

# Bilingual Development in Spanish-background Children, Ages 0-3

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## HHS Roundtable Meeting

### *Supporting Positive Language and Literacy Development in Young Language Minority Children:*

#### *Research, Policy and Practice*

##### **Research Panel on Bilingual Development from 0 to 5 years**

**Moderator:** Diane August

**Panelists:** Barbara Zurer Pearson, Carol Scheffner Hammer, Gisela Jia, and Kathryn Kohnert

##### **Sponsors**

**National Institute for Child and Health and Human Development:** Office of Planning, Research and Evaluation, the Office of the Assistant Secretary for Planning and Evaluation; Administration for Children and Families

**U.S. Department of Health and Human Services:** the Office of Head Start, and the Child Care Bureau

**U.S. Department of Education:** Institute of Education Sciences and the Office of Special Education Programs



## The Basic Question

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- What are OPTIMAL language exposure patterns for language minority children (for whom multiple languages are not a choice, but a fact)?
- 
- What kinds of research could tell us the answer(s)?

## Basic Question 2

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- Is there any research that establishes bilingualism as a risk?
- For children already at-risk because of poverty and minority status, how much ADDED risk (if any) do they incur from bilingualism?

## Basic question 3

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- Finally, does the research give parents, caregivers, or communities any guidance about which language environments provide the best opportunity for growth in bilingual children ages 0 to 3?
- (Implied question: Is there any research that supports a goal of making children who are potentially bilingual become monolingual [in English]?)
- Those are three of the questions that motivated our research....

## Bilingualism Study Group / University of Miami

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- Infant Study 25 babies 3 months to 3 years, and
- Language & Literacy (LLBC) 960 children 5-11

D. K. Oller

Vivian Umbel

Ana Navarro

Rebecca Eilers

Vanessa Lewedag

Sylvia Fernandez

Maria Fernandez

Alan Cobo-Lewis

Virginia Gathercole

Barbara Zurer Pearson

NICHD 5R01 HD30762 to D.K. Oller & R. E. Eilers

NIDCD Bilingualism Supplement to Longitudinal Infant Vocalizations Project

## First some terminology...

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- Our “bilingual babies” didn’t speak two languages, not even one!
- So, what is “bilingual”?

# No agreed-on definition of BL

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## Wide range

- UN interpreter → bilingual infant
  - highly skilled in 2 → no speaking or listening skill
- 
- One can be “bilingual” on basis of input alone.
    - Infant, kindergartener new to the 2<sup>nd</sup> language
    - (Kind of a promissory note for future skill)



## 2. Many Patterns of Normal Bilingual Development

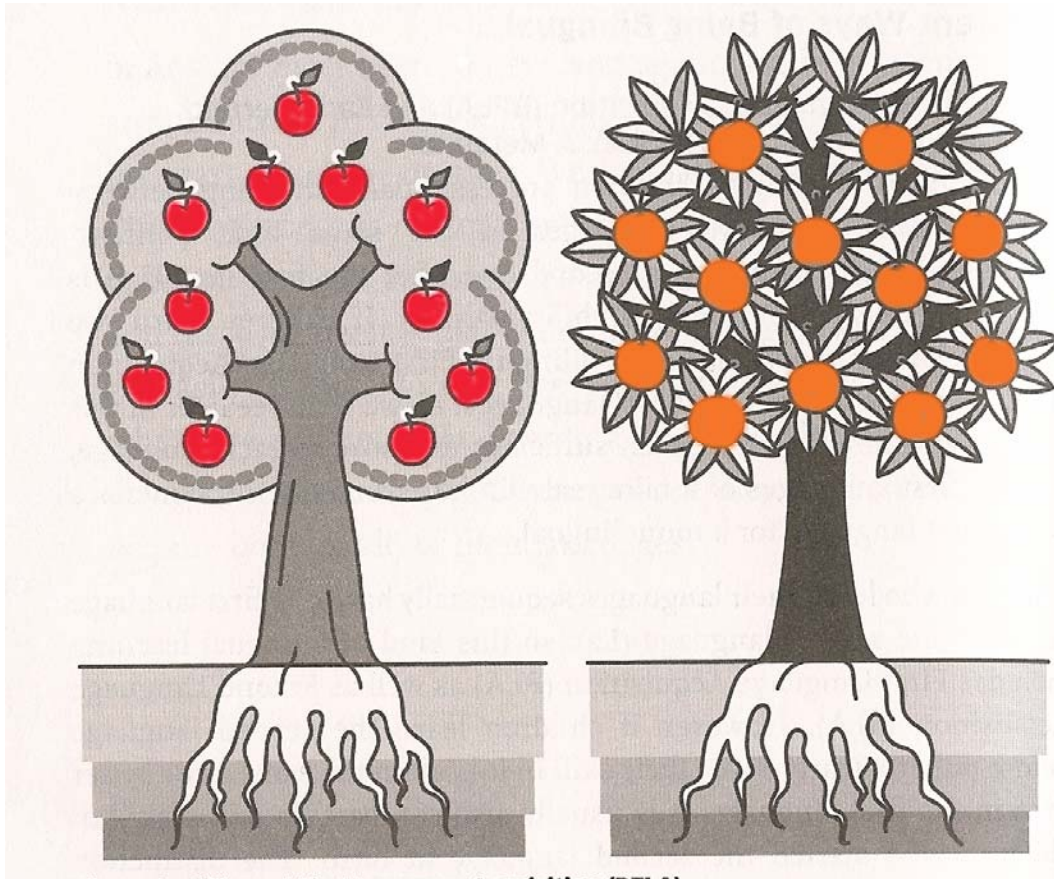
“Bilingual” is a spectrum.

Bilingual First Language Acquisition (BFLA) vs. early Second Language Acquisition (SLA)

Dominant vs. non-Dominant vs. Balanced



# Bilingual First Language Acquisition



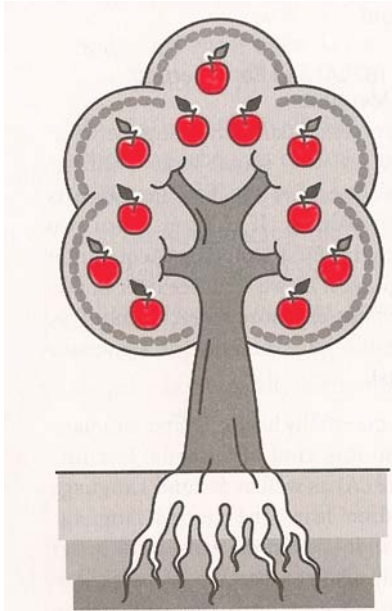
Two languages from birth.

Balanced (often)

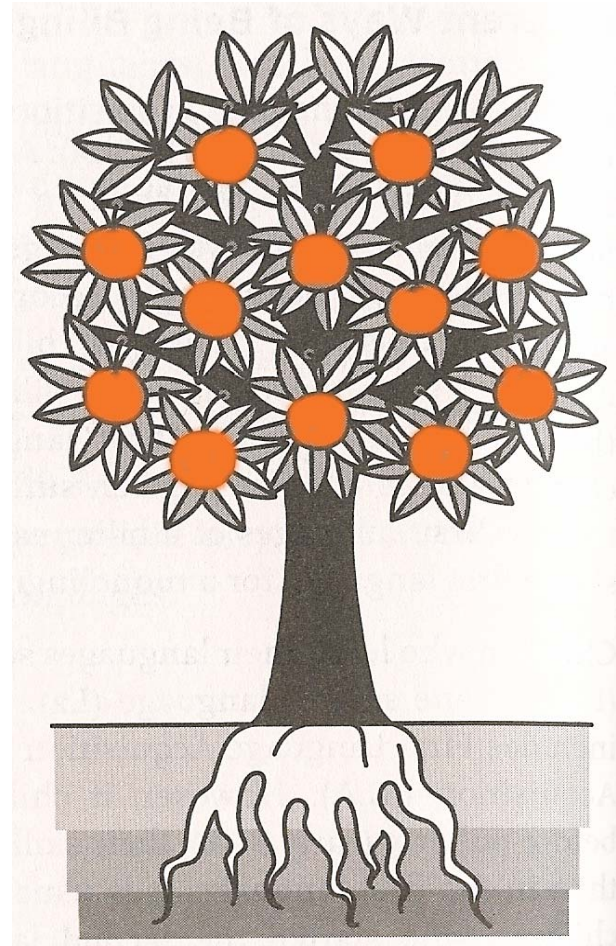
Independent of each other? (maybe)

From *Raising a Bilingual Child*, Pearson, 2008

# Even 2 languages learned at birth can be unequal.

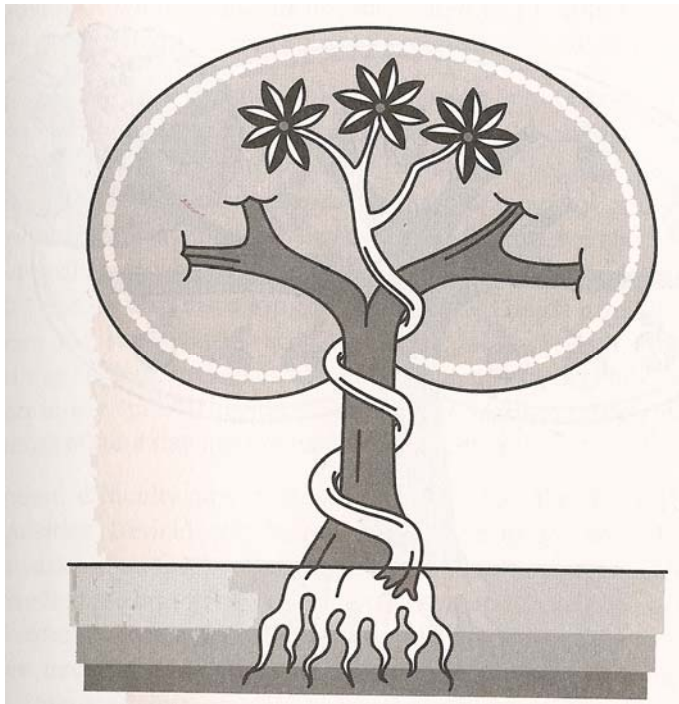


Depends on type and amount of exposure.



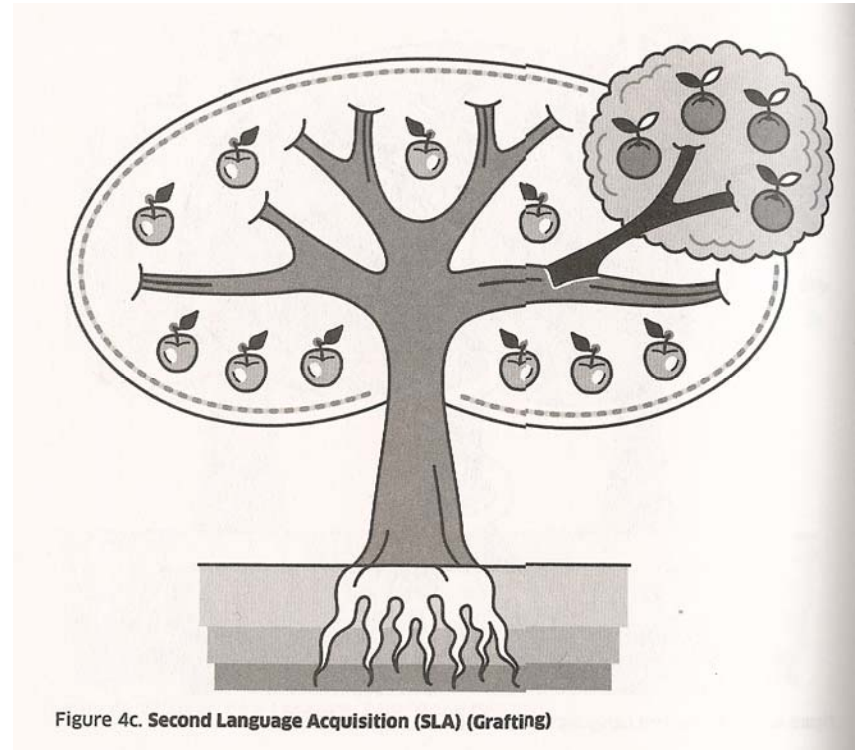
# SLA : Start to learn one first; then add the second

early



How independent?

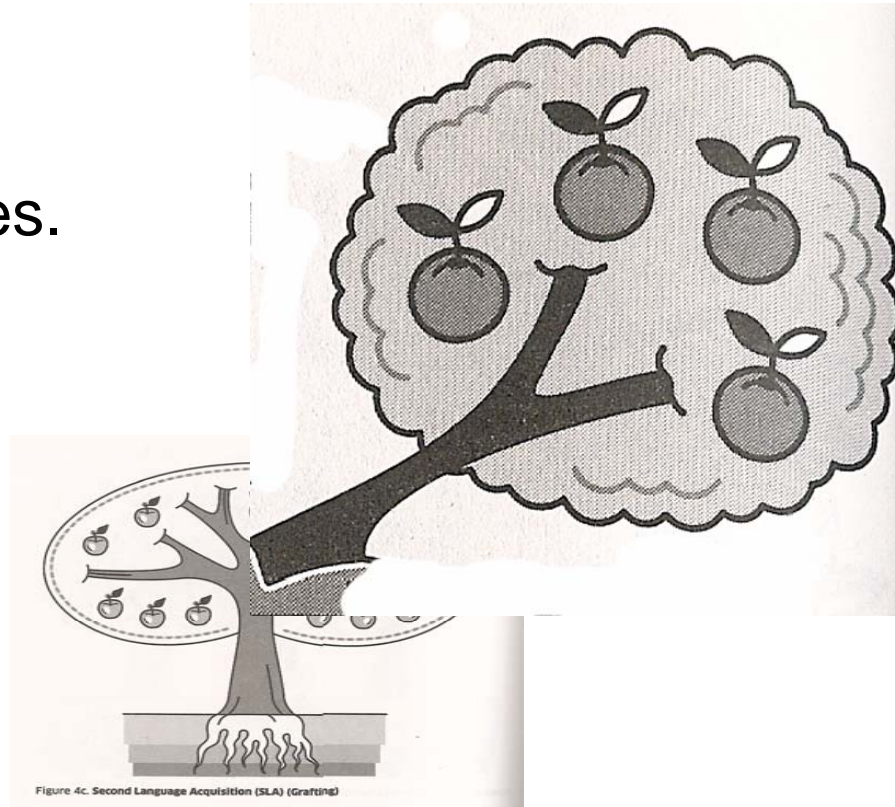
Late(r)



How balanced?

# An L2 can overtake an L1.

And often does.



## Need to know which language is “Dominant”

- We call them L1 and L2, but L1 not necessarily the best. (*See new Israeli study...*)
- The one you use the most (and value the most)
- Can they be equal? Yes, but rarely are.
- Does one take away from the other?
  - It can.
  - It doesn't have to.
    - (PFLO, 1997; Kohnert, 1998, 2001; Gathercole, 2002, 2007; Pearson & Fernandez, 1994; Hakuta & D'Andrea, 1992)

## Early Second Language Acquisition

- Not well understood
- Most comparisons of BFLA and SLA are with older second language learners –or vis-à-vis monolinguals

Need more research to investigate “ultimate attainment” comparing BFLA and eSLA Cummins and Collier say it will take 5 years for SLA child to catch up to ML. When catch up to BFLA?

After 5 years, how (in)distinguishable are they??

3.

## Expectations for Bilingual Development

Receptive vs. Expressive Language  
(Hard to study receptive language in infants)

Onsets vs. Inventories





## “Infants” don’t speak –Progress is hard to see

- Babies are making great strides in receptive language; we can tell only with laboratory techniques; *look at heartbeat (or sucking rate, or gaze) in millisecond increments in data pooled over groups of children. One doesn’t see/ or recognize the behavior in a single child.*
  - Werker (1984, 1992), goes from “universal listener” at 6 months to “language-focused” listener by 12 months
  - Fernald (2007), see when toddlers understand a word by tracking differences in eye-gaze to target and distractor
- Methods: naturalistic observation and parent report

## Emergence of expressive language—robust, universal timetable

| Approximate age           | Emerging behavior  |
|---------------------------|--|
| 6 months<br>+/- 3 months  | Mature “canonical” babbling (bababa dadada). The syllables of any language.      |
| 14 months<br>+/- 5 months | First words (or signs)/ symbolic play<br>Using one thing as a symbol for another |
| 18 months<br>+/- 7 months | First 50 words, first two-word utterances  |
| 36 months                 | The full basic sentence grammar acquired.  |

## Like walking, consistent onset, same wide window

- Hard to interrupt
- Happens in all languages and cultures (haven't found one where it doesn't)
- Same for bilinguals, in at least one language, often in two.
- Sources: Oller et al. 1997; Doyle, Champagne & Segalowitz, 1977; Pearson and Fernandez, 1994; Petitto et al. 2001. Patterson, 1998; Paradis & Genesee, 1996)
- Like walking or binocular vision, a human endowment, not a "talent" like figure skating or golf (Hyltemstam & Abrahamsson, 2000).

## Variability is the norm

- Individual differences small compared to overall uniformity around the world—but variability is the norm.
  
- People often forget the HUGE variability in MLs—within the defined windows.
  - CDI norms: Mean for expressive language at 20 months = ~150 words, 10<sup>th</sup> percentile 32, 90<sup>th</sup> percentile 405.
  - Standard deviation = the mean (Fenson et al. 2003).

## Some research to tell us when to worry

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- The windows are pretty “rigid.” The upper bound is a signal to worry.
  - 10 months for babbling (Oller & al., 1998 telephone study);
  - 18-19 months for 1<sup>st</sup> words (Wetherby & Prizant, 2002)
  - 25 months for 1<sup>st</sup> two-word utterances (Fenson et al. 2003; Rescorla et al., 1989, 1991)

## “Inventories” more vulnerable to reduced exposure of bilingual context than “Onsets.”

### Less vulnerable

- Phonological development—seems to be no decrement; Phonemic inventory of a language is finite (more or less)
- Syntactic details are more varied cross-linguistically, but broad **regularities** of languages mastered at same approximate timetable as monolinguals.

### More vulnerable

- **Vocabulary** is potentially infinite, learned one by one, from uses in many different sentence contexts. Learning specific words in one language does not help another (PFO, 1995; no processing work on this before 3).
- However **word form irregularities** are also vulnerable.

# Do babies get a boost from BL? Consensus is “Dual Systems” with some small interaction

▪ (Paradis & Genesee, 1996)

- Developmental patterns for bilinguals typically resemble monolinguals of each language for a given structure.
- Minimal transfer, constrained by the structures of the two languages relative to each other—only a few structures are sufficiently similar to “cross over.” (Mueller & Hulk, 2001, 2000)
- Some facilitation/deceleration: Eg. Navarro et al. 1995 looked at phonological development, specifically, the use of final consonants, which are less common cross-linguistically and more difficult developmentally. They are more common in English than Spanish. The BL children (aged 36 mos) in Spanish used more final consonants than the ML Spanish, reflecting the pattern of English; in English they used fewer final consonants (at that age) than the English MLs, reflecting their Spanish experience.
- Cross language transfer Happens later.

## What did the babies tell us?



*A young friend from RCMA in Immokalee FL...Photographer T. Hoffman*



## What did those babies tell us (con't)?

- Bilingualism by itself was not a risk (We looked at phonology and lexicon; refer to Paradis, Genesee for syntax) 95% of our infant subjects were average or above on a variety of measures in at least one language, some in two. (PFO 1993, Navarro et al. 1995, 2005)
- Language learning was not a zero-sum game. (No evidence that one language took away from the other, although there was some “alternating” [PF, 1994])
- Language balance was dynamic. Changed over time in response to changes in input. (PFLO, 1997)

## How good were the BLs (compared to MLs)?

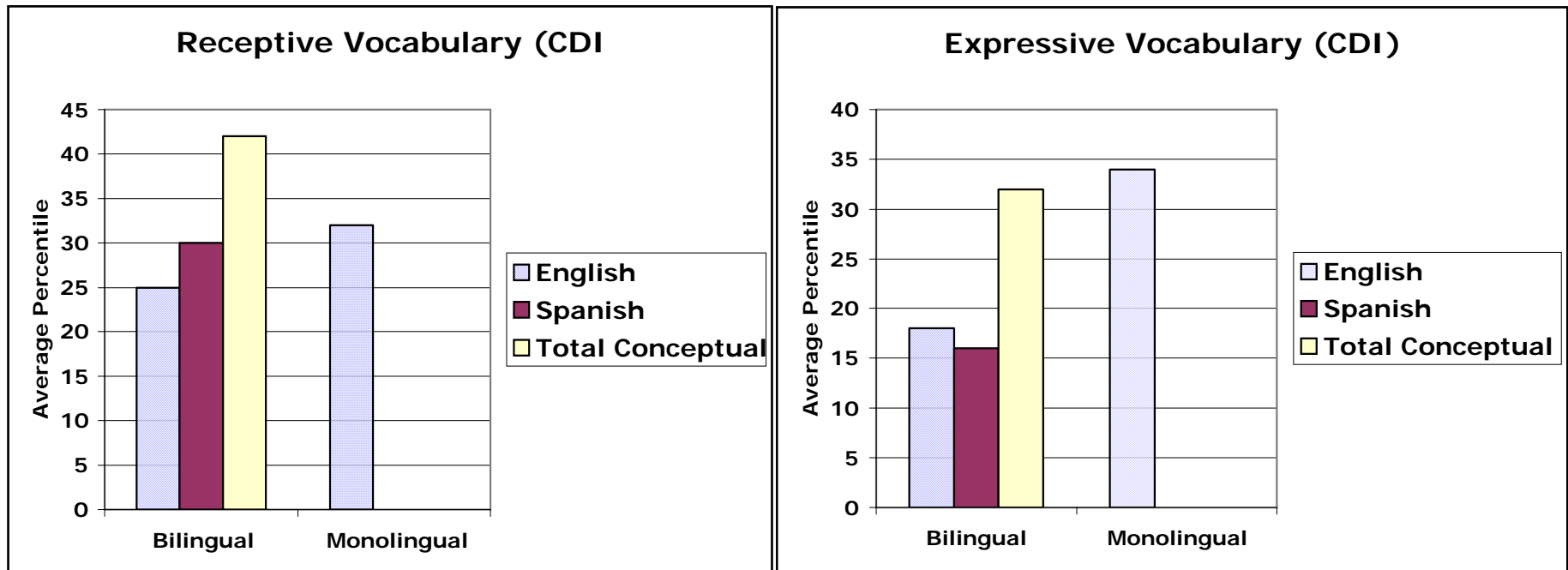
- In phonological development, every bit as good -  
-in at least one language, only one child in two languages (Navarro, 1998; Navarro et al. 1995, Pearson & Navarro, 1999).
- In receptive vocabulary, almost twice as good.
- In expressive vocabulary, good, but not twice as good. Lexical knowledge distributed across two languages (PFO, 1993; PF, 1994).

## What is “distributed”? (Oller & Pearson, 2002)

- (Know some words in both Ls (“doublets”); some in only one OR the other (“singlets”).
- Compare Receptive and Expressive vocabulary with CDI (Communicative Development Inventory, in Spanish and English) (Pearson, 1998)
- **Total Conceptual Vocabulary**: Counting words in both languages, but only different words.
  - teddy + ‘orso’ = 1;
  - teddy + orso + kitty = 2;
  - teddy + orso + kitty + agua = 3

## Receptive vocabulary BL > ML; Expressive BL = ML\*

- \* **Total Conceptual Vocabulary**: Counting words in both languages, but only different words.



Adapted from Pearson, Fernandez, & Oller, 1993

## Concept of double-language measure

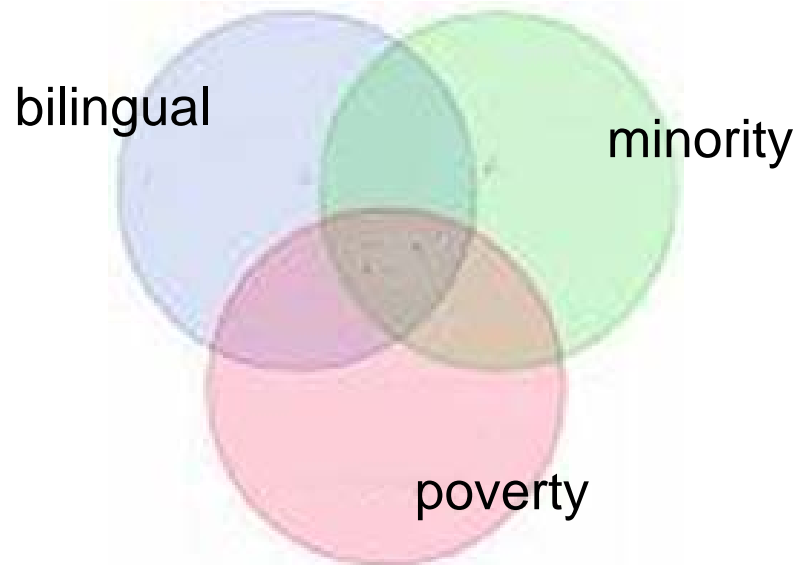
- Not just testing in two languages (better, but...)
- Both single-language scores leave out a large chunk of the child's knowledge. Umbel et al. and Fernandez et al. for example, gave PPVT and TVIP to mid SES groups. Each score average, but on low side of average. (Should be "normal curve.")
- TCV **combines** the two languages—when the measure needed is not just the # of words in a given language, but as here, the number of lexicalized concepts.

## No norms, but highlights different possibilities:

Must ask, what do I want to know??

1. Words in one language (L1)
  2. Words in other language (L2)
  3. Total number of words (L1+L2, minus any cross language homonyms, like “wawa” for water & agua)
  4. Total Conceptual Vocabulary (L1 + “singlets” in L2)
- Each plays a role. Words in each language (#1 and #2) are a rough guide to amounts of exposure in a language. When vocabulary is used as a proxy for other skills, it’s TCV (#4) that’s important. I like reporting them all (till we get some bilingual measures—like the BESA [Pena et al., forthcoming]).

# How much does bilingualism add to at-risk child's risk?



## Bilingual –by itself– not a problem

- Bilingualism the norm – worldwide
- Linguistic Diversity Index (Gordon, 2005) in US is AVERAGE (not low)
- These babies were not at-risk. 21/25 mid-SES, 3 working class, 1 very low-SES (father went to jail a couple of times during the study).
- For Basic Q 2, needed a more powerful quasi-experimental design, where we can see the consequences of different patterns of early experience (among other variables).

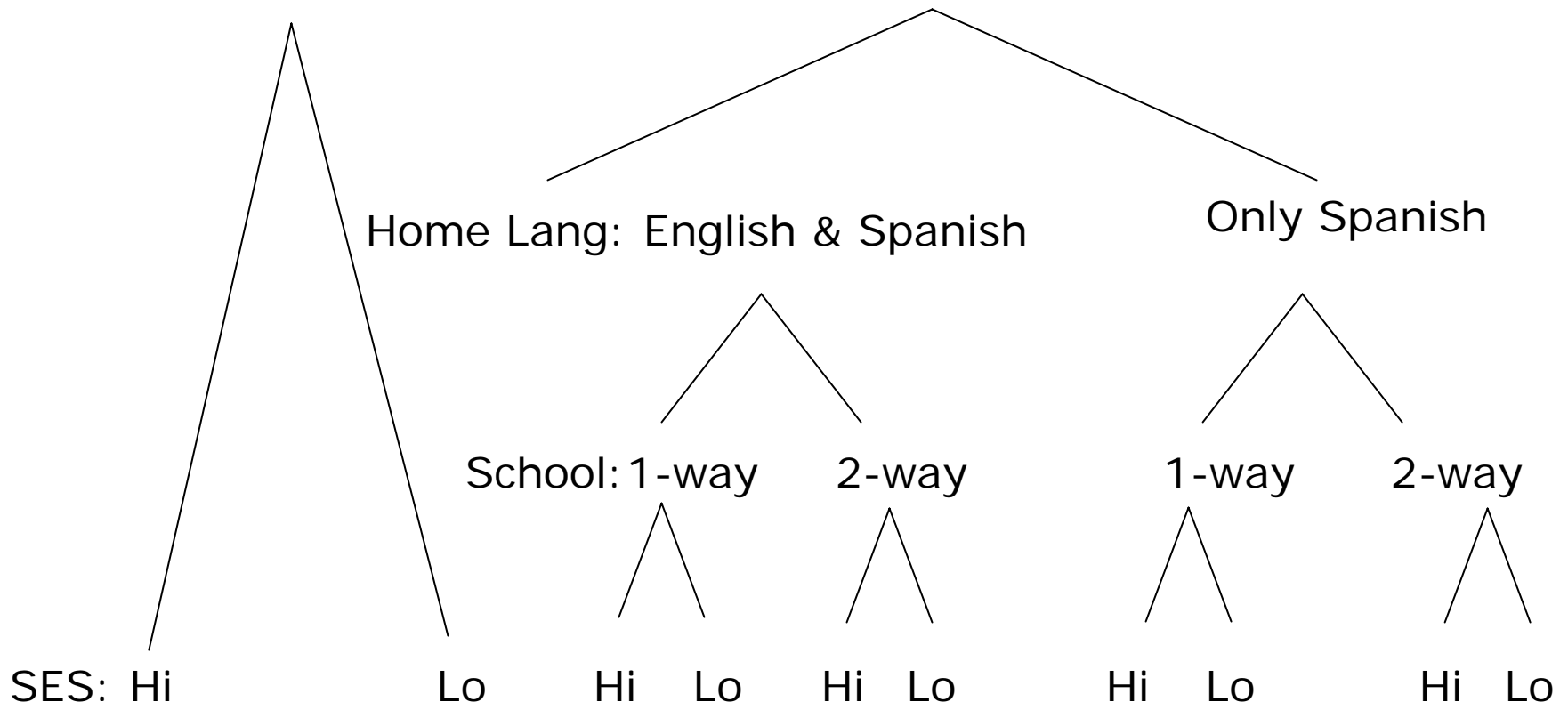


w/ Nested factorial (Core Design-LLBC, Oller & Eilers, 2002)

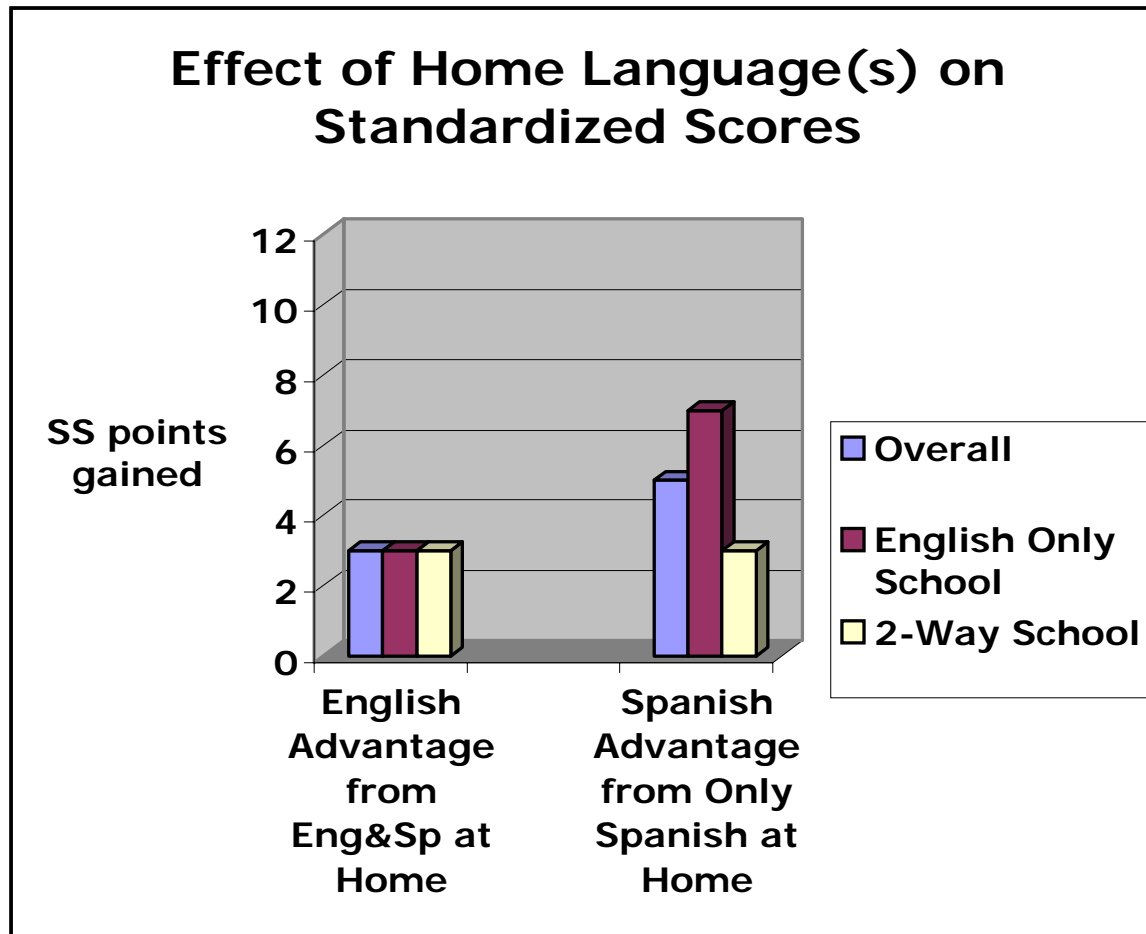
(Replicated at Kindergarten, 2<sup>nd</sup> and 5th Grades)

Monolinguals

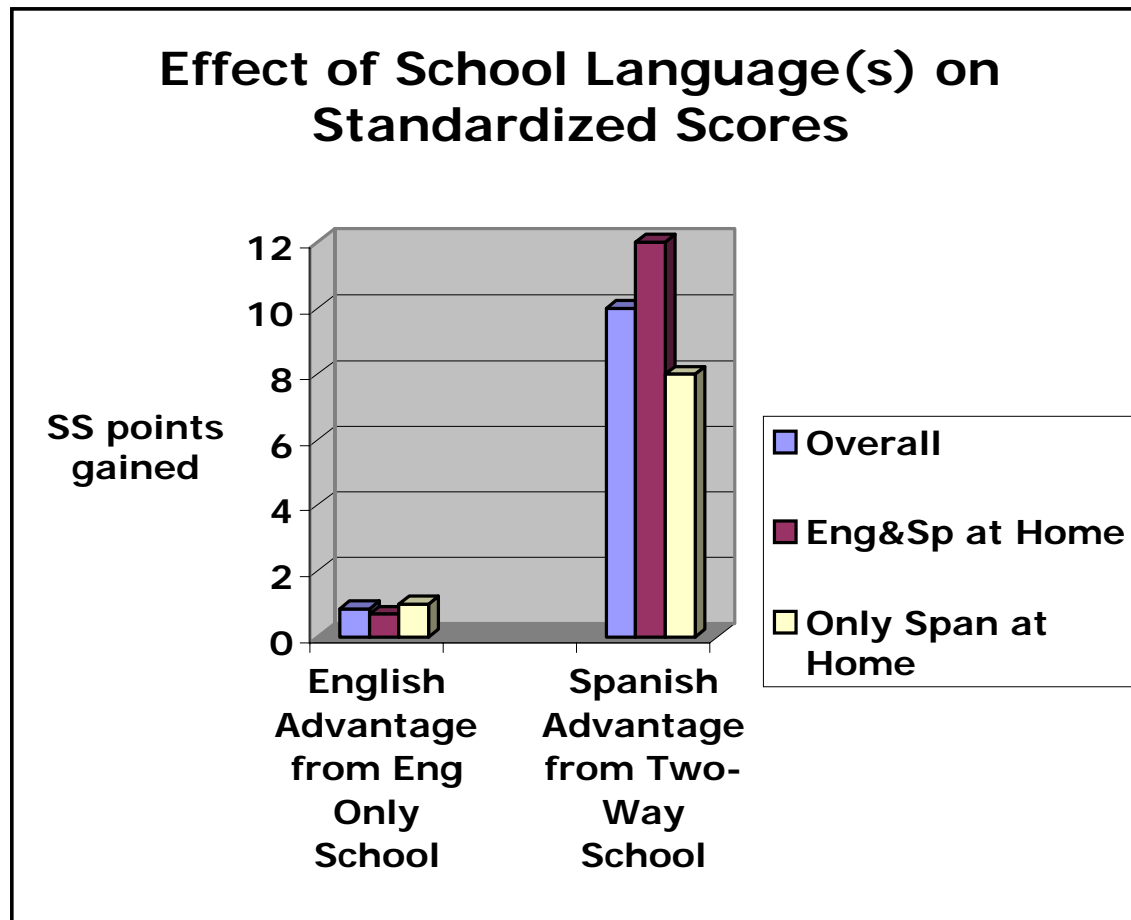
Bilinguals



# At 5<sup>th</sup> grade, difference scores for the home language groups



# At 5<sup>th</sup> grade, difference scores for school lang groups



## LLBC Answers to basic question 2

- Bilingualism was dynamic—growth over time. (Faster growth curves for the bilinguals.) Picture at K different from at 5<sup>th</sup> grade (See “threshold.” Look at the long term.)
- Linguality effect was not straightforward, different effects in different domains. (a “test effect”)
- Home language had weaker effect than school language for literacy, home language had a stronger effect than school language for oral skills.
- **SES the strongest effect. High SES BLs in most cases outscored low-SES monolinguals.**
- (But, they didn’t outscore high-SES monolinguals except in a very few places.) So even in “optimal circumstance” BL adds a risk. May be added risk of minority status and/ or assessment issues. Vocabulary and morphosyntax play disproportionate role.)

## Summing up –what does LLBC say about early language?

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- 1 Don't be poor!
  
- ML-Spanish in home—ok for English
- BL (English & Spanish in home) –ok for English
- BL (Eng & Span in home) –not great for Spanish
  - English in home less damaging if there's Spanish in school.

## What language should caregivers speak?

- Infants and Toddler needs for language growth:
  1. Continuity between home and care setting (security)
  2. One-on-one interaction
  3. Varied input – following the child's focus
  4. Support for child's efforts to communicate (Hart & Risley, 1995)
  5. Will at some point need acquaintance with community language
    - (From "Concepts of Care," Pearson & Mangione, 2006)

## What works for all goals?

- ML English doesn't accomplish #1 (continuity); (argues for Spanish)
- #2-4 can happen in any language (positive support);
- #5 (introduction to community language) argues for English.
  
- BL accomplish all 5 goals.
  
- Ideal: MLS home; BL care providers or preschool

**Thank you!**

Questions?



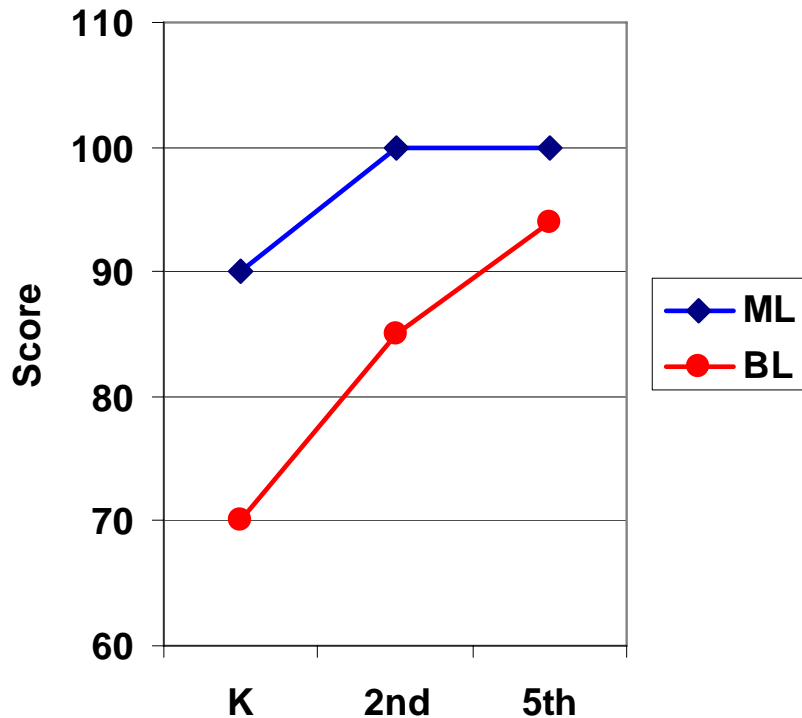


## May be the contribution of bilingualism

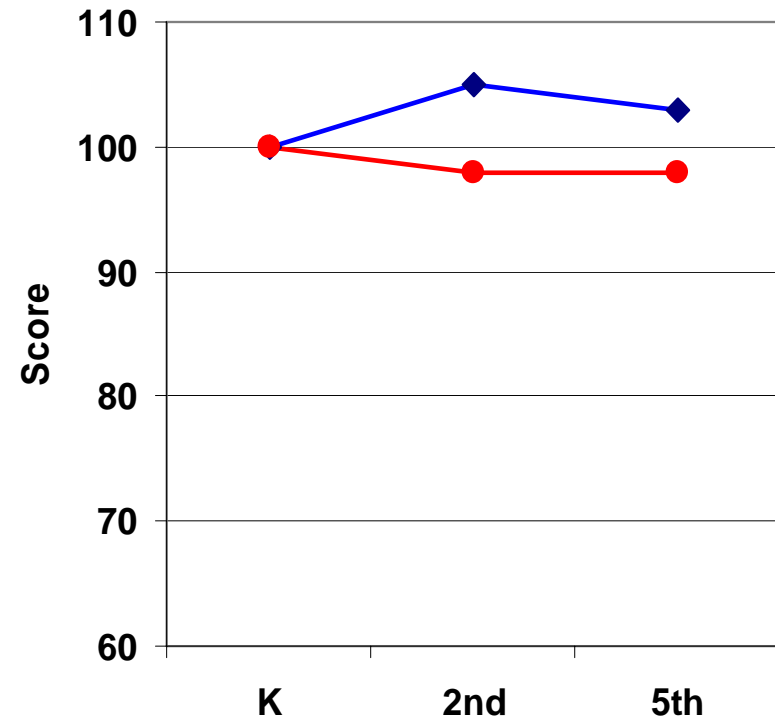
- “Onsets” are fine; “inventories” show some effect of lesser exposure...
- Vocabulary and “Morphosyntax” (word forms like “goed”, prepositions)
- Single-language inventories get great emphasis because in MLs, there is a strong correlation between, for example, vocabulary and other language (and cognitive) skills.
- Doesn't hold for bilinguals

# Profile effect: Vocabulary poor indicator for BLs

### PPVT Scores by Grade



### Proofreading Scores by Grade

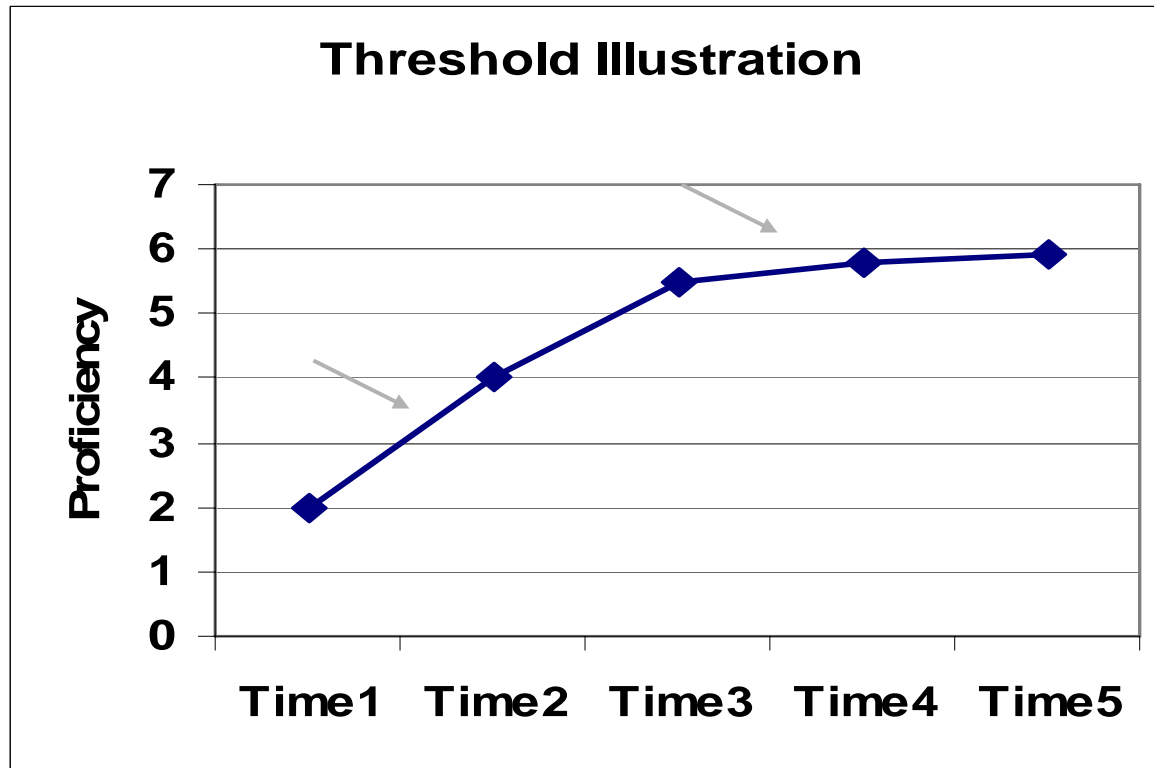


i.e. other skills are average, even with low vocabulary (or high)

From LLBC, 2002; Oller et al. 2007

## 3rd principle: Concept of the THRESHOLD:

Exposure matters, up to a point



## Answers to Question 3 (what language scenario is optimal?)

- English-only in the home and English-only in the school gave only short term advantage in English. (By 5<sup>th</sup> grade, on average 3 standardized point difference—mostly in lexicon, not literacy.) (Pearson, 2007)
- If we had found English-only in home and school a great benefit, that might have been indication to sacrifice Spanish for greater English (but we didn't find that).
- (Might say, E-Only didn't hurt them—but there are strong social, emotional, and cultural reasons not to lose L1 (See Tabors & Snow...; Wong Fillmore, 1991 etc.)

## Will there be any linguistic benefits for children 0-3 from bilingual environment?

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- BL “independent”—neutral
- BL “interdependent” – higher level skills
- Practical value, but most “advantages” kick in later (metalinguistic understanding, helping to learn to read, skill transfer etc. Bialystok, Cummins)
- The two languages seem relatively distinct for the young child from the outset. See Conboy & al. Two-word utterances, use of verbs depends on mass of words in a language.

## Why is minority status independent of SES a problem for English?

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- Don't know.
- Worse language models?
- Reduced exposure, affects single-language "inventories"?
- Parents don't feel that the institutions work for them?

## Dual Systems

Old questions: One system or two?

Neurological and experimental evidence says 2 from the outset. (Nuria, Werker)

Monolingual vs. Bilingual Mode

## xx Why is minority status independent of SES a problem for English?

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- Less used in formal registers (playground vs. classroom) Why vocabulary?
- Lower prestige, less motivation to preserve and improve it
- Less print and other media in it – less to talk about that happens in the language
- Less access to cultural and political institutions in the medium of the minority language
  
- *Takes more exposure to a minority language than a majority language for same “amount” of learning (PFLO, Vihman et al.)*
- *→ the majority language can cede some space??*



## Monolingual vs. Bilingual MODE *(Grosjean, 2001)*

- Monolingual MODE – use 1 language at a time (within an interaction, within an utterance)
  - Can move back and forth from ML mode in one language to ML mode in another – quickly, even young children can
- Bilingual MODE – use both languages in the same interaction, within an utterance
- Hybrid: “Non-converging conversations.” Two people speak to each other in different languages. Each in ML Mode for speaking; BL mode for hearing.

# Language MODE is a choice

- Varies by individual or by community
- One generally accommodates to the other people in the conversation
  - Purists vs. those who celebrate “Spanglish” (like Stavans)
  - Can’t do it with monolinguals, but when possible many BLs seem to prefer it.
- People worry about children mixing. They speak what they hear.
  - Canadians have shown that children as young as two are sensitive to what language the situation calls for and can regulate their speech in that direction—but not always perfectly, they are apprentices.
  - Many anecdotes of children being more clear on who speaks what than adults are.

## Code-switching or mixing

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- Often interpreted as confusion
- Can be used to fill lexical gaps
- Actually a skilled behavior
  - Utterance must fit both grammars
  - Not random
  - Canadians (Allen) show children's skill even in languages as disparate as Inuktitut and English (or French)

## Example of broad regularities versus exceptions in learnability (*Paradis et al., 2006*)

- Comparing BL French- and-English learners to French and English monolinguals on regular verbs, irregular verbs, and “overregularizations” (like I digged a hole).
- Regular verb endings have high “type frequency”—they are used with many different verbs--aids in learnability. No ML-BL differences (for children dominant in that language).
- Irregular verbs in English have low type frequency and relatively low token frequency, and thus are harder to learn. Takes bilinguals longer to amass enough exposure to sort them out. Irregular verbs in French are more “productive”, there are more in the same “family,” so type frequency is higher, and the BL decrement is much smaller.

## Effects of exposure, con't

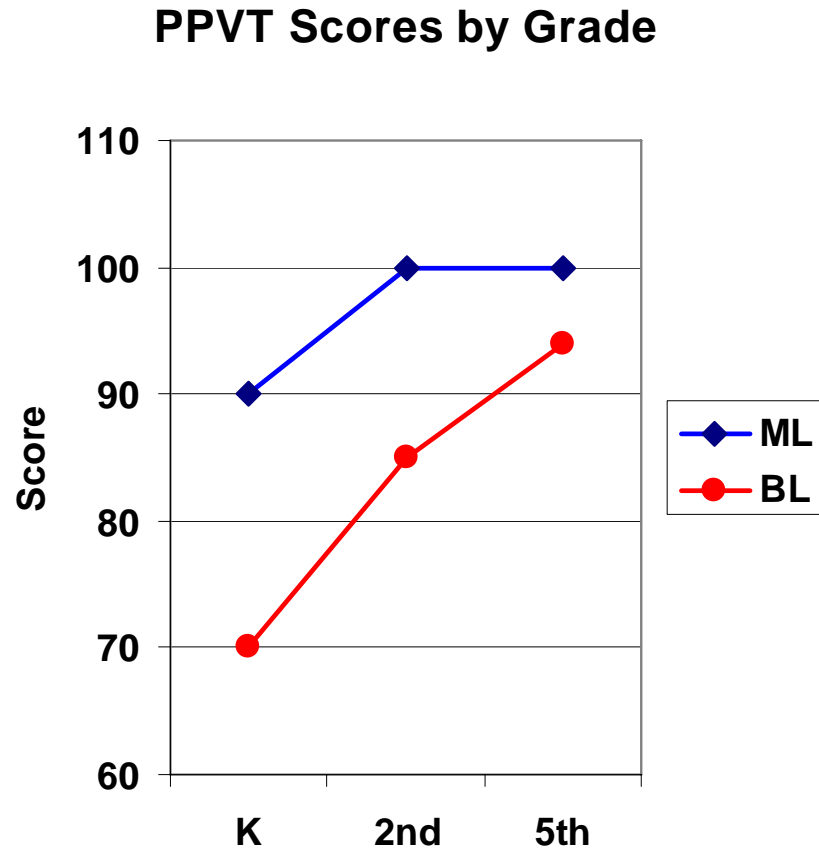
- Both groups make “overregularizations.” That is they use the pattern in error where there are exceptions to the pattern. The type frequency is sufficient, but the token frequency is not.
  
- Reduced exposure has differential effect according to
  - 1) dominance,
  - 2) complexity of the structure and task, and
  - 3) type and/ or token frequency of the structure in the input.

## Why vocabulary?

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- (Phonology seems more independent)
- Vocab correlates with other scores.
- Like “temperature”—the temperature is not the disease, but it accompanies it.
- Vocabulary not the language, but it a reasonable “thermometer” or .....“barometer”
  
- But not for developing bilinguals

# Principle 3: Long-term vs. short-term



## Nature & Nurture: Supporting Positive Development



LAD (or MAD) & LASS

Language Acquisition Device

Multilingual Acquisition Device

Language Acquisition Support System



## How much nature? How much nurture?

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- Scientists estimate about 50-50. (Cole et al. 2004; Pearson, 2008)
- But how can you nurture twice as much learning in the same amount of time (and “space”)??!
- third bulleted point

## Subtractive vs. Additive

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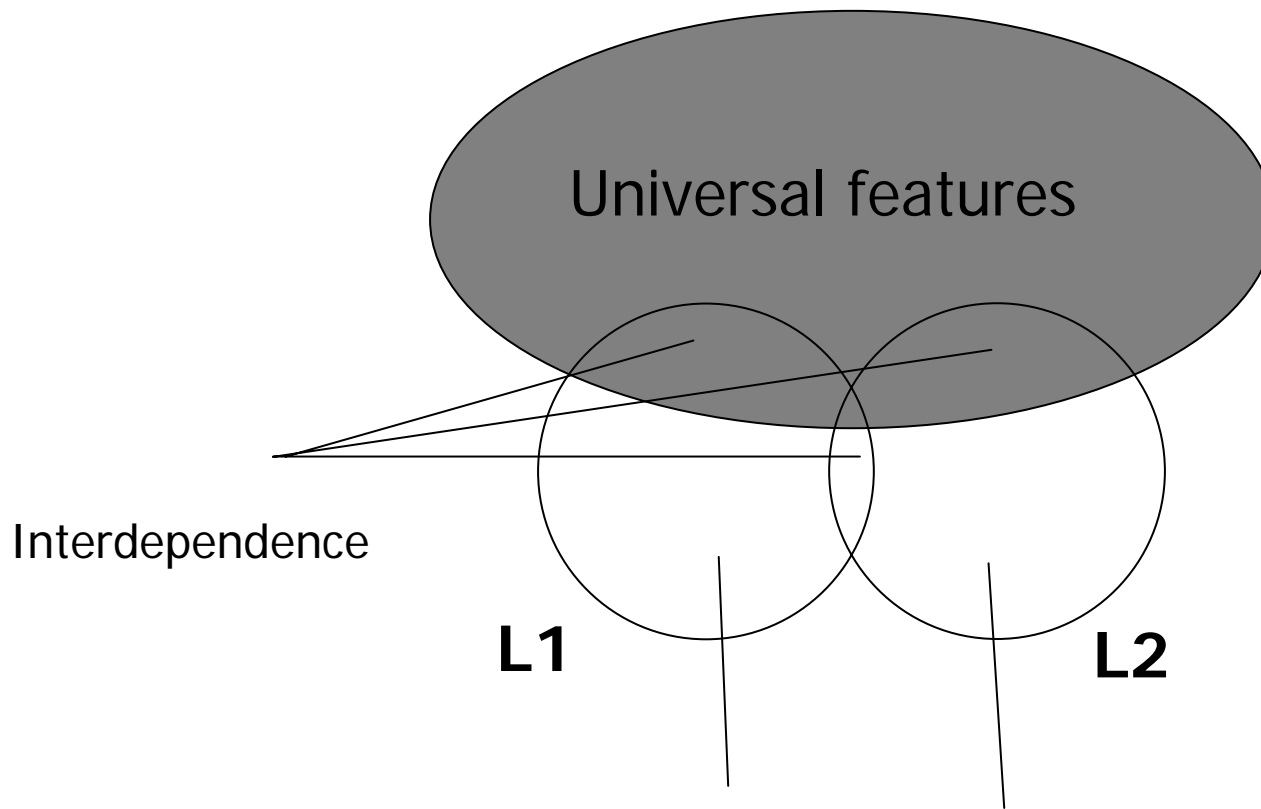
- Elite bilinguals ADD a 2<sup>nd</sup> language
- Immigrant bilinguals are often asked to replace one language with the other (serial monolingual).
  
- Language used for relationships, for thought, to get more language.

## How can child learn 2 languages in same time as 1?

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1. Basic capacity is larger than needed for one language
2. Languages interact, facilitate each other (in some domains); are interdependent
3. Capacity not fixed over time: Long-term vs. short term
  - Delay with a catch-up clause
  - Concept of a threshold

# 2nd principle: Languages interact. $1 + 1 = 2$



## Consider child learning sounds of Eng and Span

- Spanish:  $i_s, e, o, u, a$
- English:  $i_e, e, o, u + \upsilon + \varepsilon (+ 8 \text{ others})$

Child has:  $i_s, e, o, u + \varepsilon$

(how many is that? 5 or 8?)

## 4 ways to count

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1. English only (4)
2. Spanish only (4)
3. Total (added together) (8)
4. Total Conceptual (5)

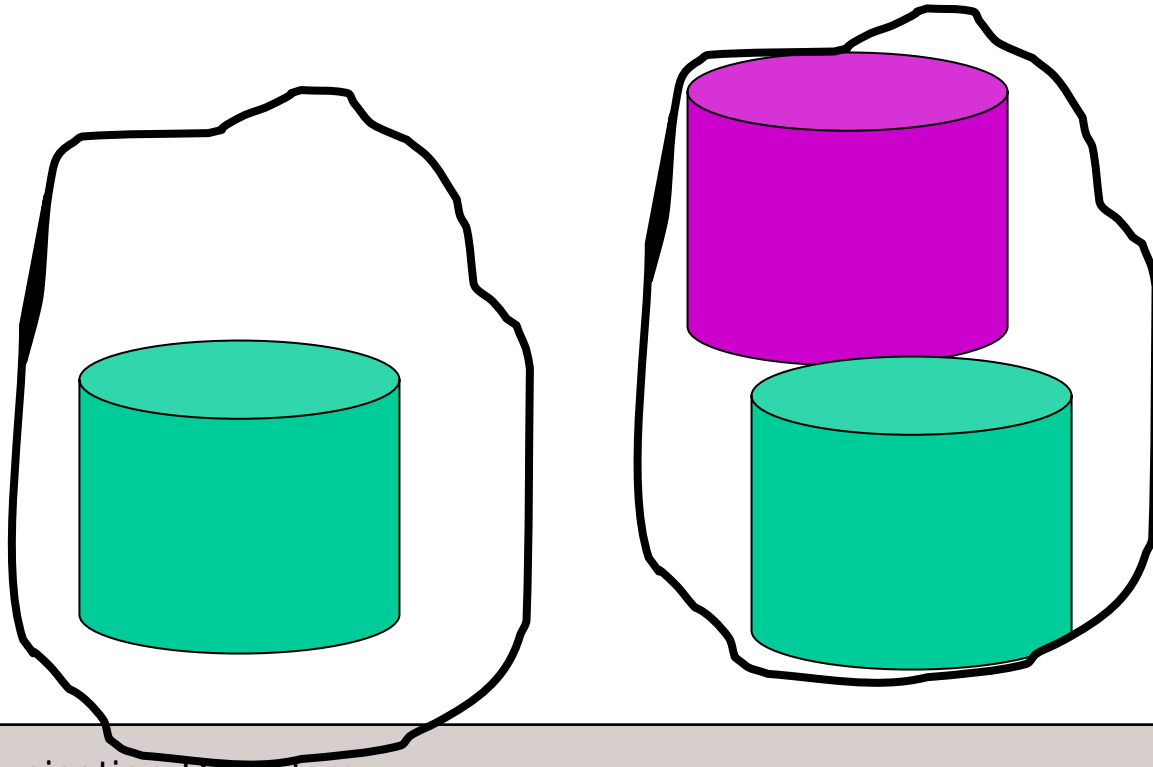
## 3<sup>rd</sup> principle:

### short term (limited) vs long-term (not limited)

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- Less exposure for each language in any given day (24 hour limit/ 12 waking hours)
- We're talking years.

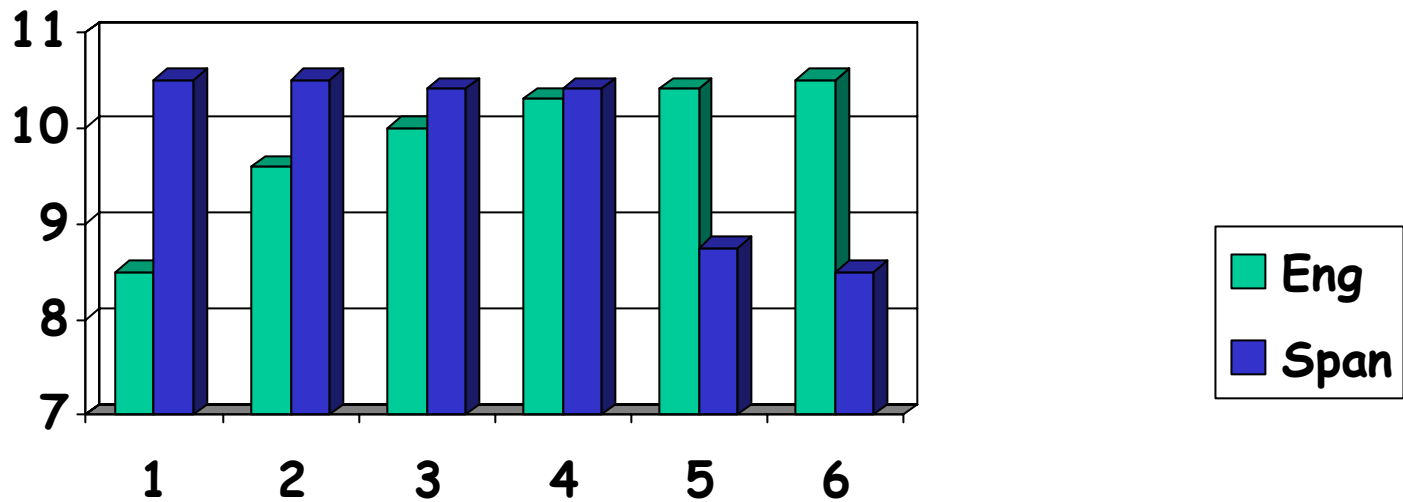
# 1<sup>st</sup> principle: Language Capacity greater than ML requires





# 1<sup>st</sup> principle: Learning 2<sup>nd</sup> language doesn't require loss of 1<sup>st</sup>.

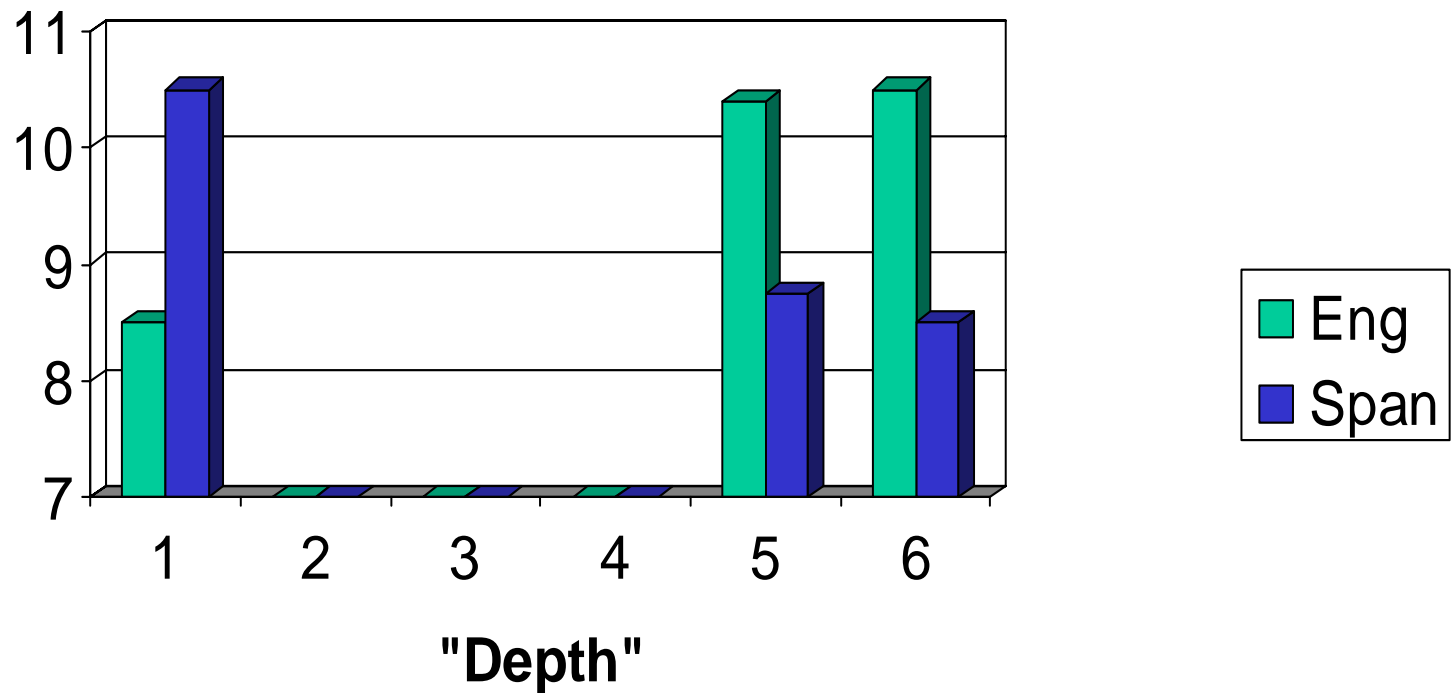
English and Spanish Proficiency by Time in U.S.



"Depth"

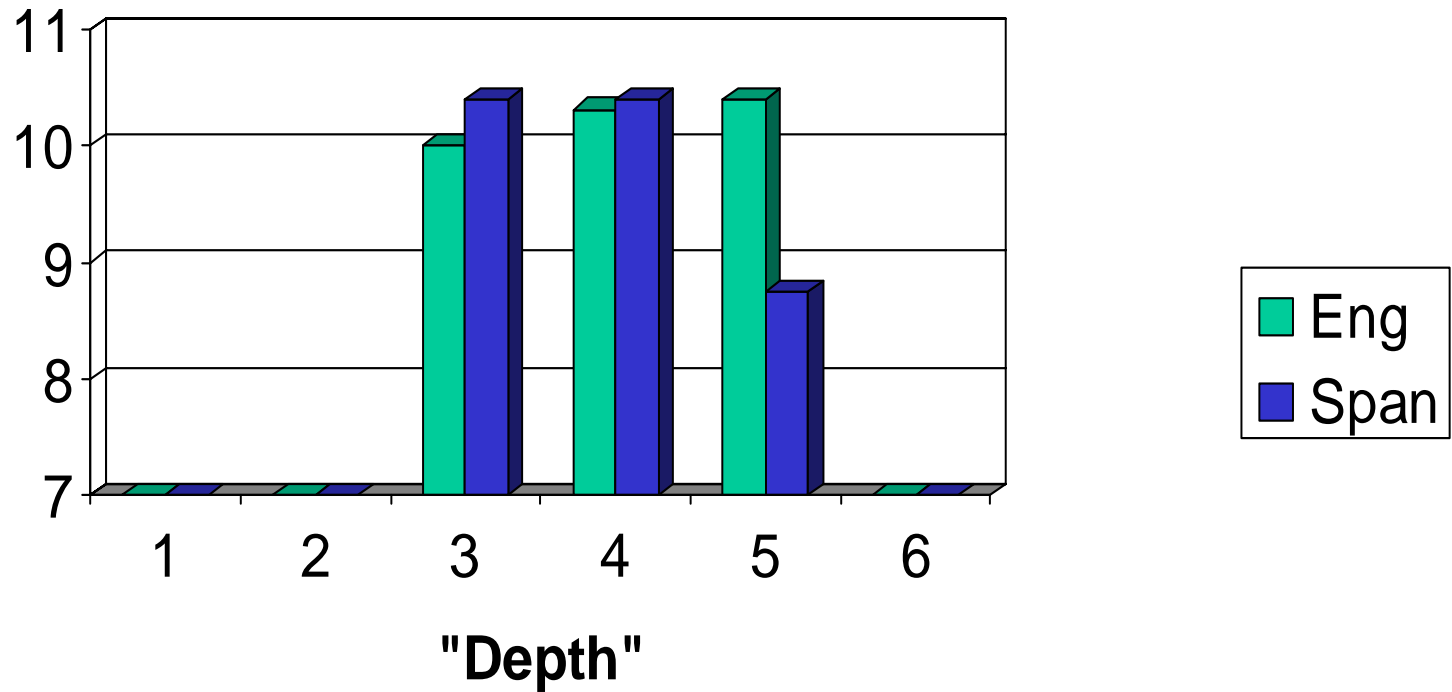
# Demonstration of subtractive LL

## English and Spanish Proficiency by Time in U.S.



# Demonstration of additive BL

English and Spanish Proficiency by Time in U.S.



## Sources for today's talk

- Laboratory studies (esp. for receptive development)
  - Werker, Fernald, and others
- Observational studies/ quasi-experimental designs
  - Bilingualism Study Group (U of Miami)
- Parent Report forms – ML & BL
  - Fenson et al., Pearson et al., Patterson, Marchman, Conboy
  
- Focus on Hispanic background children, under age 3
  - (also some Canadian, Welsh – on “input”
    - Paradis & Genesee, Gathercole & Hoff
  - Language and Literacy in Bilingual Children (LLBC)
    - Oller & Eilers, 2002 – retrospective viewpoint/ home language)

## Some linguistic progress is ignored

- (We don't think of it as "language")
- Declarative Pointing vs. Imperative Pointing
- Following gaze, Showing
- Taking turns, Making communicative bids
- See Early Social Communication Scale,
- Joint attention, reading others' intentions
- (Crucial skills, not tied to any specific language, but needed for all languages.)

## Limitations on what we can HEAR

- Infants' poor articulation make it difficult to recognize progress. Harder with bilingual child when context shifts.
  - (Navarro et al. 2005 – blind listeners could understand only 24% out of context of what was understood 100% in context. Adults in same protocol, went down to 96%. Out of context, MLs and BLs equal—in dominant language. Only one subject of our 10 showed equal competence in both languages in this task.)
- Performance (Muscular Dexterity) limitations (tongue and jaw are hard!) Distinguish more than they can say.
- Once the child has a linguistic representation, now there are Performance limitations in retrieval. (See T. Gollan, also Nicoladis, in press)
  - (Older) Children who failed to produce low-frequency words in elicitation procedure, recognized them in PPVT-like presentation.

## (Some) Lab findings for bilinguals

- They can distinguish two familiar languages from birth if in different “rhythm classes”; from 5 months within rhythm classes (Nuria & Sebastian-Galles, 200x)
- They “keep” two sets of contrasts for related sounds, one for each language when “learning to ignore” is progress (Werker, 2006)
- MLs tend to orient to the familiar sound; BLs to the novel sound (Werker, 2006)