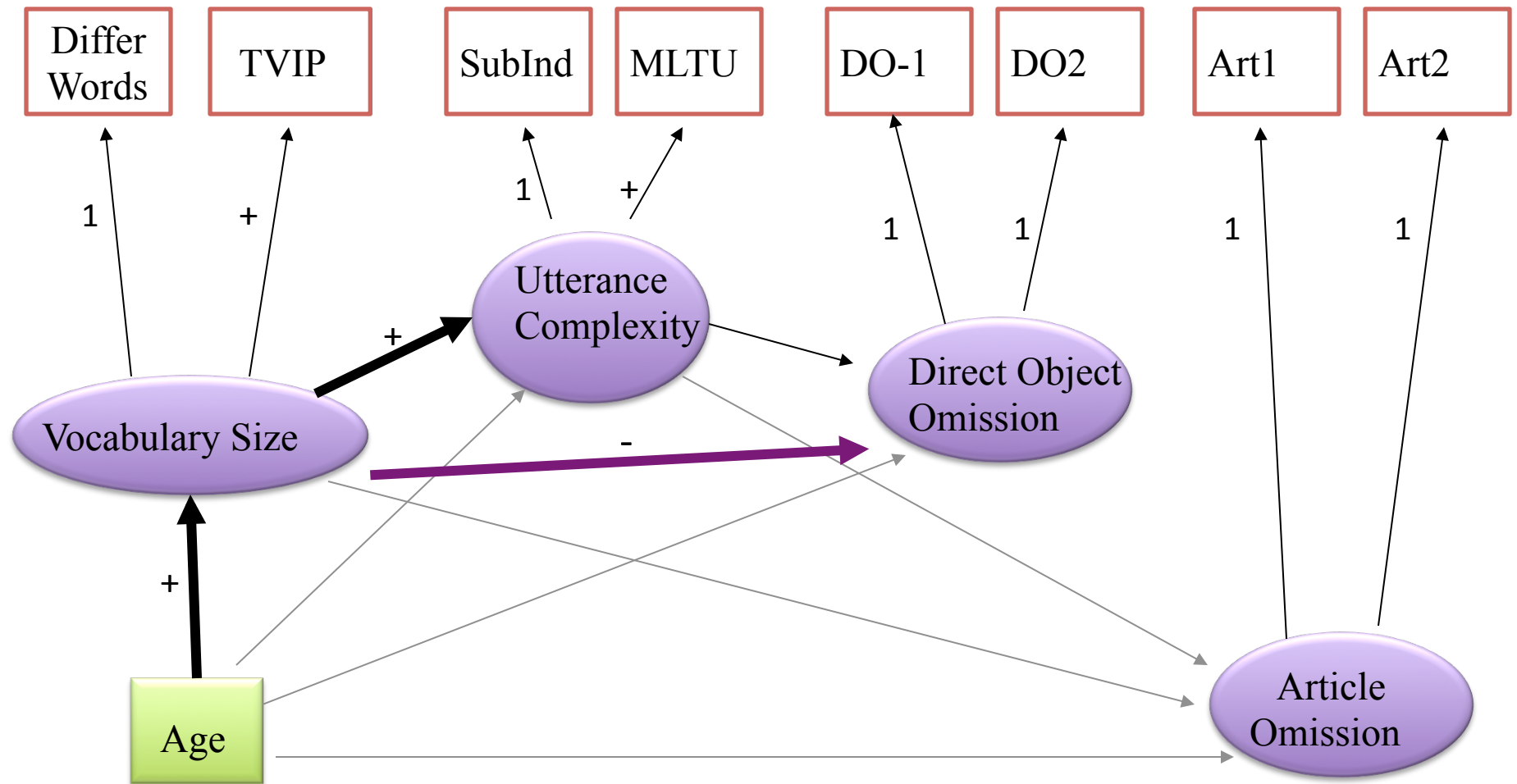
Predictions for bilingual children

- **Directional Influence hypothesis:** Timing of development in one language determines timing in the other. Possibly, from dominant to non-dominant.

- **Default retention**: Bilingual children retain developmental defaults longer (expect delays...)

- **Default retention, lexical version:** Bilingual children retain developmental defaults **only** for lexically sensitive domains of parametrization

Kupisch (2007)

- Emergence and productive use of determiners in longitudinal corpus of German/Italian children (from 1;4-3;0)
- 4 bilingual children, Italian as heritage lge, in a German context
- 3 German monolinguals; 4 Italian monolinguals
- No general delays in Italian for bilinguals;
- However, bilingual children acquiring Italian simultaneously with German use German articles more often in obligatory contexts.
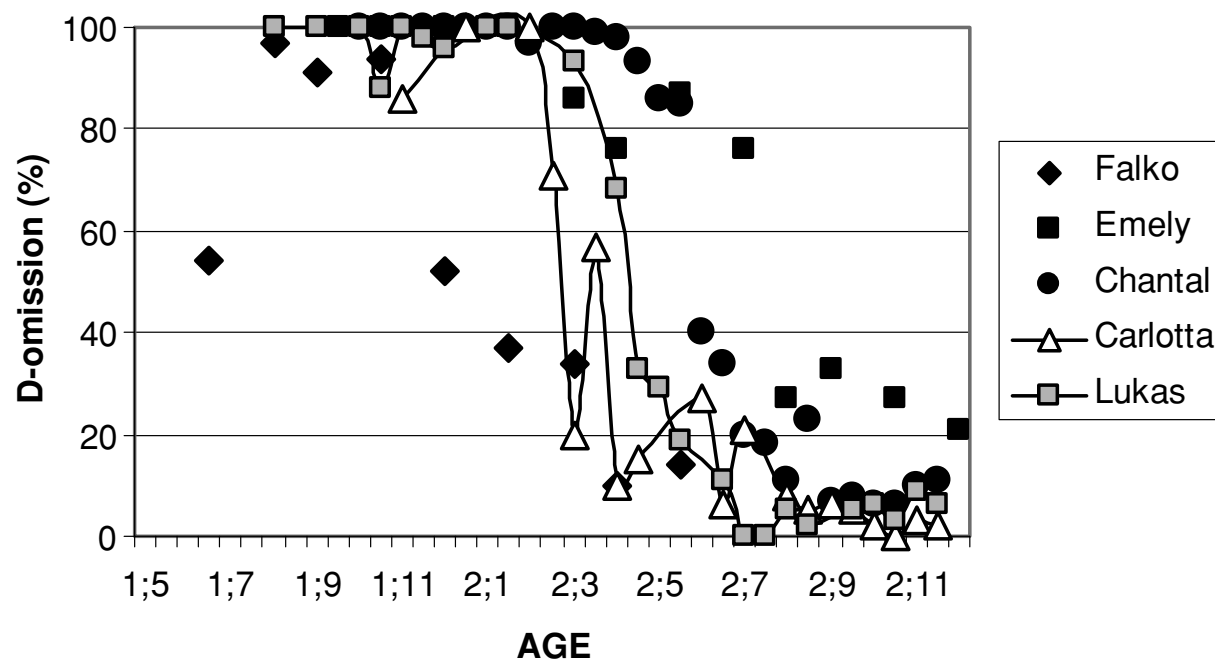
From Kupish (2007)

Figure 9. Rate of D-omission in German, the two balanced children compared to monolingual children.

Italian dominant chidren omission rates ahead.

Bilingual children's clitic omissions

- Higher early rates of ungrammatical object clitic omissions in bilinguals in their heritage Romance language (Müller et al. 1996; Müller & Hulk 2001); but not always: Paradis, Crago & Genesee (2005/2006): simultaneous bilinguals in Montreal/ Ottawa areas with dual support in the home context found at age 3, non significant rates of clitic production in <u>spontaneous</u> speech than monolinguals. Ceiling w/Dets for both.

More recent corpus data

- Larrañaga & Guijarro Fuentes (2012):Analysis of spontaneous speech in Basque-Spanish bilinguals: initial high rate of clitic drop but it decreases. Cross language influence from Basque (a referential object drop language) is short-lived.

- No effects in Jacobson (2011): 45 school-age (6-11 years) heritage bilinguals enrolled in an exit transitional bilingual program; with strong home support for the language (TD low rates 2%-7%, cf. monolinguals in Castilla & PL 2010)

In elicited contexts

- More accurate developmental measure: in corpus studies, there are difficulties with reliability detecting *null objects.

- Pérez-Leroux, Pirvulescu & Roberge (2009): comparing French-dominant children in a bilingual context (Toronto);

- Null objects are a universal option and serve as a structural default; phasing out the omission stage is fixing lexical recoverability (→null cognate)

VP

V   N

s-selection Ø
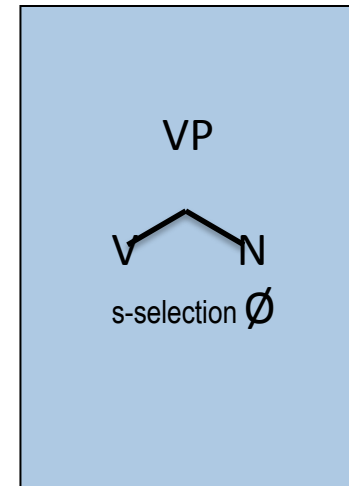
The null object approach

- Transitivity is a lexical property:

  He ate √ Ø / √ a sandwich.

  He devoured *Ø / √ a sandwich.

- Implicit objects (English) have lexical recoverability.

  He ate Ø=something edible.

- Initial omissions happen because children overrely on discourse-recoverability (Allen 2000). Acquisition consists of expunging the inappropriate identification mechanism; retaining the target.

- Are bilingual children extending the default stage?

→Yes, when the other language is topic drop (Hulk & Müller)

→Adult heritage speakers of Chinese background in Peru, retain some null object overgeneration in Spanish.

…what about cases where transfer cannot implicated?? (French, where the other language is English, but elicited data)

Pérez-Leroux, Pirvulescu & Roberge (2009)
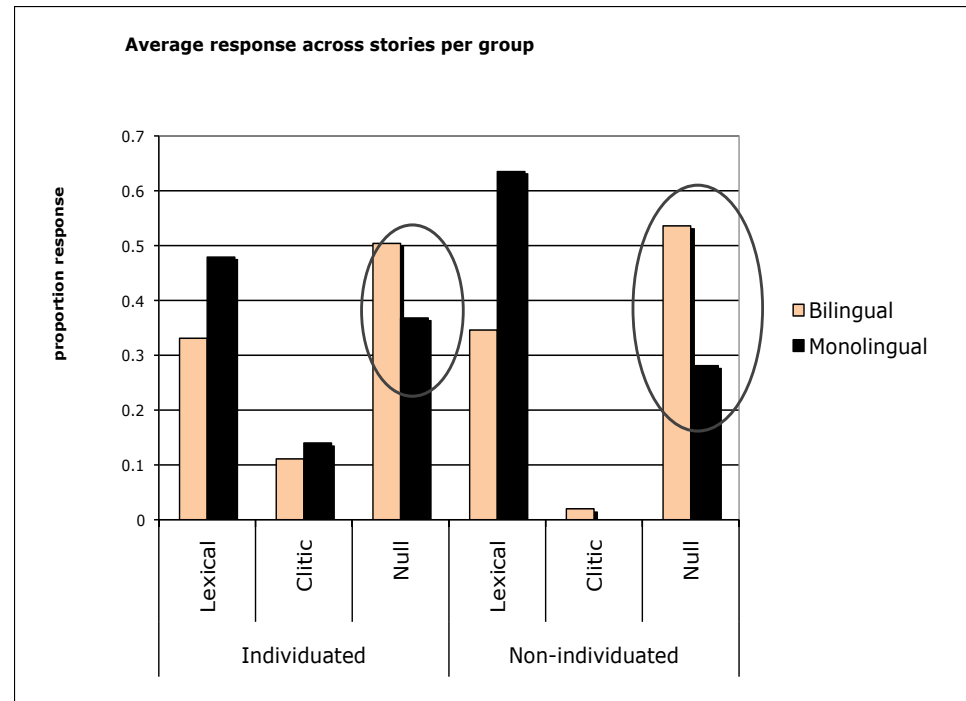
Subsequent replications (in press): more bilingual children have higher omission rates.

Timing interactions

- Directional effects: should predict <u>acceleration</u>, as the other language (English) is an early omission stage language, in comparison to French (late omission stage); or <u>no effect</u> since they were primarily French learners.

- A default retention approach would predict bilingual delays

- But only an approach taking seriously the role of <u>lexical develoment </u>in functional elements would predict the asymmetry between determiner and object omissions in heritage bilinguals.

3. Linearization

a) Clitics

b) Interrogative inversion

3a. Clitic placement

- Greek clitics: uniformly preverbal; not a vulnerable domain for heritage Greek children living in the UK, aged 7-9 (100% target in Argyri & Sorace 2007)

- Spanish clitics in heritage adults in English context shows no attrition in production (Montrul 2004; Silva Corvalán 1994); High proportion of clitic use and minimal errors with finiteness (CL Vfin vs. Vinf CL)

Clitic climbing

- Clitic climbing:

lo quiero ver   Cl [Vfin   Vinf]   clitic climbing

quiero verlo   Vfin   [Vinf Cl]   base

want to see it   Vfin   [Vinf pronoun]   English

- Adult heritage speakers show preference for proclisis (Montrul 2010; Thomas 2011) when compared to monolinguals

- Child attrition suggested by an elicited imitation study (Pérez-Leroux, Cuza & Thomas 2011)

Elicited imitation (Pérez-Leroux, Cuza & Thomas 2011)

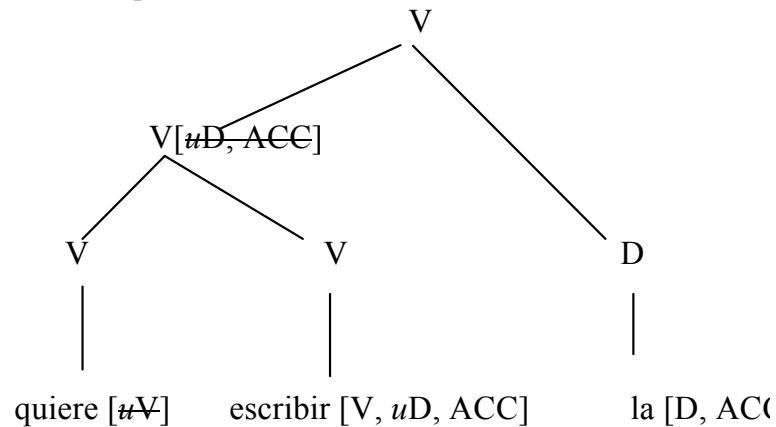| Errors	Monolingual Eisenchlas (2003)	Sequential bilinguals	Simultaneous bilinguals
Fronting V1 V2 CL ⟵	Main error pattern	15%	15%
Post position CL V1 V2 ⟶	no	25%	25%
Elisión de CL en proclisis Ø V1 V2	no	no	20%

incongruences

- Heritage children suggest attrition; adult results do not. →Sampling: Adult results might represent the high fluency spectrum of Heritage Bilingualism.

- Clitic position for finiteness seems not vulnerable to attrition; but it does for clitic climbing; Why? Both positions are target congruent; preferences might change (Hulk & Müller 2001; Silva Corvalan 1994)

- Systems. How can a strong pronoun (in DP position) affect the distribution of a clitic (an object agreement marker)
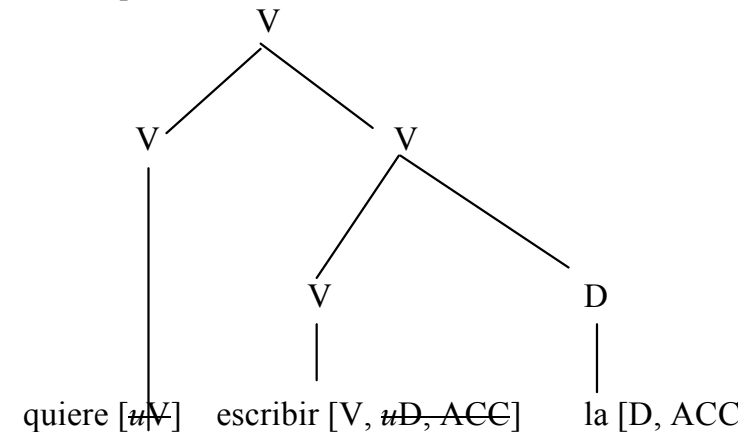
Order of merge (Masullo 2004)

Climbing: restructure first

(5)   La [quiere [escribir]]

```
                              V
                            /   \
            V[uD, ACC]           \
              /    \              \
           V          V            D
           |          |            |
        quiere      escribir      la [D, ACC
        [uV]      [V, uD, ACC]
```

English compatible: DO first

(6)   Pedro [quiere [escribirla]]

```
                      V
                    /   \
                  V'      V
                  |      /  \
                  |     V     D
                  |     |     |
               quiere escribir la [D, ACC
               [uV]  [V, uD, ACC]
```

Reordering is completely dependent on lexical selection; surface base position can originate on either derivation; in the derivation where verbal complex is merged first shows both hosts are available to the clitic for linearization at PF (Cuervo, p.c.)

- Lexical items optionally select the categories they merge with;

- Bilingual effects can thus be stated at a lexical level, attributing it to cross-language lexical and syntactic priming

- Priming can alter the preferences for the two selectional options for first merge; potentially leading to attrition of the Spanish-only option favored by monolingual children, namely merge V-V first)

Interrogative inversion

- Bilingual interrogative inversion errors are rare; and possibly unidirectional (Austin, Blume & Sánchez in press); Some bilingual non inversion errors do occur,

  ¿Qué tú comes? (not by the CS speakers)

  What you eat

- de Houwer (2009) notes that do insertion or auxiliary inversion is not recreated in the Spanish of bilingual children.

Argyri & Sorace (2007)

- Heritage speakers of Greek (in UK) were significantly different from Greek dominant (in Greece) and from monolinguals in accepting noninverted subjects in embedded wh contexts and wide focus contexts.

  [ti efage i Maria].

  what ate-3SG the Maria-NOM

  *[ti i Maria efage].
    (~33%acceptance, 11% production)

Dutch/French heritage children

- Dutch: early language, w/ few developmental errors; order is Wh V S, resulting from V to C

- French: variable targets: *est-ce que*, in situ, non-inverted

- Heritage Dutch 5 year-olds show some non-inversion (7%, 14% for adj & arg questions); some in situ, mostly argumental (10%)

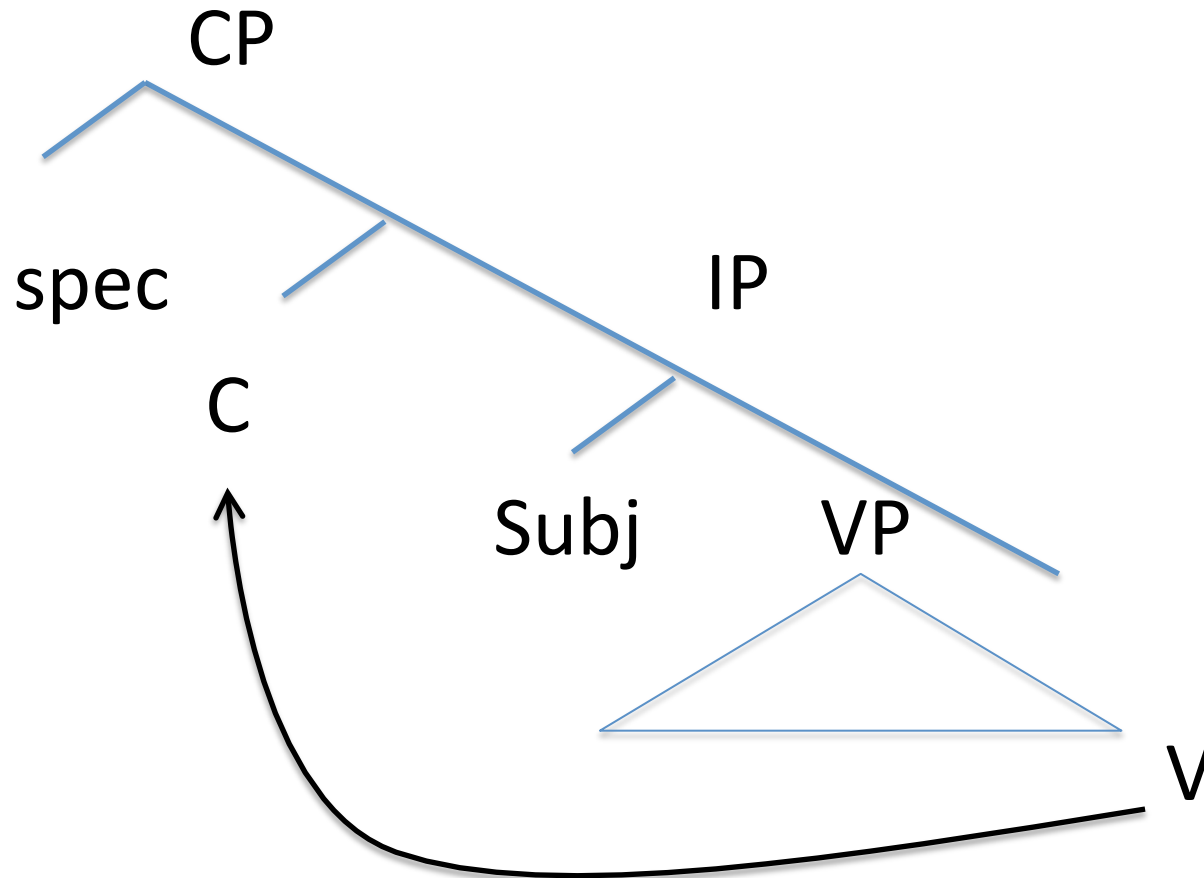 *Waarom je huilt?* (Bi5:1 4;02.19)

      why you cry

  Jij doe wat giraffe? (Bi-5:4 4;06.1)

   you do what Giraffe   (Strik & PL 2011)

Dutch inversion

account

- Qualitative effects (aka transfer) <u>can</u> be introduced in the grammar of the bilingual child;

- Under restrictive conditions: intermediate derivational steps can appear in the development of monolingual children (traditional acquisitional defaults), or be triggered by contact between the grammars of bilingual children.

- Can also be described also in terms of syntactic priming: structural configuration at the point of spell-out.

Cuza & Strik (2011)
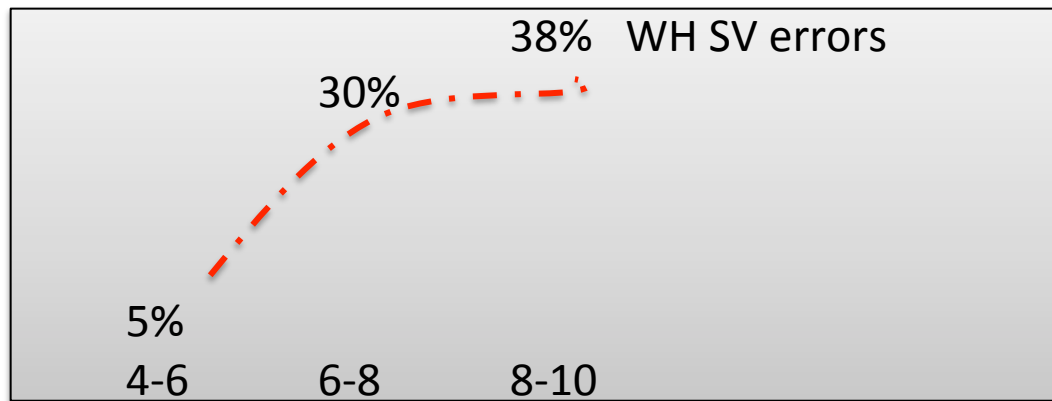
Higher non inversion rates for embedded clauses, whereas both are categorically VS.

Interrogative inversion presents the same problem as clitic-climbing: how to represent loss of what is already acquired?

Spanish inversion

CP

spec

C

Ø

IP

VP

I

Subj

V

¿Qué siempre lee Juan por las mañanas?
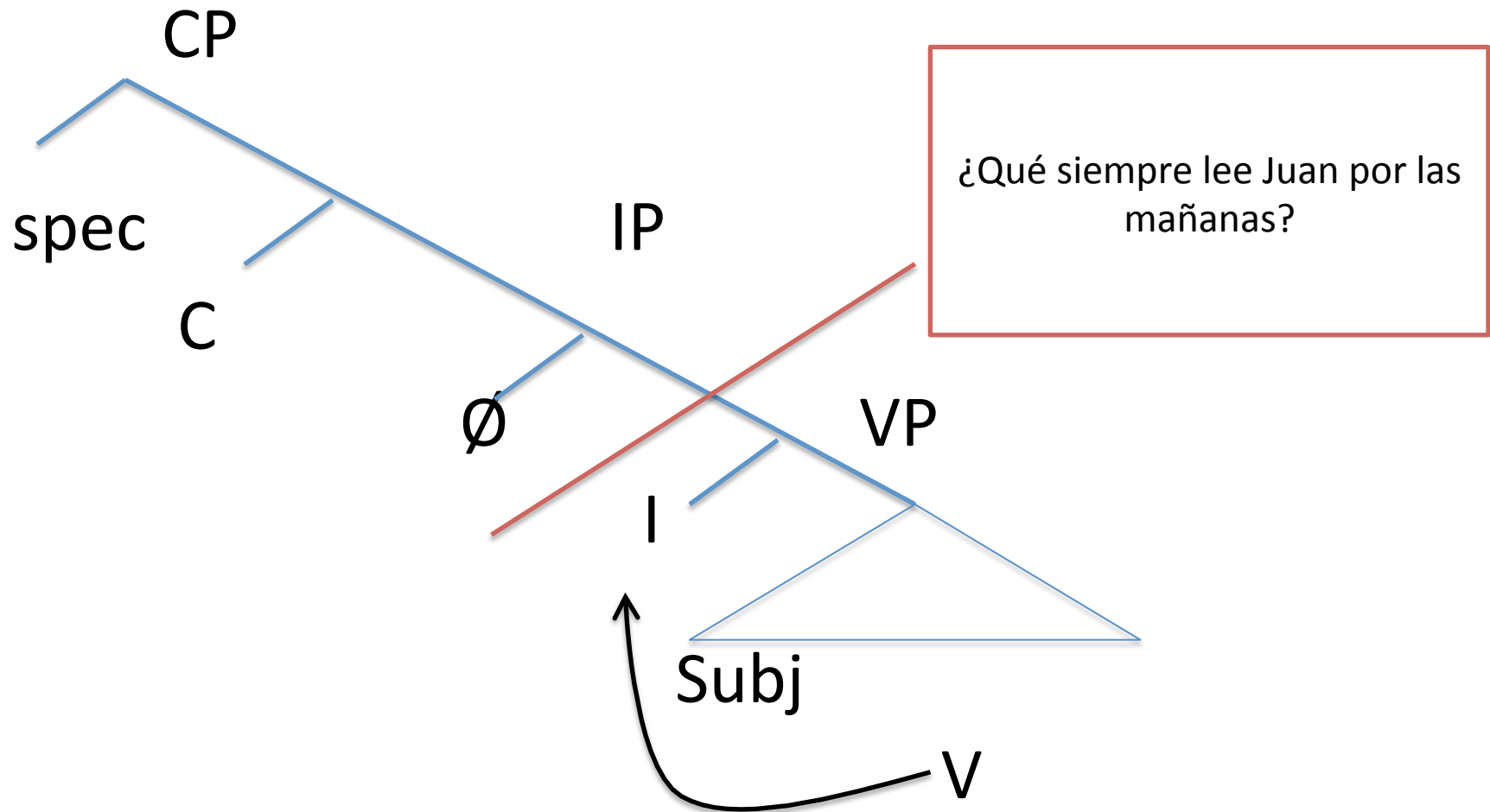
Summary

- Like omissions, word order bilingual effects might be fruitfully described in default terms: structural and selectional defaults, derivational stages.

- Development out of these defaults can be described in terms of lexical development, both the encyclopedic and the functional lexicon seem to play a role.

- Incorporating the lexical dimension can help us refine hypothesis about bilingual syntax.

- Such lexical approach to bilingual effects can describe grammar interaction at finer grained resolution.

In conclusion

- Heritage children can have monolingual-like attainment for some domains;

- Developmental sensitivity to being in a bilingual context

- No simplistic direct effect of input quantity and development: clear documented cases of acceleration; persistent effects in unexpected domains

- Rather, variability in the intensity and timing of experience determines the interaction between components of linguistic knowledge.

- Many domains of human behavior are best described in terms of multiple interacting timescales;

- Language development may be one such case: it takes months to accomplish phonemic tuning; a minute for a syllable distribution, a single exposure for fast mapping of a vocabulary item, years and years to learn passive structure.

- For these children we have studied, acquisition of their heritage language is often at risk, on the edge;

- Reduced input has selective impact across domains; this allow for a closer examination of modular interaction in development.

- This group of bilinguals gives us a unique opportunity to understand the nature of syntax, and our ability to acquire it.

Thanks

- M. Pirvulescu, L. Colantoni, J. Markle LaMontagne, N. Nagy, A. Cuza, D. Thomas, A. Castilla, for various forms of support.

- Members of the Language Acquisition Lab and the Toronto Psycholinguistics Group for feedback.

The Road Less Travelled

Date: October 26-27, 2012
Location: Victoria College,
University of Toronto

Invited Speakers Terry Au, University of Hong Kong
Nancy Hornberger, University of Pennsylvania
Naomi Nagy, U. of Toronto –
Maria Polinsky, Harvard Carmen Silva-Corvalán, USC

Organizing committee: Christina Kramer, Olivia Marasco, Joanne Markle LaMontagne, Ana T. Pérez-Leroux, Keren Rice, and Stephen Rupp.

Email: heritage.conf.2012@gmail.com;

Website: http://individual.utoronto.ca/perezleroux/site/roadlesstravelled.html