Development of a Bilingual Test for Spanish-English Children: A Long and Winding Road

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Disclosures

- All authors benefit financially from royalty payments from the BESA.

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Introduction & Overview
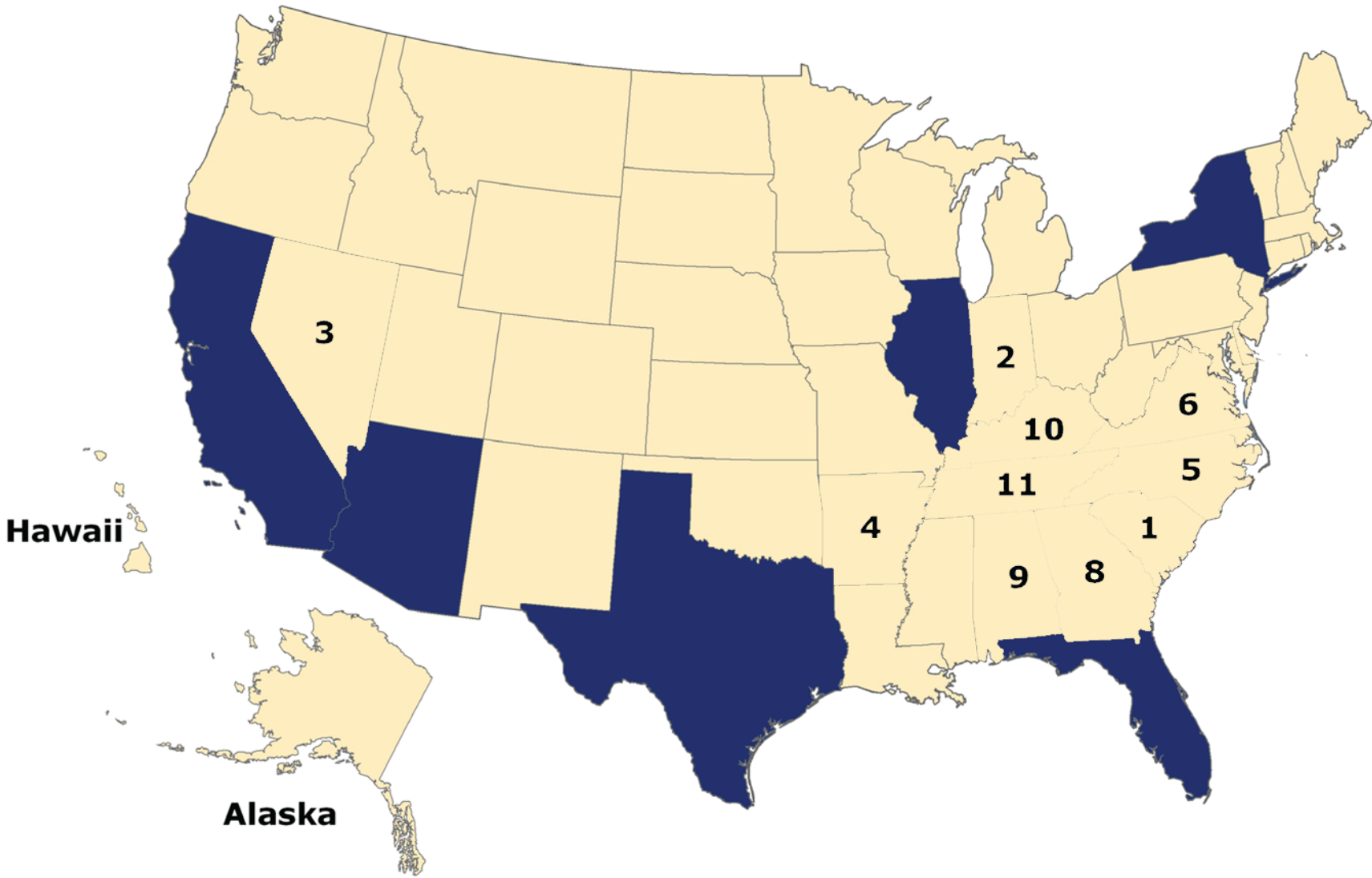
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HABLA
Human Abilities in Bilingual Language Acquisition

Introduction

- Demographics

- Measurement considerations
  - Bilingualism
  - Selection of test items

States with 150,000 or more ELL students (2007-2008)

Notes: There were no states with the size of ELL population between 250,000 and 700,000.
Source: National Clearinghouse for English Language Acquisition, State Title III Information System.

States with 150,000 or more ELL students (2007-2008)

States (ranked) with more than 200 percent ELL growth (1997-1998 to 2007-2008)

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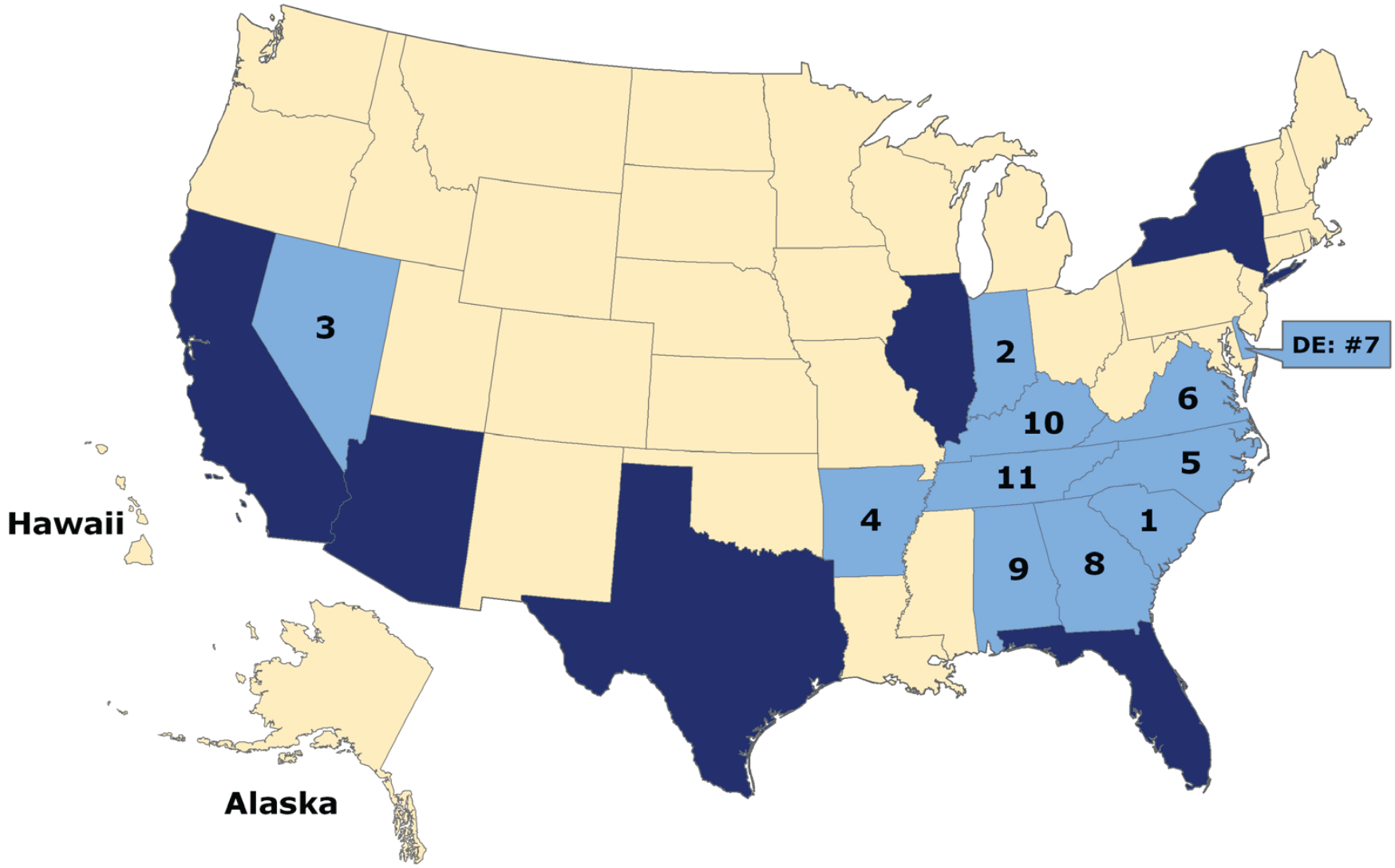
3

2

6

10

11

5

4

1

9

8

Hawaii

Alaska

Notes: There were no states with the size of ELL population between 250,000 and 700,000.
Source: National Clearinghouse for English Language Acquisition, State Title III Information System.

Challenges in Assessment of Bilingual Children
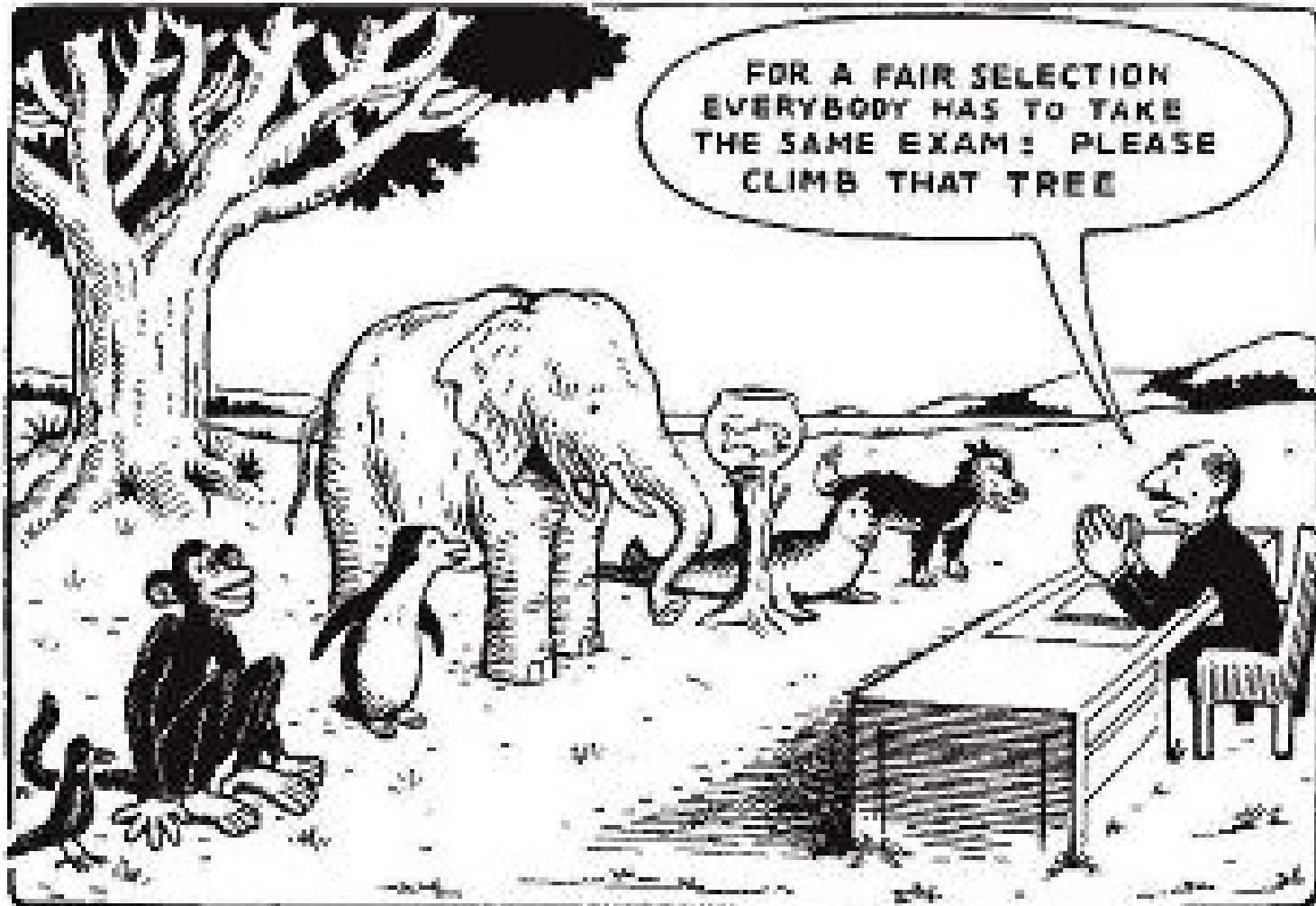
Bilingualism

- HIGHLY VARIABLE

  at individual level

Measuring L1 and L2

- Age of L2 exposure

- Current use and exposure

- Direct testing
  - What do we test?
    - Vocabulary
    - Grammar
    - Narrative

Language Dominance

		Dominance Semantics			Total
		E	B	S	
60% Eng	E	205	13	5	223
40-60% Both	B	42	39	41	122
60% Span	S	12	25	211	248
Total		265	80	260	605

Language Dominance

		Dominance Semantics			Total
		E	B	S	
60% Eng	E	205	13	5	223
40-60% Both	B	42	39	41	122
60% Span	S	12	25	211	248
	Total	265	80	260	605

Language Dominance

		Dominance Morphosyntax			Total
		E	B	S	
60% Eng	E	212	4	7	223
40-60% Both	B	62	12	48	122
60% Span	S	21	17	210	248
	Total	295	33	265	593

Language Dominance

		Dominance Morphosyntax			Total
		E	B	S	
60% Eng	E	212	4	7	223
40-60% Both	B	62	12	48	122
60% Span	S	21	17	210	248
	Total	295	33	265	593

Language Dominance

		Dominance Morphosyntax			Total
		E	B	S	
Dominance Semantics	E	253	5	7	265
	B	39	18	23	80
	S	11	10	239	260
	Total	303	33	269	605

Language Dominance

		Dominance Morphosyntax			Total
		E	B	S	
Dominance Semantics	E	253	5	7	265
	B	39	18	23	80
	S	11	10	239	260
	Total	303	33	269	605

Challenges in Assessment

True Language Impairment

vs.

Outcomes of Divided Input

Challenges in Assessment

- Second language learning looks like PLI
- First language loss looks like PLI

Challenges in Assessment

- Test domain by language experience (Peña, Bedore & Zlatic-Guinta, 2002)
  - Knowledge gaps due to sociocultural influences
  - Could appear to have more limited vocabulary knowledge

    Pragmatics

    Phonology

    Semantics

    Morphosyntax

Challenges in Assessment

- Bilingual Language Test Development
  - Divided time in each language (Bialystok, 1999; Gollan, Montoya, Cera & Sandoval, 2008; Kohnert, 2010; Pearson, & Fernández, 1994)
  - Age of acquisition of L1/L2 varies
  - Familiarity with content varies

Identification/Classification of LI

- Goal is to develop items that
  - Are challenging for children with LI (sensitive items)

  BUT

  - Appropriate for children with different levels of experience (insensitive to experience)

Plan

- Development of test norms using item analysis approach
  - LI and NL
  - Compare by different levels of experience in L1 and L2

Steps in Test Development

- Plan the test
- Write items for each area of plan (1.5 to 3 times as many items as you'll need)
- Administer all items to small sample of at least 50 (or up to several hundred)
- Conduct item analysis
- Administer revised test to another sample
  - Cross-validation

Item Difficulty
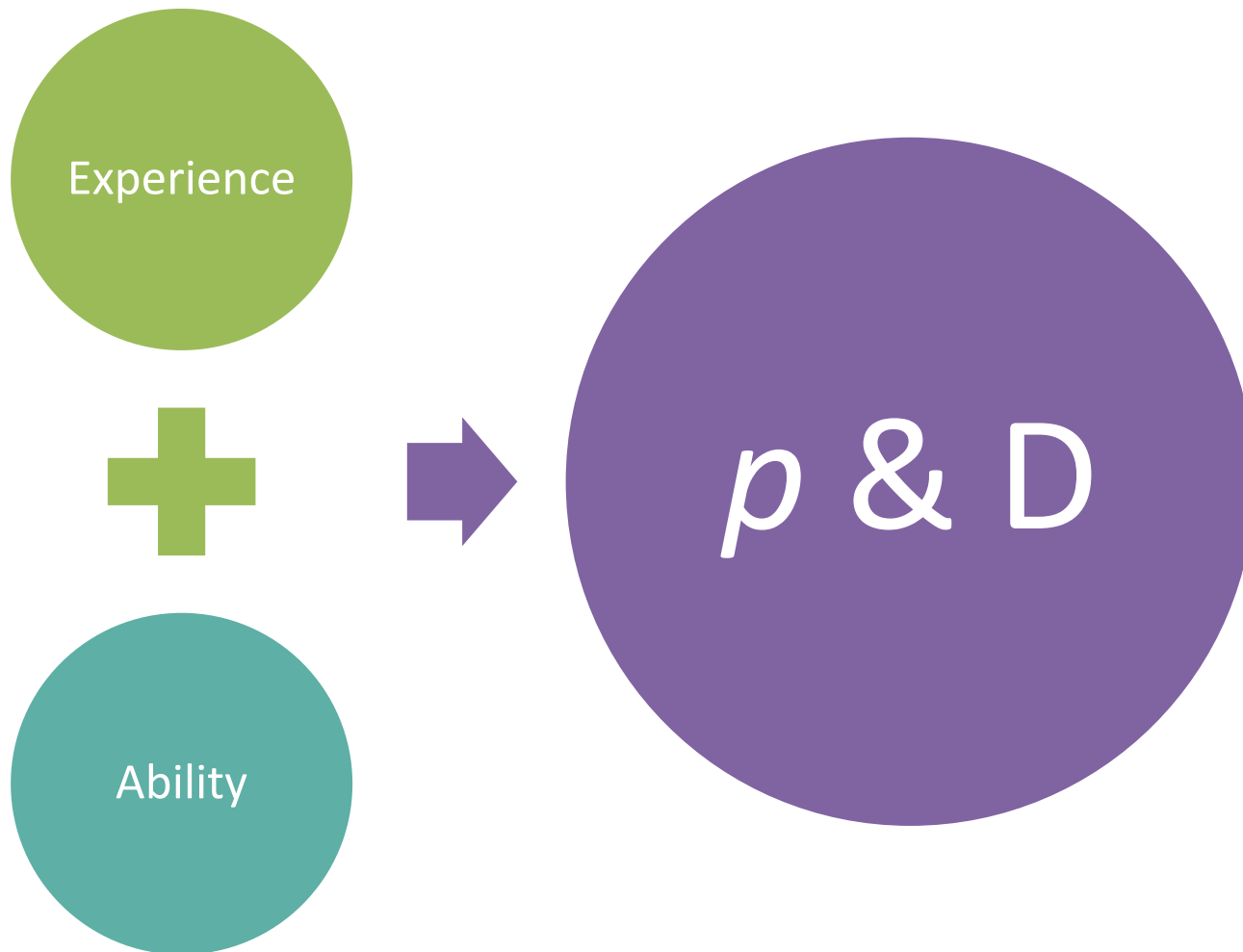
- P (or p_i) = % of population who got the item correct

- If close to 1 or 0 discarded

- Item selection depends on purpose of test

Item Discrimination

- $D = (p_i - p_{ii})$

    p_i is normative group (TLD)

    p_{ii} is clinical group (LI)

- Yields number between .00 and .99

- Greater number indicates item works to discriminate between the two groups

Application to Bilinguals

Experience

+

Ability

→

p & D

Language Experience → Item Discrim

- Calculated p-values for children by
  - ABILITY level
  - language EXPERIENCE
- Calculated D
  - language EXPERIENCE

	English
	Spanish

Development of a Bilingual Test

- Test blueprint
  - Focus on markers
- Iterative approach

Large item set

Smaller item set

Final
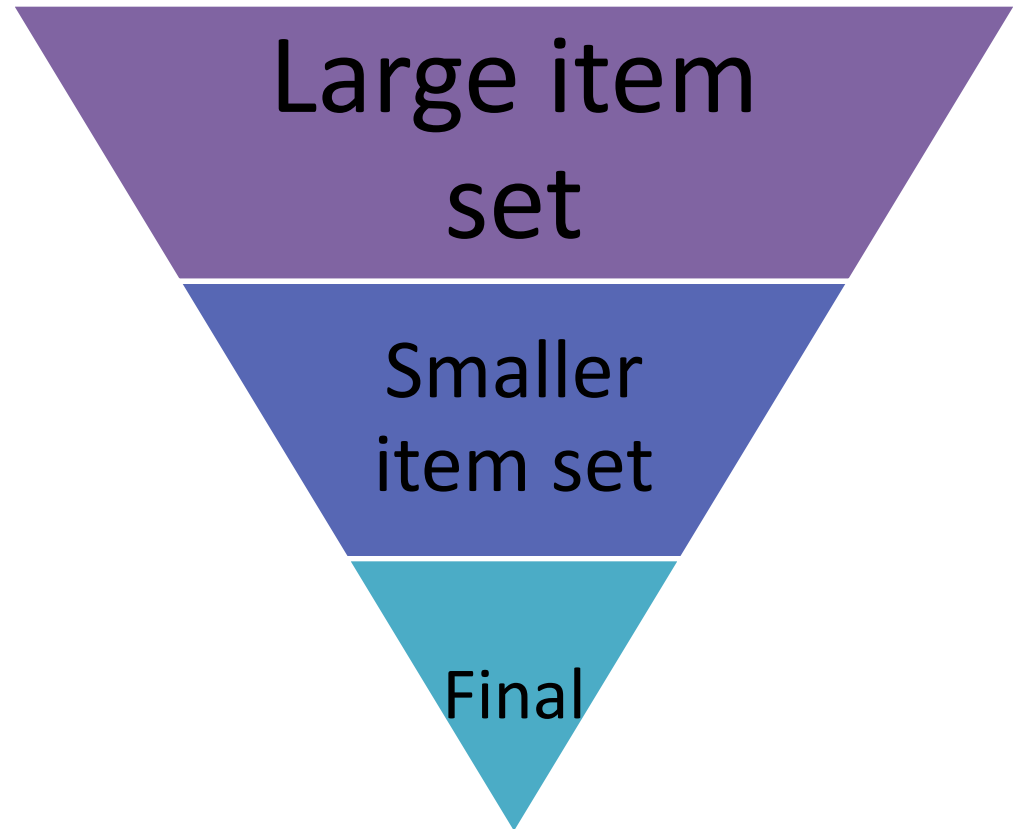
Development of a Bilingual Test

Four Domains:

- Phonology

- Pragmatics

- Semantics

- Morphosyntax

Phonology

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Events in 1997

- Bill Cosby wins People's Choice Award
- *Simpsons* airs 167th episode (now over 530 episodes)
- FCC makes 711 for emergency calls for those w/ hearing- or speech-impairments
- *The English Patient* wins the Academy Award
- Microsoft releases Internet Explorer 4.0 (now, it's 10)
- Microsoft buys Hotmail
- My older daughter was 1; my younger daughter was not born. They are now…

Weaknesses with Phonology Assessments c. 1997

- Not standardized
- 3-position test (i.e., I-M-F; a lá GFTA)
- Single analysis vs. multiple analyses
- Dialect specific
- Lack of internal validity
  - Opportunities for phonemes
  - Opportunities for phonological patterns
  - Phonotactic structure

Spanish vs. English Phonetic Inventory

Stops	Spanish	p	b	t	d	k	g		
	English	p	b	t	d	k	g		
Nasals	Spanish	m	n	ɲ					
	English	m	n	ŋ					
Fricatives	Spanish	f	s	x					
	English	f	v	s	z	θ	ð	ʃ	ʒ	h
Affricate	Spanish	ʧ							
	English	ʧ	ʤ						
Liquids	Spanish	l							
	English	l	ɹ						
Flap	Spanish	ɾ							
Trill	Spanish	r							
Glides	Span./Eng.	w	j						

Syllable Types (Hammond, 2001)

	English	Spanish*
V	[e] "a"	[a] "a"
CV	[li] "Lee"	[lo] "lo"
VC	[ot$mil] "oatmeal"	[en$traɾ] to enter
VCC	[ɪts] "its"	[abs$trak$to] abstract
CVC	[bot] "boat"	[dos] "dos"
CVCC	[bots] "boats"	[peɾspekti$βa] "perspective"
CCV	[ple] "play"	[pla$to] "plato"
CCVC	[tɹen] "train"	[tren] "train"
CCVCC	[tɹenz] "trains"	n/a
CCCV	[stɹa] "straw"	n/a
CCCVC	[stɹaŋ] "strong"	n/a
CCCVCC [	stɹɪŋz] "strings"	n/a
CCCVCCC	[stɹɛŋkθ] "strength"	n/a
CCCVCCCC	[stɹɛŋkθs] "strengths"	n/a

Internal Validity: Phonotactic Structure

- # of opportunities for each phoneme (including vowels)
- Frequency-of-occurrence on sounds on the subtest & in the language
- # of opportunities for common phonological patterns
- Mono-, di-, & multi-syllabic words
- Most commonly occurring word initial and word internal clusters
- (Attempt) for dialect neutral words
- Indicated effect(s) of dialect for each word

Assessment Design

- Separate subtests for Spanish and English
- 28 words in Spanish; 31 in English
- All singleton consonants in Spanish and English are targeted (except /ʒ/ in English).
- Each sound targeted at least 1x. Most sounds targeted at least 1x in syllable initial and syllable final positions.
- Commonly occurring:
  – initial consonant clusters; e.g., /plato/
  – abutting consonant pairs; e.g., /elefante/

Assessment Design

- All vowels targeted at least once (except /ɑɪ/ and /ɔɪ) in English).

- Words of varying length are included.
  - Spanish: 1-, 2-, 3-, 4-, and 5-syllable words
  - English: 1-, 2-, 3-, and 4-syllable words

- Varying stress: words with stress on antepenultimate, penultimate, and final syllables.

Scoresheet: Spanish

Stimulus / Trans.	Production	Elicitation	Syllable Initial	Syllable Final	Vowel	Dialectal Variation
tren		–Spont.				
[tren]		–F1. para ir al trabajo –F2. en la estación, hay un…	tr____	n____	e___	[tre:] [trẽ]
	Score: 0 1	–Imit.				

Spanish: No Dialect Error

Stimulus Trans.	Production	Elicitation	Syllable Initial	Syllable Final	Vowel	Dialectal Variation
tren	[ten]	–Spont.				
[tren]		–F1. para ir al trabajo –F2. en la estación, hay un…	tr__[t]__	n____	e___	[tre:] [trẽ]
	Score: ⓪ 1	–Imit.				

Spanish: Dialect Feature

Stimulus Trans.	Production	Elicitation	Syllable Initial	Syllable Final	Vowel	Dialectal Variation
tren	[trẽ]	–Spont.				
[tren]		–F1. para ir al trabajo –F2. en la estación, hay un…	tr_____	n_____	e____	[tre:] [trẽ]
	Score: 0 ①	–Imit.				

Scoresheet: English

Stimulus Trans.	Production	Elicitation	Syllable Initial	Syllable Final	Vowel	Dialectal Variation
frog		–Spont.				
[fɹɑg]	Score: 0 1	–F1. it is green and swims in the water –F2. in the pond, we heard the croak of a… --Imit.	fɹ_____	g_____	ɑ_____	

Completed Scoresheet: English

Stimulus Trans.	Production	Elicitation	Syllable Initial	Syllable Final	Vowel	Dialectal Variation
frog [fɹɑg]	[fɑg] Score: ⓪ 1	–<u>Spont.</u> –F1. it is green and swims in the water –F2. in the pond, we heard the croak of a... --Imit.	fɹ_[f]____	g____	ɑ____	

Scoring/Analysis

	Whole Word		Syllable Initial		Syllable Final		Total Consonants		Vowels		Total Segments	
	Eng.	Span.	Eng.	Span.	Eng.	Span.	Eng.	Span.	Eng.	Span.	Eng.	Span.
Total Number of Errors												
Total Number Correct												
Total Possible	31	28	64	70	33	12	97	82	51	67	148	149
Percent Correct												

Scoring/Analysis

	Whole Word		Syllable Initial		Syllable Final		Total Consonants		Vowels		Total Segments	
	Eng.	Span.	Eng.	Span.	Eng.	Span.	Eng.	Span.	Eng.	Span.	Eng.	Span.
Total Number of Errors	14	14	27	32	13	3	40	35	11	3	51	38
Total Number Correct	17	14	37	38	20	9	54	47	40	64	97	111
Total Possible	31	28	64	70	33	12	97	82	51	67	148	149
Percent Correct	54.8	50.0	57.8	54.3	60.6	75.0	**55.7**	**57.3**	78.4	95.5	65.5	74.5

Interpretation

	Sample Child		Typically Dev.		Children w/ SSD	
	Eng.	Span.	Eng.	Span.	Eng.	Span.
% Consonants Correct	**55.7**	**57.3**	90.9	88.9	78.4	74.5
% Vowels Correct	78.4	95.5	97.5	98.5	94.4	94.6
% Segments Correct	65.5	74.5	93.2	93.3	83.9	83.6

Secondary Analyses

- Phonetic Inventory

- %-of-Occurrence of Phonological Patterns

  – Final consonant deletion, unstressed syllable deletion, cluster reduction

  – Stopping, palatal & velar fronting, liquid simplification

- Other Errors

- Vowel Errors

Sensitivity/Specificity

- Sensitivity
  - English: 93.5%
  - Spanish: 83.6%

- Specificity
  - English: 93.1%
  - Spanish: 95.0%

Phonology Subtest Highlights

- Reliable

- Valid

- Accounts for Dialect

- Primary & Secondary Analyses

- Effective & Efficient

- Done before my daughters went to college!

BESA - Pragmatics

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Pragmatics

- "Use of the appropriate message or interpretation in relation to the communicative context." (Bishop, 1997)

- "A 'test' of pragmatics is almost contradictory in terms. Since pragmatics involves the use of language for real communication, we need to assess it in a more naturalistic context…" (Paul & Norbury, 2012)

Pragmatics

- Dependent on context, experience, and social demand of situation

- Pragmatic disorders/difficulties not unique to children with language disorders (Bishop, 2003; Bonifacio, et al., 2007)

  – L2 learners (Brice & Montgomery, 2010)

Few available instruments to assess pragmatics

- Observation of parent-child interaction.

- Questionnaires/parent-report measures .

  - "Talks to people without any encouragement or starts conversations with strangers"

- Set up situations

  - "Mary saw a little boy stealing candy at the store. She ran over to her mother and said, ……"

Common, structured activity with temptations

- Within the child's experience

- Creates need to say/do something

- Options
  - Making a Peanut Butter Sandwich (Creaghead, 1984)
  - Wrapping a present – "A Present for Diego"

Target Items

- Focus on communicative intentions (Assertive speech acts)
  - **Requests**
    - Request for Information   *"What is that called?*
    - Request for Actions/Attention   *"Gimme that!"*
    - Request for Clarification   *"¿Un qué?/ A what?"*
  - **Assertives**
    - Comments/Statements   *"This is a fun game."*

Pragmatics Test

A Present for Diego

A Present for Diego

Materials:

- ❑ Box
- ❑ Wrapping paper
- ❑ 3 short colored ribbons (red, blue, green)
- ❑ 3 long colored ribbons (not long enough to go around the box)
- ❑ 2 tape dispensers (one empty)
- ❑ Mushki
- ❑ 1 Puppet/doll (Optional)
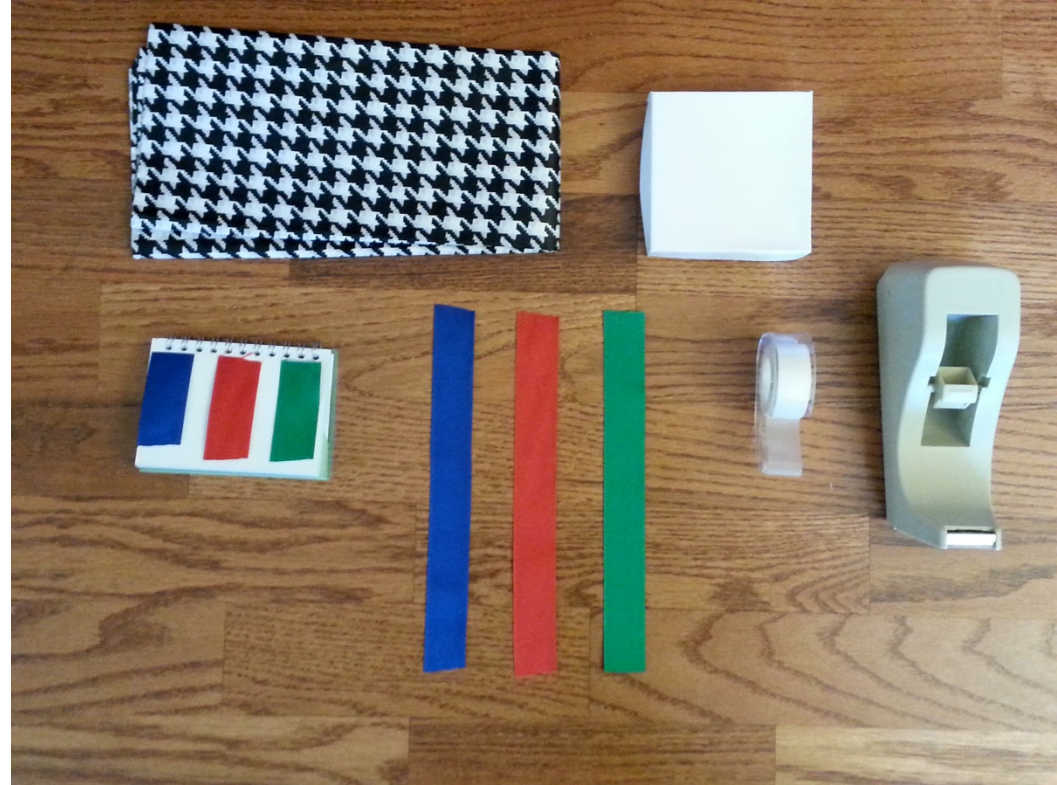
ENGLISH PRAGMATICS ACTIVITY – A PRESENT FOR DIEGO

NOTE: This is an optional activity that can be used to establish rapport with the child as well as to observe how the child uses / understands pragmatic language. This activity is to be used for descriptive purposes only and does NOT contribute to any score.

Materials: 1 small box, wrapping paper cut to size, 3 short colored ribbons (red, blue, green), 3 long colored ribbons (red, blue, green), 2 tape dispensers (one empty), 1 mushki (non-descript object that rings), 1 puppet.

| Context	Expected Child's Response (Verbal/Nonverbal)		Can Do Task (Y,N)	
Keep all materials in bag. Only bring out the closed box containing the mushki.				
E-PR1: Let's wrap Diego's present. I bought Diego a great gift. It's in the box *(shake box)*. What do you think it is? **Alt:** Let's wrap Diego's present. This is my friend Timmy. He's going to help us wrap Diego's present. Sometimes he can be silly, but don't let him fool you. I bought Diego a great gift. It's in the box *(Timmy shakes box)*. Tell Timmy what you think it is.	**Response to request for information** ❑ ball ❑ bell ❑ coins (quarters) ❑ I don't know/ NR	❑ bracelet ❑ [motions ringing] ❑ shrug	Y	N
E-PR2: It's a mushki. *(mumbled)*	**Request clarification or information** ❑ Oh!? ❑ What is that? ❑ What's a mushki? ❑ Hmmm?	❑ [purses lips, questioning look] ❑ [tilts head, questioning look]	Y	N

Examiner:

Let's wrap Diego's present.

I bought Diego a great gift.

It's in the box.

(Shake box).

What do you think it is?

Alt:

Let's wrap Diego's present.

This is my friend Timmy. He's going to help us wrap Diego's present. Sometimes he can be silly, but don't let him fool you.

I bought Diego a great gift.

It's in the box *(Timmy shakes box).*

Tell Timmy what you think it is.
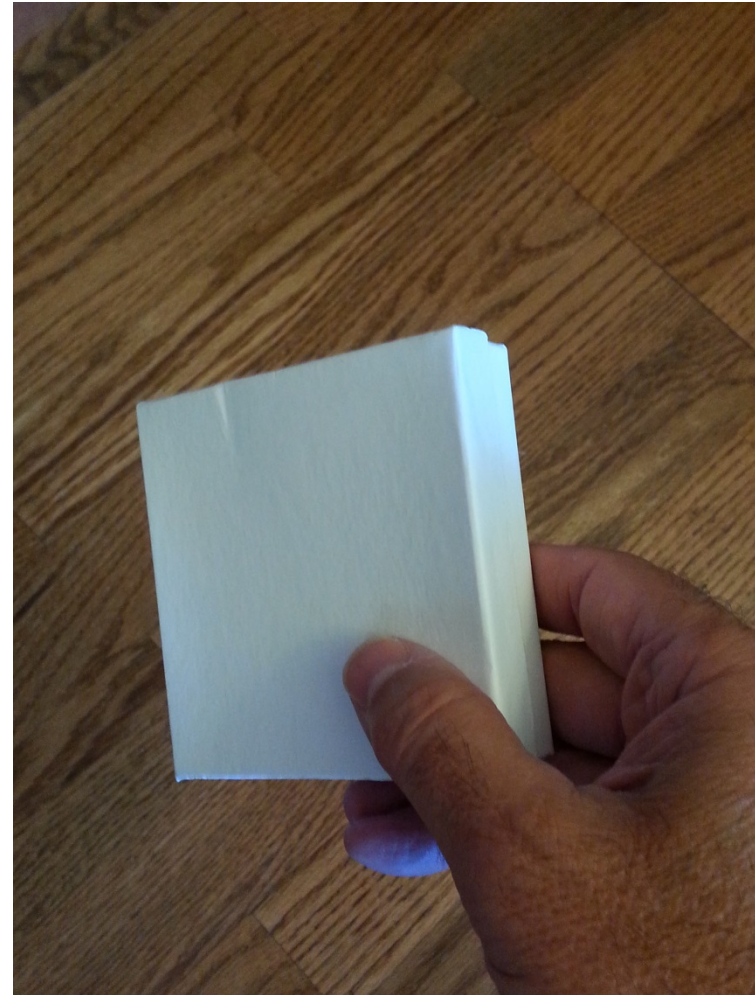
- Responsive Act
  - Child 1. A toy
  - Child 2. NR

Examiner:

It's a MUSHKI!!!!

- Request for Clarification
- Request for Information
  - Child 1. A what?
  - Child 2. What is a Mushki?
  - Child 3. (Puzzled look)

Examiner:

A mushki, see *(Open box)*.

We use mushkis to bingle the waddles.

Request for clarification
- Child 1. What?

Comment/Statement
- Child 2. You are crazy.

Examiner:

Let's see, to wrap the present we need wrapping paper, tape, and ribbon.
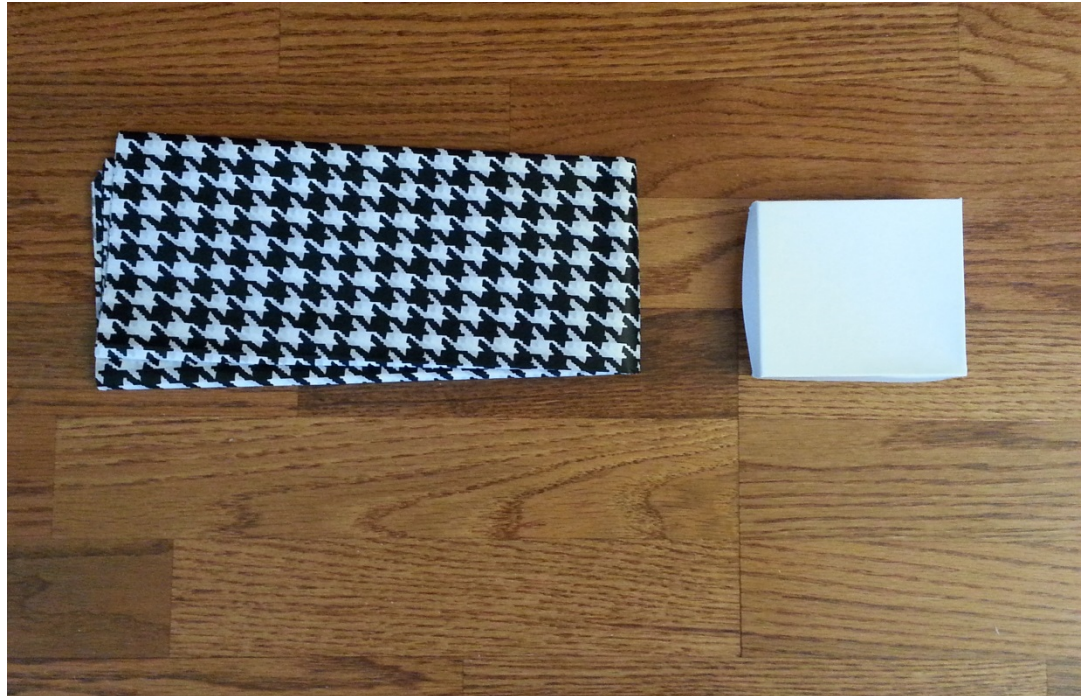
Do you remember how to wrap a present?

Tell me.

- Comments/Statements
  - Child 1. "Bueno, lo primero que se hace es comprar todos los materiales necesarios para completar la tarea."
  - Child 2. "Box y ribbon pa el party."

Examiner:

(Place paper and box on table)

Let me have the ribbon

(Ribbon not on table)

- Comments/Statements
  - Child 1. We only have paper and a box.
  - Child 2. There is no tape.

- Request for Information
  - Child 3. Where is the tape?

Examiner:

I forgot, it's in the bag.

(Pull out red, blue, and green ribbons)

I have a red ribbon, a blue ribbon, and a green ribbon.

Which one do you want?

(Child points or says color he wants)

Here is the ___

*(Give the **wrong** one)*

- Statement
  - Child 1. That one is green.
  - Child 2. That is not the one I want.

- Request for Information
  - Child 3. Where is the red one?

Examiner:

Oh, I'm sorry.

(Give the correct ribbon)

(Bring up empty tape dispenser. Begin wrapping present).

Please give me some tape.

(Tape dispenser has no tape)

- Statement
  - Child 1. There is no tape.

- Request for Information
  - Child 2. Where is the tape?

Examiner:

I better get another one.

(Get dispenser with tape.)

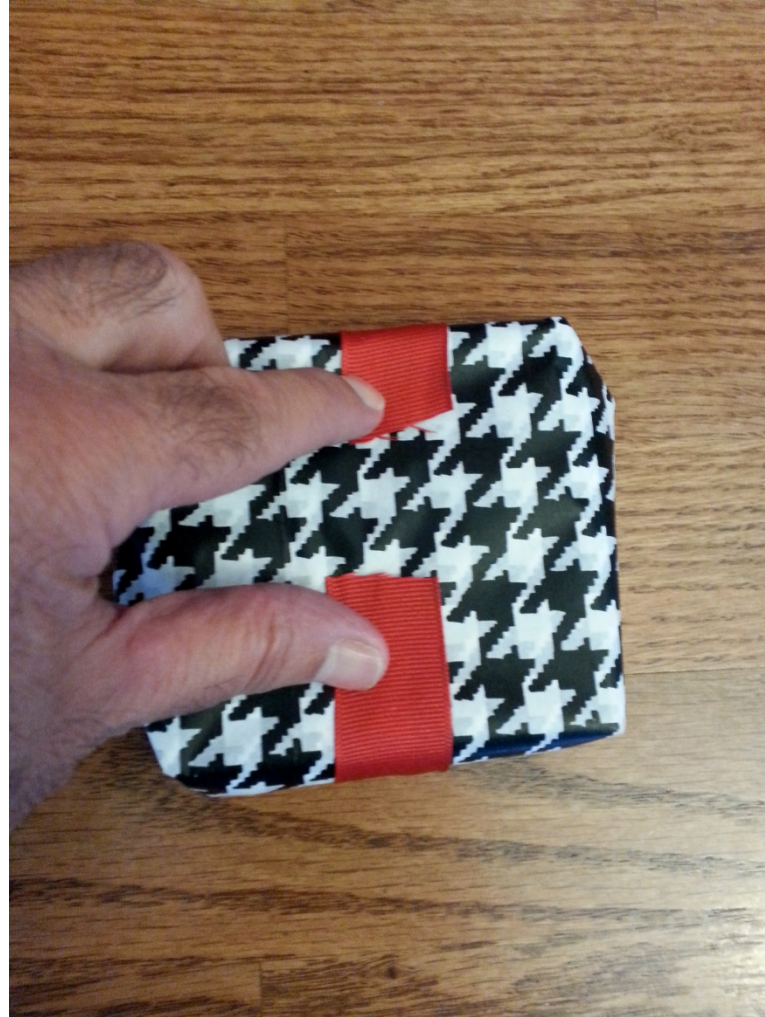OK, now we have to put the ribbon…

(Keep ribbons)

Put the ribbon on.

- Request for Action
  - Child 1. Let me have it.

- Statement/comment
  - Child 2. I don't have the ribbon
  - Child 3.Where is mine?

Examiner:

(Give ribbons, ribbons are too short)

- Statement
  - Child 1. The ribbon is too short.
- Request for Information
  - Child 2. Do you have a longer ribbon?

Examiner:

So what do you think
we should do?

- Responsive act
  - Child 1. "Not put any ribbons."
  - Child 2. "Tape the ribbon."
  - Child 3. "Tie two ribbons to make a long one."

Task wrap-up

Examiner:

Great idea.

I think Diego is going to love his present.

What do you think Diego is going to say?

"Thank you for the present."

"I think he is going to hate it!"

Context	Expected Child's Response (Verbal/Nonverbal)		Can Do Task (Y,N)	
E-PR4: Let's see. To wrap the present we need wrapping paper, tape, and ribbon. *(Do not take out materials)*. What do I do next? **Alt:** Let's see. To wrap the present we need wrapping paper, tape, and ribbon. *(Do not take out materials)*. Do you know how to wrap a present? Tell Timmy how to wrap a present.	**Statement**			
	❑ **get paper, then tape, then bow** ❑ **cut the paper, wrap gift** ❑ **other 2-part wrapping sequence** ❑ NR ❑ I don't know		Y	N
E-PR5: *(Examiner starts wrapping.)* Let me have the ribbon. *(Not on table.)*	**Comment or Disagreement**			
	❑ **I don't know where it is** ❑ **there's no ribbon** ❑ **they're in there** ❑ **[looks around and shrugs to indicate it's not there]** ❑ NR ❑ opens box and closes it		Y	N
E-PR6: Oh I forgot. It's in the bag. *(Pull out the **short** red, green, and blue ribbons.)* I have a red ribbon, a blue ribbon, and a green ribbon. Which one should we use? *(Pause for reply.)* Here's the _____. *(Give child the **wrong** ribbon.)* **Alt:**	**Disagreement**			
	❑ **comment about wrong color** ❑ **I want(ed) the *xx* one** ❑ **[gives ribbon back and indicates no]** ❑ **[looks at wrong color and pauses,**		Y	N

Interpreting Scores on Pragmatics
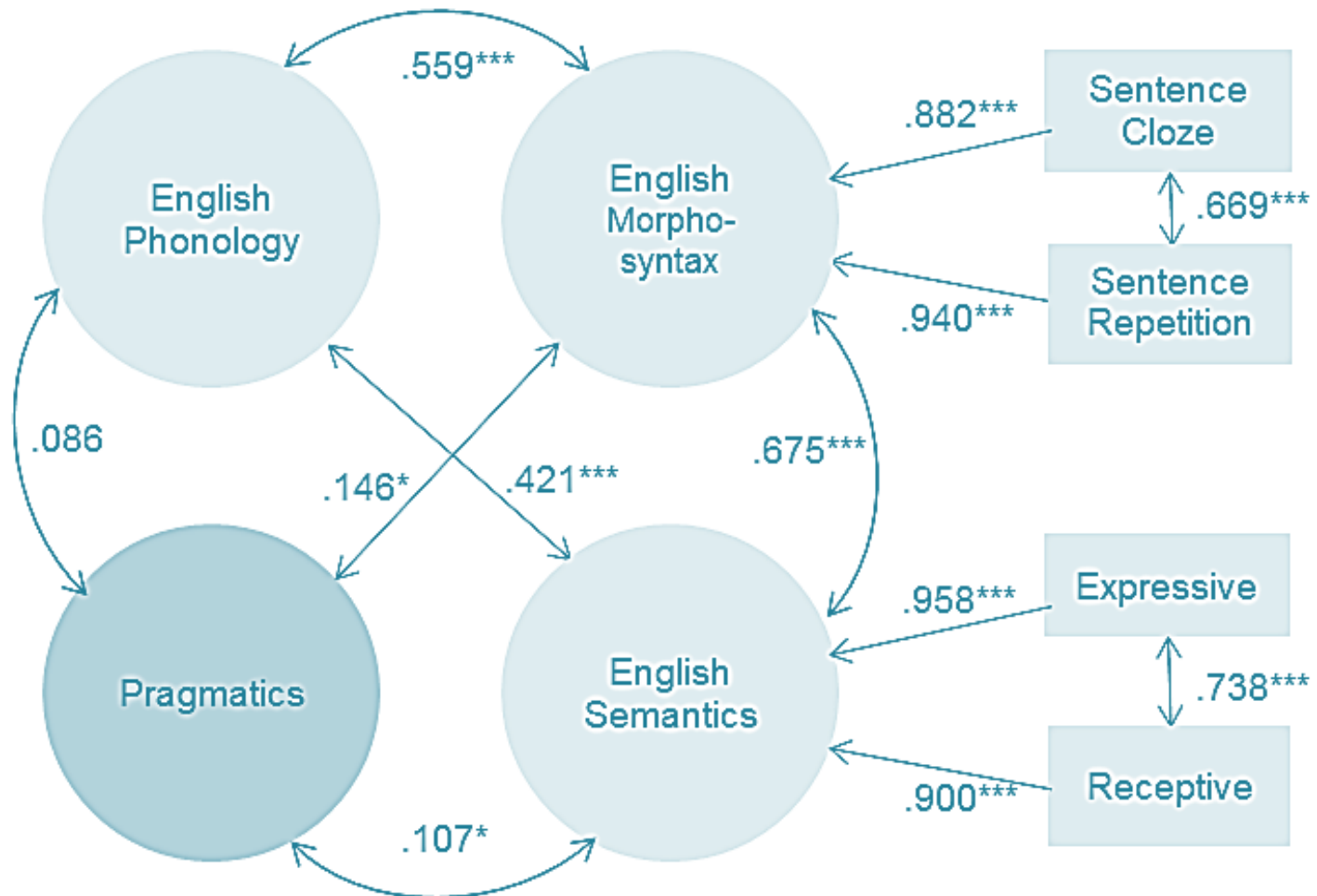
Interpreting Scores on Pragmatics
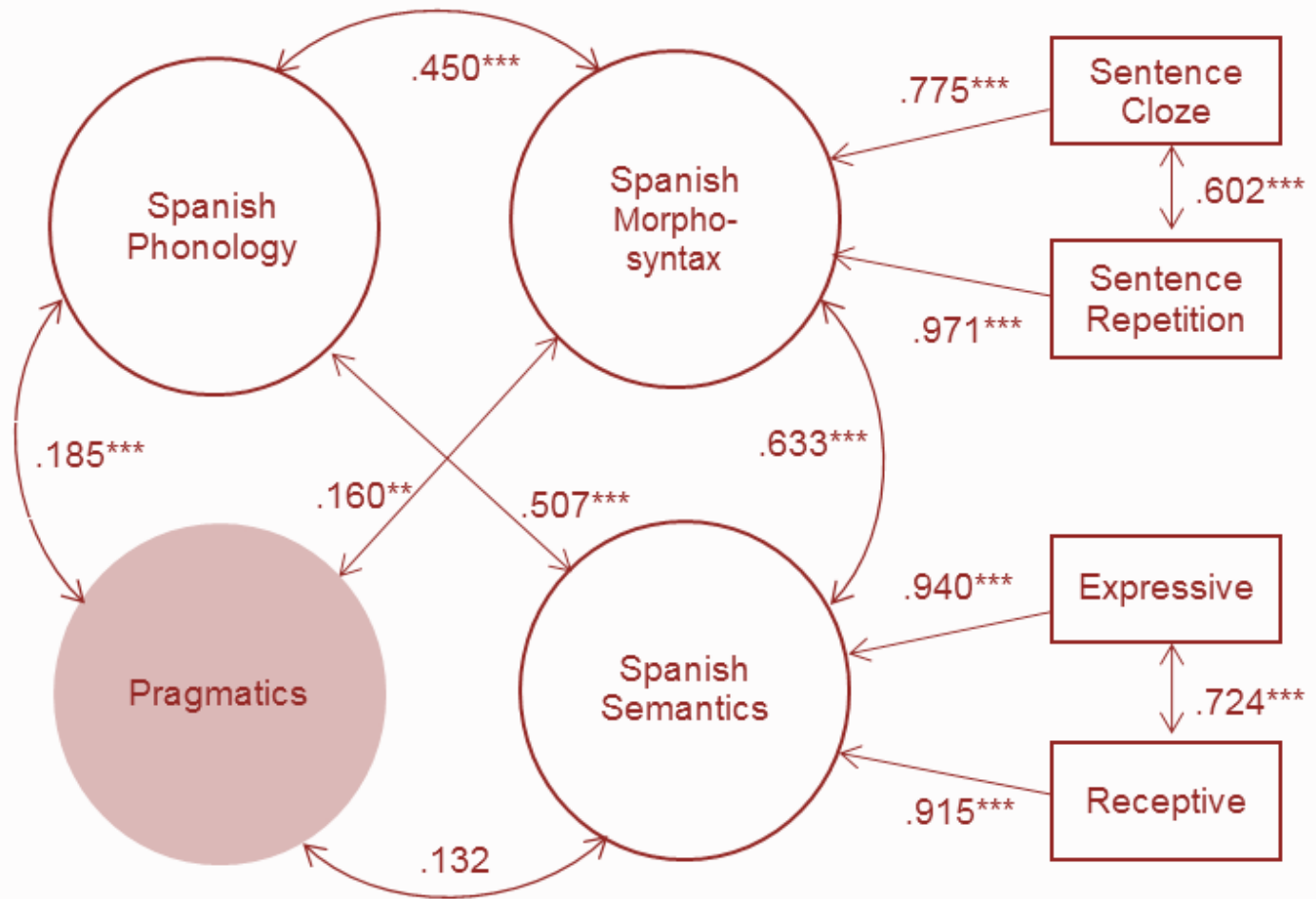
Note: * p < .05; ** p < .01; *** p < .001

Language Profiles

PROFILE	Morpho-Syntax	Semantic	Pragmatics
1	OK	OK	OK
2	OK	OK	LO
3	LO	LO	OK
4	LO	LO	LO

What do you know?
What have you accomplished?

- Established some rapport with child

- Insight into the child's phonology, morpho-syntax, semantics

- Good impression of how difficult it will be to test this child

- Pragmatic strengths/challenges

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Semantics

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HABLA
Human Abilities in Bilingual Language Acquisition

Semantics & PLI

- Children with PLI:
  - Weak semantic representations & semantic depth
    (McGregor et al., 2002; Sheng, Peña, Bedore, & Fiestas, 2012)
  - Require more exposures to learn new words
    (Alt et al., 2012; Gray, 2003, 2005)
- BUT
  - Vocabulary knowledge often WNL (low normal)

Semantics & Bilingualism

- Bilingual children:
  - Learning ability is normal
  - Concepts may be shared across the two languages
  - Divided input results in less reinforcement of the vocabulary children have
  - Children need to learn the phonotactics of their L2 (Alt et al., 2013)

  BUT

  - Vocabulary knowledge often low normal on single word vocabulary measures

Semantics test task

- Goal is develop an item set that is challenging enough to discriminate the performance of children with and without LI.

- But is NOT dependent on language specific vocabulary.

- Organize around core areas that taps knowledge across their languages.

Areas

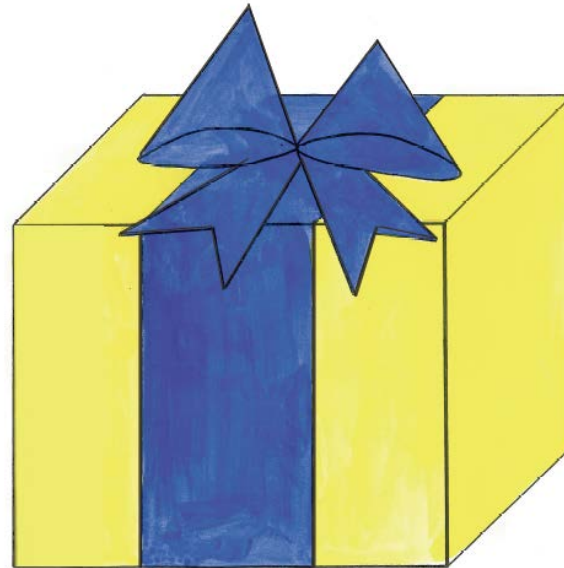| Target	Examples	Background Literature
Analogies	Hamburger is to plate as soup is to _____ .	(Rattermann & Gentner, 1998)
Descriptions	Tell me three things about a school bus.	(Clark, 2001)
Category Generation	Tell me the names of as many zoo animals as you can think of.	(Nelson & Nelson, 1990)
Similarities & Differences	What makes these two cards go together?	(Bloom, 2000; Choi, et al., 1999)

Areas

Target	Examples	Background Literature
Functions	What do you use a pencil for?	(Crystal, 1998; Peña & Quinn, 1997)
Associations	Tell me a word that goes with <u>bird</u>.	(Sheng, et al., 2004)
Linguistic Concepts	What color is this balloon?	(Golomb, 2013; Vermeer & Shohov, 2004; Wilcox, 1999)

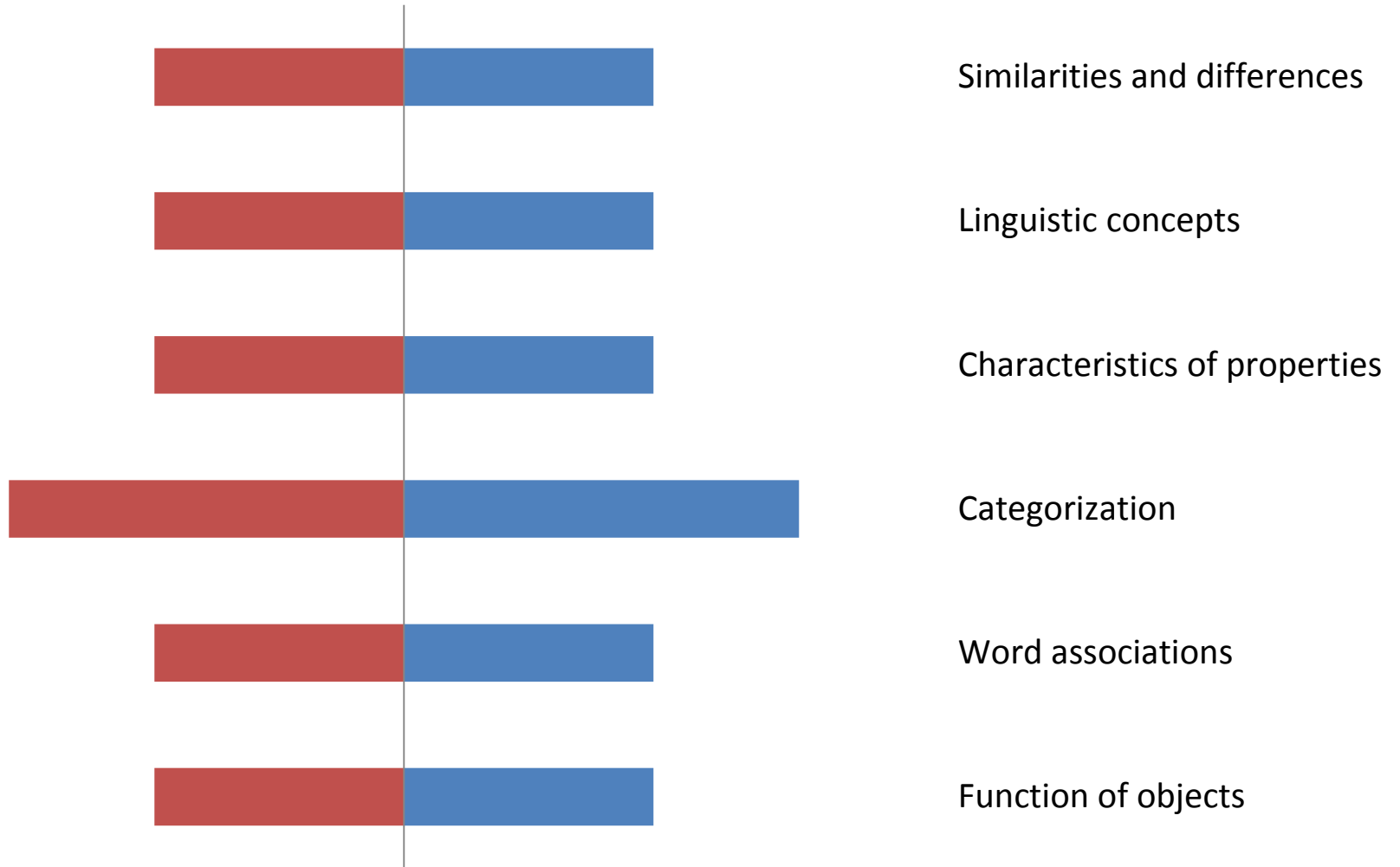# Items are challenging enough to separate TD and LI
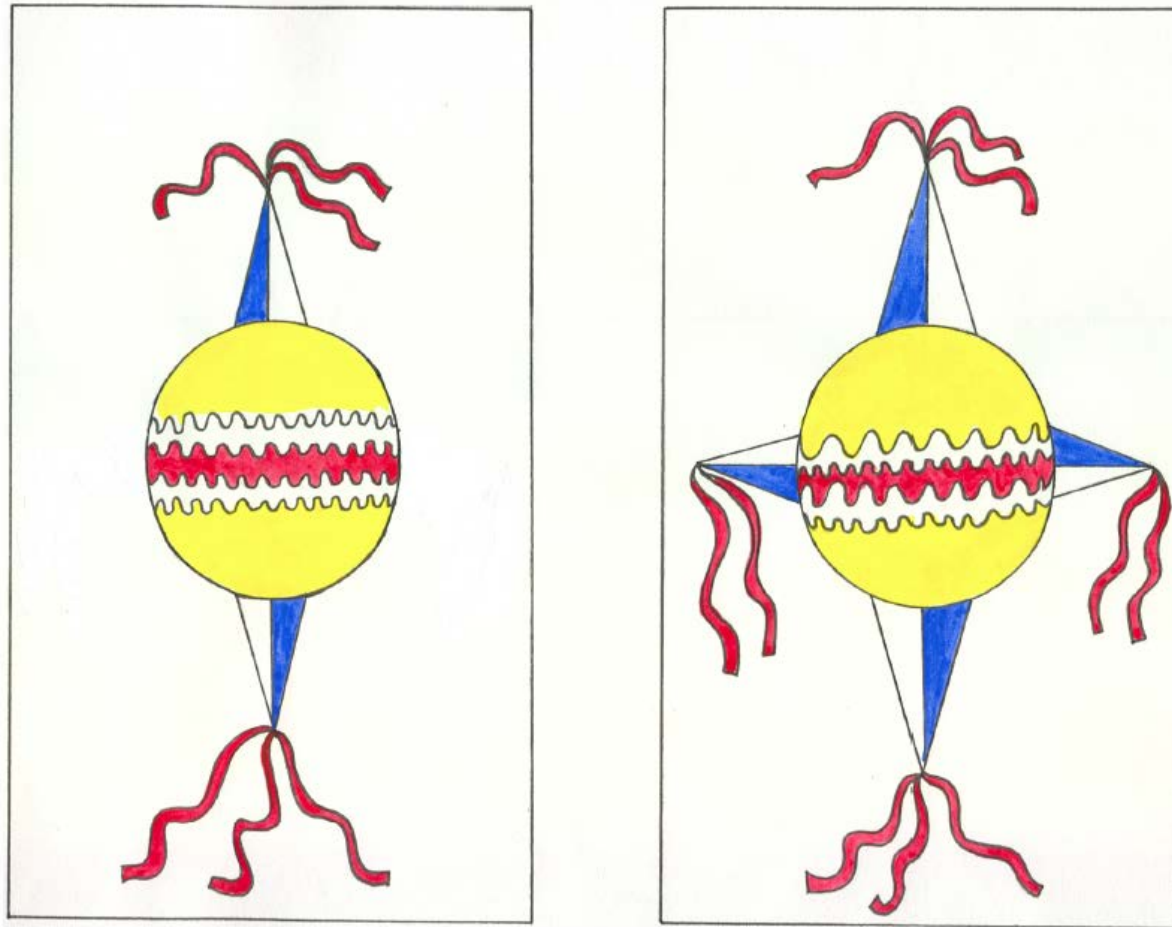
Psychometric equivalence

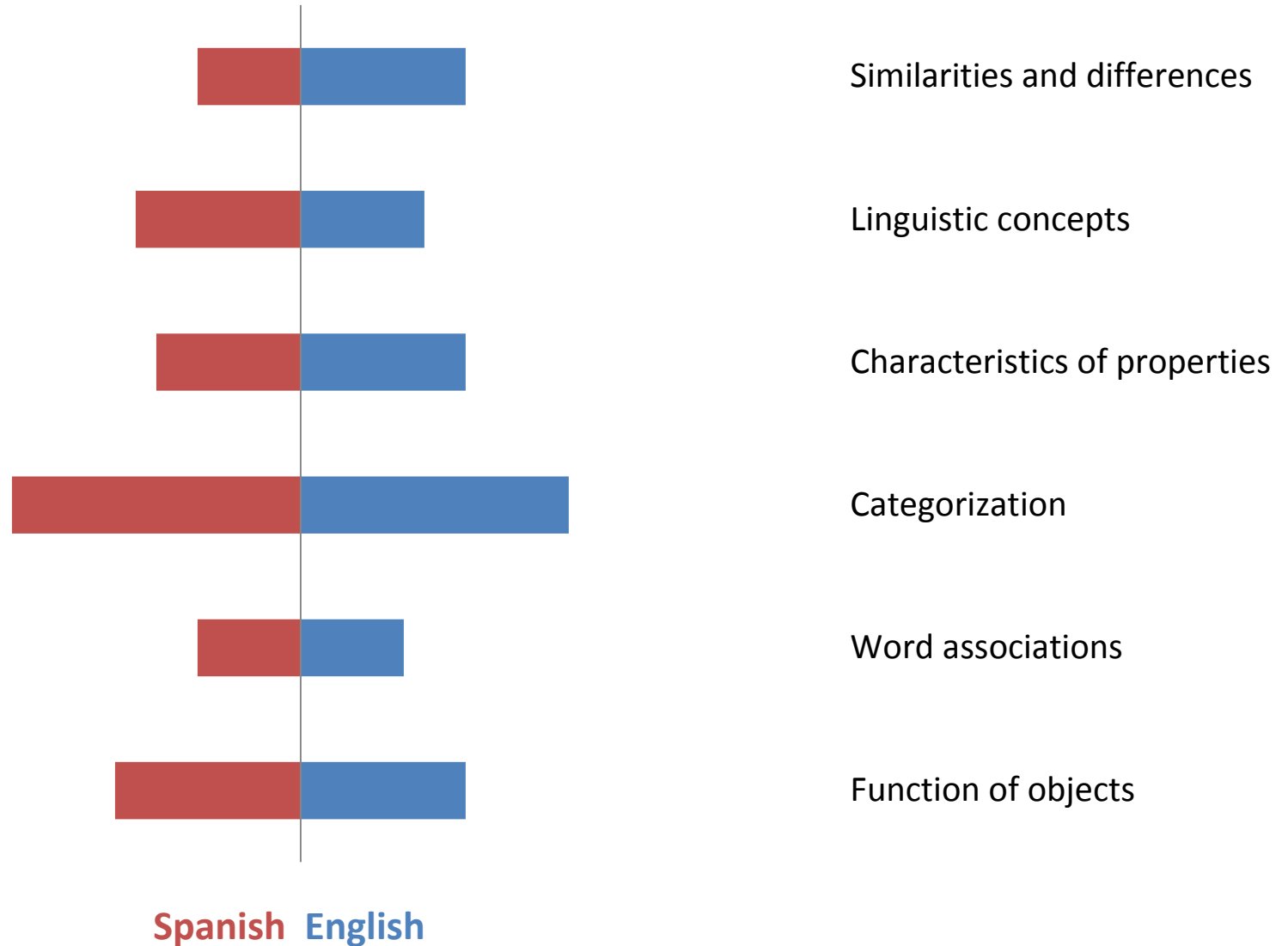# Items require semantic knowledge but not specific vocabulary

Sample scoring

E-S11: Here are two gifts that Diego's friends brought. **What makes these two gifts go together?** (SD)	☐ **bow** ☐ **color of bow** ☐ color ☐ size ☐ other:_____	☐ **moño** ☐ **color del moño** ☐ tamaño ☐ otro:_____	1	0	OL
E-S12: What shape is this present? (CP)	☐ **square** ☐ **rectangle** ☐ **cube** ☐ color ☐ circle ☐ open it	☐ **cuadrado** ☐ **rectángulo** ☐ **cubo** ☐ círculo ☐ abrirlo	1	0	OL
E-S13: It was time to eat. **Tell me all the foods you can think of.** (CT) Prompt: "Tell me more." **3 are required** to get item correct but let the child produce as many responses as possible.	☐ **egg** ☐ **cake** ☐ **hamburger** ☐ **pizza** ☐ **hot dog** ☐ **beans** ☐ **rice** ☐ **apple** ☐ other:____	☐ **huevo** ☐ **pastel** ☐ **hamburguesa** ☐ **frijoles** ☐ **arroz** ☐ **manzana** ☐ otro:_____	1	0	OL

Semantics

Similarities and differences

Linguistic concepts

Characteristics of properties

Categorization

Word associations

Function of objects

Spanish English

Semantics

Similarities and differences

Linguistic concepts

Characteristics of properties

Categorization

Word associations

Function of objects

Spanish **English**

Semantics

Similarities and differences

Linguistic concepts

Characteristics of properties

Categorization

Word associations

Function of objects

Spanish English

Performance reliably increases with age

Age	Spanish		English	
	Normal Language	Language Impaired	Normal Language	Language Impaired
4	.55	.26	.57	.26
5	.67	.37	.65	.35
6	.79	.48	.80	.49

Item discrimination

Age	Semantics	
	Spanish	English
4	.29	.31
5	.29	.30
6	.31	.31

Correlation with related measures

Language Sample Measures	
Number of different words	.412***
Number of total words	.315***
Main verbs	.301***
Percentage of Grammatical utterances	.314***
Standardized Test Comparisons	
EOWPVT-Bilingual Raw Scores	.406***

Semantics classification accuracy

	Age Group	Cut-Score	Sensitivity	Specificity	+ Likelihood Ratio	- Likelihood Ratio
Spanish	4	80	89.7	78.3	4.13	.131
	5	82	72.0	88.5	6.26	.316
	6	81	87.5	87.4	6.94	.143

Semantics classification accuracy

	Age Group	Cut-Score	Sensitivity	Specificity	+ Likelihood Ratio	- Likelihood Ratio
Spanish	4	80	89.7	78.3	4.13	.131
	5	82	72.0	88.5	6.26	.316
	6	81	87.5	87.4	6.94	.143
English	4	86	83.3	78.5	3.87	.213
	5	85	80.0	80.5	4.10	.248
	6	81	81.5	86.9	6.22	.213

Semantics classification accuracy

	Age Group	Cut-Score	Sensitivity	Specificity	+ Likelihood Ratio	- Likelihood Ratio
Spanish	4	80	89.7	78.3	4.13	.131
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English	4	86	83.3	78.5	3.87	.213
	5	85	80.0	80.5	4.10	.248
	6	81	81.5	86.9	6.22	.213
Best	4	88	85.2	80.6	4.39	.184
	5	88	75.0	82.2	4.21	.304
	6	82	82.4	87.3	6.49	.202

Morphosyntax

Vera Gutierrez-Clellen

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Morphosyntax

- Most children with LI have significant difficulty learning their grammar.

- Their grammatical difficulties have been reported across languages with very different morphosyntactic characteristics (Leonard, 1998).

For a grammatical measure to be valid for identification

- Need to have linguistically appropriate targets

- <u>For Spanish:</u>

  - Articles (Restrepo & Gutierrez-Clellen, 2001; Bedore & Leonard, 2001; Bosch & Serra, 1997; Eng & O'Connor, 2000)

  - Clitic pronouns (Bedore & Leonard, 2001; Bosch & Serra, 1997; Jacobson & Schwartz, 2002)

  - Complex verbs such as subjunctives, complex syntax (Gutiérrez-Clellen, 1998)

For a grammatical measure to be valid for identification

- <u>For English:</u>
  - ed, 3rd p. sing -s, copula and auxiliary BE, auxiliary DO, possessive nouns, plurals, passives (e.g., Rice & Wexler, 1996; Bishop, 1979; Oetting & Rice, 1993; van der Lely, 1996)

For a grammatical measure to be valid for identification

- The measure must also show acceptable sensitivity and specificity across different groups of speakers.

- The test must be appropriate for use with different Spanish dialects (e.g., Puerto Rican and other Caribbean dialects; Mexican American)

- Should work with children who speak non-standard English varieties as well.

# For a grammatical measure to be valid for identification

- The measure should be valid with children learning two languages or who are bilingual.
- Spanish-English bilingual children in the U.S. may show a different grammatical profile than monolinguals:
  - They may experience language loss or attrition when home or school contexts do not promote the maintenance of the home language,
  - And/or when tested in their second language, they may show errors related to limited language proficiency, not impairment.

Morphosyntax
Test Development

- Large pool of items based on Spanish and English child language research

- 112 items for Spanish

- 127 items for English

Spanish Morphosyntax

■ Spanish
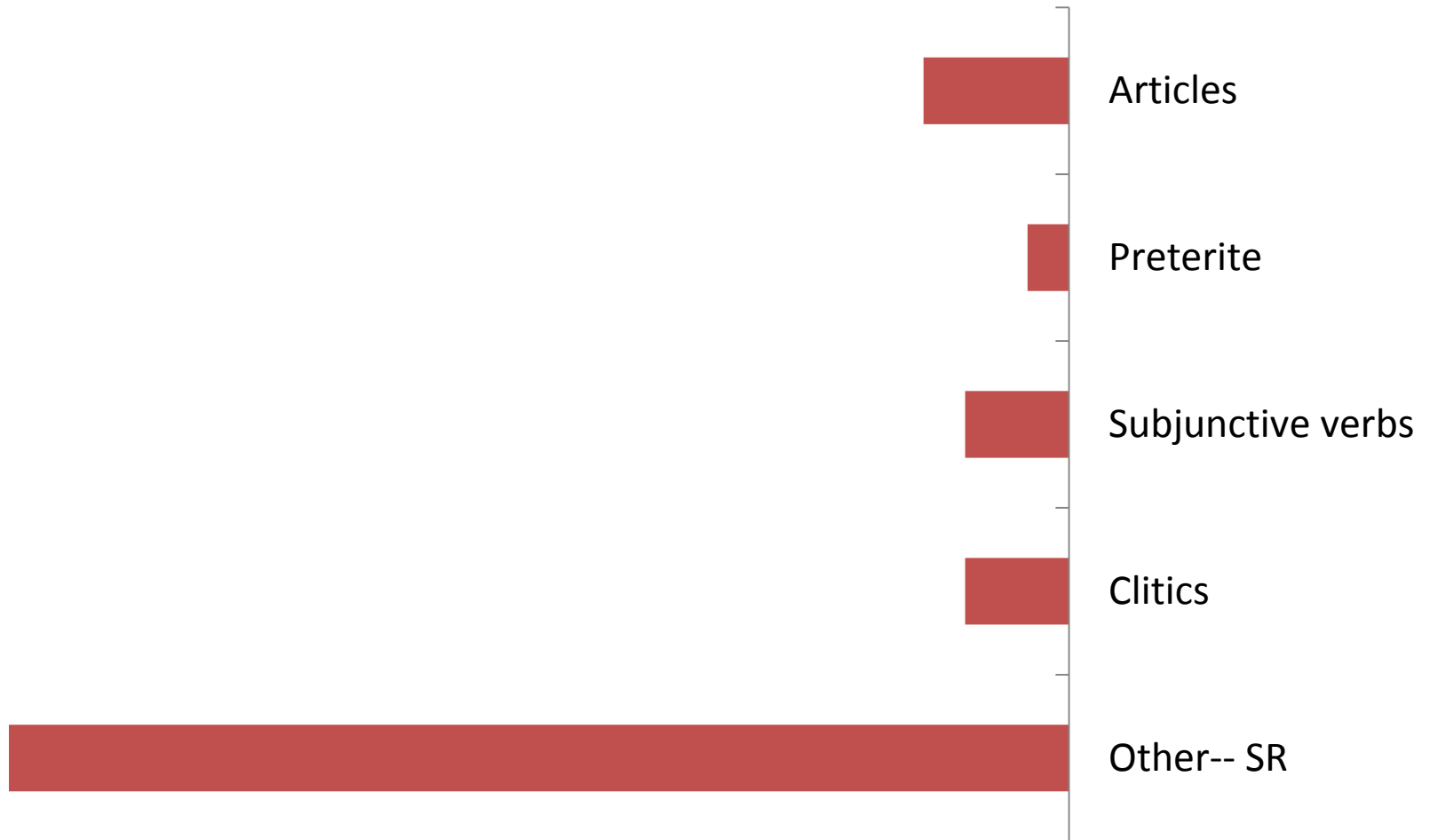
E: Los niños tienen unos carros. ¿Y aquí qué tienen los niños? Tienen …
C: **un/el** carro.

Articles

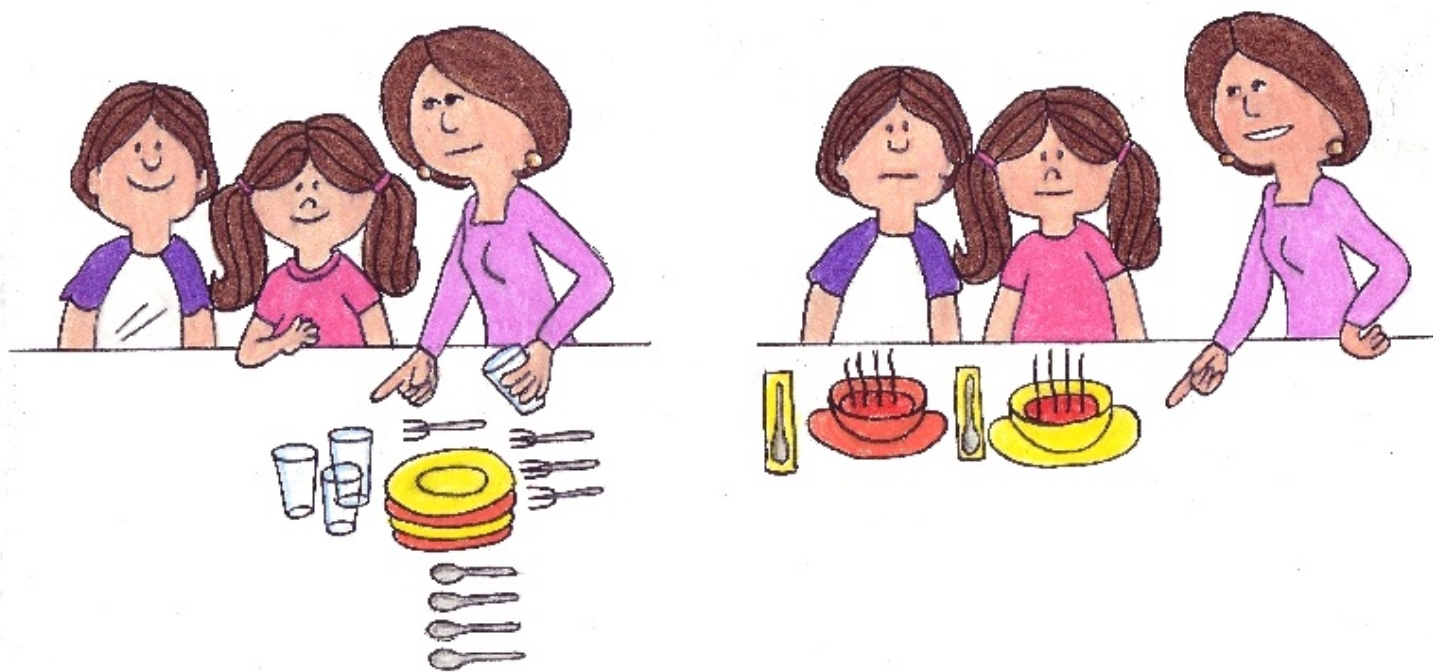E: Juan va a pintar la mesita. ¿Y aquí qué hace Juan con la mesita? Juan …
C: **La** pinta/está pintando

Clitics

E: La mamá quiere que pongan la mesa. ¿Y aquí, qué quiere? La mamá quiere que ….
C: **coman/tomen** la sopa.

Subjunctive

Dialect-scoring modifications

- The following dialectal differences were not penalized:
  - "leísmo" (i.e., le/lo/him) (common in some variants of Mexican Spanish
  - Plural omissions in articles and clitic pronouns (e.g. lo/los/the) (common in Spanish Caribbean dialects)

Validity of Spanish Morphosyntax

- 160 children: 80 with language impairment (LI) and 80 with typical Language development (TLD).

- Sampled from Texas, Georgia, Pennsylvania, and California

- Randomly assigned to Exploratory or Confirmatory groups to evaluate the classification accuracy of the S-MST (TLD vs LI classification)

Spanish language groups

- Spanish-Only Proficient (SP)
  - LI and TLD

- Spanish Dominant Bilingual (SDB)
  - LI and TLD

Caribbean Spanish and Mexican Spanish Scores
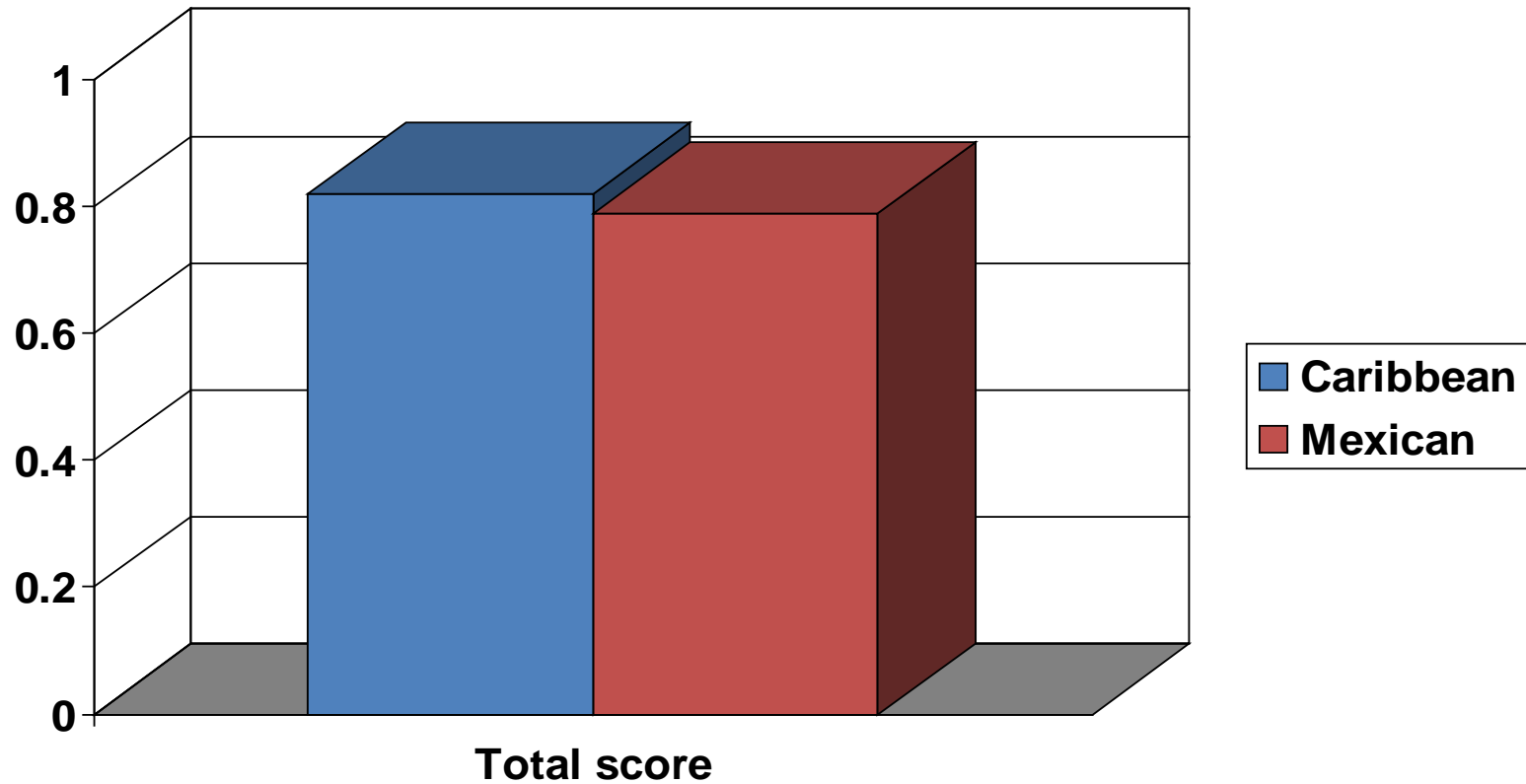
Spanish Cut-off Scores

	Expl Sensitivity	Expl Specificity	Conf Sensitivity	Conf Specificity	Cut-off Scores
4;0 to 5;1	**86.4%** (19/22)	**86.4%** (19/22)	**87.5%** (7/8)	**100%** (8/8)	**.50**
5;2 to 5;11	**94.4%** (17/18)	**94.4%** (17/18)	**100%** (7/7)	**100%** (7/7)	**.70**
6;1 to 7;0	72.2% (13/18)	**83.3%** (15/18)	42.8% (3/7)	**100%** (7/7)	**.70**

Spanish Dominant and Spanish-Only Scores
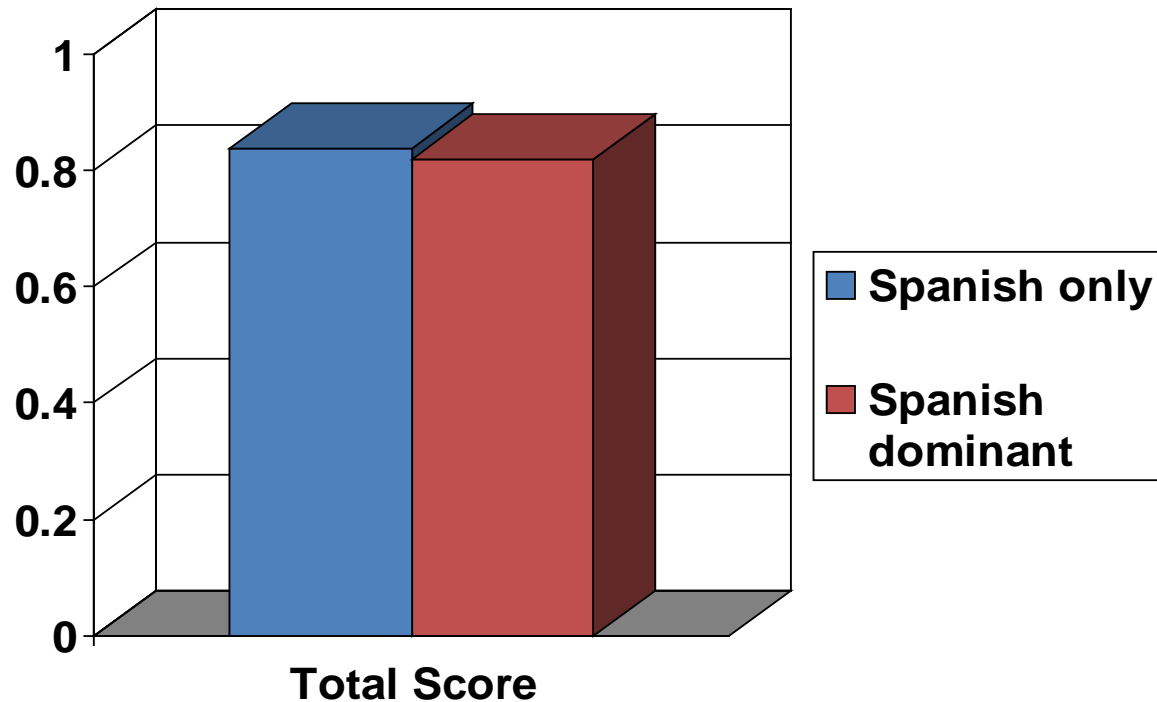
English Morphosyntax

■ English

Possessives

Third Person Singular

Regular and Irregular Past

Plural Nouns

Copula

Negatives

Passives

Other-- SR
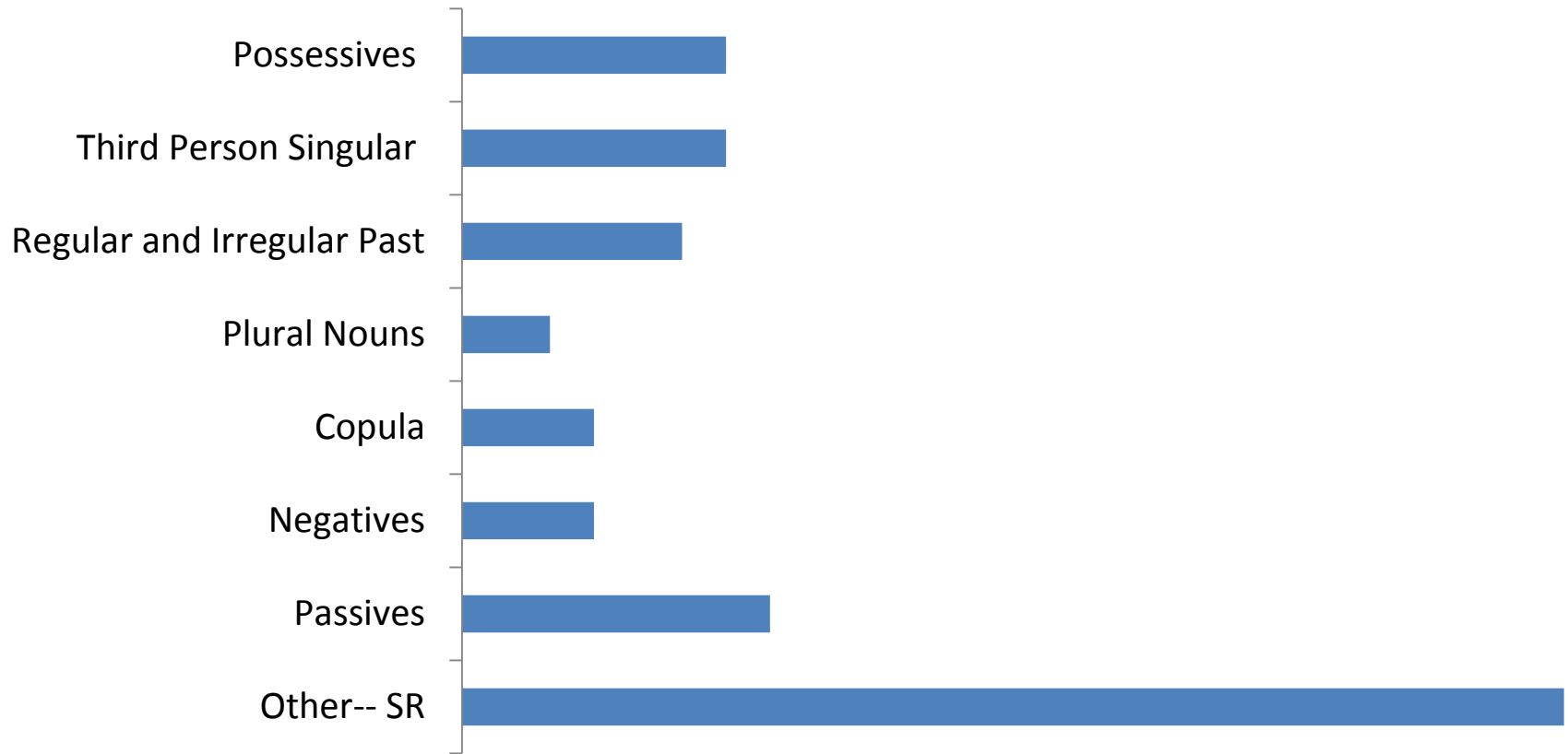
63 items

E: Today he is going to take a bath. And yesterday, he did that too. What did he do yesterday? Yesterday he…
C: **took** a bath.
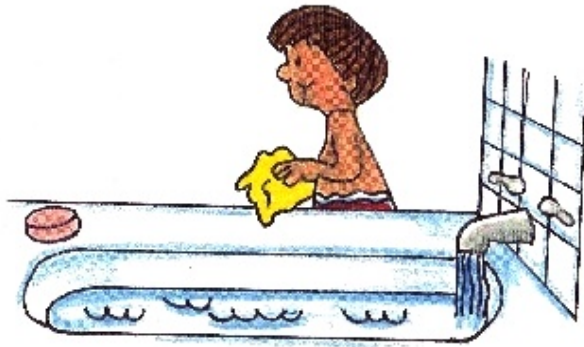
Past Tense

E: The girl is buying an orange. And here, what is the girl buying? She is buying…
C: **oranges**.

Plurals

E: Every day the children buy ice-cream. And here, this boy does too. What does he do every day? Every day the boy …
C: **buys** ice-cream.

3rd Singular

English Language Groups

111 children: 59 with TLD and 52 with LI

- Sampled from the Southwest and the Northeast (CA, TX, and PA)

- English- Only Proficient

- English Dominant

Validity of English Morphosyntax (first round)

	Sensitivity	Specificity	Cut-off score
SW EO	**82.1%** (23/28)	**89.3%** (25/28)	**.61**
SW EDB	**80%** (8/10)	**90%** (9/10)	---
NE	**85.7%** (12/14)	61.9% (13/21)	---

Final Steps

- Tested a larger sample of children

- Conducted item-analysis to reduce number of items

- Evaluated if the final item set had good classification accuracy

  - For children who speak different dialects of Spanish and English

Morphosyntax Sample

- 492 children took Spanish morphosyntax

- 393 children took English morphosyntax

- 128 children completed BOTH

Participants

Spanish		TLD	LI
	4 year old	94	37
	5 year old	98	21
	6 year old	92	10
		294	68

English		TLD	LI
	4 year old	56	39
	5 year old	88	33
	6 year old	90	18
		234	90

Item Analysis and Selection Process

- Item discrimination by age (at 6-month intervals)

  - For each item: % of TLD that passed the item minus % LI that passed the item

  - Item retained if: >.25 across a minimum of 3 age groups; no negative values for the other 3 ages; AND average across age was at least .2

- Selected best 3-4 items for each target

Final Sets

■ Spanish   ■ English

Spanish	English
Articles	Possessives
Present Progressive	Third Person Singular
Preterite	Regular and Irregular...
	Plural Nouns
Subjunctive verbs	Present and Past Aux +...
	Copula
Clitics	Negatives
	Passives
Other-- SR 37 targets	Other-- SR 33 targets
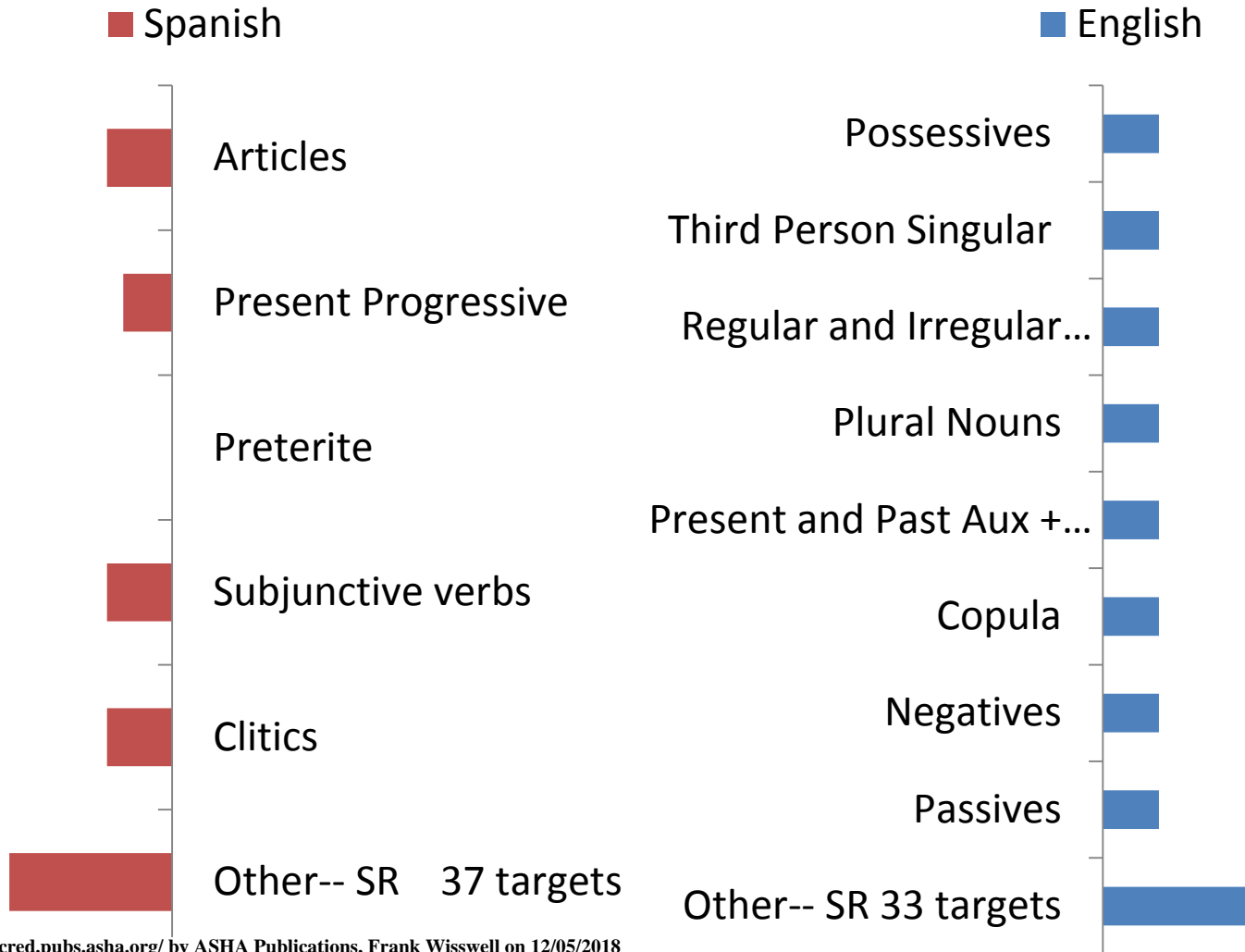
Classification Accuracy BEST Language

Age Group	Cut-score	Sensitivity	Specificity	+ Likelihood Ratio	- Likelihood Ratio
4	84	90.9	83.2	5.41	.109
5	85	89.7	84.7	5.86	.122
6	81	96.4	89.9	9.54	.040

Best Composite Score

- Best score for morphosyntax + semantics combined, regardless of language

- Composite scores based on the Best language scores (e.g., Morpho Eng + Sp Sem; Morpho Sp + Eng Sem, etc)

Morpho Eng	X		X	
Morpho Spn		X		X
Sem Eng	X			X
Sem Spn		X	X	

Best Composite Classification

Subtest	Age Group	Sensitivity	Specificity	+ Likelihood Ratio	- Likelihood Ratio
Semantics + Morphosyntax	4	92.3	85.8	6.50	.090
	5	88.9	84.9	5.88	.131
	6	96.0	92.4	11.32	.151

Item Bias

		East > West	West > East	Central > West	West > Central	East > Central	Central > East	Total diff Items
Spanish	Morphosyntax	0	3	0	0	0	2	3*
	Semantics	0	0	0	0	0	0	0
English	Morphosyntax	0	9	0	0	0	3	10*
	Semantics	1	0	0	0	1	1	2*

East Coast Composites

Subtest	Age Group	Sensitivity	Specificity	+ Likelihood Ratio	- Likelihood Ratio
Semantics + Morphosyntax	4	93.8	88.9	8.45	.070
	5	78.3	80.0	3.92	.271
	6	90.9	87.8	7.45	.104
	All	86.0	82.8	5.00	.169

Conclusions

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