

Comprehension Strategies Should Be Taught Explicitly

- Comprehension difficulties in 4th Grade Readers
 - 38% have trouble reading and explaining a paragraph
- Indexing
 - good readers associate words and phrases with objects and actions in the environment or mental images of objects and actions and use their ideas of these objects and images to make sense of what they are reading
 - This strategy improves performance
 - Glenberg, A. M., Gutierrez, T., Levin, J. R., Japuntich, S., & Kaschak, M. P. (2004). *Journal of Educational Psychology*, 96, 424-436

Paper (20%) and Project (20%)

- Issue in Acquiring Literacy Naturally
- Paper
 - Background Literature Review
 - Question to be addressed
 - Expected Results and Implications
- Application
 - My Matching Games
 - Read With Me
 - Example

Example Project

- Alphabet
- Bicameral Orthographies
 - Uppercase and Lowercase Letters
 - Latin, Cyrillic, Greek, Armenian, Coptic
 - Signal Capitalization
 - The girl talked to Leaf.
- Unicase scripts
 - Chinese, Japanese, Korean Arabic, Farsi, Hebrew, and Thai



Egyptian hieroglyphs (pron.: [/'haɪ.ər.əˌɡlɪf/](#) ***HYR-o-GLIF***, [/'haɪ.roʊˌɡlɪf/](#)) ***HY-roh-GLIF***) were a formal writing system used by the ancient Egyptians that combined logographic and alphabetic elements.

	ʾaleph	[ʾ]		lamedh	[l]
	beth	[b]		mem	[m]
	gimmel	[g]		nun	[n]
	daleth	[d]		samekh	[s]
	he	[h]		ʾayin	[ʿ]
	waw	[w]		pe	[p]
	zayin	[z]		tsade	[ṣ]
	heth	[ḥ]		qoph	[q]
	teth	[ṭ]		reš	[r]
	yodh	[y]		šin	[š]
	kaph	[k]		taw	[t]

The **Phoenician alphabet**, called by convention the **Proto-Canaanite alphabet** for inscriptions older than around 1200 BC, was a non-[pictographic consonantal alphabet](#), or [abjad](#).^[1] It was used for the writing of [Phoenician](#), a Northern [Semitic](#) language, used by the civilization of [Phoenicia](#).

Ⲁ	ⲁ	Ⲓ	ⲓ	Ⲕ	ⲕ	Ⲗ	ⲗ
Ⲙ	ⲙ	Ⲏ	ⲏ	Ⲑ	ⲑ	Ⲓ	ⲓ
Ⲕ	ⲕ	Ⲗ	ⲗ	Ⲙ	ⲙ	Ⲏ	ⲏ
Ⲑ	ⲑ	Ⲓ	ⲓ	Ⲕ	ⲕ	Ⲗ	ⲗ
Ⲙ	ⲙ	Ⲏ	ⲏ	Ⲑ	ⲑ	Ⲓ	ⲓ
Ⲕ	ⲕ	Ⲗ	ⲗ	Ⲙ	ⲙ	Ⲏ	ⲏ
Ⲑ	ⲑ	Ⲓ	ⲓ	Ⲕ	ⲕ	Ⲗ	ⲗ
Ⲙ	ⲙ	Ⲏ	ⲏ	Ⲑ	ⲑ	Ⲓ	ⲓ
Ⲕ	ⲕ	Ⲗ	ⲗ	Ⲙ	ⲙ	Ⲏ	ⲏ

Coptic or Coptic Egyptian (ⲀⲁⲂⲃⲄⲅⲆⲇⲈⲉⲊⲋⲌ *Met Remenkēmi*) is the latest stage of the [Egyptian language](#), a northern [Afro-Asiatic](#) language spoken in [Egypt](#) until at least the 17th century.

A α	alpha	N ν	nu
B β	beta	Ξ ξ	ksi
Γ γ	gamma	Ο ο	omicron
Δ δ	delta	Π π	pi
E ε	epsilon	Ρ ρ	rho
Z ζ	zeta	Σ σς	sigma
H η	eta	Τ τ	tau
Θ θ	theta	Υ υ	upsilon
I ι	iota	Φ φ	phi
K κ	kappa	Χ χ	chi
Λ λ	lambda	Ψ ψ	psi
M μ	mu	Ω ω	omega

Greek alphabet chart © by deTraci Regula; licensed to About.com

The **Greek alphabet** is the script that has been used to write the [Greek language](#) since the 8th century BC

Letters and Shape Differences

- The shapes of the English letters (A, B, D, E, F, G, H, I, J, L, M, N, Q, R, T, Y) are significantly different in upper and lowercase.
- The remaining letters differ mainly in size (C, K, O, P, S, V, W, X, Z).
- Teach both for children learning to read.

Letters and Shape Differences

- Shape Differences make letter learning more difficult.
- Three levels of categorization
 - Superordinate, Basic, Subordinate
- Shape differences signal a difference in basic level categorization
 - Animal, Bird, Robin
 - Furniture, Chair, Bench

Letters and Shape Differences

- Successive Matching Task
 - Same or Different name
 - Physical vs. Name Matches
 - AA 80 ms faster than Aa

Test of Value of Capitalization

- Read My Books
 - Capitalization: Present or Not
 - Settings
 - Set Appropriate Rate of Presentation
 - Speech Playback Off
 - Text
 - English
 - Show all Words
 - Good Night Gorilla
 - Caps
 - No Caps

REPRESENTING CAPITALIZATION OF LETTERS WHILE PRESERVING THEIR CATEGORY SIMILARITY TO LOWERCASE LETTERS

Typical Capitalization with Arial Font Size 12 ¶

Alligator is an animal. Beaver is an animal. Coyote is an animal. Duck is an animal. Eagle is an animal. Fish is an animal. Giraffe is an animal. ¶

¶

Capitalization is Size 14 replacing Arial Font Size 12 ¶

alligator is an animal. beaver is an animal. Coyote is an animal. duck is an animal. eagle is an animal. fish is an animal. giraffe is an animal. ¶

¶

Capitalization is Size 15 replacing Arial Font Size 12 ¶

alligator is an animal. beaver is an animal. Coyote is an animal. duck is an animal. eagle is an animal. fish is an animal. giraffe is an animal. ¶

¶

Capitalization is Size 16 replacing Arial Font Size 12 ¶

alligator is an animal. beaver is an animal. Coyote is an animal. duck is an animal. eagle is an animal. fish is an animal. giraffe is an animal. ¶

¶

My Matching Games

- Tile Matching
- Written Words Differ in Shape
 - Uppercase vs Lowercase
- Written Words Differ in Size
 - Large vs Small
- Prediction
 - Size differences will be easier than shape differences.

My Matching Games

- Settings
- Easy Layout
- No Baldi, No Voice Volume
- Adjust Max Text Size
 - Equal Size in Uppercase vs Lowercase task
 - Size Difference in Lowercase task

Critical Periods

- Language experience is important
- Influence of top-down knowledge
 - FLMP
 - ECM emergent coalition model
- Recent talk by Virginia Marchman

What is fluency in understanding?

Adults listen *predictively*, anticipating how speech will continue by integrating linguistic and contextual information on multiple levels from moment to moment in real time....

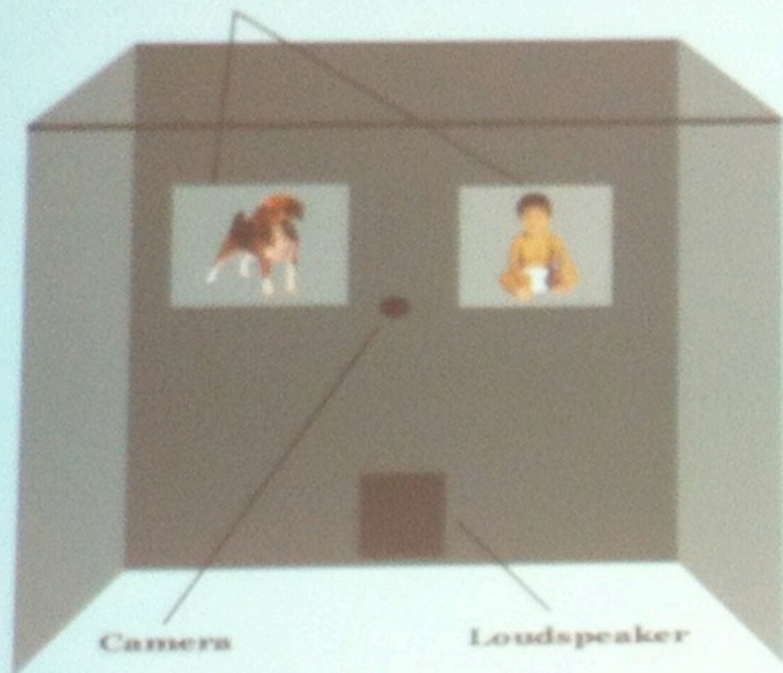
- LEXICAL kan-ga -> roo
- SEMANTIC let's read a -> book
- MORPHOSYNTACTIC those are -> [plural]

...and very young children do too!

Swingley, Pinto, & Fernald (1999); Fernald, Swingley, & Pinto, (2001); Zangl & Fernald (2007); Lew-Williams & Fernald (2007); Song & Fisher (2005); Styles & Plunkett (2009); Mani & Plunkett (2010); Johnson & Heuttig (2011); Borovsky, Elman & Fernald (2012).

"looking-while-listening" procedure

Fernald et al. (1998, 2006, 2008)



"Where's the baby?"

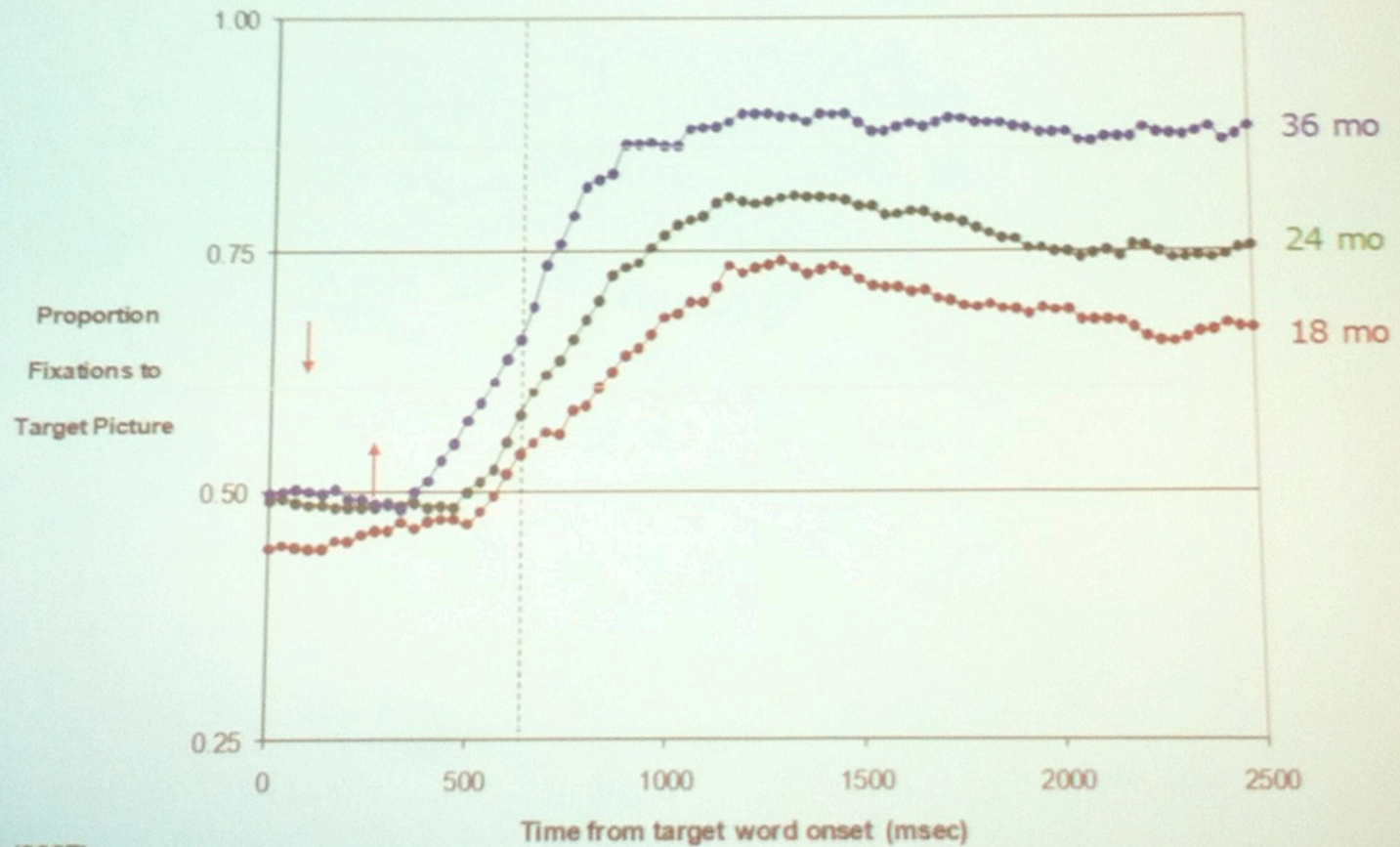
Reaction Time (RT)

Accuracy

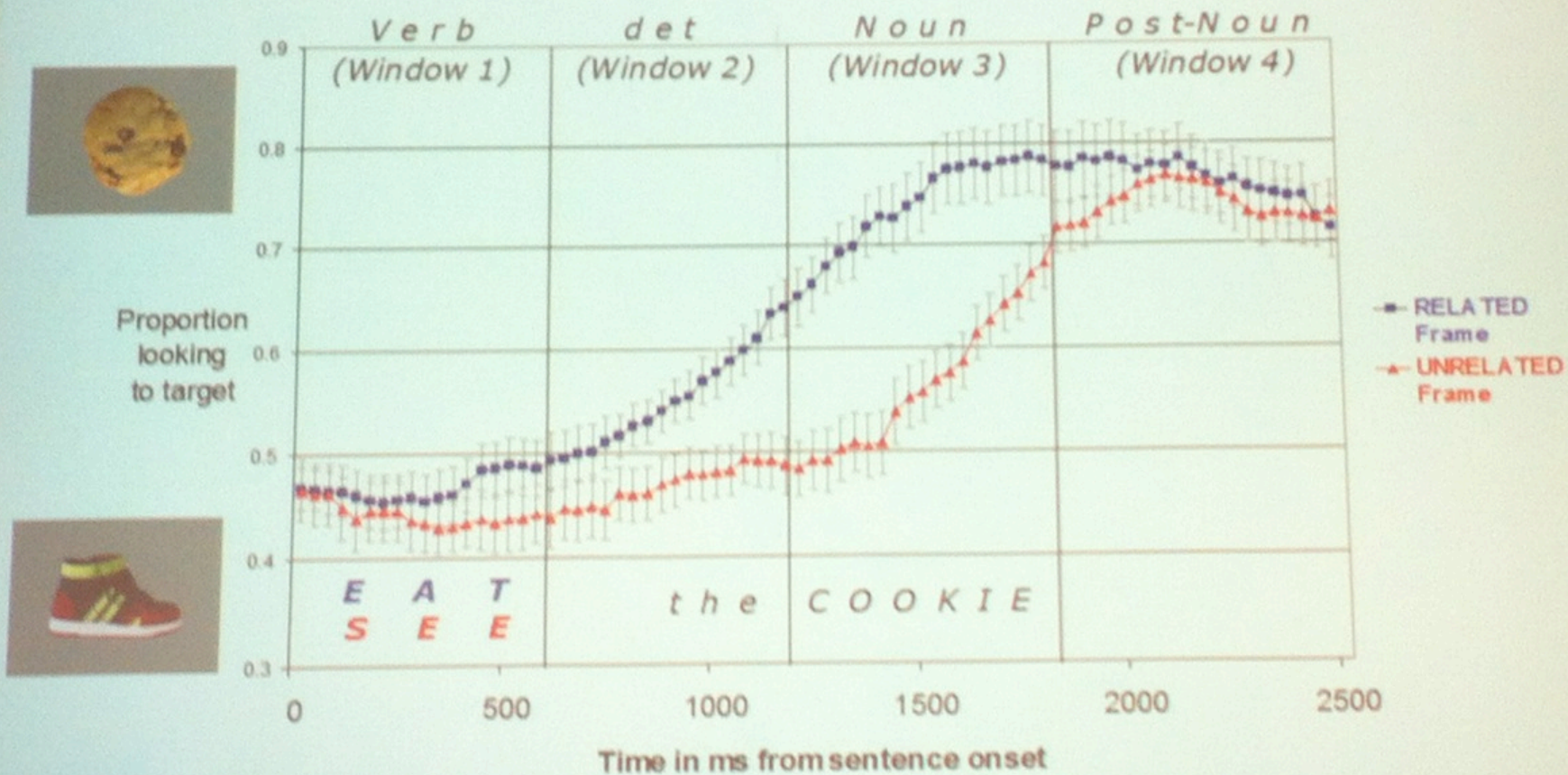


Children become faster and more accurate in online interpretation of familiar words over the 2nd & 3rd years

Where's the DOGGY?

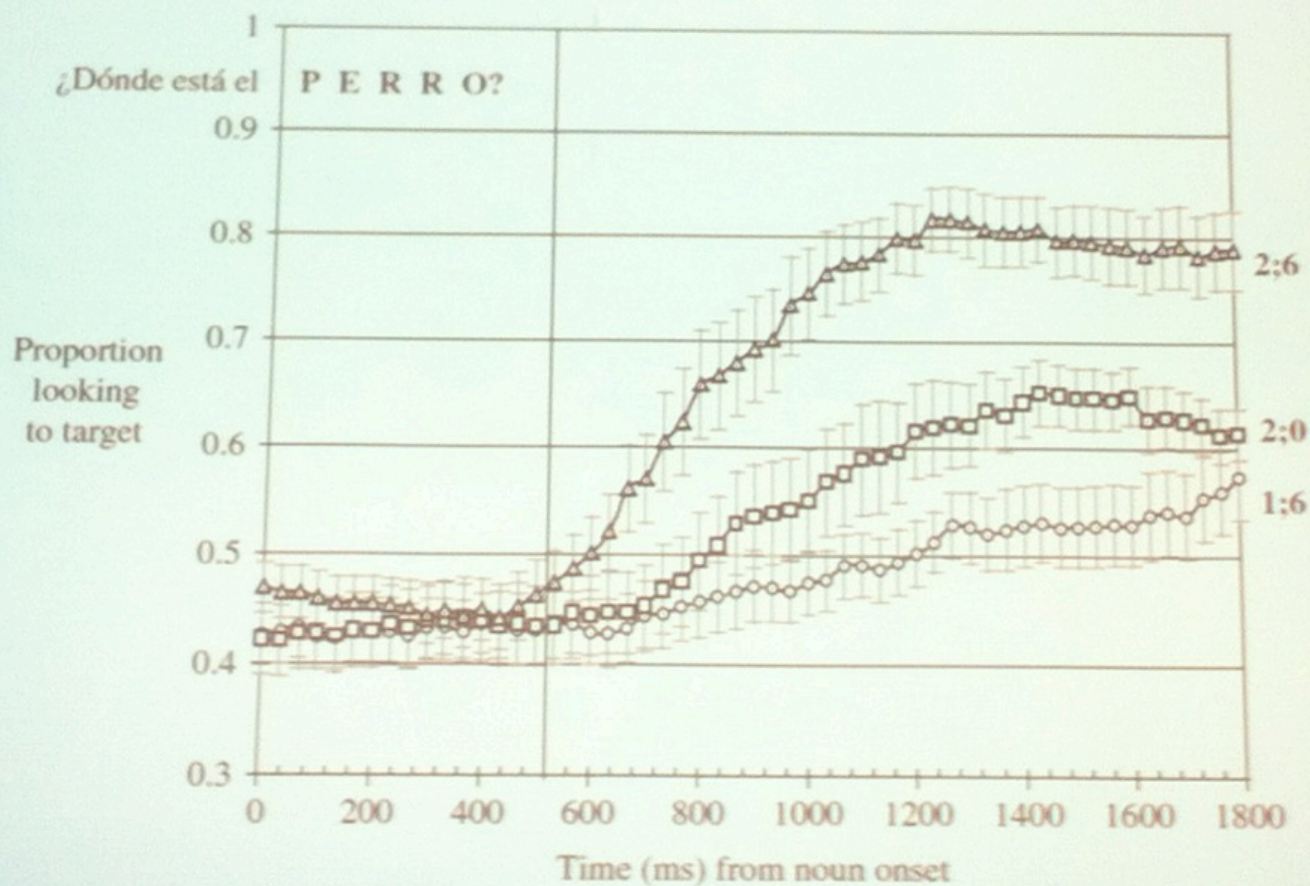


English-speakers begin to shift to the correct picture sooner when the verb is *informative*

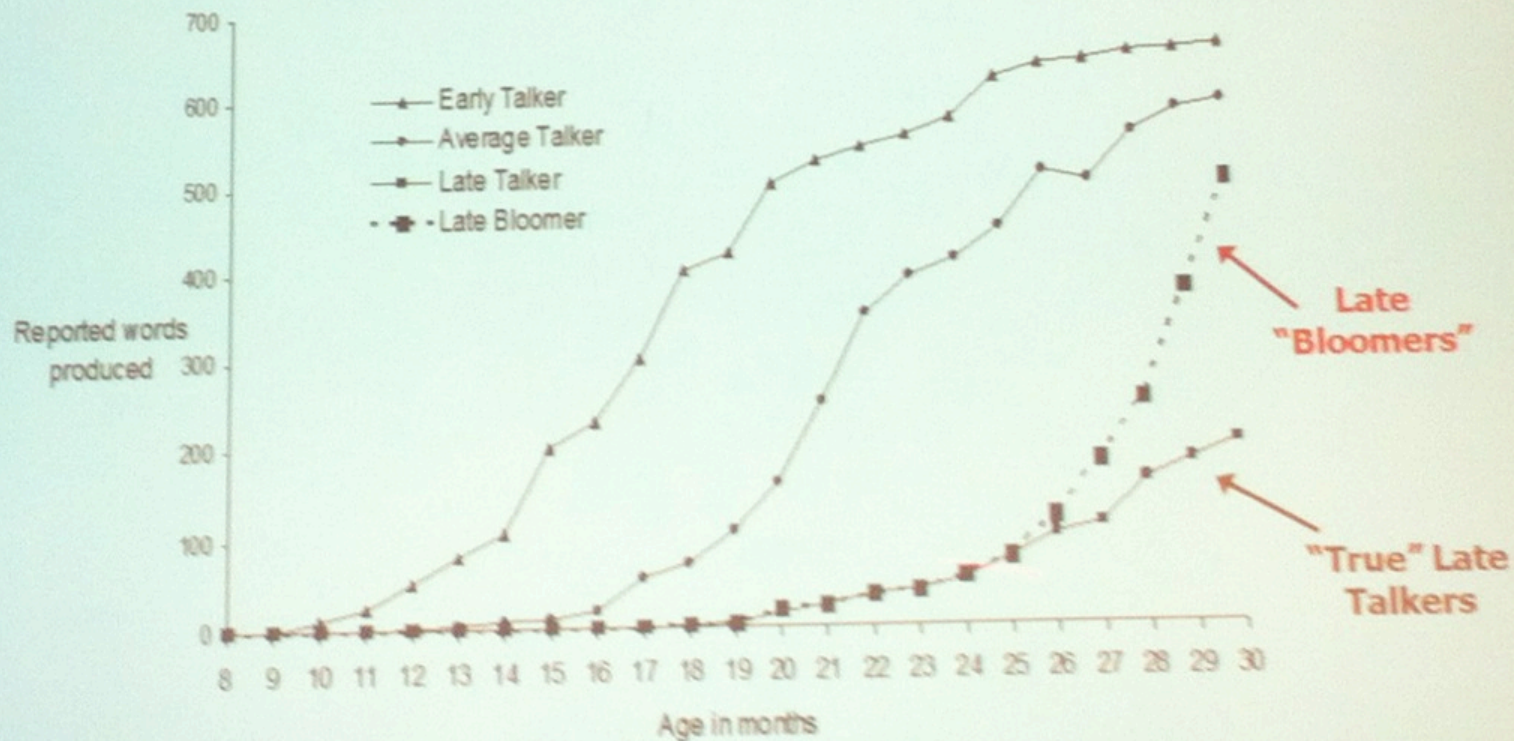


26-mos-old English speakers ($n = 22$)

Similar developmental changes for Spanish-learning children



Online language processing measures may be useful for earlier diagnosis of children at-risk for language delay



Adapted from Thal, Bates, Goodman & Jahn-Samilo (1997)

A follow-up study of TD children 5 years later...

Is efficiency in spoken language understanding at 25 months related to later language and cognitive skills as 8 years of age?

25 months



8 years



Significant correlations between language measures in infancy and school-age outcomes

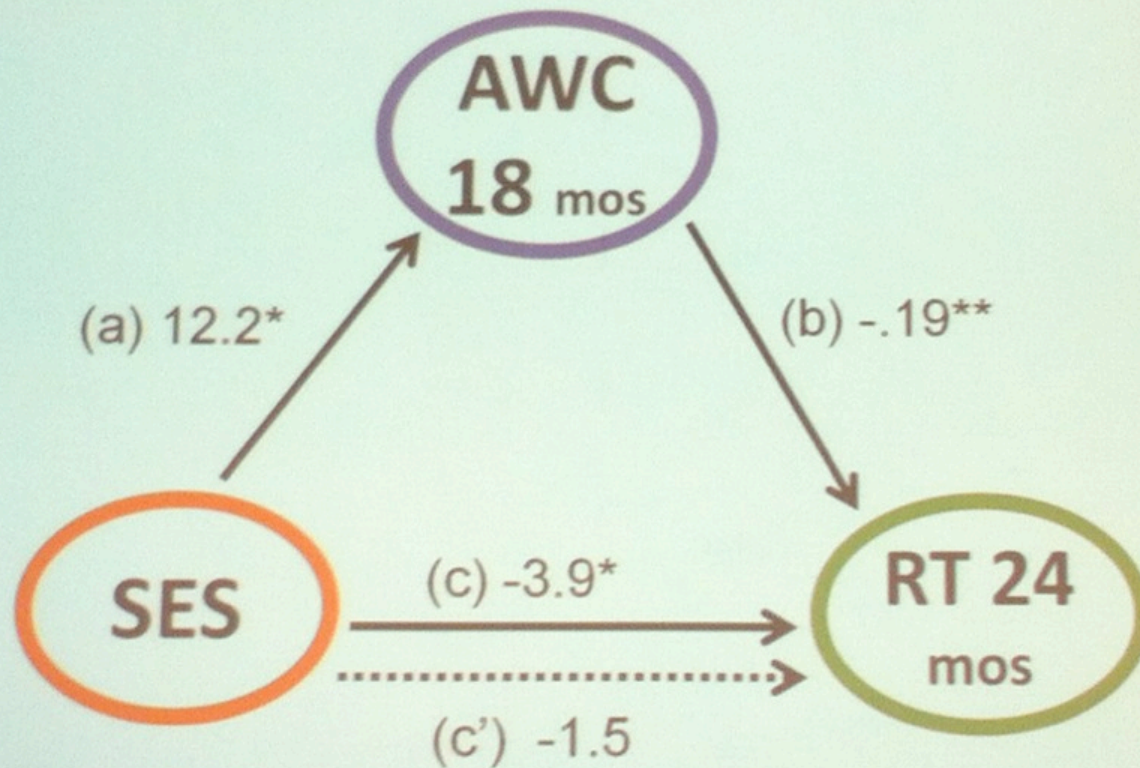
	Language measures at 25 mos.		
	Reported CDI Vocabulary	LWL RT	LWL Accuracy
CELF-4			
Overall ELI	.48**	-.49**	.45**
Expressive Vocabulary	.26	-.43**	.68**
K-ABC-II			
Overall MPI	.53**	-.40*	.47*
Sequential Processing	.59**	-.59**	.49**

RT (but not vocabulary) predicts language and cognitive outcomes in Spanish....
and big SES effects

Predictor: 24-months	5 year outcome	
	Spanish Expressive Language	Non-verbal IQ
Vocabulary	.19/.20	-.01/-.02
RT	-.44**/-.46**	-.36*/-.34*
SES (HI)	.36*/.35*	.65**/.64**

Second number in each pair
controlling for English exposure

Amount of caregiver talk mediates the relation between SES and RT



Infant Language Processing

- Marchman Study
 - <http://babylab.stanford.edu>
- Top Down Processing
- Speed of Understanding
- Predicts Language Skill
- Predicts Cognitive Skill
- Importance of
 - Caregiver Input
 - Vocabulary

Current Practice in Reading Instruction

- Grounded in Spoken Language
- Focus on Decoding
 - Print to Sound
- Essentially Ignores Structure of Orthography

Phonics Instruction

- The primary focus of phonics instruction is to help beginning readers understand how letters are linked to sounds (phonemes) to form letter-sound correspondences and spelling patterns and to help them learn how to apply this knowledge in their reading.

Oversight in Phonics Instruction

- Current Question
 - What sound does the letter x make
- New Question
 - What letters spell the sound x
 - How do you spell the sound x
 - Why Our Children Can't Read and What We Can Do About It: A Scientific Revolution in Reading [Paperback] by Diane McGuinness

Possible letters and letter combinations and example words with their pronunciations.

Letters	Pronunciations in Words (In Red)
b	BAT
c k ck	CAT KICK BACK
d	DOG
f ff ph	FLY BLUFF PHONE
g	GATE
h	HAT
j g dge ge	JUG GYM JUDGE GEM
l ll	LOT HILL
m mb	MAN BOMB
n kn	NOW KNOT
p	POT
r wr	RAT WRONG
s ss c ce	SIT BASS CITY DICE
t	TOP
v	VOTE
w	WON
y	YES
z	ZOO
ch tch	CHEW ITCH
sh ti ce	SHOW NATION OCEAN

th	THISTLE
th	THEM
wh	WHICH
ng	SONG
a	HAT
e	BET
i	HIT
o	TOT
u	BUT
a-e a ai ay	MATE MAY BAIT HAY
e y ea ee ei	SHE EMPTY MEAT BEET RECEIPT
i-e y i igh	BITE MY HI HIGH
o-e o oa ow	VOTE GO BOAT BOW
u-e u ew ue oo	CUTE GURU DEW TRUE BOOT
ar	CAR
er ur ir	PERT FUR FIR
or ore	OR TORE
oi oy	TOIL TOY
ou ow	OUT TOWER
o u	SON HUT
aw au a	AWFUL AUTHOR ABOUT
air are ear	AIR CARE NEAR

Table. The possible spellings of the phonemes in English.

/A/ a (table), a_e (bake), ai (train), ay (say) Long A; Fonzie's greeting

/a/ a (flat) Crying baby; baby lamb; home alone

/b/ b (ball) Beating heart; drum

/k/ c (cake), k (key), ck (back) Nutcracker; golf shot; camera

/d/ d (door) Knocking; dribbling ball

/E/ e (me), ee (feet), ea (leap), y (baby) Long E; shriek

/e/ e (pet), ea (head) Rocking chair; creaky door; hard of hearing

/f/ f (fix), ph (phone) Angry cat; clothes brush; electric fan; soda fizz

/g/ g (gas) Croaking frog, gulping soda

/h/ h (hot) Out of breath; warm breath; tired dog

Table. The possible spellings of the phonemes in English.

/g/ g (gas) Croaking frog, gulping soda

/h/ h (hot) Out of breath; warm breath; tired dog

/I/ i (I), i_e (bite), igh (light), y (sky) Long I

/i/ i (sit) Crying puppy; icky sticky; baby pig

/j/ j (jet), dge (edge), g[e, i, y] (gem) Scrub brush; wood rasp;
jump rope

/l/ l (lamp) Flying saucer; mixer

/m/ m (my) Mmm mmm good; delicious sound

/n/ n (no), kn (knock) Mosquito; motorboat

/O/ o (okay), o_e (bone), oa (soap), ow (low) Long O; Oh, I see

/o/ o (hot) Say ah; doctor sound; cool drink; yawn

/p/ p (pie) Popcorn; water drip; stone skip; soap bubbles

/kw/ qu (quick) Coffee pot; typewriter

Table. The possible spellings of the phonemes in English.

/kw/ qu (quick) Coffee pot; typewriter

/r/ r (road), wr (wrong), er (her), ir (sir), ur (fur) Chain saw;
angry lion; robot; growling dog

/s/ s (say), c[e, i, y] (cent) Flat tire; hair spray; sizzling bacon

/t/ t (time) Ticking clock; timer; automatic sprinkler

/U/ u (future), u_e (use), ew (few) Long U

/u/ u (thumb), a (about), e (loaded), o (wagon) I dunno;
mother bear; punch in the stomach; foghorn

/v/ v (voice) Electric shaver; airplane; vacuum

/w/ w (wash) Lariat; fly rod; washing machine

/ks/ or /gz/ x (box, exam) Soda can; grease gun

/y/ y (yes) Sticky mess

/z/ z (zoo), s (nose) Buzzing bee; arc welder; zipper

Table. The possible spellings of the phonemes in English.

/OO/ oo (boot), u (truth), u_e (rude), ew (chew) Ghost; howling wolf; owl

/oo/ oo (book), u (put) Lifting weights; chin-up bar

/oi/ oi (soil), oy (toy) Seal; squeaky gate; spring

/ou/ ou (out), ow (cow) It hurts; inoculation; sting

/aw/ aw (saw), au (caught), a[l] (tall) Poor thing; crow

/ar/ ar (car) Spinning tire; grinding gears; gargle

/sh/ sh (ship), ti (nation), ci (special) Be quiet; watering the lawn

/hw/ wh (white) Blow out the candle

/ch/ ch (chest), tch (catch) Old train; antique car; chipmunk

/th/ or /th/ th (thick, this) Peeling tape; angry goose; wet shoes

/ng/ ng (sing), n (think) Gong; string bass

/zh/ s (measure) Sawing wood; sander

Orthographic Structure

- two broad categories of orthographic structures
 - statistical redundancy
 - Position sensitive measures
 - Bigram frequency
 - rule-governed regularity
 - Phonological constraints
 - Scribal constraints