Rethinking Bilingual Delay & Disorder

Elizabeth D. Peña

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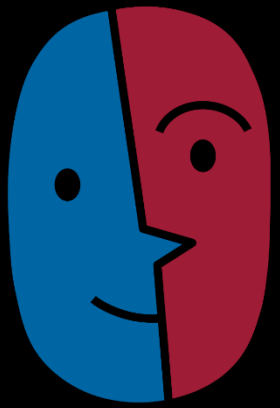


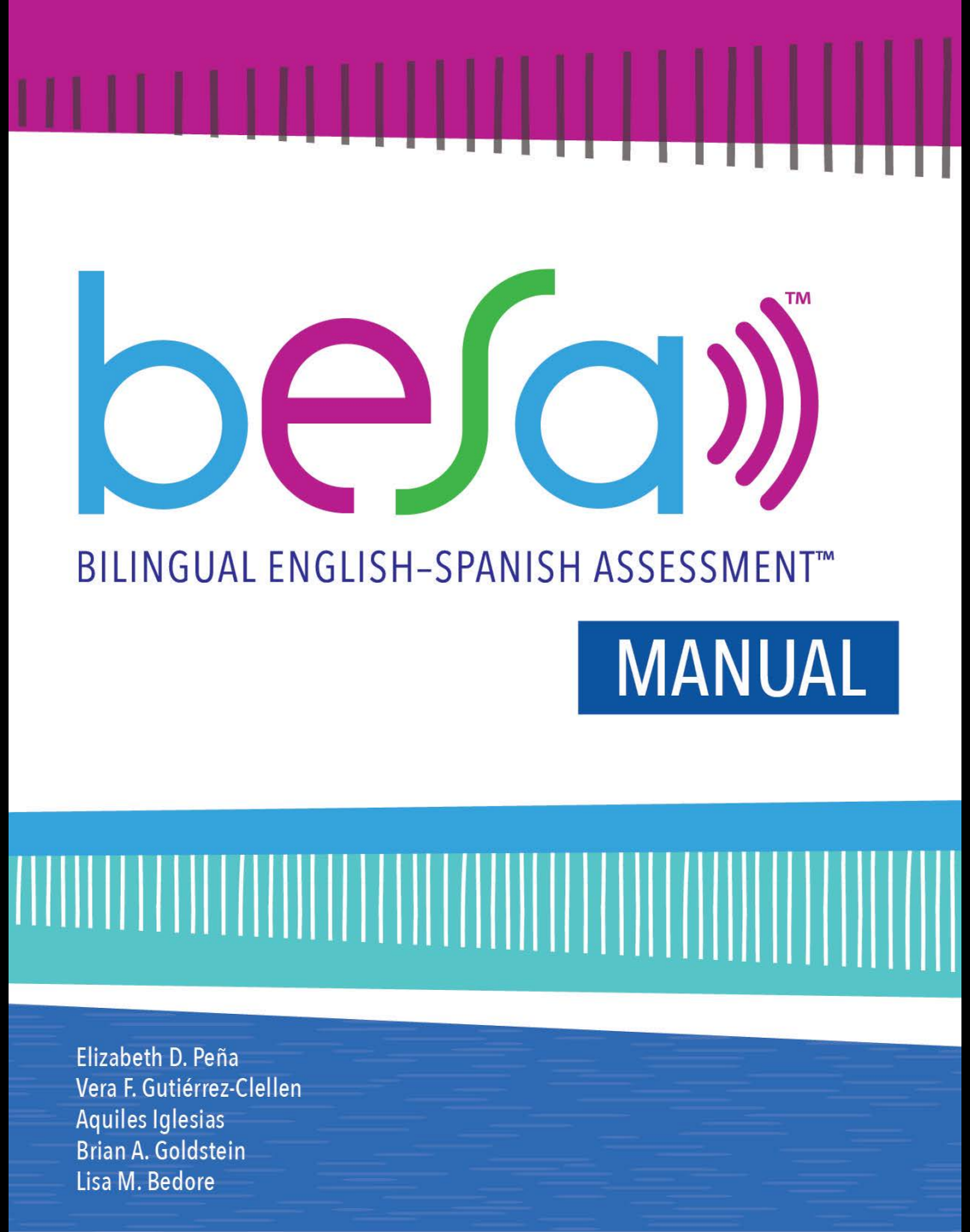
HABLA

human abilities in bilingual language acquisition

Disclosures

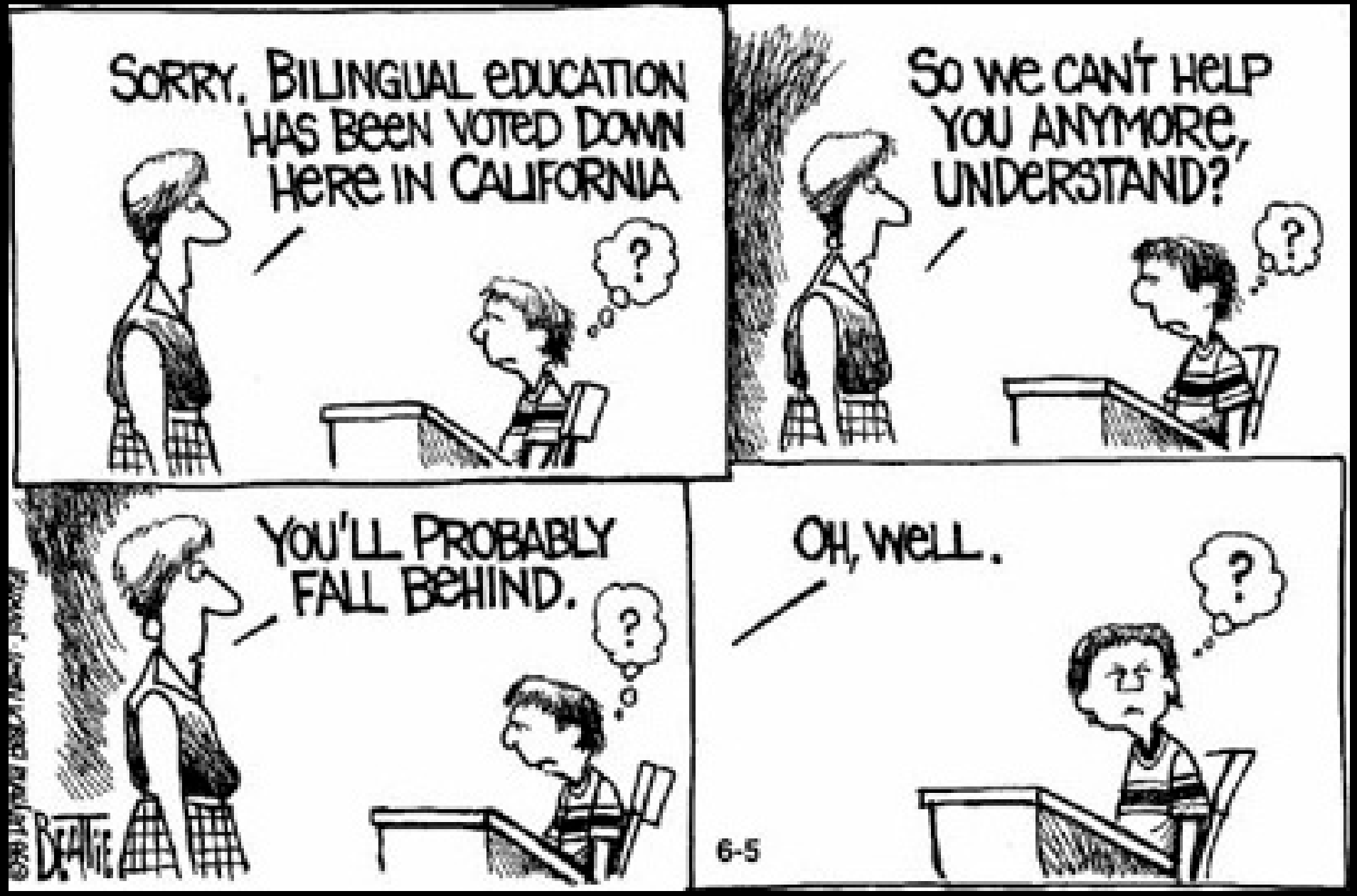
U.S. Department of Health & Human Services | National Institutes of Health

NIH National Institute on Deafness and Other Communication Disorders (NIDCD)




ENGLISH
RUSSIAN
CHINESE
PUNJABI
JAPANESE
ARABIC
HINDI
BENGALI
SPANISH
PORTUGUESE
THE
MOST
SPOKEN
LANGUAGES
IN THE WORLD


Vietnamese
Bengali
Tagalog
Greek
Gujarati
Spanish
Hindi
Arabic
German
Panjabi
Russian
Italian
Portuguese
Chinese
Polish
Japanese
Persian
French_Creole
Korean
Urdu


SORRY. BILINGUAL EDUCATION HAS BEEN VOTED DOWN HERE IN CALIFORNIA.
?
SO WE CAN'T HELP YOU ANYMORE, UNDERSTAND?
?
YOU'LL PROBABLY FALL BEHIND.
?
OH, WELL.
?
BEATTIE
6-5


THE BENEFITS
OF
BEING BILINGUAL
¡HOLA!


Hello
Bonjour
שלום
你好
Ciao
Բարև
Hola
नमस्ते
Здравству
السّلام


Apple
la Manzana
?


MEOW.
MUST BE NICE TO BE BILINGUAL.

Outline

- Are bilinguals at greater risk for DLD?
- How do we consider L1 and L2 performance in diagnostic decision-making?
- What is the nature of the “bilingual delay” (is it really a thing?)

Outline

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- How do we consider L1 and L2 performance in diagnostic decision-making?
- What is the nature of the “bilingual delay” (is it really a thing?)

Developmental Language Disorder

10%	Often invisible	phonology grammar vocabulary social skills learning memory

DLD

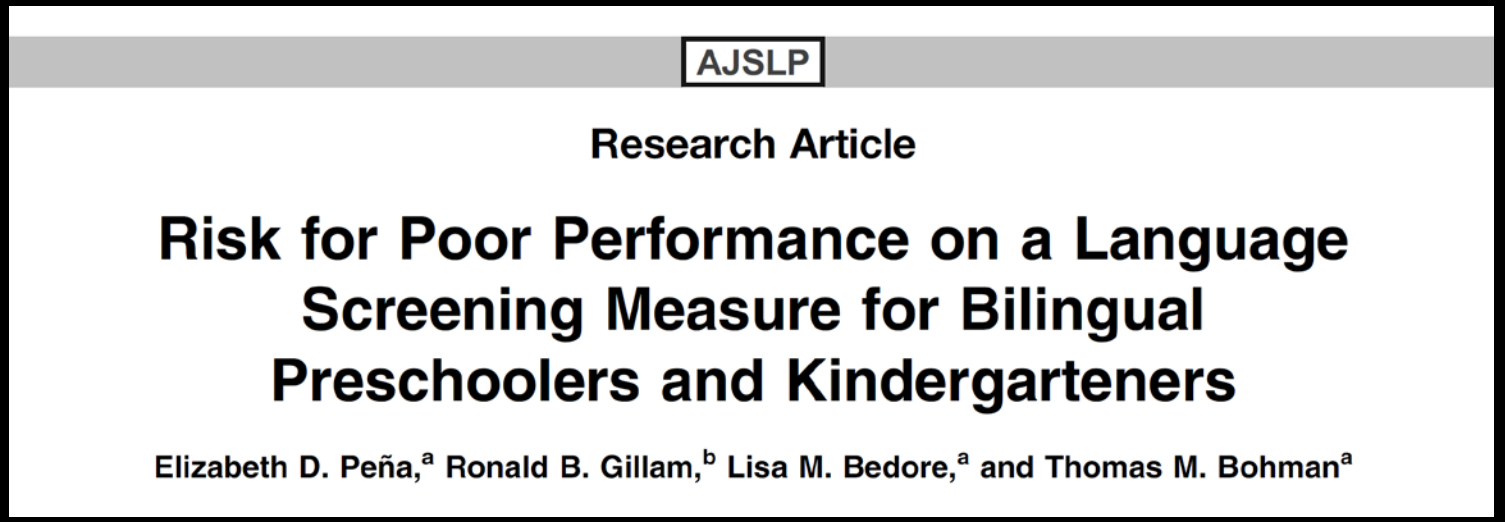
- Developmental language disorder (DLD) is a language disorder that delays the mastery of language skills in children who have no hearing loss or other developmental delays

Bilingual DLD

- Developmental language disorder (DLD) is a language disorder that delays the mastery of language skills in children who have no hearing loss or other developmental delays
- Not an effect of second language acquisition
- Affects BOTH languages

Bilingualism & Risk for DLD?

- Weak links hypothesis– Gollan
  - Divided time in each language → lower (absolute) item frequency
- Inhibitory control– Bialystok
  - Language switching over time → cognitive advantage



Participants

- 1198 Latino children
  - 63-81 months (late PK, early K)
  - 54% female
- AoA English
  - 50.3% between birth-2 years
  - 49.7% 3 years or later

	At Home			At School/Preschool/Day Care			
Ages	Spanish	Both	English	Spanish	Both	English	NA
0-1	✓						✓
2-3	✓						✓
2-3	✓						✓
3-4		✓			✓		
4-5		✓			✓		
5-6		✓			✓		
6-7							
7-8							
8-9							

	Participants		Language(s)					
	(parent, sibling, peer)	Waking Hours	Participant—Input			Child—Output		
Time			Spanish	Both	English	Spanish	Both	English
7a.m.	mom dad sibs	1	2	1	0	2	0	0
8a.m.	↓	1	2	0	0	2	0	0
9a.m.		1	2	0	0	2	1	0
10a.m.		1	2	0	0	2	0	0
11a.m.	grandma	1	0	1	0	2	0	0
12p.m.	↓	1	0	1	0	2	0	0
1p.m.		1	0	1	0	2	1	0
2p.m.	siblings &	1	2	1	0	2	1	0
3p.m.	mom	1	2	1	0	2	1	0
4p.m.	↓	1	2	0	0	2	0	0
5p.m.		1	2	0	0	2	0	0
6p.m.		1	2	0	0	2	0	0
7p.m.	aunts, uncles	1	0	1	0	0	1	0
8p.m.	family	1	0	1	0	0	1	0
9p.m.	↓	1	0	1	0	0	1	0
10p.m.		1	2	1	0	2	1	0
11p.m.		1	2	1	0	2	1	0
		Sum Weekend Hours: (F) 15	12 + 6 = 18 (B) Sum Weekend Input Score			6 + 9 = 15 (D) Sum Weekend Output Score		

Measures

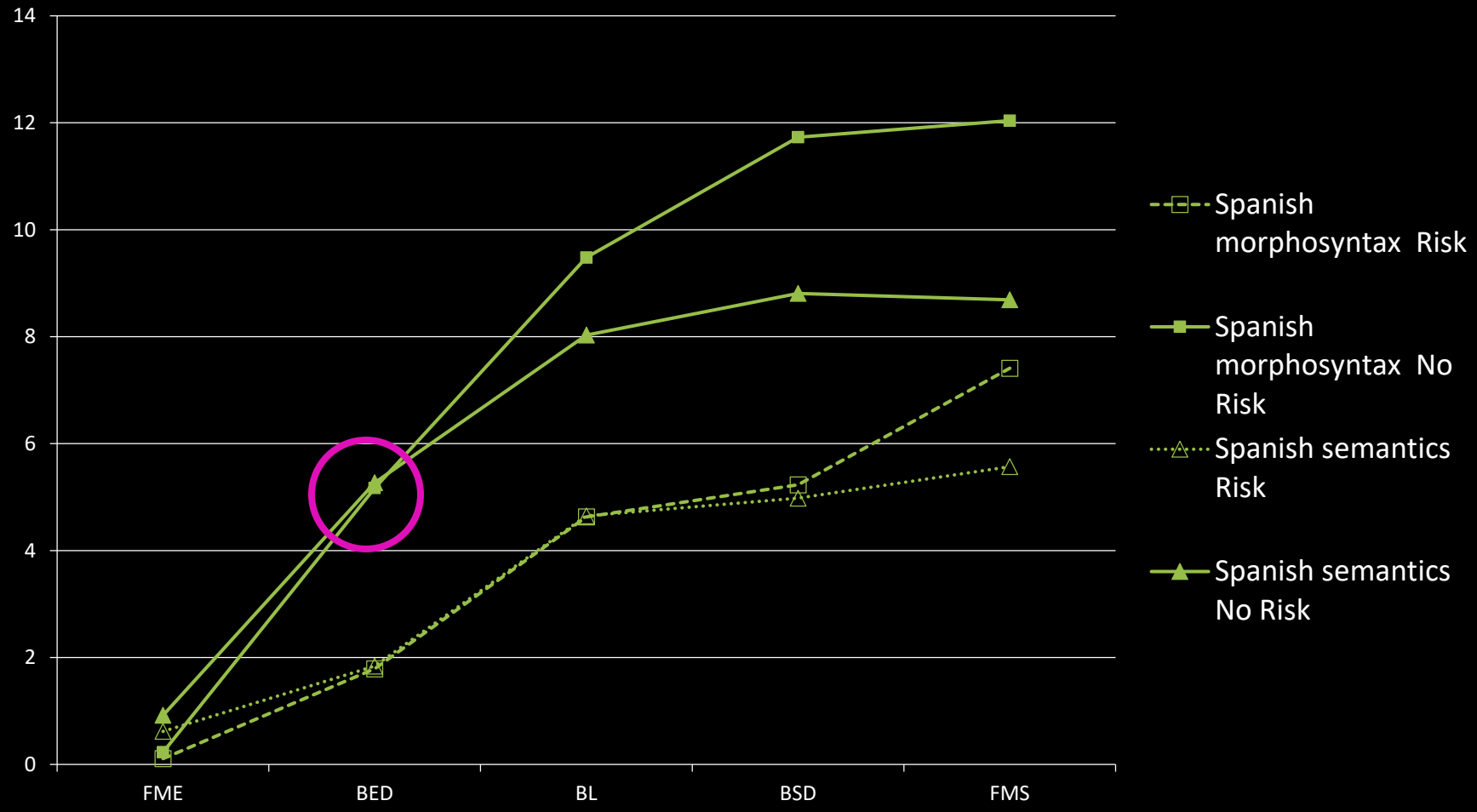
- BIOS
  - Classify by exposure
  - Bilingual English Spanish Oral Screener (BESOS)
    - Morphosyntax
    - Semantics
  - ALL tested in Spanish & English

S	Se	SE	sE	E

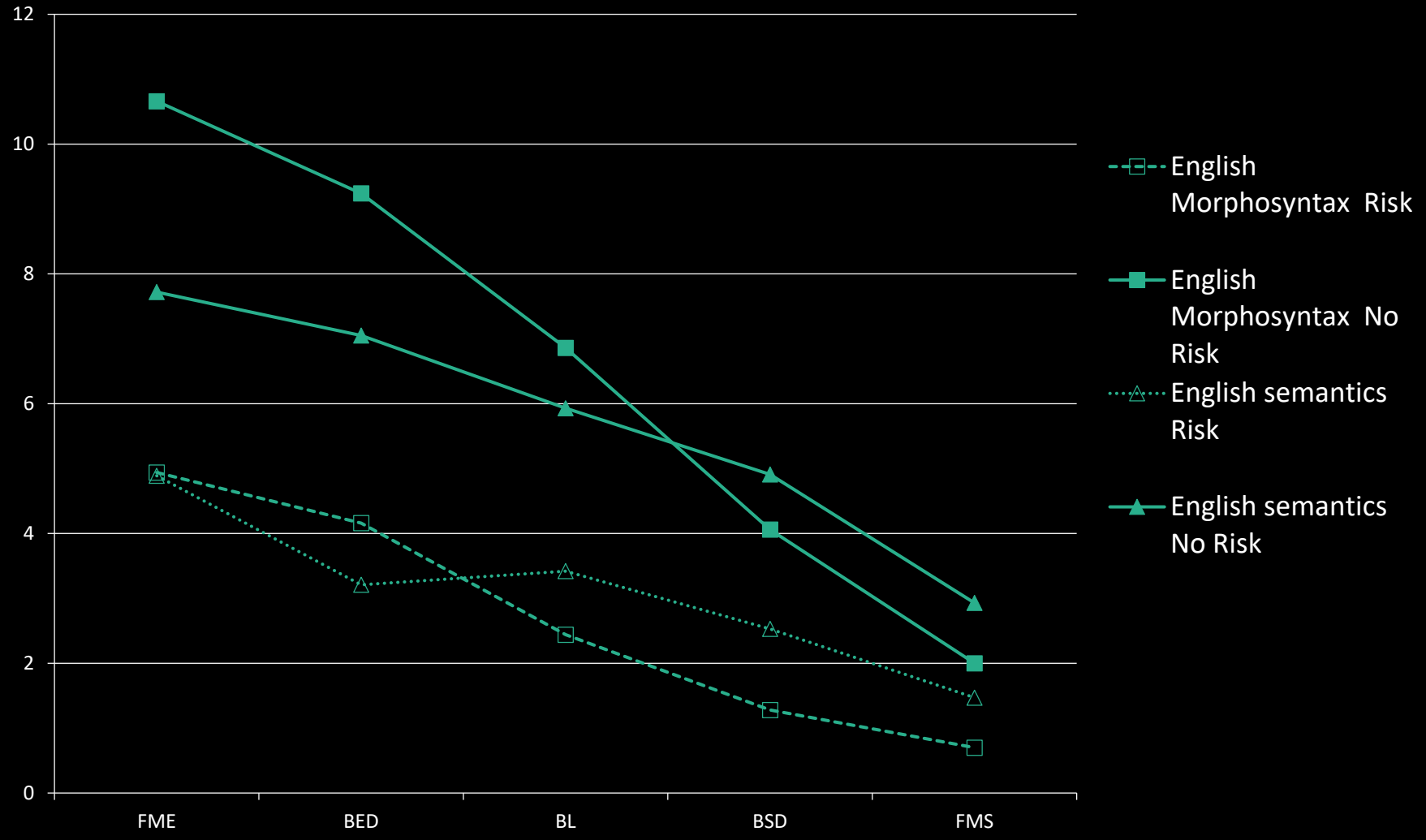
Participants

- Divided into risk and no-risk groups
  - Risk
    - 3/4 subtests at or below 25th percentile
    - Morphosyntax Spanish
    - Morphosyntax English
    - Semantics Spanish
    - Semantics English

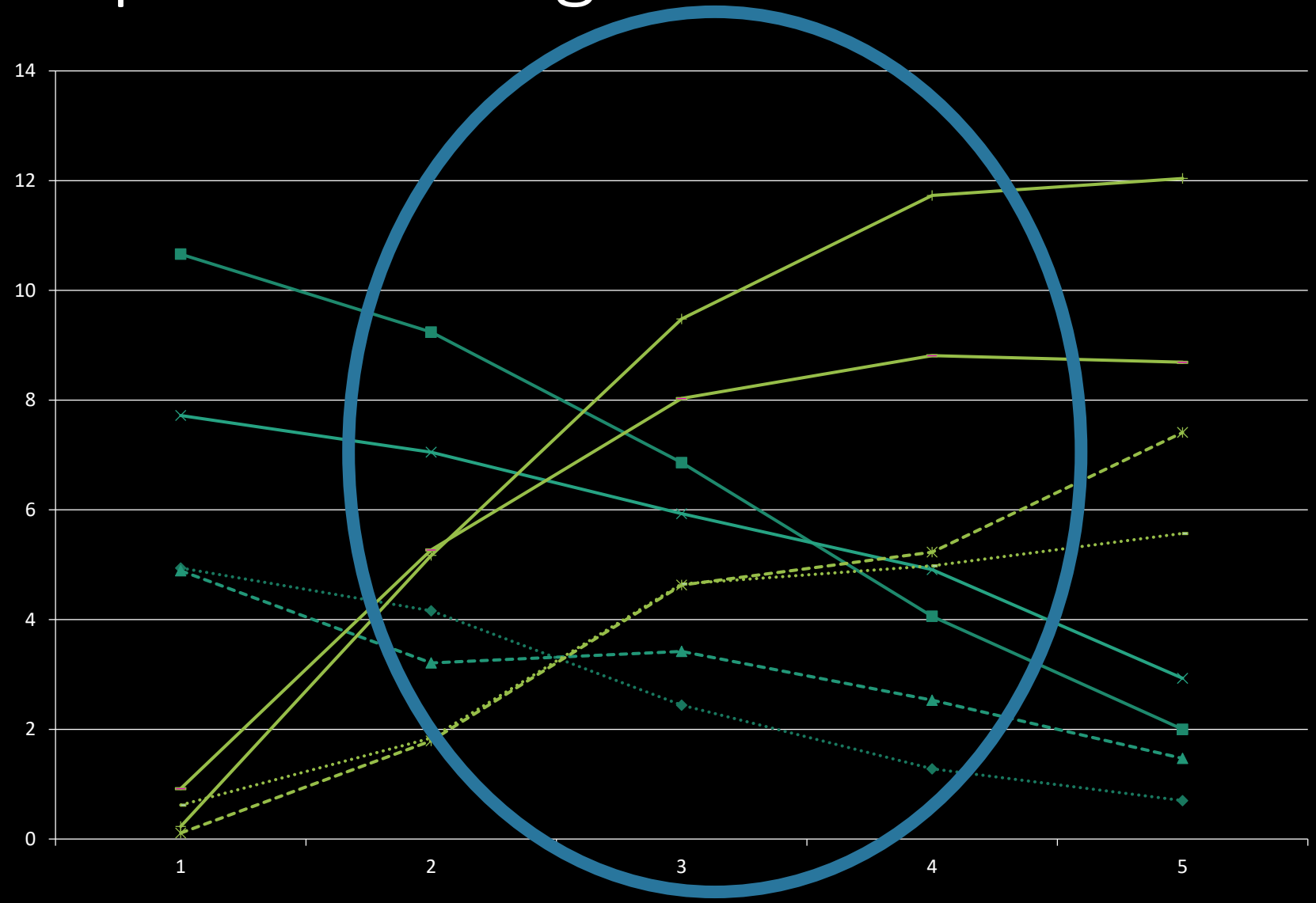
Spanish Scores



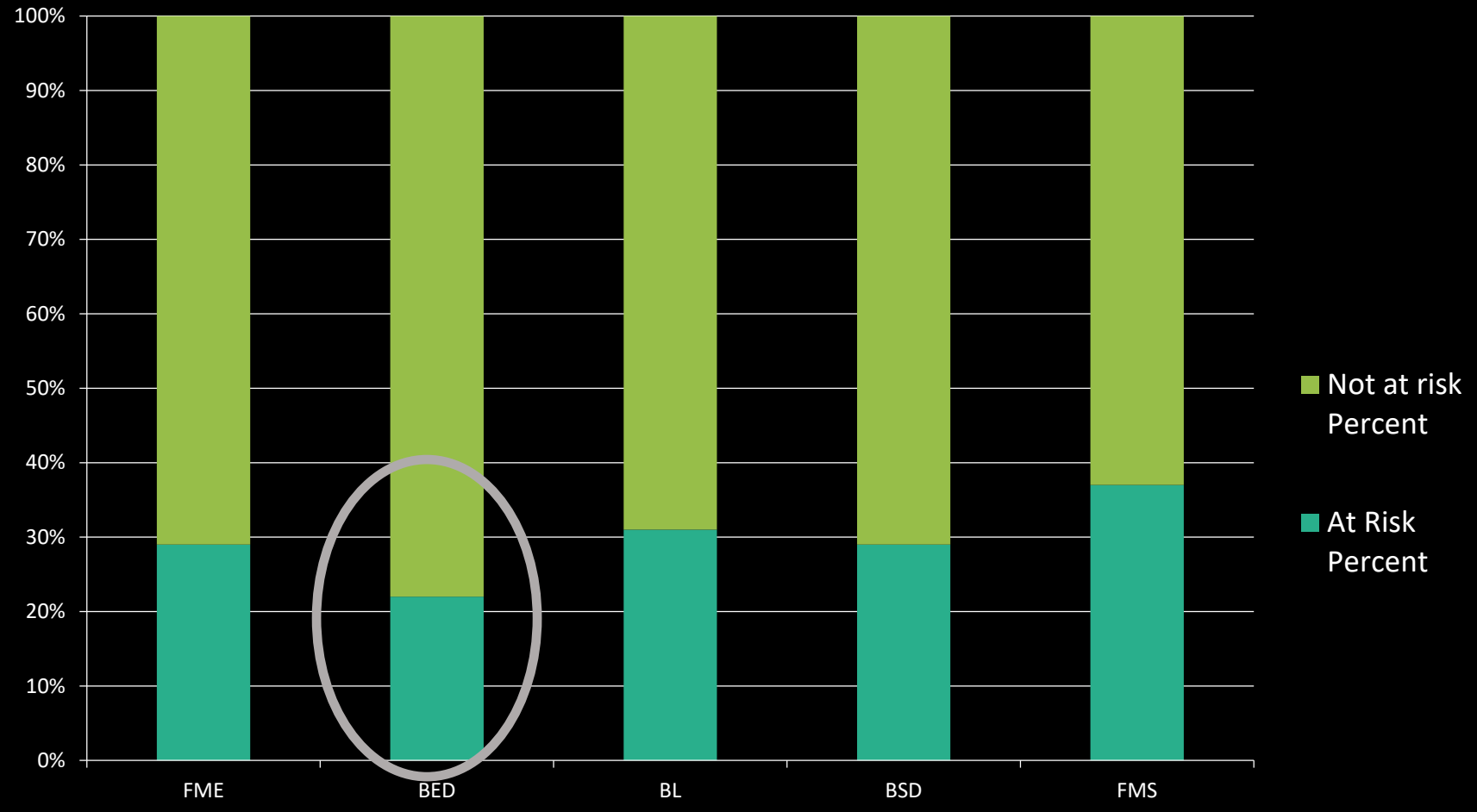
English scores



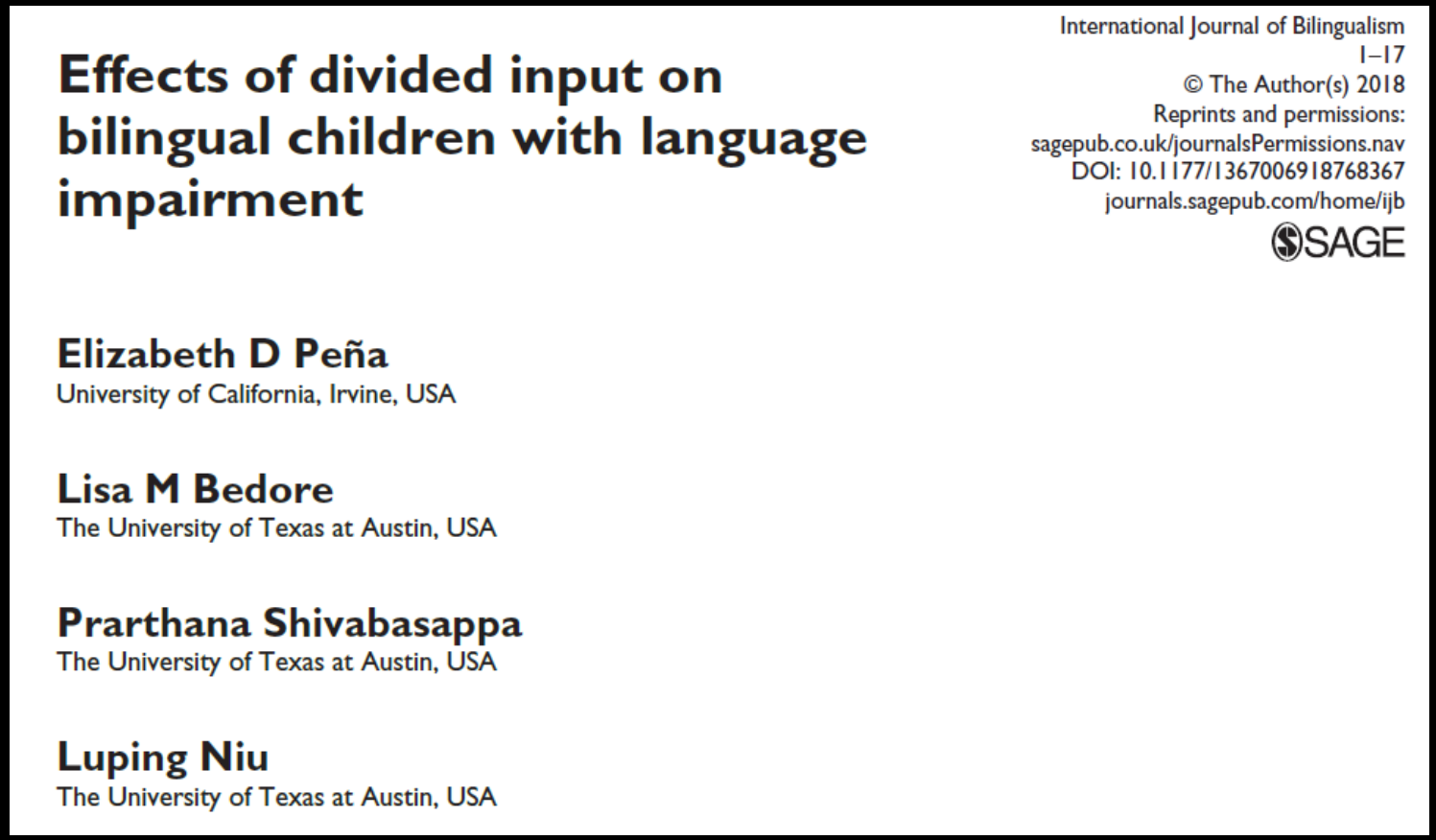
Spanish & English Scores



% Risk x Language Group



What about bilingual DLD?



Effects of divided input on bilingual children with language impairment

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1–17

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SAGE

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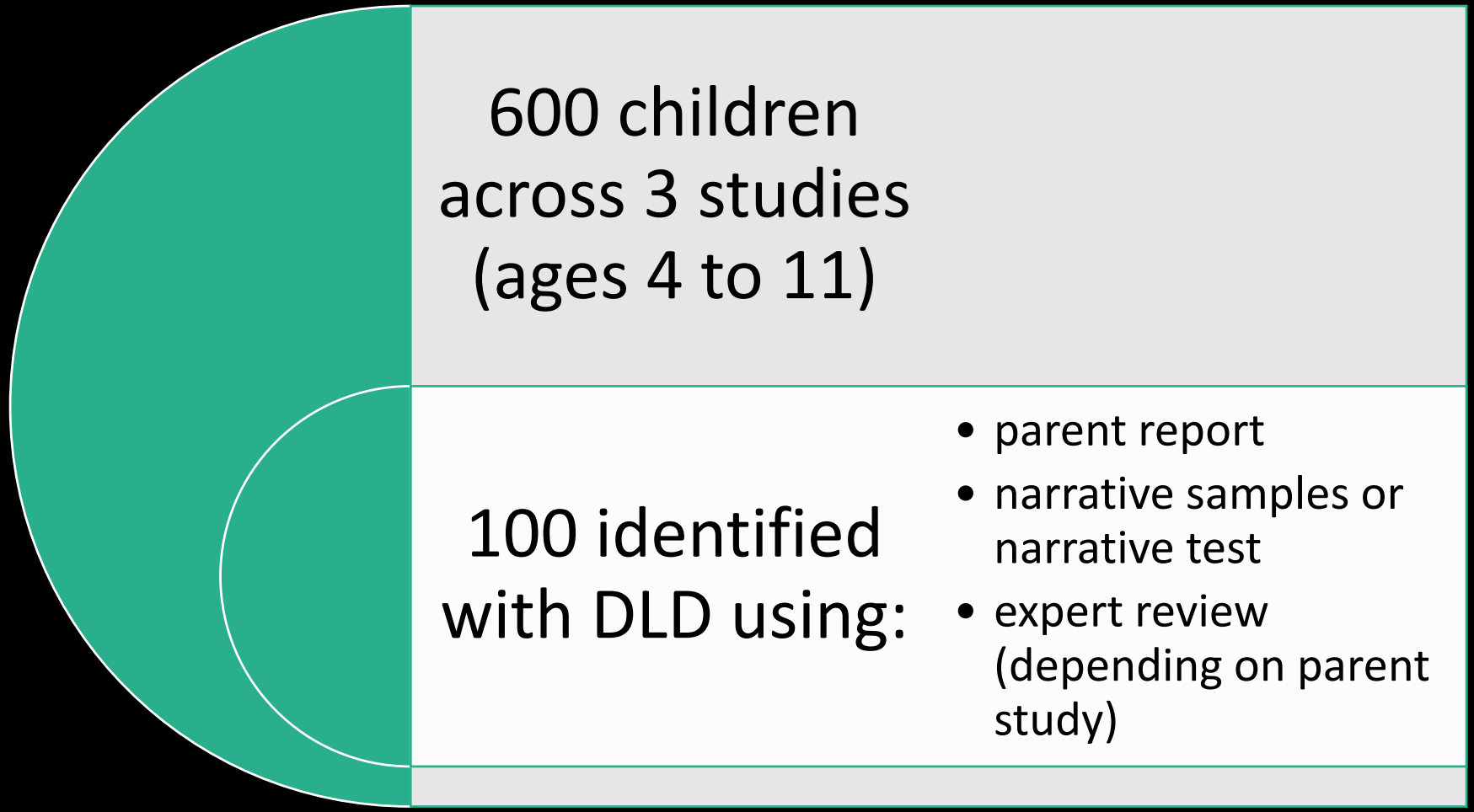
The University of Texas at Austin, USA

Luping Niu
The University of Texas at Austin, USA

Participants



Grouping (reference measures)

- Parent report
- Teacher report
- Clinical observation
- Grammaticality

Procedures

Children tested using (Index Measure):

- BESA (4 to 6;11) or BESAME (7 to 11;11)
- Morphosyntax: Spanish & Englisih
- Semantics: Spanish & English

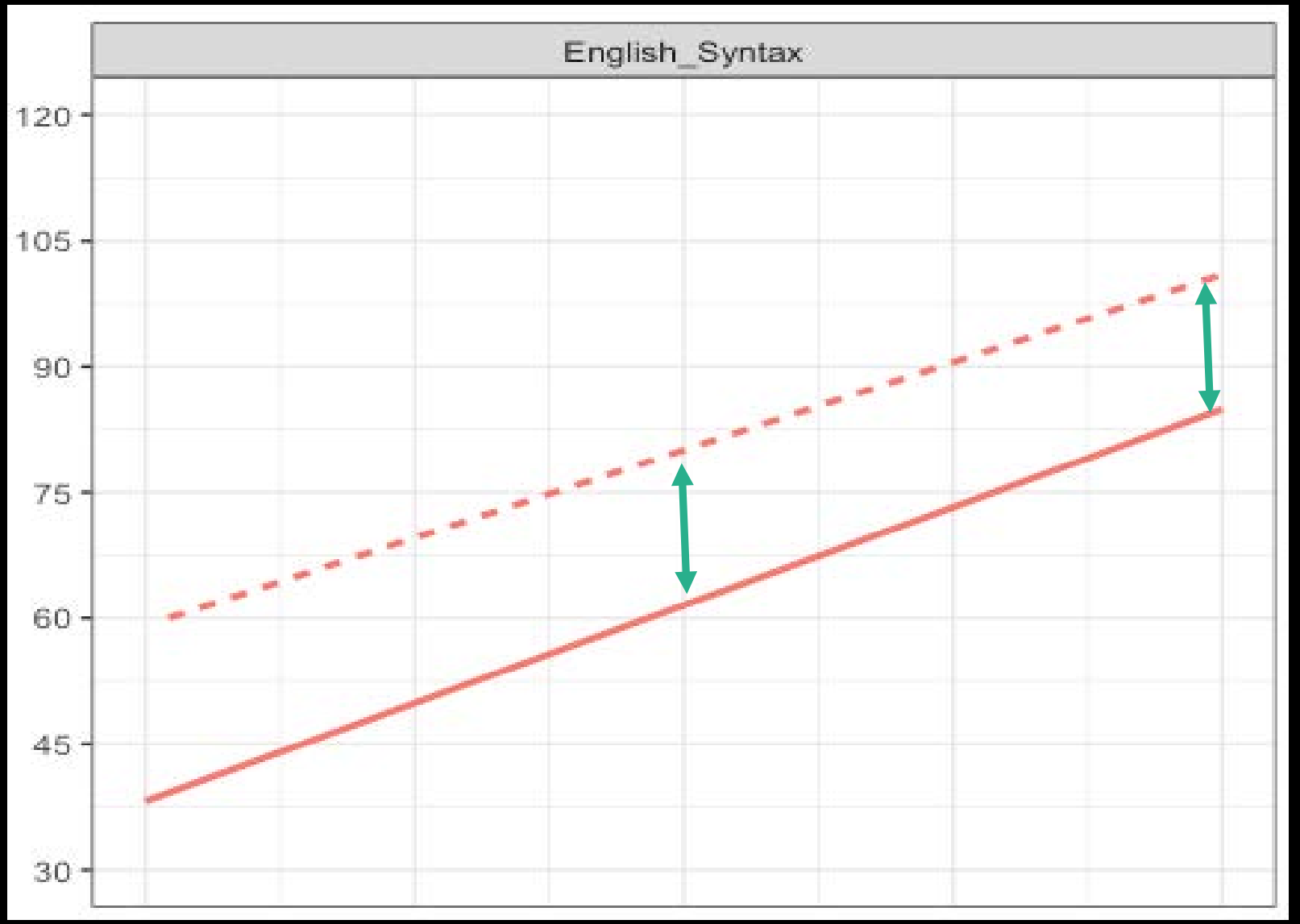
Parent interview:

- Bilingual Input Output Survey (BIOS)

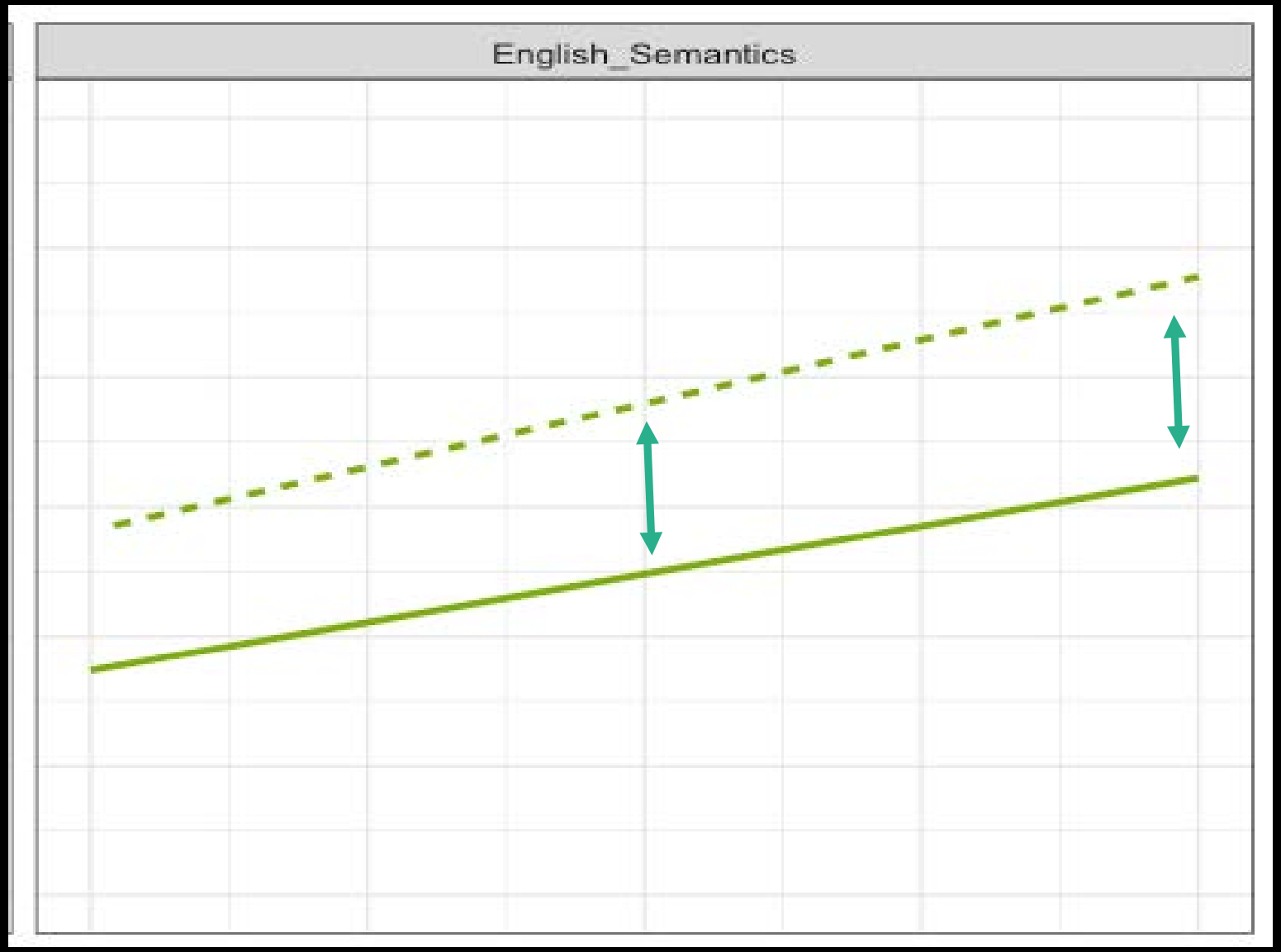
Results

	Typically Developing		Developmental Language Disorder	
	M	SD	M	SD
English Semantics	86.53	20.02	64.80	16.73
Spanish Semantics	94.63	18.88	65.37	19.38
English Morphosyntax	77.54	22.26	53.12	20.29
Spanish Morphosyntax	88.76	20.83	54.31	19.47

Results


English_Syntax
120
105
90
75
60
45
30
High Spanish Exposure
High English Exposure

Results


English_Semantics
High Spanish Exposure
High English Exposure

Conclusions so far…

- Bilingualism does not increase risk for DLD
  - Distributed knowledge
- Bilinguals with DLD are not more impaired than monolinguals with DLD
  - Monolingualism does not cure bilingual DLD
- Slight advantage for those who have been bilingual longer
  - Inhibitory control

Clinical implications…

- Encourage families to maintain their home language
- Don’t tell parents to stop using their home language

Overview

- Are bilinguals at greater risk for DLD?
- How do we consider L1 and L2 performance in diagnostic decision-making?
- What is the nature of the “bilingual delay” (is it really a thing?)

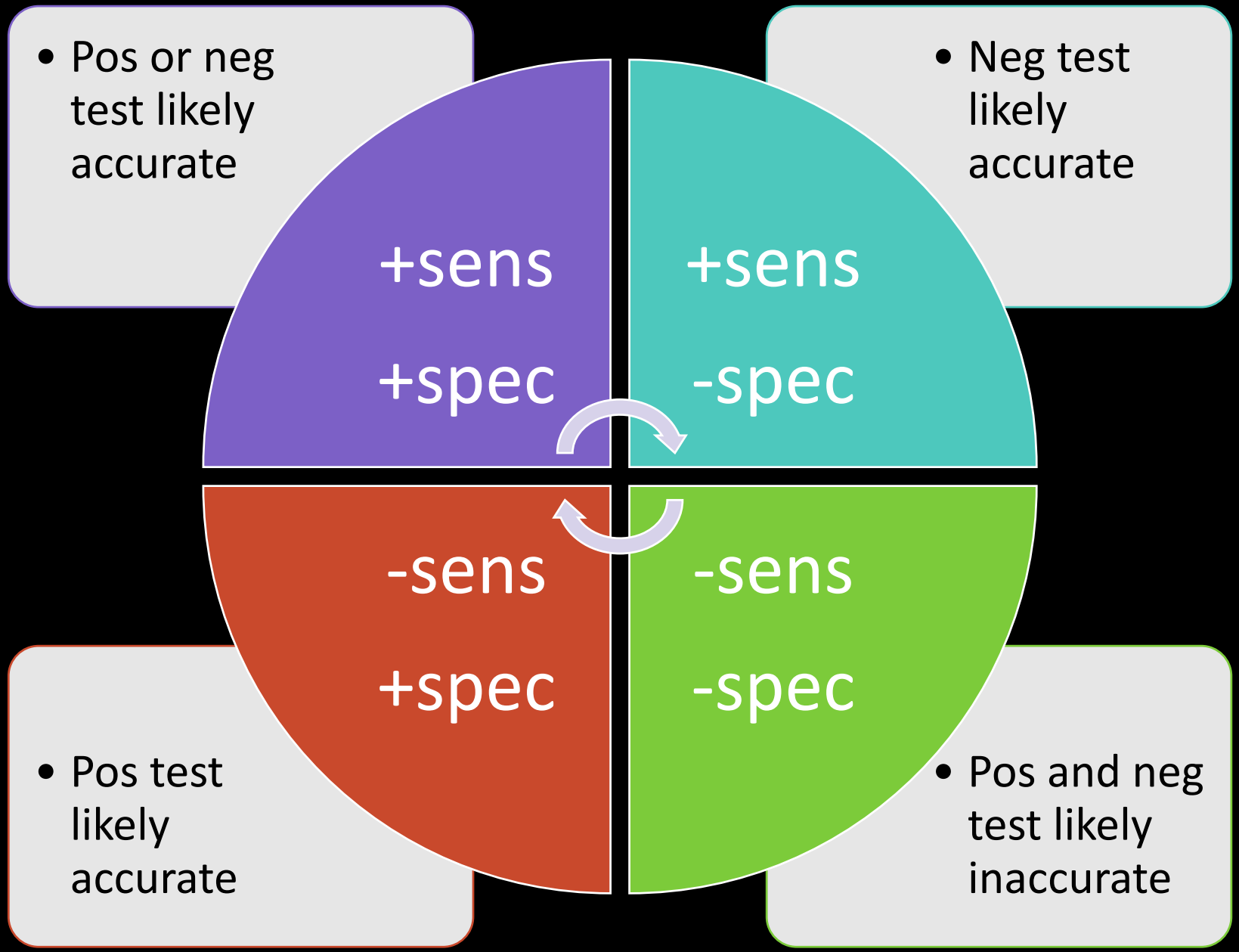
Challenges in Assessment

- Second language learning looks like DLD
- First language loss looks like DLD
- Language Dominance
  - Age of first English exposure
  - Percent of current exposure
- Test domain (by language experience)

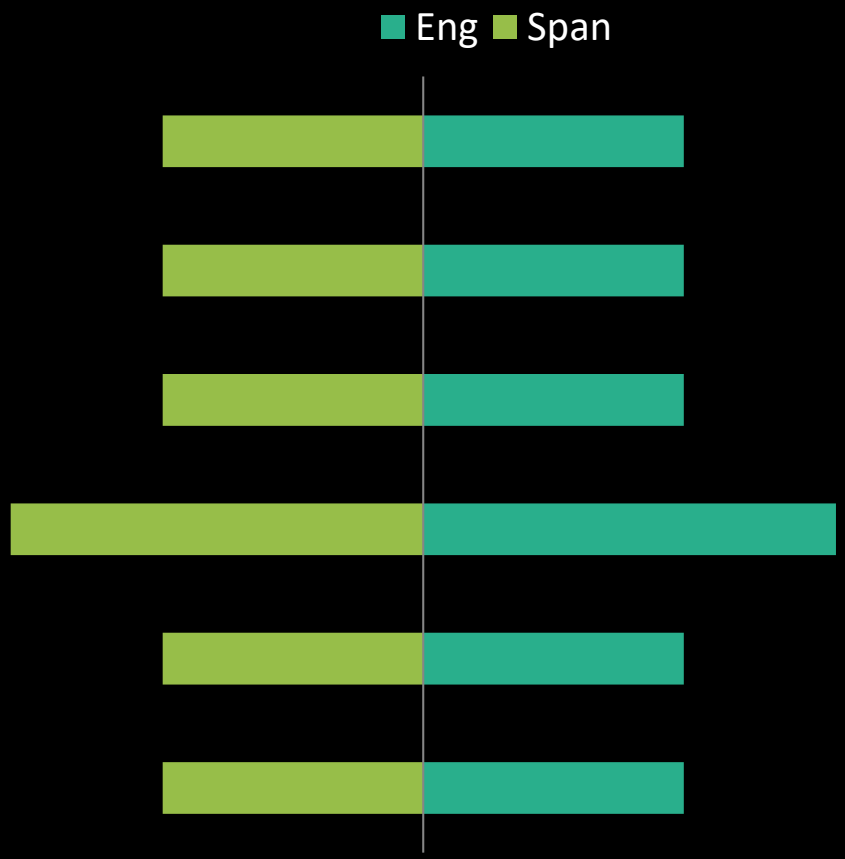
Classification Accuracy

- For diagnostic decisions:
  - 80% sensitivity
  - 80% specificity

- For screening
  - 80% sensitivity or better
  - 70% specificity (can be more variable)


• Pos or neg test likely accurate
+sens
+spec
• Neg test likely accurate
+sens
-spec
-sens
+spec
• Pos test likely accurate
-sens
-spec
• Pos and neg test likely inaccurate

Semantics



Similarities and differences

Linguistic concepts

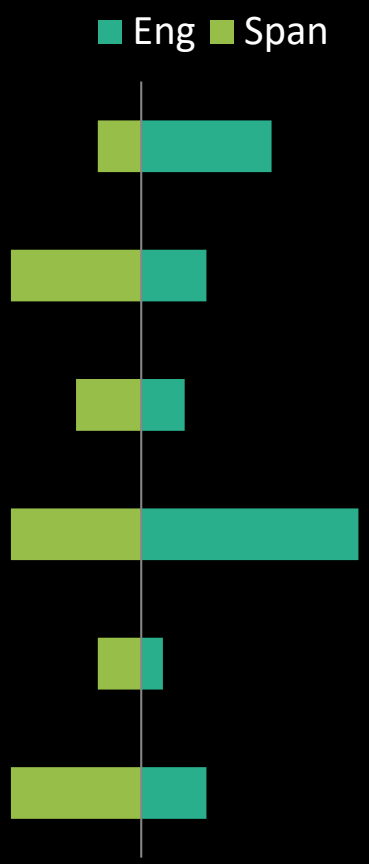
Characteristics of properties

Categorization

Word associations

Function of objects

Semantics



Similarities and differences

Linguistic concepts

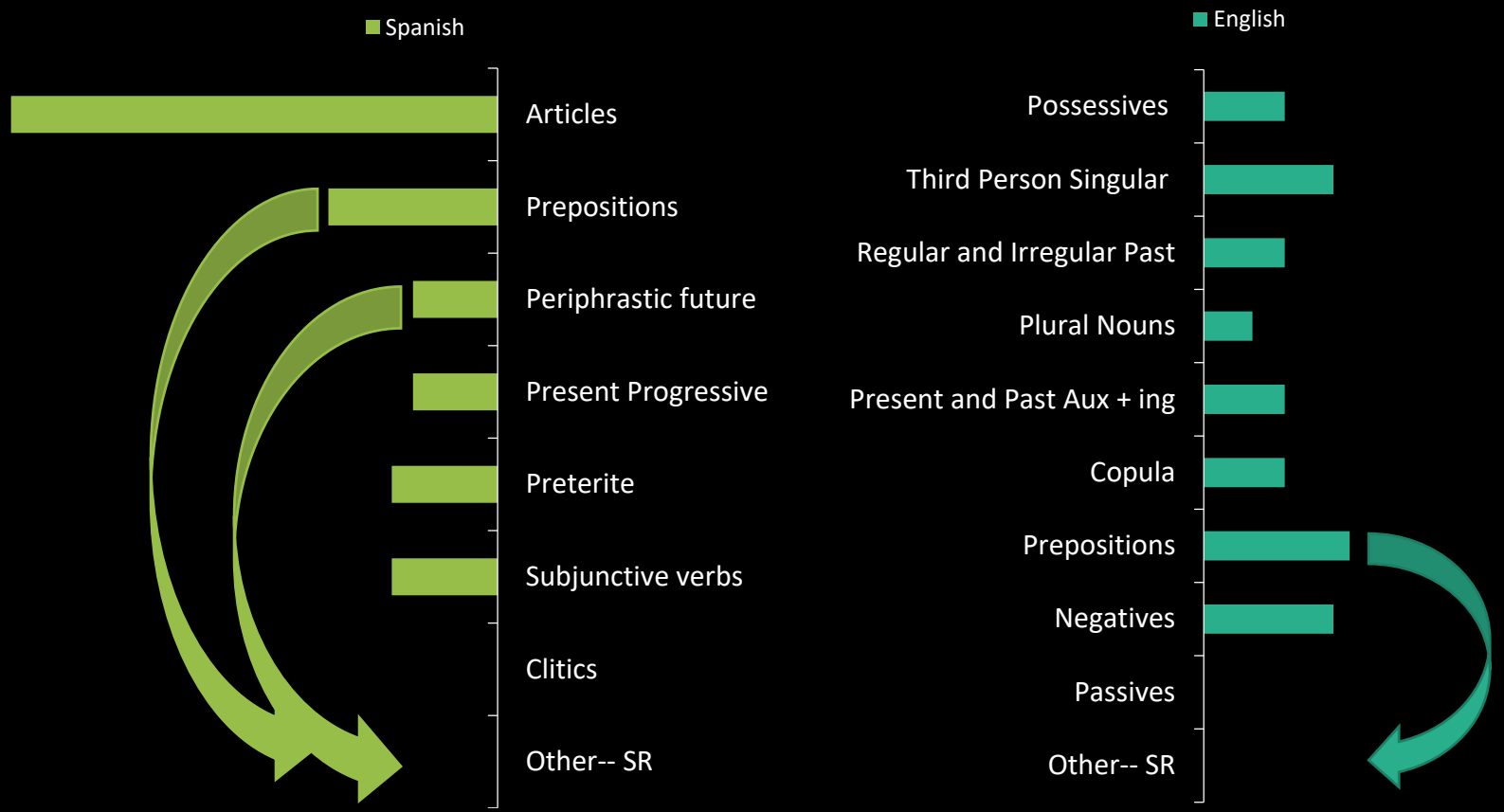
Characteristics of properties

Categorization

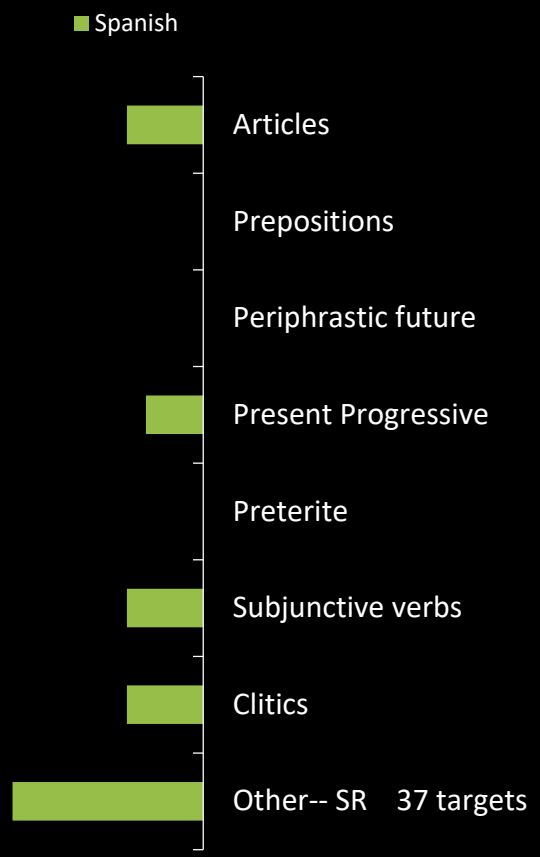
Word associations

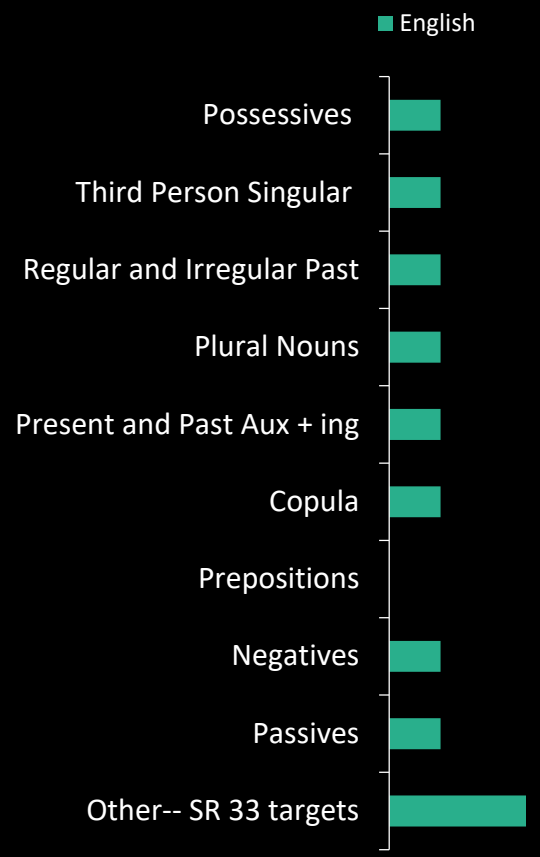
Function of objects

Morphosyntax

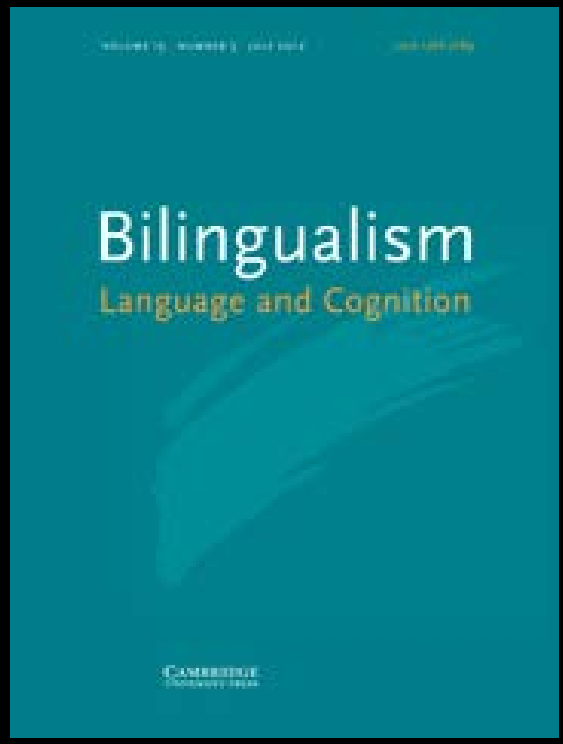


Morphosyntax





Language Dominance



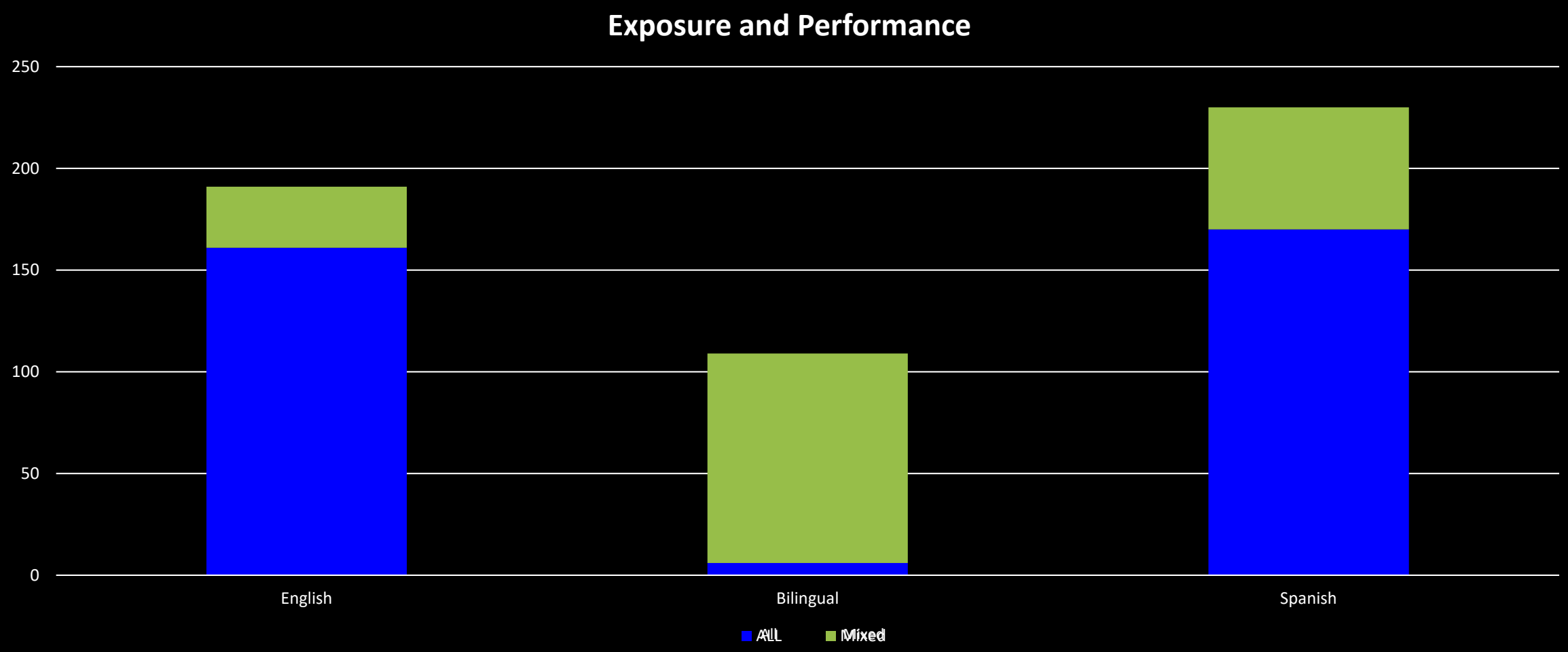
The measure matters: Language dominance profiles across measures in Spanish–English bilingual children

LISA M. BEDORE, ELIZABETH D. PEÑA, CONNIE L. SUMMERS, KARIN M. BOERGER, MARIA D. RESENDIZ, KAI GREENE, THOMAS M. BOHMAN and RONALD B. GILLAM

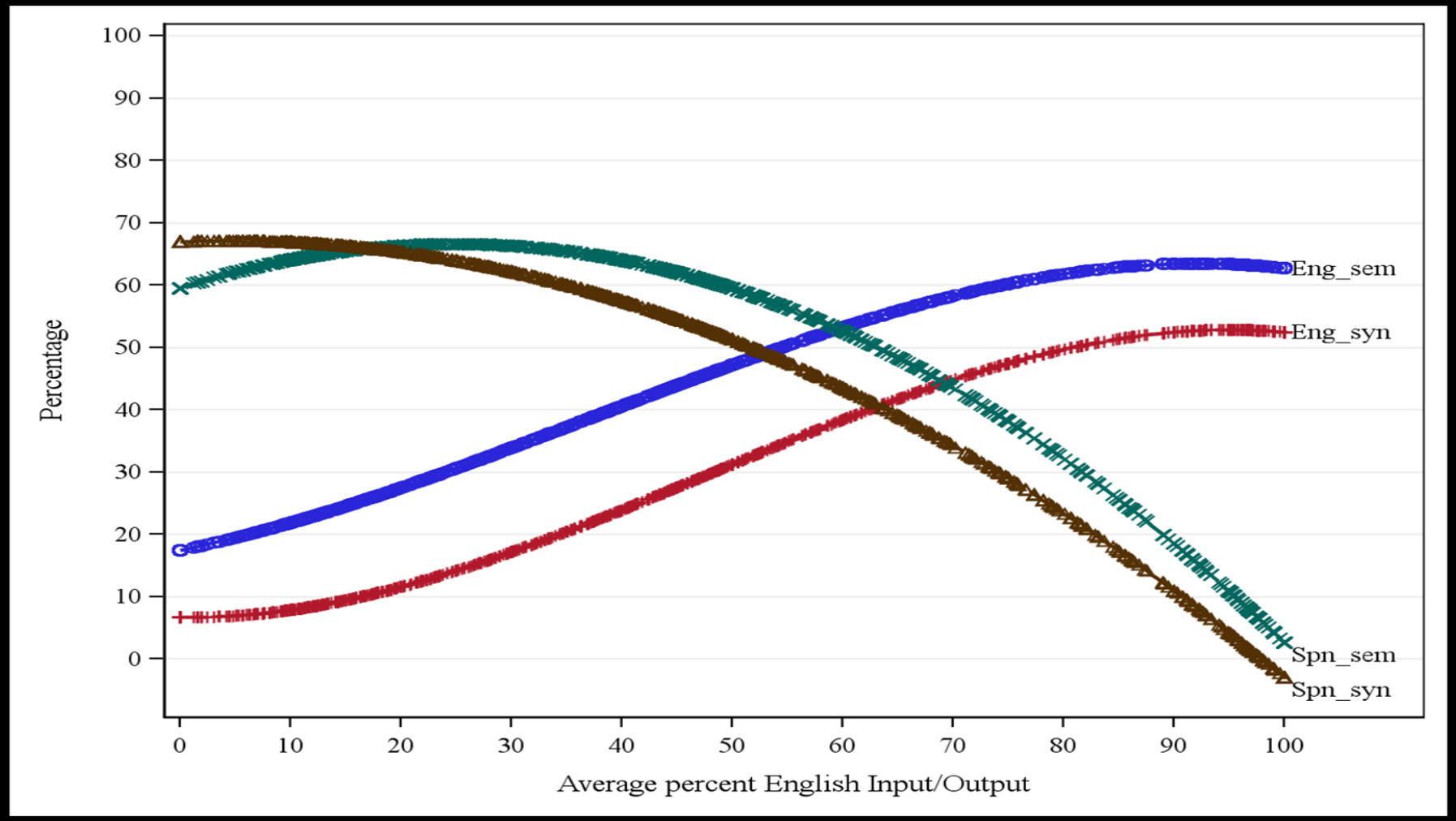
Language Dominance

		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

Dominance


Exposure and Performance
250
200
150
100
50
0
English
Bilingual
Spanish
ALL
Mixed

How much exposure to test in one language?



70%

Language of Testing

BIOS-Home Language Profile: Enter and circle Averaged Input/Output to determine testing language(s).										
SPANISH	0%–10%	11%–20%	21%–30%	31%–40%	41%–50%	51%–60%	61%–70%	71%–80%	81%–90%	91%–100%
SIO: Obtained %					X					
EIO: Obtained %					X					
ENGLISH	91%–100%	81%–90%	71%–80%	61%–70%	51%–60%	41%–50%	31%–40%	21%–30%	11%–20%	0%–10%
	Test in English			**Test in Both**				**Test in Spanish**		

BIOS-School Language Profile: Enter and circle Averaged Input/Output to determine testing language(s).										
SPANISH	0%–10%	11%–20%	21%–30%	31%–40%	41%–50%	51%–60%	61%–70%	71%–80%	81%–90%	91%–100%
SIO: Obtained %							X			
EIO: Obtained %							X			
ENGLISH	91%–100%	81%–90%	71%–80%	61%–70%	51%–60%	41%–50%	31%–40%	21%–30%	11%–20%	0%–10%
	Test in English			**Test in Both**				**Test in Spanish**		

Two Languages to Test Bilinguals?

- Bilinguals do not perform like monolinguals
- Bilinguals do not perform similarly in both of their languages

International Journal of Language & Communication Disorders

INT J LANG COMMUN DISORD, MARCH–APRIL 2016,
VOL. 51, NO. 2, 192–202

Research Report

Assessment of language impairment in bilingual children using semantic tasks: two languages classify better than one

Elizabeth D. Peña, Lisa M. Bedore and Ellen S. Kester

Journal of Communication Disorders 53 (2015) 30–41

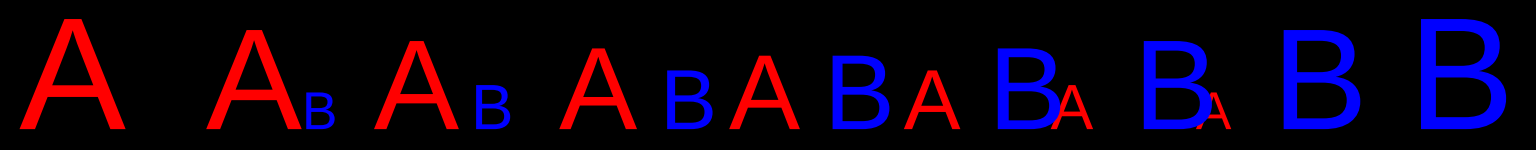
Contents lists available at ScienceDirect

Journal of Communication Disorders

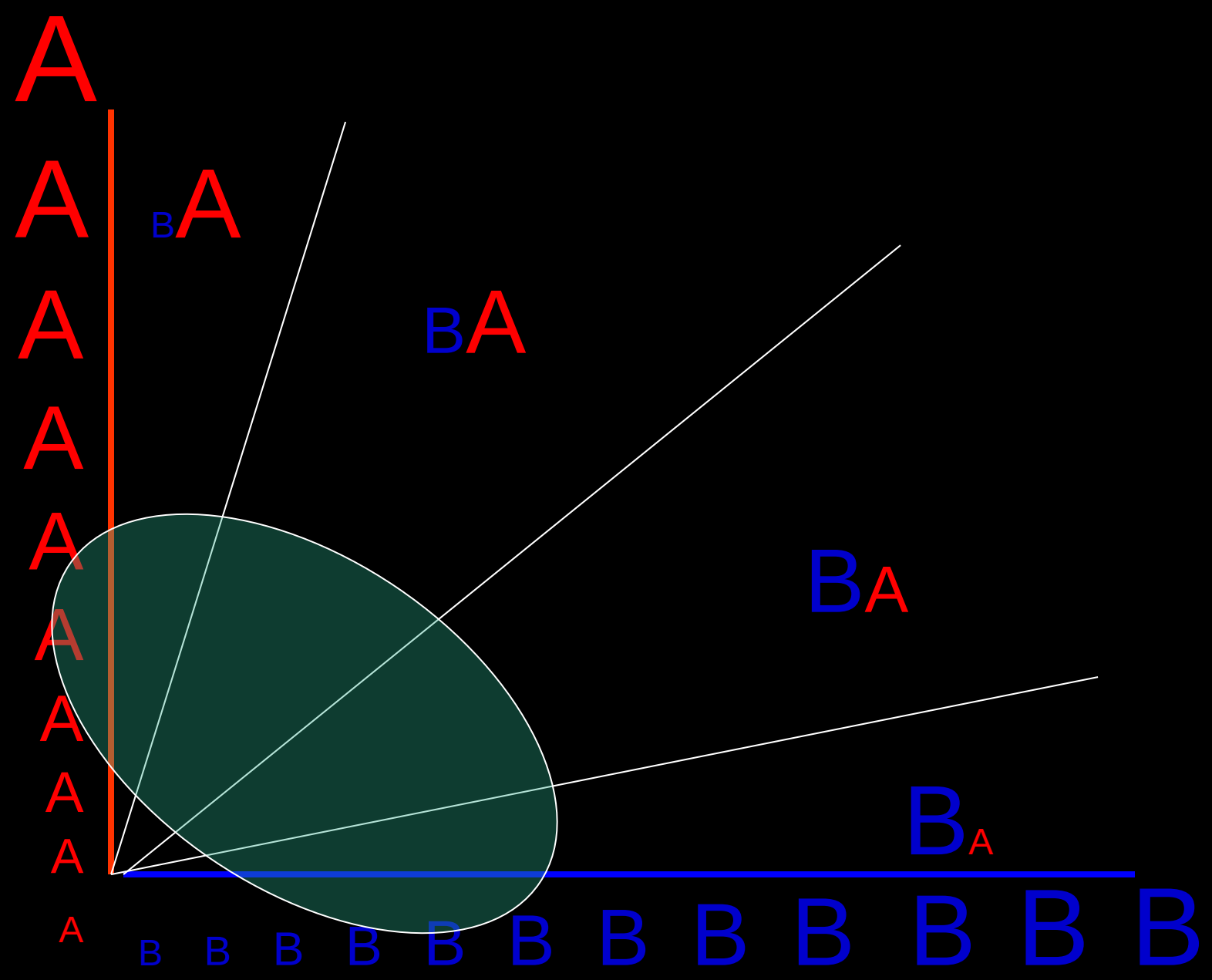
ELSEVIER

Discriminant accuracy of a semantics measure with Latino English-speaking, Spanish-speaking, and English–Spanish bilingual children

Elizabeth D. Peña [a,*], Lisa M. Bedore [a], Ellen S. Kester [b]



Valdes & Figueroa (1994)



Pena, Bedore & Kester (2003)

Best Results when we test in BOTH

International Journal of Language & Communication Disorders

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Assessment of language impairment in bilingual children using semantic tasks: two languages classify better than one

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AJSLP

Research Article

Utility of a Language Screening Measure for Predicting Risk for Language Impairment in Bilinguals

Mirza J. Lugo-Neris,[a] Elizabeth D. Peña,[a] Lisa M. Bedore,[a] and Ronald B. Gillam[b]

Participants (BESA field test)

		FME	BSE	FMS	All
LI	4	19	34	19	72
	5	23	25	13	61
	6	6	23	4	33
		48	82	36	166
TD	4	47	44	37	130
	5	53	106	70	227
	6	43	105	56	201
		143	255	163	561

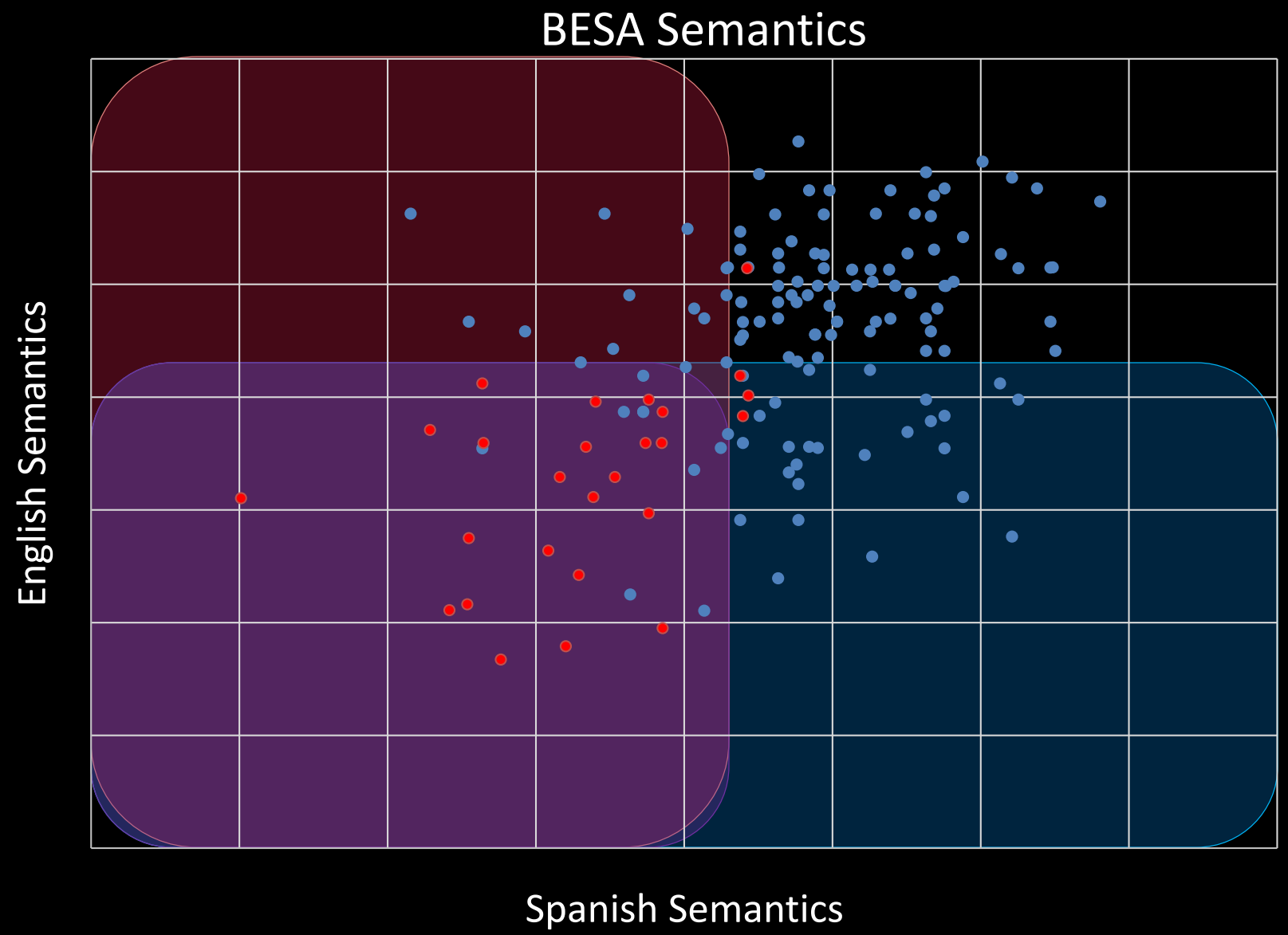
Procedure

- Children tested in Spanish, English or both
- Ability testing: language samples, parent/teacher questionnaire, clinical concern
- Bilingual input-output based on parent/teacher questionnaire

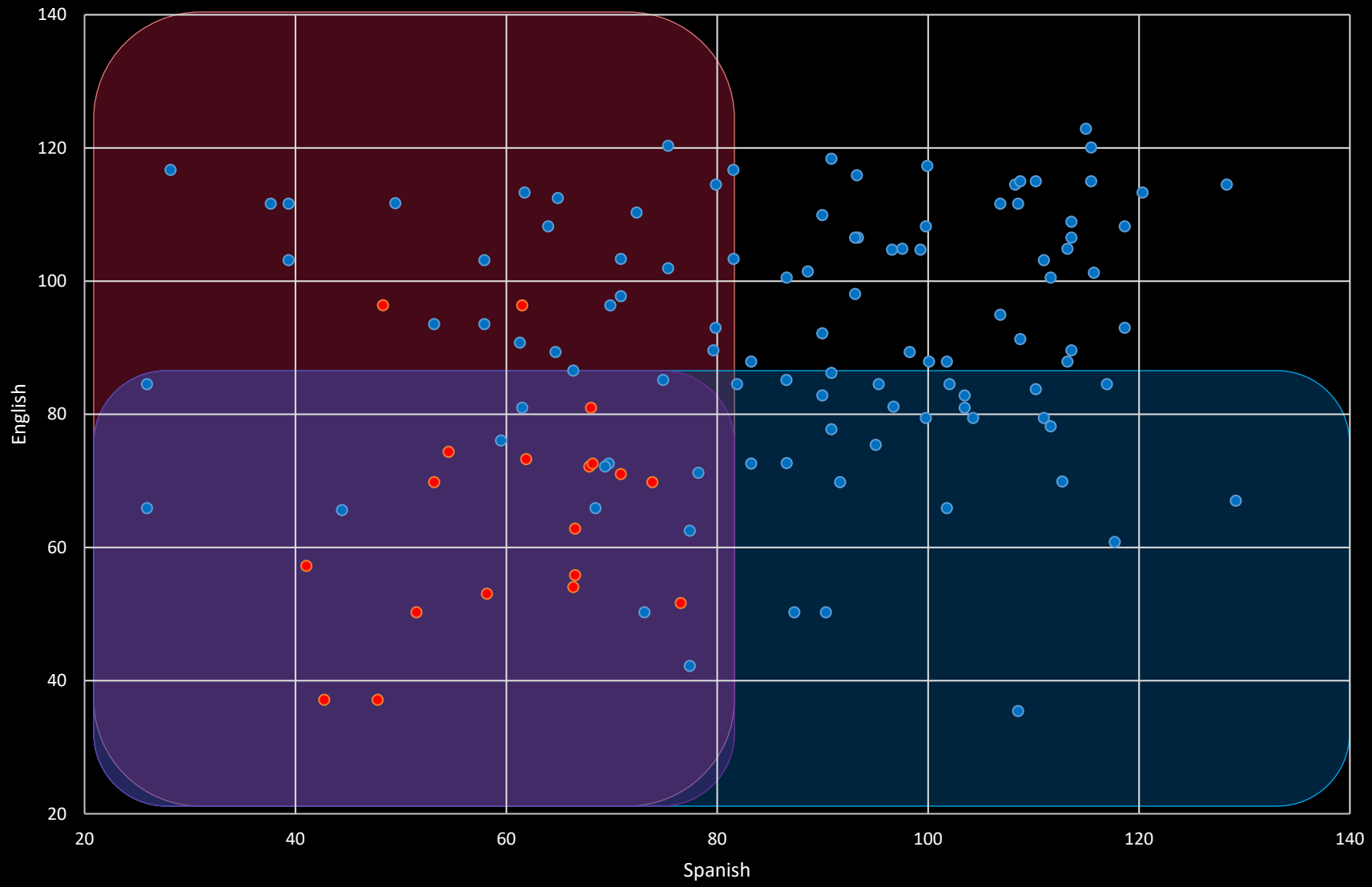
- Bilingual English Spanish Assessment– BESA Semantics

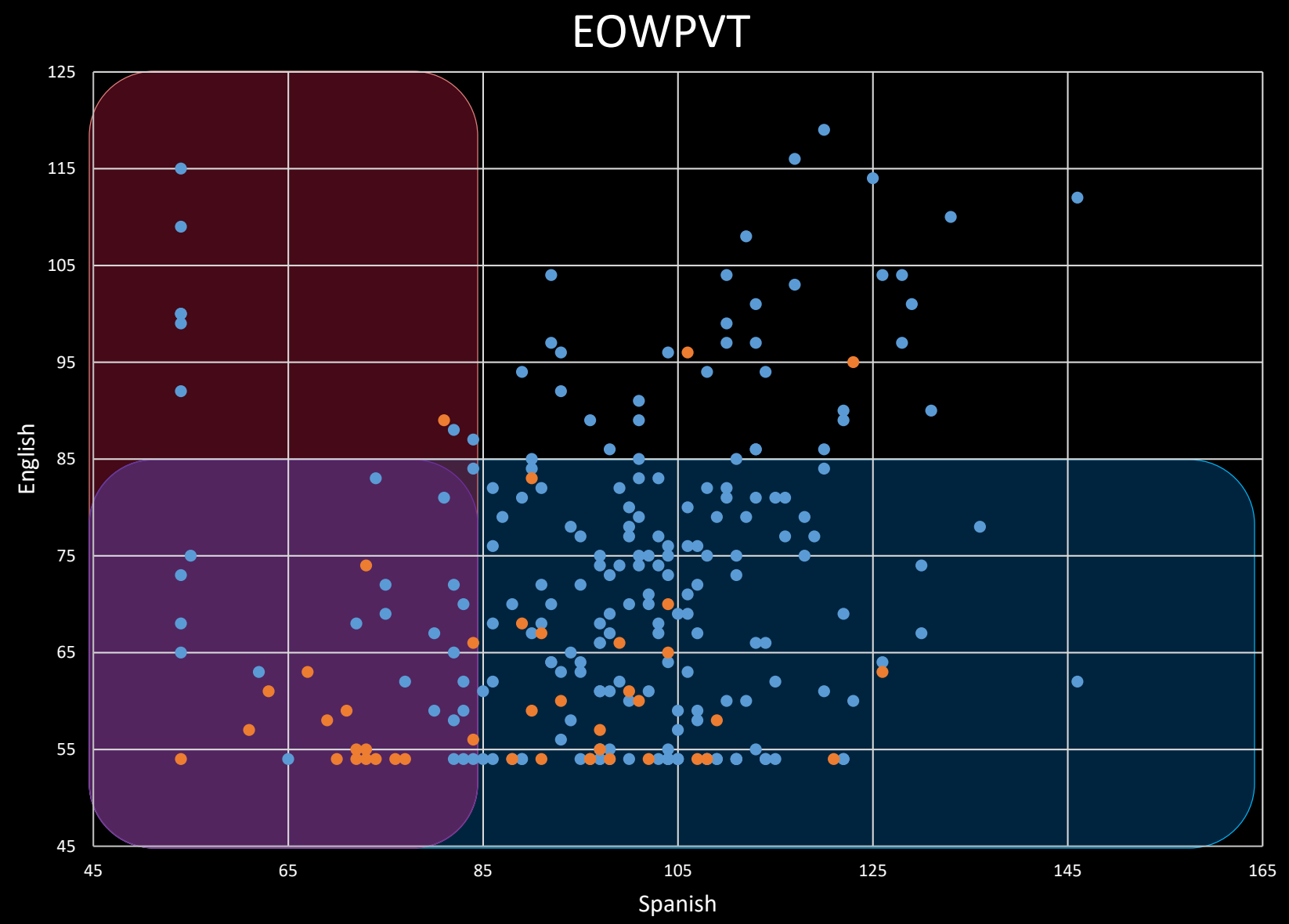
	Age	Sensitivity (LI as LI)	Specificity (TD as TD)	+ likelihood ratio	- likelihood ratio
English Semantics	4	81.0%	73.1%	3.01	0.26
	5	90.0%	63.3%	2.45	0.16
	6	52.6%	85.7%	4.09	0.48
Spanish Semantics	4	70.0%	83.3%	4.19	0.36
	5	93.8%	77.8%	4.25	0.08
	6	87.5%	86.8%	6.63	0.14

	Age	Sensitivity (LI as LI)	Specificity (TD as TD)	+ likelihood ratio	- likelihood ratio
English Semantics	4	81.0%	73.1%	3.01	0.26
	5	90.0%	63.3%	2.45	0.16
	6	52.6%	85.7%	4.09	0.48
Spanish Semantics	4	70.0%	83.3%	4.19	0.36
	5	93.8%	77.8%	4.25	0.08
	6	87.5%	86.8%	6.63	0.14
English & Spanish Semantics	4	85.7%	100.0%	infinite	0.12
	5	90.9%	84.0%	5.68	0.11
	6	91.7%	85.7%	6.41	0.10

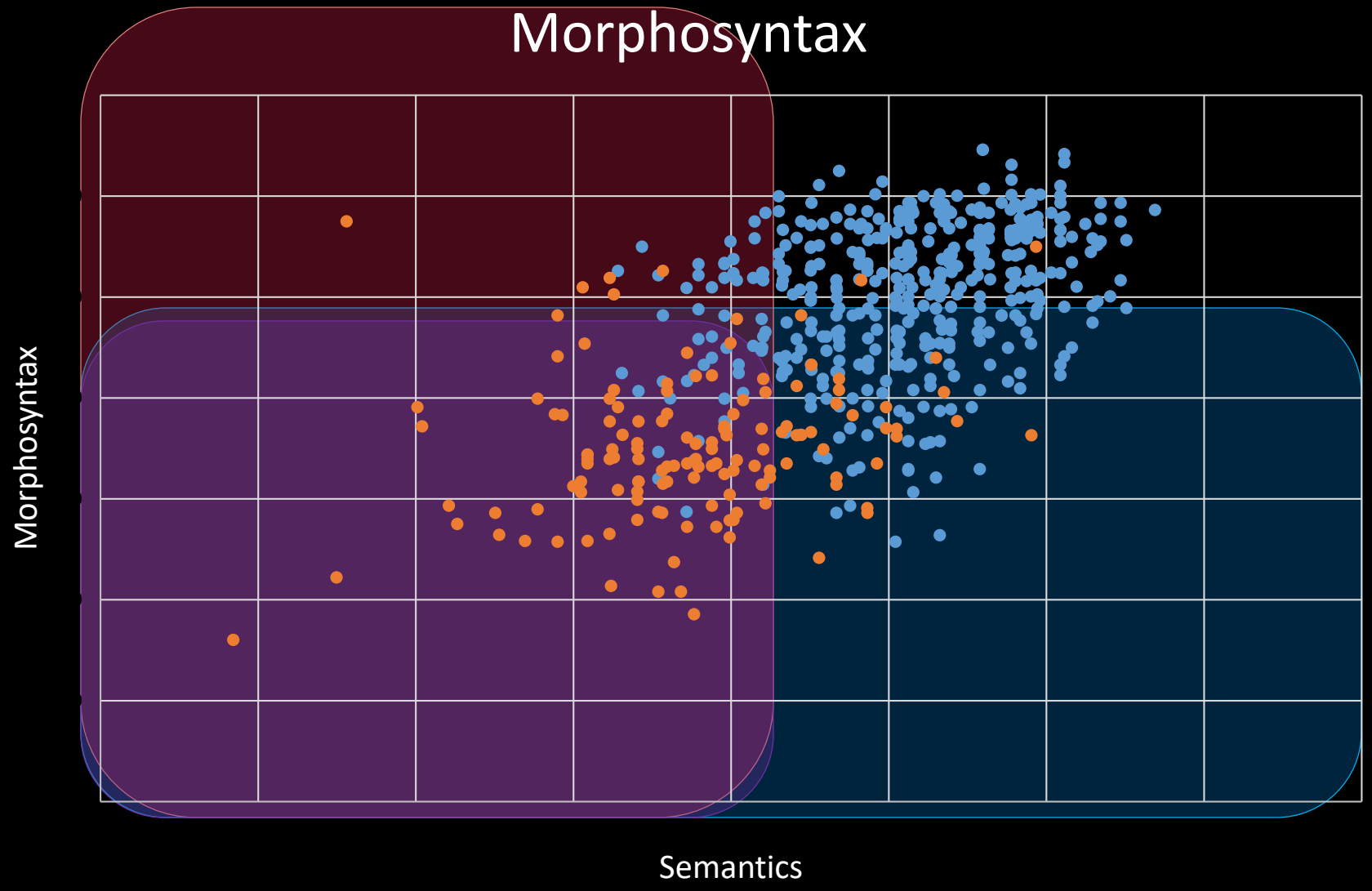

BESA Semantics
English Semantics
Spanish Semantics

BESA Morphosyntax




EOWPVT
125
115
105
95
85
75
65
55
45
English
45
65
85
105
125
145
165
Spanish

Composite Scores: Semantics & Morphosyntax



Composites across Domains & Language

- Semantics
- Morphosyntax
- Narratives

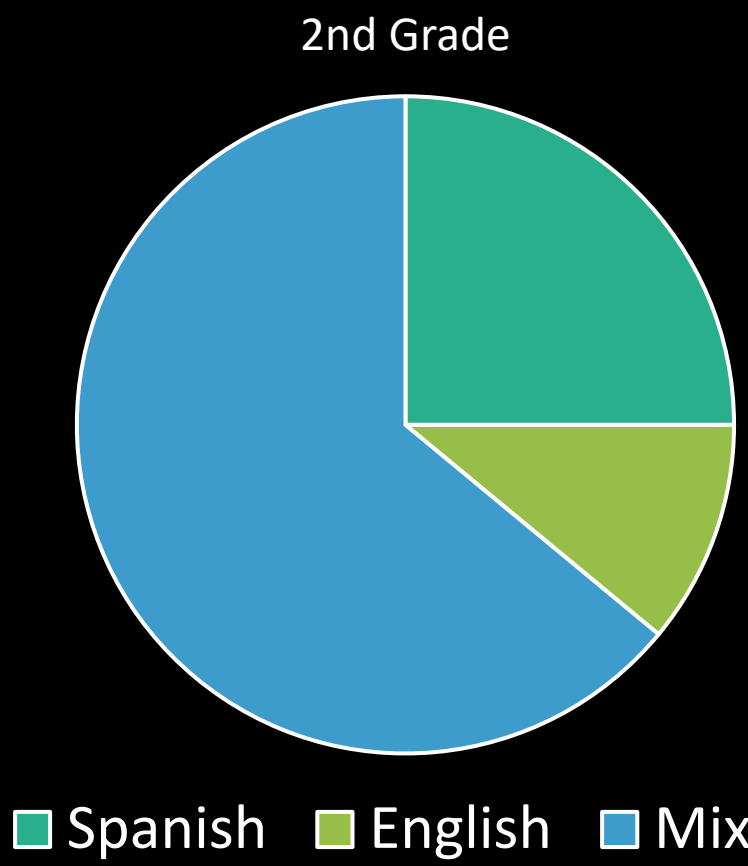
Identifying Developmental Language Disorder in School Age Bilinguals: Semantics, Grammar, and Narratives

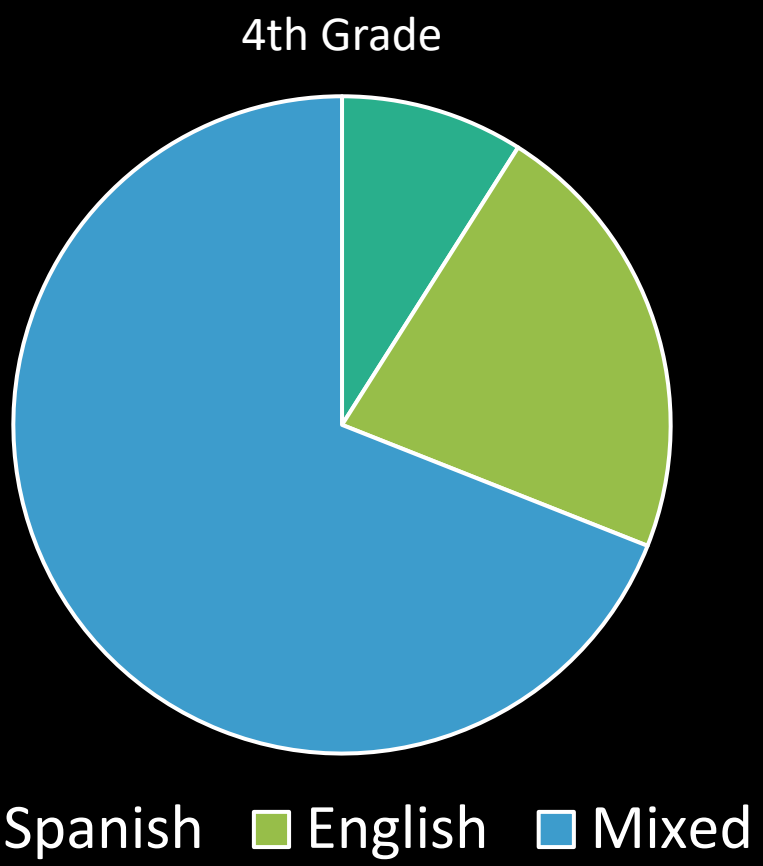
Elizabeth D. Peña[a], Lisa M Bedore[b], Mirza J. Lugo-Neris[c], and Nahar Albudoor[c]

Participants

Second Grade		**Fourth Grade**	
TD	DLD	TD	DLD
n = 92	n = 19	n = 57	n = 7

Mixed Dominance is Common





Results

2nd Grade Measures	Structure Matrix
BESA-ME Morphosyntax	0.988
TNL	0.550
BESA-ME Semantics	0.529

89% sensitivity
89% specificity

Results

4th Grade Measures	Structure Matrix
BESA-ME Morphosyntax	0.839
BESA-ME Semantics	0.702
TNL	0.615

77% sensitivity
86% specificity

Clinical Implications…

- Reliable assessment in one language if exposure > 70%
- Mixed dominance is common
- Test in two languages for diagnostic accuracy

Overview

- Are bilinguals at greater risk for DLD?
- How do we consider L1 and L2 performance in diagnostic decision-making?
- What is the nature of the “bilingual delay” (is it really a thing?)

Commonly Accepted

- Bilingual children demonstrate a delay in both their languages

Where does this come from?

Bilinguals performed consistently low on:

- Measures of IQ
- Academic Measures
- Language Measure

"a hardship devoid of apparent advantage" (Yoshioka, 1929, p. 476).

Code switching as linguistic confusion (Saer, 1923)

Bilingualism as a "social plague" (Epstein, 1905)

- “This might be considered evidence that the use of a foreign language in the home is one of the chief factors in producing mental retardation as measured by intelligence tests”

  (Goodenough, 1926, p. 393)

Divided Input

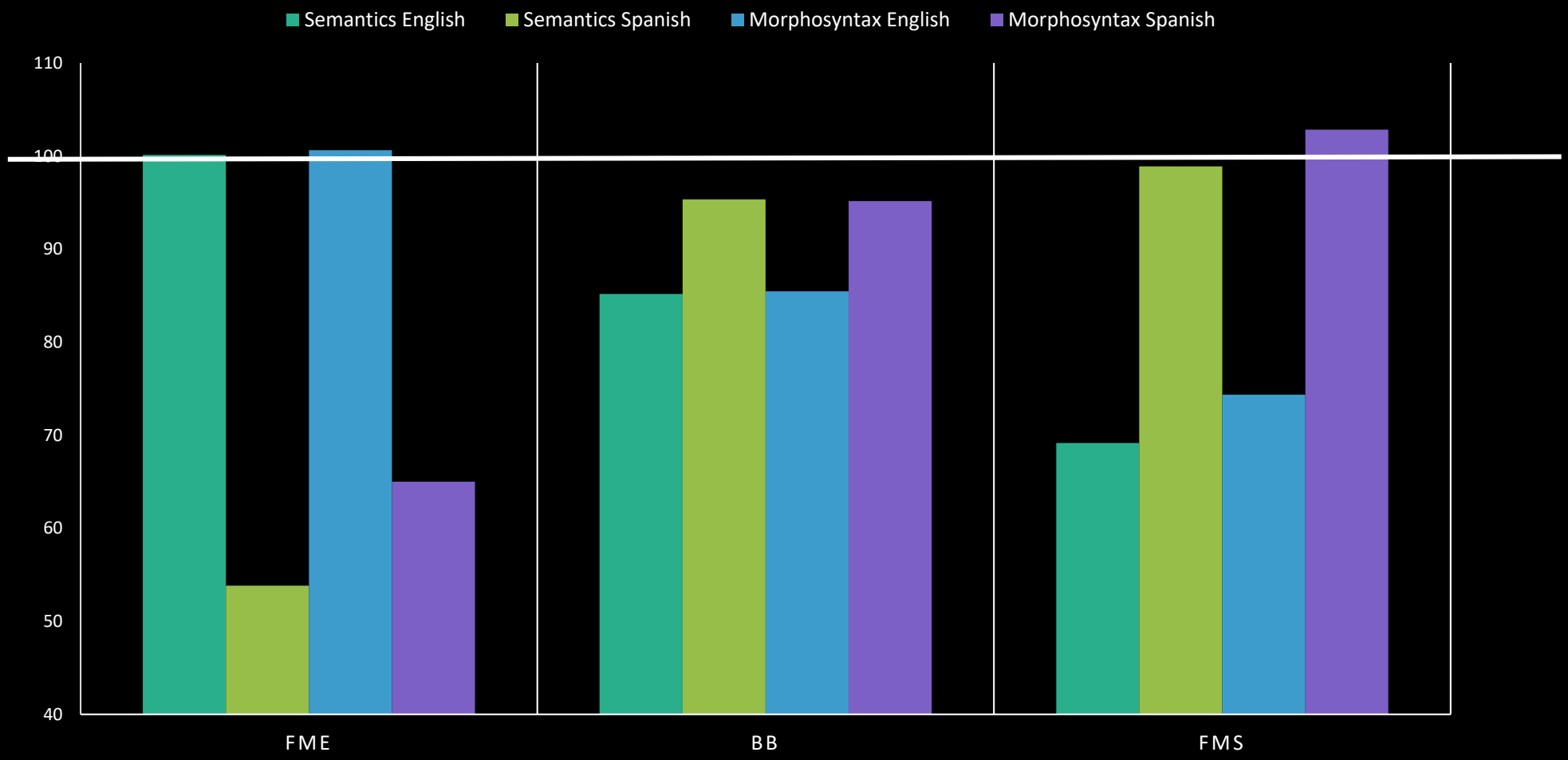
- High variation
  - When children learn L1 and L2
  - Proportion of input/output in each language
  - What they learn in each language → content x context

Rethinking the bilingual delay

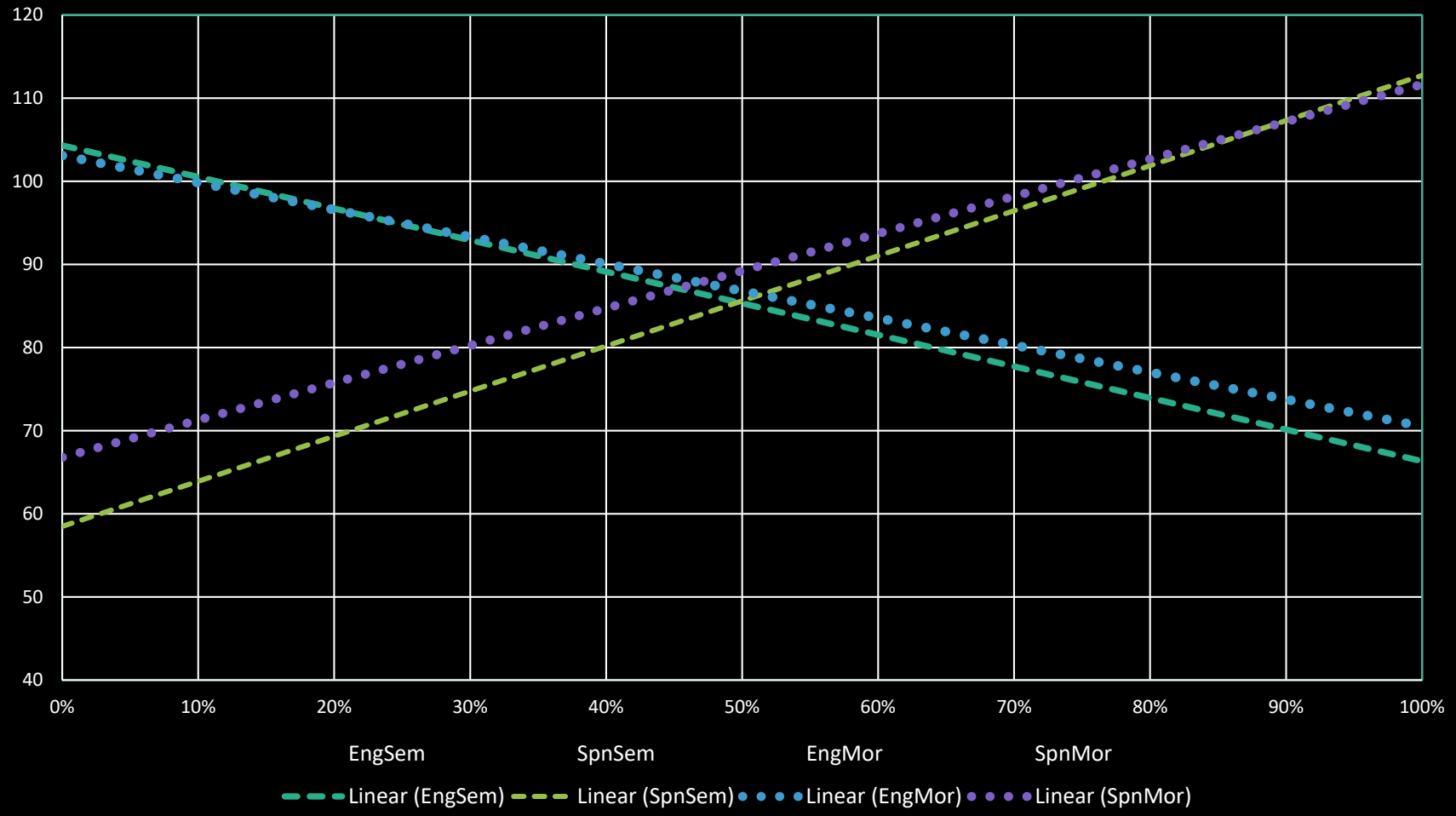
Participants

- 1595 preschool age children in database
  - Excluded 79 who scored below -1.5 SD across the board
  - Excluded 180 with missing data
- 1336 typically developing with complete data
  - BIOS
  - Semantics
    - Spanish & English
  - Morphosyntax
    - Spanish & English
- 3 groups:
  - FME, BB, FMS

Bilingual & Functional Monolingual Language Scores



Scores in each language x exposure



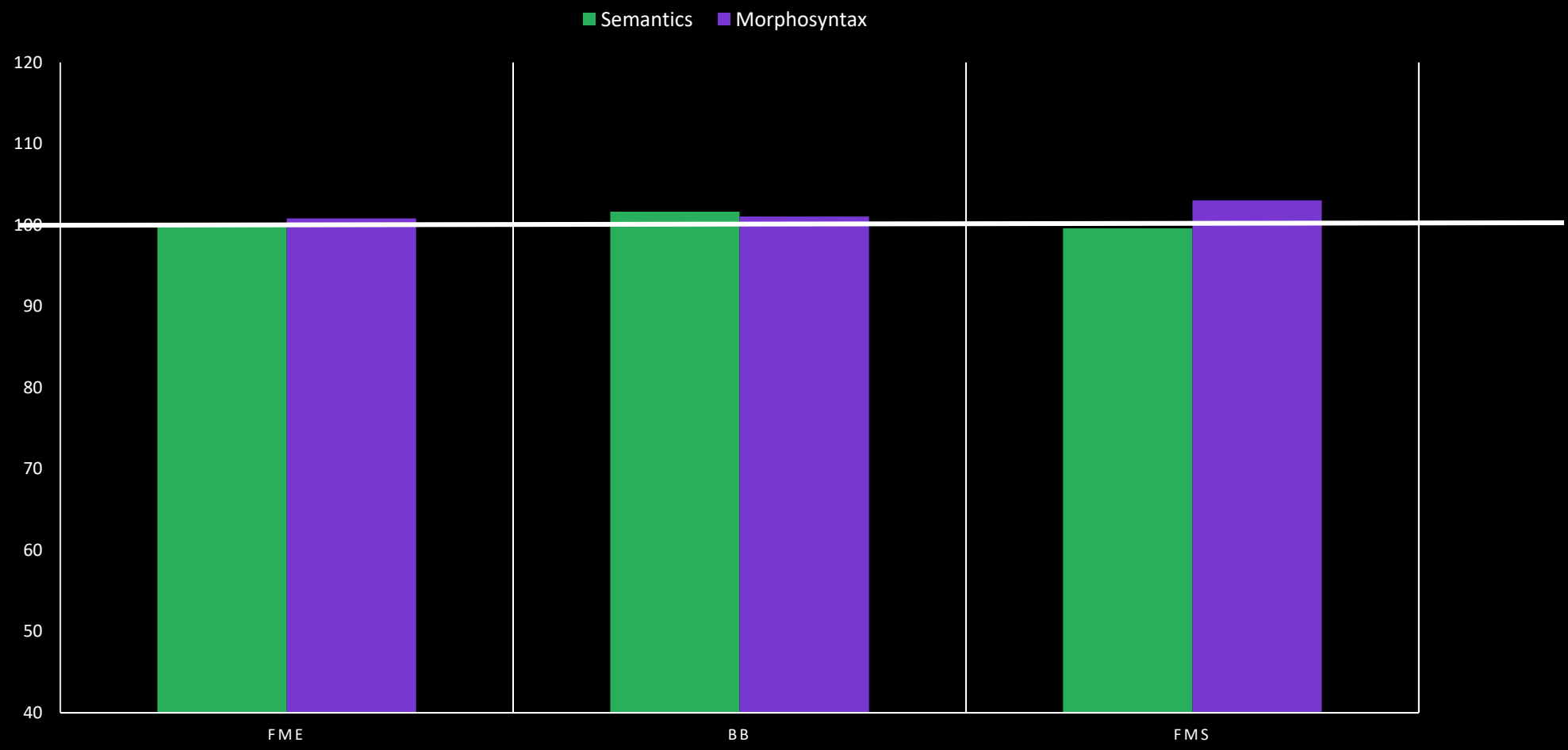
Individual Scores x Language

English Functional Monolinguals	
English	Spanish
91.90	71.96
109.13	71.96
98.79	68.85
112.58	68.57
95.35	68.57
122.92	68.57
109.13	68.57
98.79	68.57
74.67	68.57
102.24	68.57
102.24	68.57
102.24	68.57
81.56	68.57
112.58	68.57

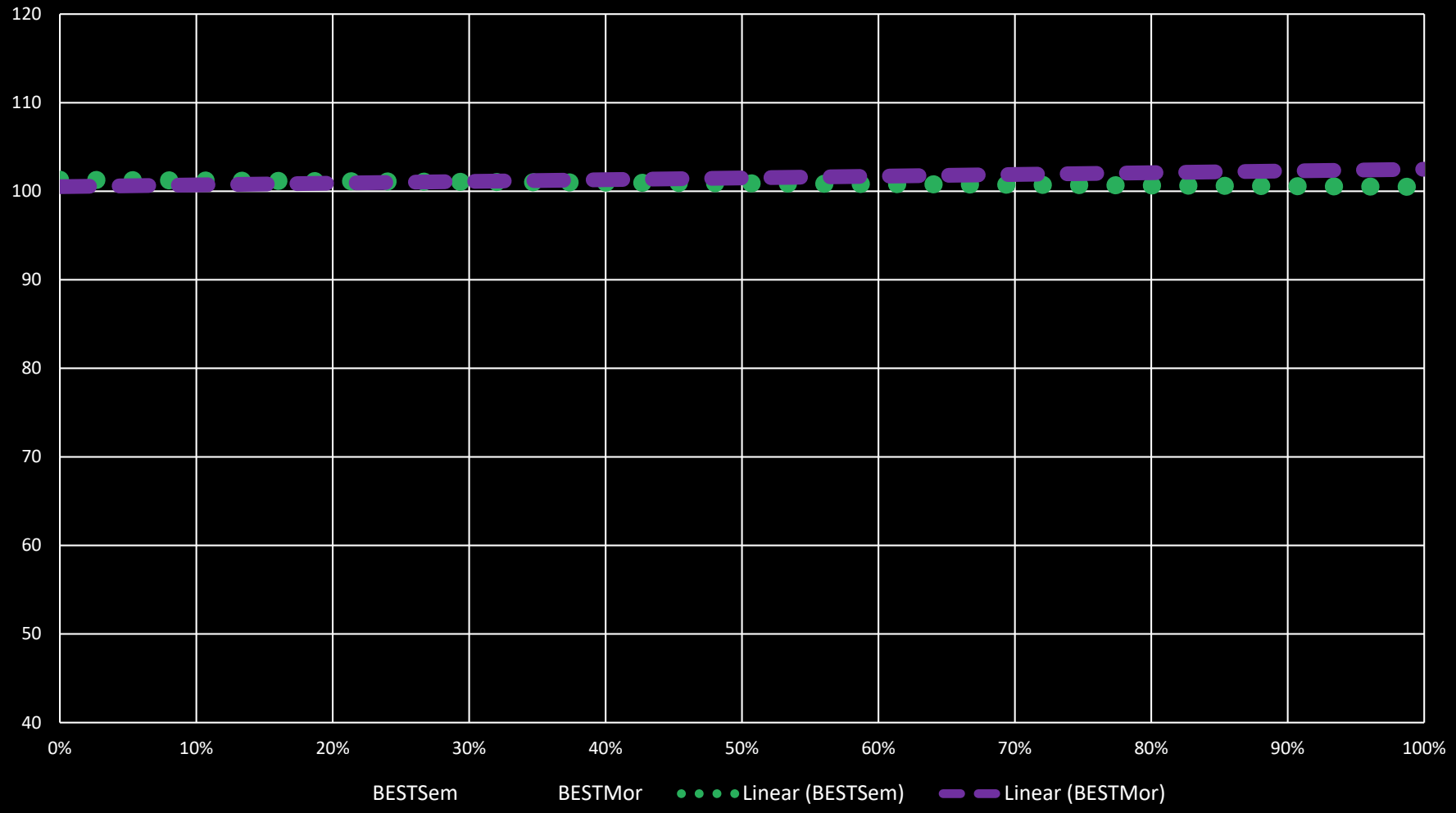
Balanced Bilinguals	
English	Spanish
65.71	94.27
101.58	94.27
87.23	94.27
85.01	92.35
112.58	65.28
71.22	65.28
102.24	65.28
105.16	60.31
44.86	109.81
71.22	105.95
69.30	94.27
71.22	90.23
71.22	72.41
80.06	113.13

Spanish Functional Monolinguals	
English	Spanish
65.71	109.36
71.22	108.06
78.11	105.95
65.71	105.58
71.22	104.49
74.67	100.93
74.67	99.15
65.71	98.04
78.11	97.36
71.22	95.75
71.22	95.75
78.11	90.23
88.45	90.23
71.22	88.96

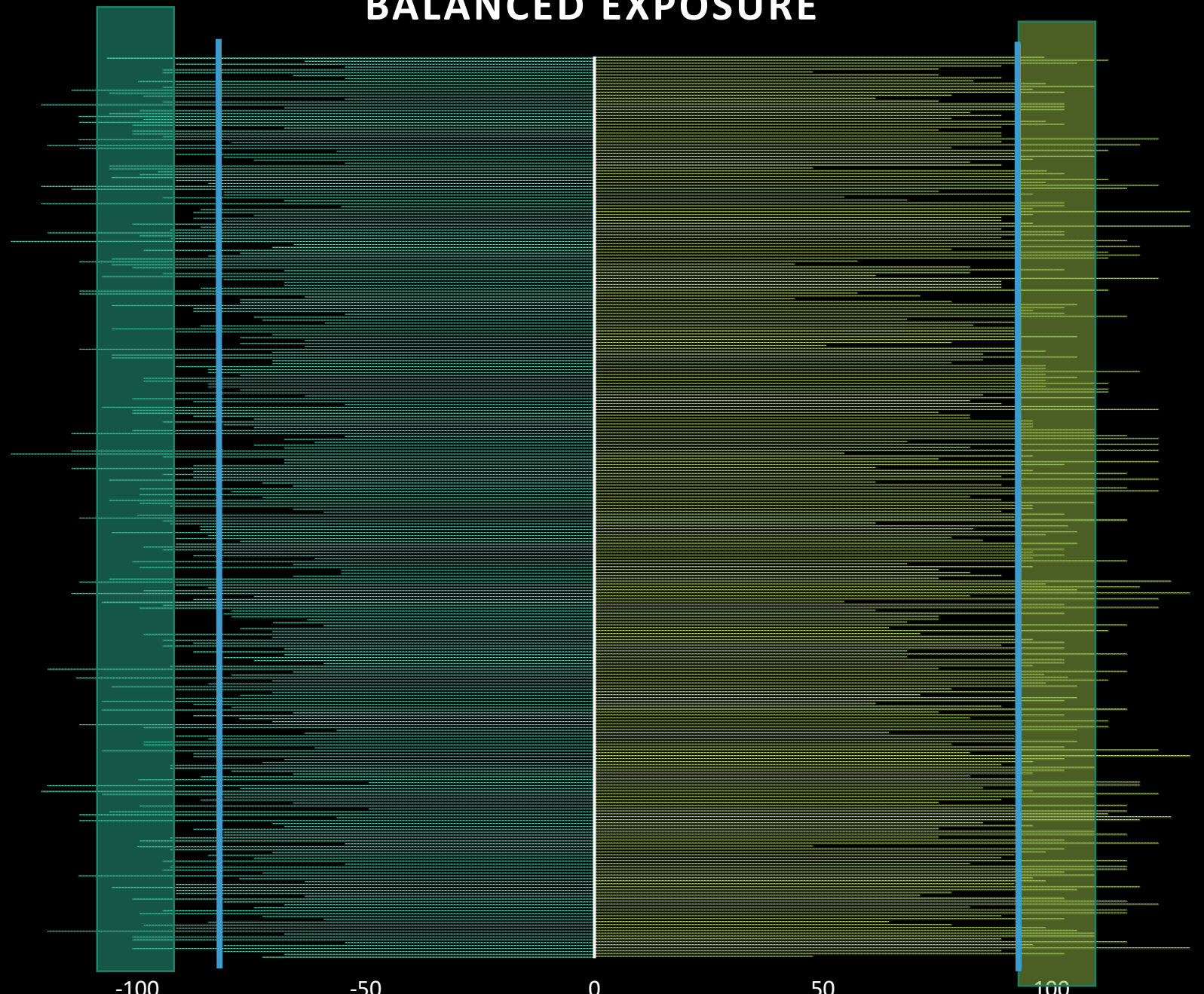
Bilingual & Functional Monolingual Best Language Scores



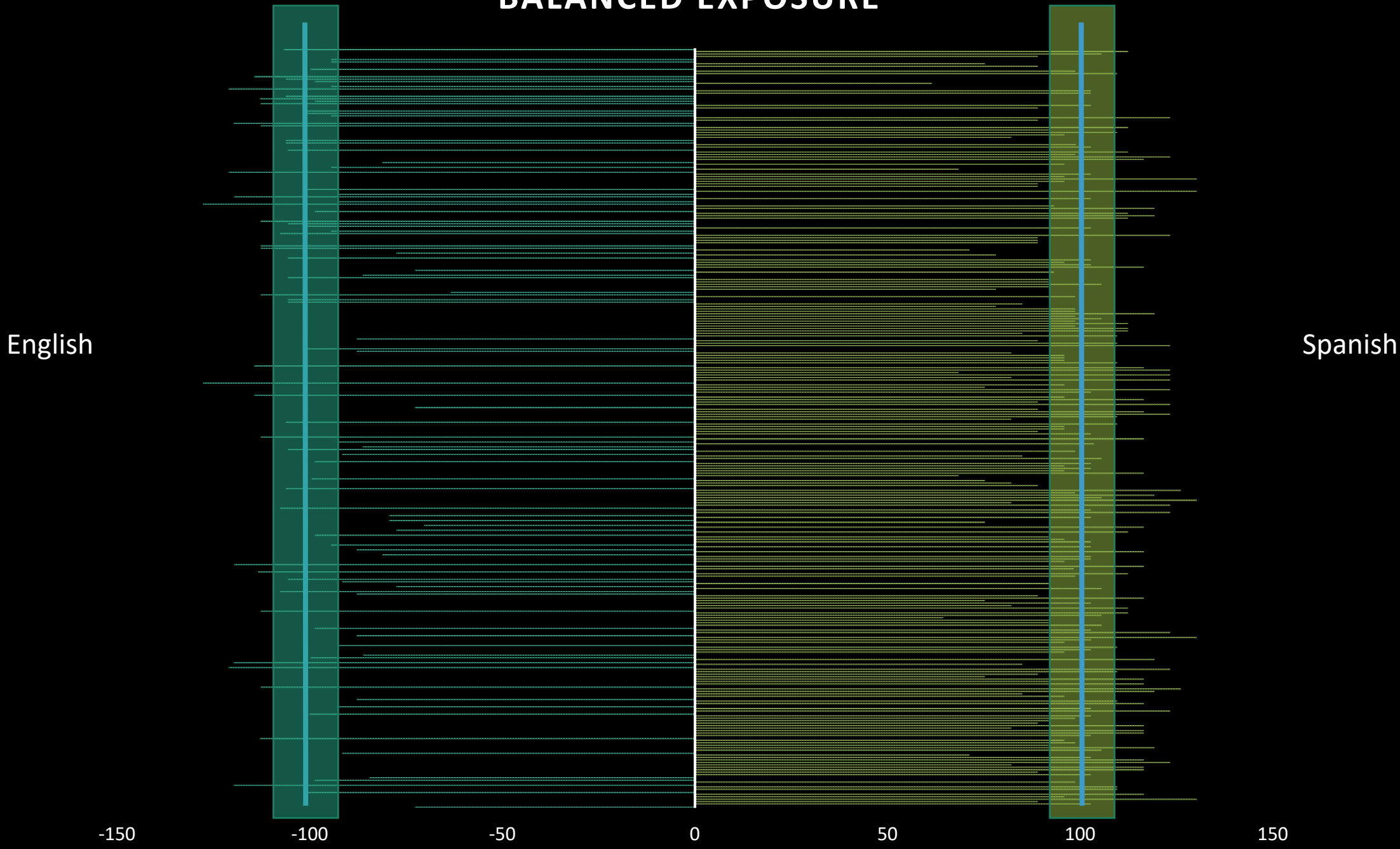
Best Score x Exposure



BALANCED EXPOSURE



BALANCED EXPOSURE



So, do bilinguals in fact show delays in both languages?


MYTH
BUSTED

Bilinguals are WNL in at least one language

Conclusions

- Bilingualism is NOT an added risk for DLD (and could be an advantage)
- Clinical diagnostic accuracy can be obtained by combining both languages
- The bilingual delay is a myth

Clinical Implications…

- Use tools that have good sensitivity and specificity (standardized or not)
- Look at best language for clinical decision making
- Question assumptions about the bilingual delay

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Selected References

- Anaya, J.B., Peña, E.D., Bedore, L.M. (2018). Conceptual scoring of expressive vocabulary: A discriminant functions analysis. Language, Speech, & Hearing Services in Schools. 49, 85-97.
- Bedore, L.M., Peña, E.D., Griffin, Z., & Hixon, J.G. (2016). Effects of age of English exposure, current input/output, and grade on bilingual language performance. Journal of Child Language. 43(3), 687-706.
- Bedore, L.M., Peña, E.D., Summers, C., Boerger, K., Resendiz, M., Greene, K., Bohman, T., & Gillam, R. (2012). The measure matters: Language dominance profiles across measures in Spanish/English bilingual children. Bilingualism: Language and Cognition. 15, 616-629.
- Lugo-Neris, M., Peña, E.D., Bedore, L.M., & Gillam, R.B. (2015). Utility of a Language Screening Measure for Predicting Risk for Language Impairment in Bilinguals. American Journal of Speech-Language Pathology. 24, 426-437.
- Peña, E.D., Bedore, L.M., & Kester, E.S. (2016). Assessment of Language Impairment in Bilingual Children using Semantic Tasks: Two Languages Classify Better than One. International Journal of Language and Communication Disorders. 51, 192-202.
- Peña, E.D., Bedore, L.M., & Kester, E.S. (2015). Discriminant accuracy of a semantics measure with Latino English-speaking, Spanish speaking, and English-Spanish bilingual children. Journal of Communication Disorders, 53, 30-41.
- Peña, E. D., Gillam, R. B., Bedore, L.M., & Bohman, T. (2011). Risk for poor performance on a language screening measure for bilingual preschoolers and kindergarteners. American Journal of Speech Language Pathology. 20, 302-314.
- Peña, E.D., Bedore, L.M., Lugo-Neris, M., & Albudoor, N.E. (2020). Identifying Developmental Language Disorder in School age Bilinguals: Semantics, Grammar, and Narratives. *Language Assessment Quarterly*.
- Peña, E.D., Bedore, L.M., Shivabasappa, P. & Niu, L. (2018). Effects of Divided Input on Bilingual Children with Language Impairment. International Journal of Bilingualism. 1-17.