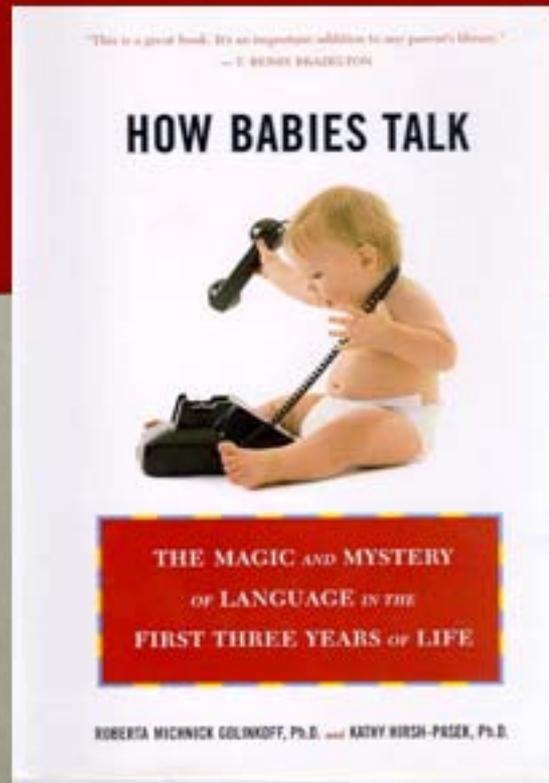


# Speaking out for the role of language and play in early literacy

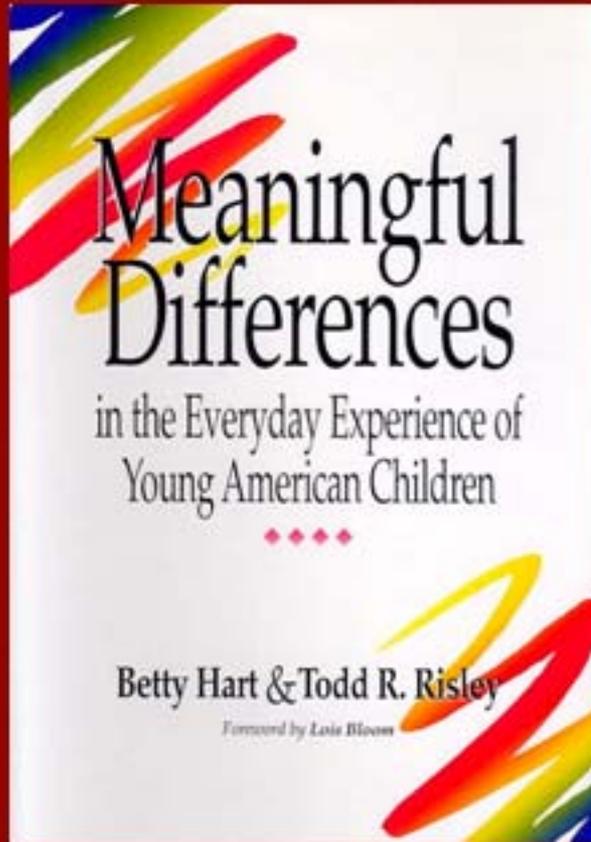


Roberta Michnick Golinkoff, Ph.D.  
University of Delaware

# Shocking revelations!

The role of poverty in language development

# 1995: Hart and Risley



Examines language input to children from...

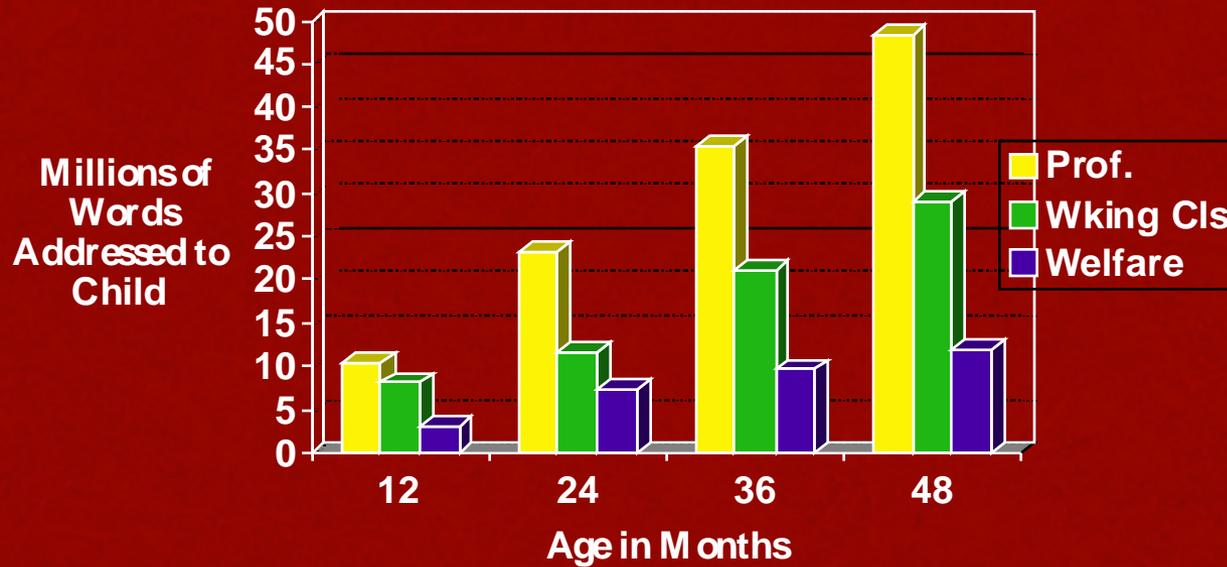
Welfare

Working class

Professional families

(see also Hoff, 2002, 2003; Pancsofar & Vernon-Feagans, 2010)

# Results?



*Number of words heard per hour by children in each group:*

*Welfare - 616*

*Working Class - 1,251*

*Professional - 2,153*

# Significance?

## Children's recorded vocabulary size?

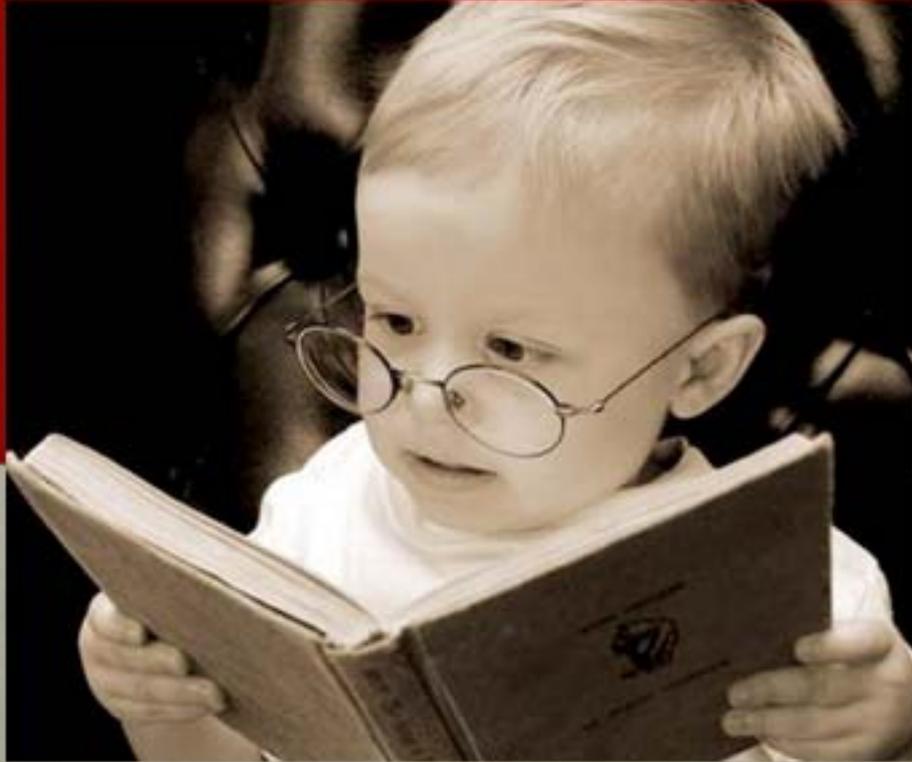
Professional - 1,116

Working Class - 749

Welfare - 525

- Vocabulary assessed at age 3 predicted PPVT scores at age 9-10 ( $r = .58$ ) and TOLD (more comprehensive)  $r = .72$

# Link to reading?

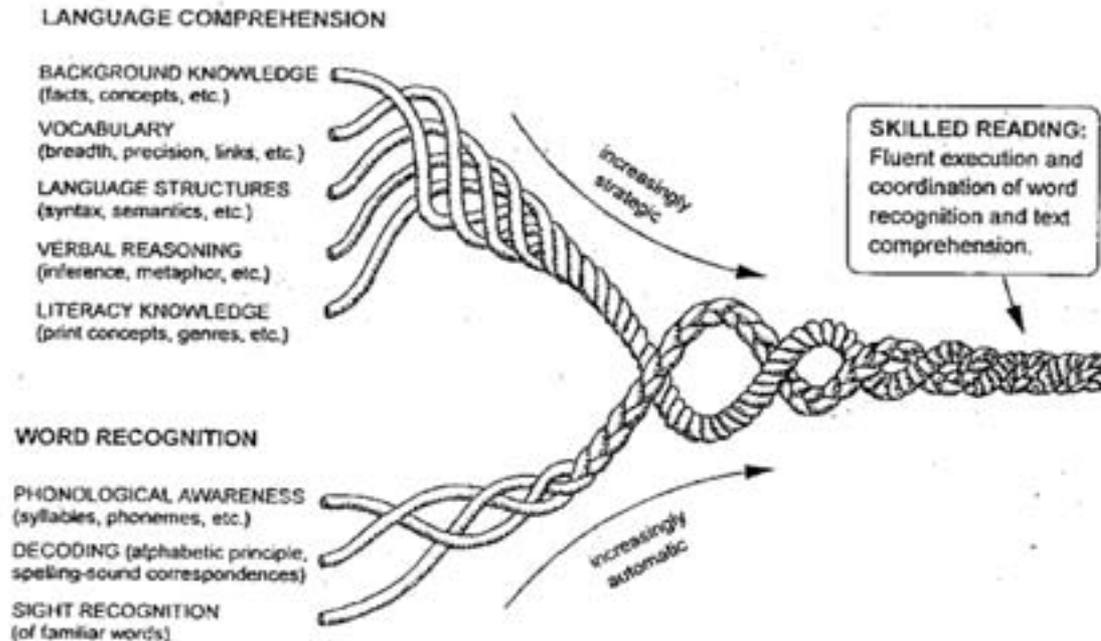


# Link to reading:

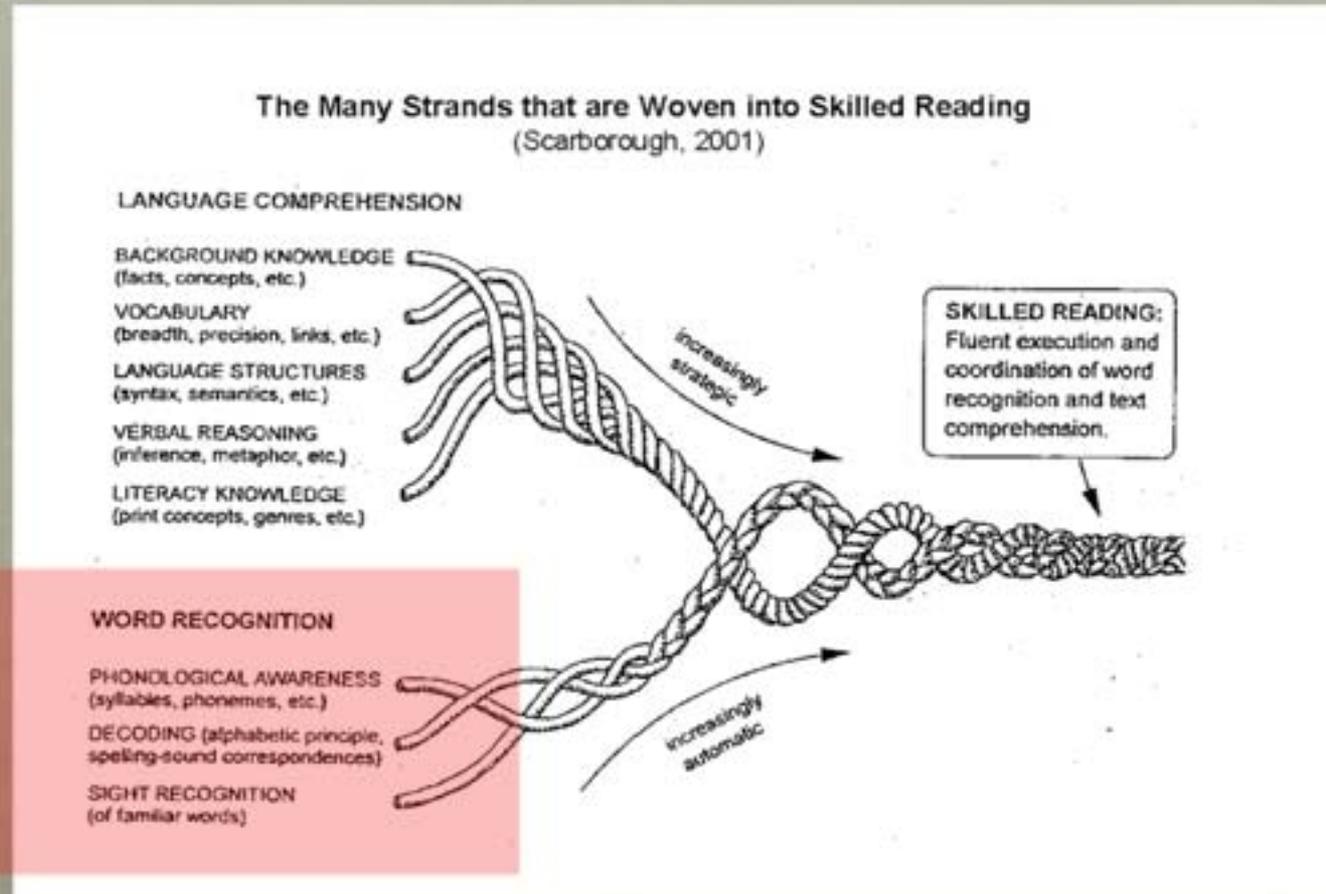
- Numerous studies report significant relationships between language skills (vocabulary and sentence structure) and reading defined as decoding and reading comprehension.
- As texts increase in complexity, language skills becomes relatively more important than code skills.
- Shift from *learning to read* to *reading to learn*. (e.g., Storch & Whitehurst, 2002; Catts et al., 2006; Vellutino et al, 2007).

# In Scarborough's terms – the two sides of reading

## The Many Strands that are Woven into Skilled Reading (Scarborough, 2001)



# We know a great deal about the word recognition or “code” skills



And they are critical for learning to read

# But code skills are not enough!

Hebrew

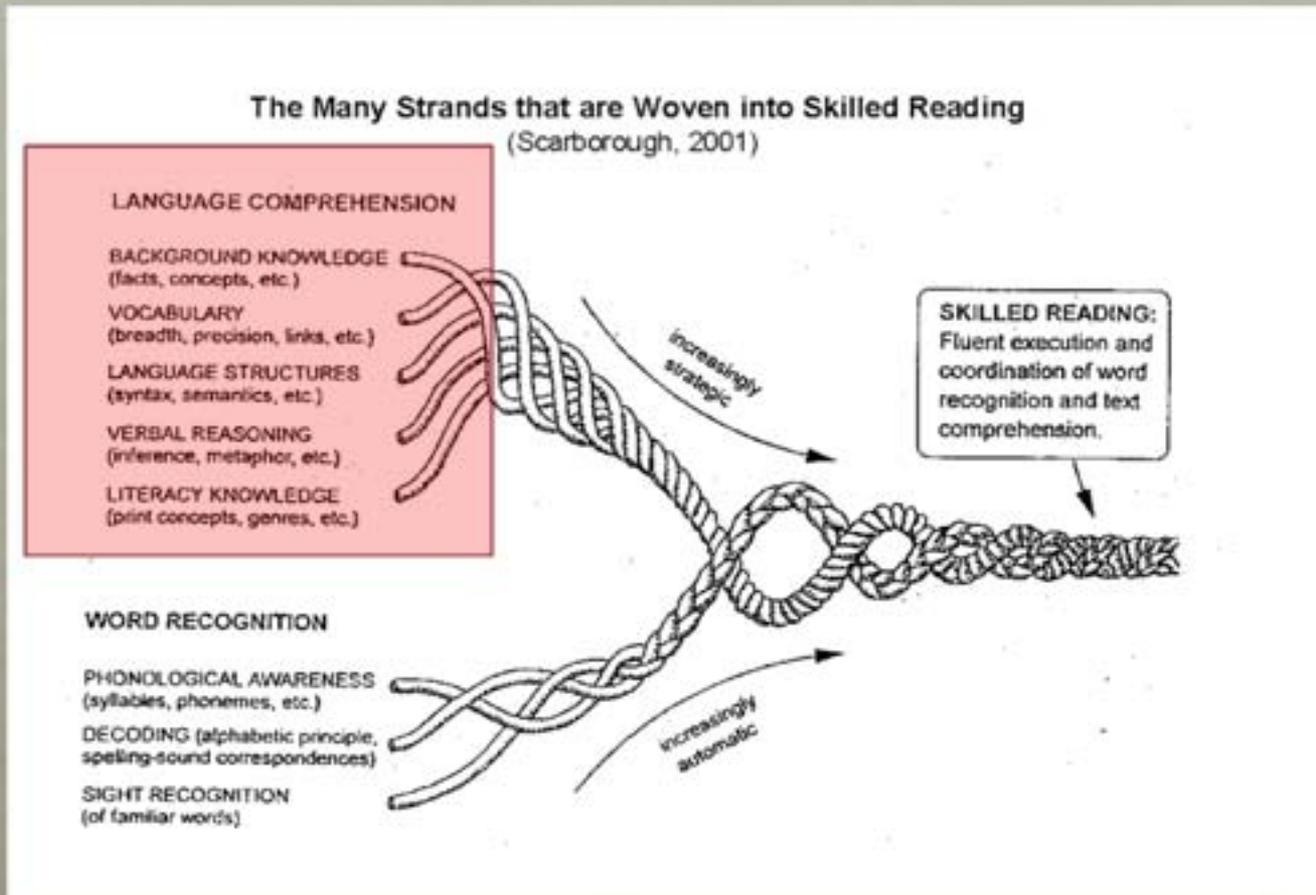
בְּרֵאשִׁית בָּרָא אֱלֹהִים אֶת הַשָּׁמַיִם וְאֶת הָאָרֶץ: 2 וְהָאָרֶץ  
הַחֲתָה תְהוֹ' וּבְהוֹ' וַיִּשַׁךְ עַל־פְּנֵי  
תְהוֹם וַיִּבְרָא אֱלֹהִים מְרִיפֹת עַל־פְּנֵי  
הַמָּתָם: 3 וַחֲאָמַר אֱלֹהִים תְּהֵאֵת אֹר  
וַחֲחֵאֹר:

Greek

Αυτή η αναφορά περιλαμβάνει σημαντικές πληροφορίες σχετικά με το πόσιμο νερό σας. Ζητήστε από κάποιον να σας τη μεταφράσει, ή μιλήστε με κάποιον που την καταλαβαίνει.

**You have to translate print into meaning!**

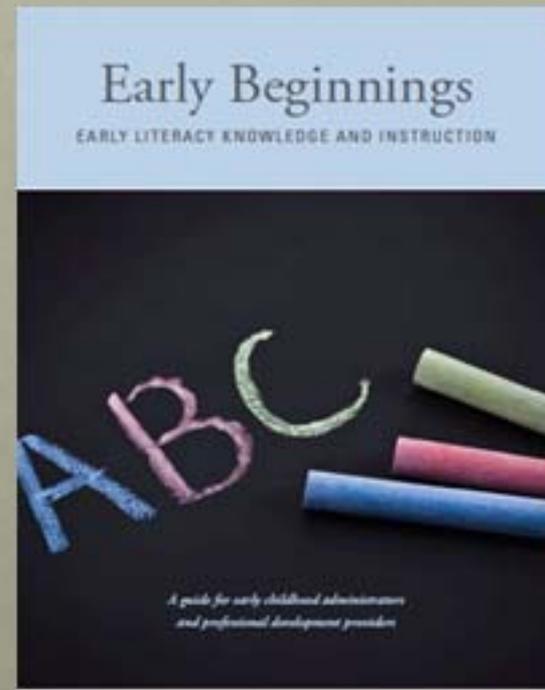
# And we know less about how to support language for reading



# Despite the importance of *language* for reading

- Early instruction spends the bulk of its time on code skills rather than on the language and experiential skills that support reading.

Report of the National Early Literacy Panel - NELP (2009) underestimates the importance of language ability, placing it as a tier two skill! (Dickinson, Golinkoff, & Hirsh-Pasek, in press)



Goodson, Layzer, Simon, & Dwyer, 2009

# So how might we build a better foundation for language skills that support reading?



There are lessons from what we know about language development in the crib that can be used in homes, day cares, and in the classroom.

- **What does all this have to do with the way we teach Germany's children?**

# EVERYTHING BECAUSE.....

Germany's children are  
the workforce of your future,  
the workforce of the year 2041



And how will Germany's children reach their potential?

# PLAYFUL LEARNING

*Free play:* Where children interact freely, invent, discover

*Guided play:* Where adults a) set up environments; and b) play alongside children

# **A Talk in 3 parts**

## **Part 1:**

**The importance of hearing lots of language for becoming a skilled reader**

## **Part 2:**

**Lessons from the crib: 6 principles of language learning**

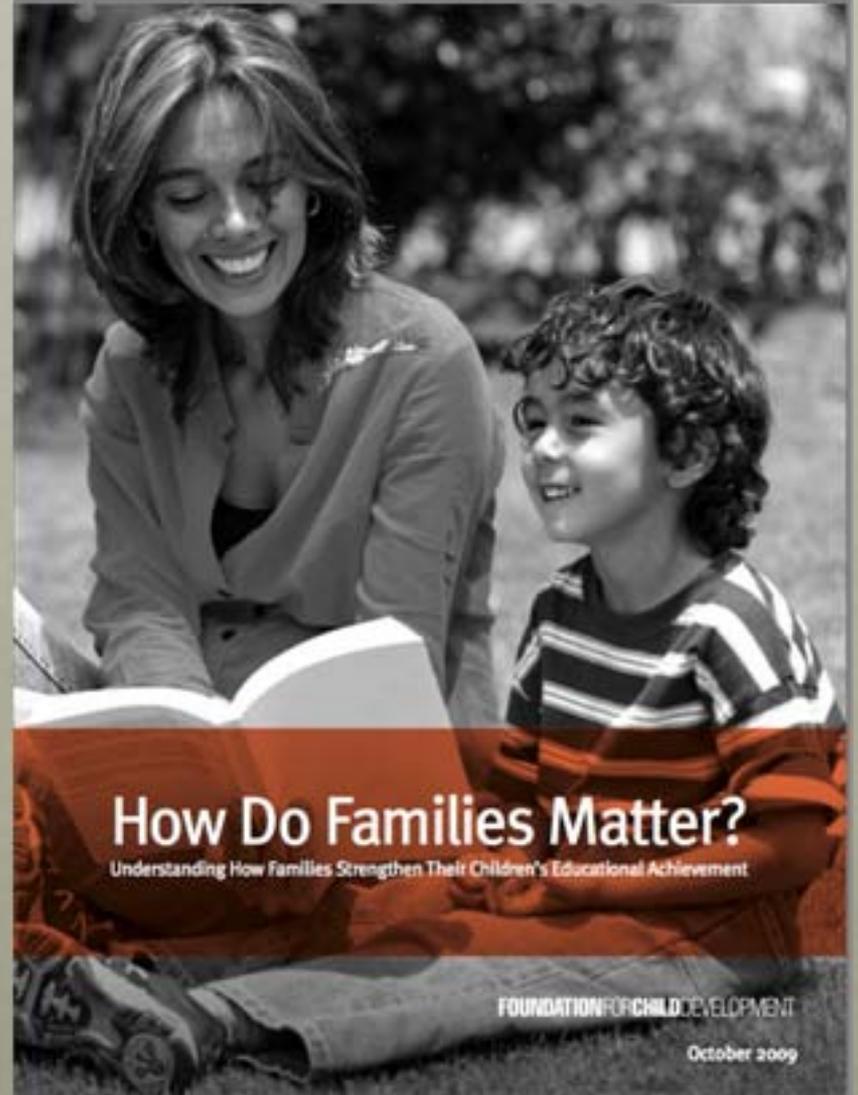
## **Part 3:**

**How to change children's trajectories for language and reading moving forward**

# **Part I: The importance of hearing lots of language for becoming a skilled reader**

**An illustration of language differences from  
the Foundation for Child Development**

# The story of 3 mothers and an eggplant



Mom #1: wheels her shopping cart down the produce aisle, where her kindergartner spots an eggplant and asks what it is. The mother shushes her child, ignoring the question.



Mom #2: responds curtly, 'Oh, that's an eggplant, but we don't eat it.'

Mom #3: 'Oh, that's an eggplant. It's one of the few purple vegetables.' She picks it up, hands it to her son, and encourages him to put it on the scale. 'Oh, look, it's about two pounds!' she says. 'You'll love it. Let's buy one, take it home, cut it open. We'll make a dish together.'



# Which child do you think will become a proficient reader?

Probably Mother 3's. And she teaches us several things:

- That language learning can and must take place everywhere! At home, the doctor's office, the supermarket, in day care and school, and on the playground.
- That language learning is best when parents and caregivers honor children's interests and build on their comments.
- Language learning occurs in the *nexus of social interaction* between adults and children and peers.

# **Let's get more specific: Language input matters for at least 5 reasons**

- 1. The calculation of statistics over the language stream**
- 2. Auditory processing of language**
- 3. Visual processing of the environment**
- 4. Language teaches concepts – builds the cognitive/experiential base for reading**
- 5. The brain needs language for typical development**

# Why Language Input Matters:

1. The calculation of statistics over the language stream

**The amount of language matters because babies do statistical analyses on the input to find patterns of sounds and words!**

1996: Saffran, Aslin & Newport



# Baby as Statistician

Saffran, Aslin, & Newport, 1996



High probability    Low probability    High probability  
PRE 80%    TTY .02%    BA BY

Could 8-month old babies detect these low and high probabilities and find the words – those statistical units that pattern together?

tokibugikobagopilatipolutokibu  
gopilatipolutokibugikobagopila  
gikobatokibugopilatipolugikoba  
tipolugikobatipolugopilatipolu  
tokibugopilatipolutokibugopila  
tipolutokibugopilagikobatipolu  
tokibugopilagikobatipolugikoba  
tipolugikobatipolutokibugikoba  
gopilatipolugikobatokibugopila

# YES! Listening to only two minutes of speech

tokibugikobagopilatipolutokibu  
gopilatipolutokibugikobagopila  
gikobatokibugopilatipolugikoba  
tipolugikobatipolugopilatipolu  
tokibugopilatipolutokibugopila  
tipolutokibugopilagikobatipolu  
tokibugopilagikobatipolugikoba  
tipolugikobatipolutokibugikoba  
gopilatipolugikobatokibugopila

They discovered that **tokibu** was a word and **latipo** was not.

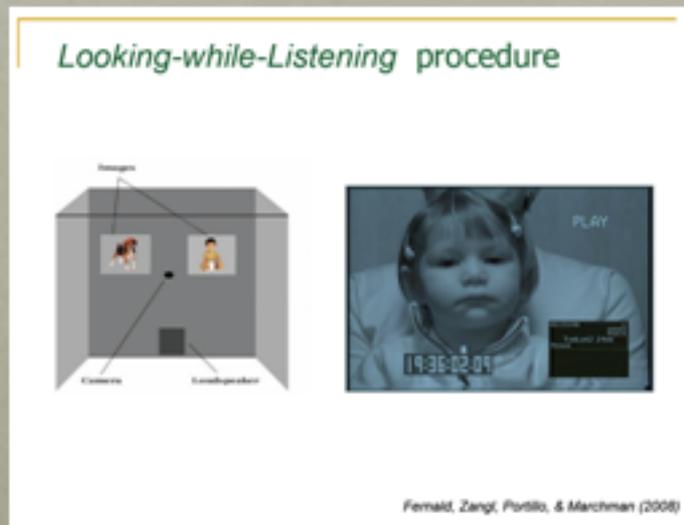
# Why Language Input Matters:

## 2. Speed of processing

**Fernald (2009) shows that the amount of language a child hears also affects processing speed and hence later acquisition of vocabulary as well as language comprehension.**

**But why should processing speed on individual words be related to language comprehension?**

# Fernald measured the amount of time it takes for a child's eyes to move from a distractor to a target

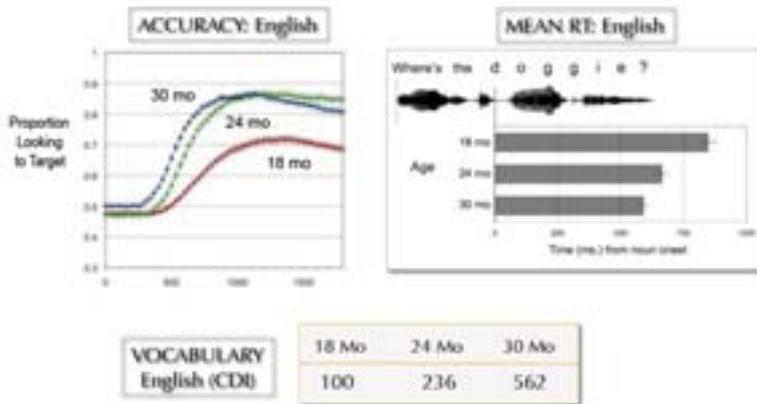


Child hears “Where’s the **dog**?” while looking at the baby.

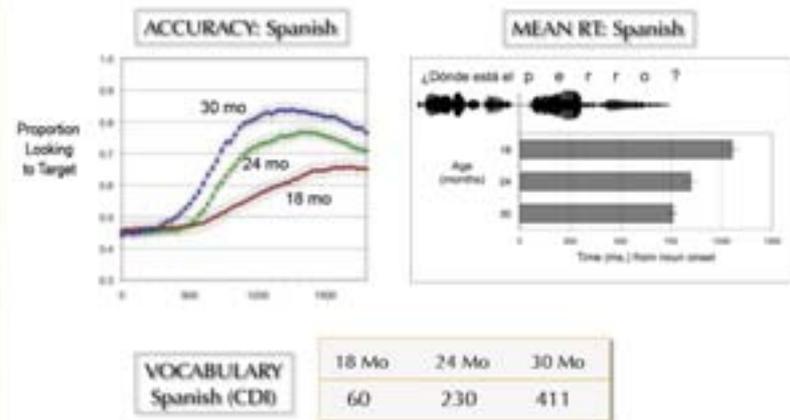
How long (in ms) does it take for the child to start looking at the dog picture?

# Results over time for English (n=76) and Spanish (n=50) children

**ENGLISH** longitudinal study: Changes in processing efficiency and vocabulary size from 18 to 30 months



**SPANISH** longitudinal study: Changes in processing efficiency and vocabulary size from 18 to 30 months



An individual child's processing speed relates to language and cognitive outcomes at age 5!

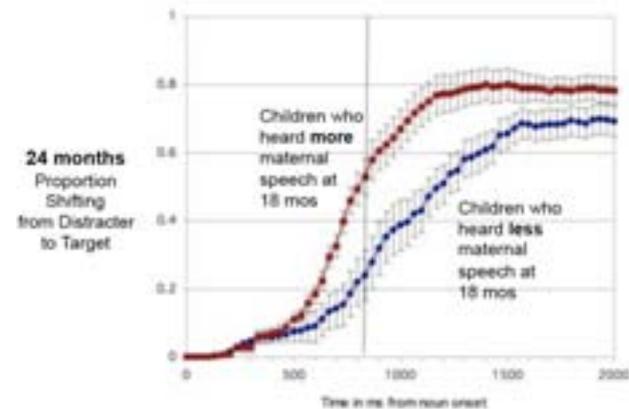
# The **amount** of input affects processing efficiency!

Does input affect *processing efficiency* as well as vocabulary growth?

- Children of mothers who talked with them more heard:
  - 7 times more words
  - 3 times more different words
  - Sentences twice as long
- Children of mothers who talked more at 18 mo had **larger vocabularies at 24 mo** AND **increased more in processing speed**  
[controlling for differences in CDI & RT at 18 mo]

Hurtado, Marchman, & Fernald (2008)

Results: Input affects uptake!



Hurtado, Marchman, & Fernald (2008)

Carnegie Hall joke!

# Why Language Input Matters:

## 3. Visual processing of the environment

When 12-month-olds hear words they know or unfamiliar words, as in “That’s a gorp!” the gamma-band oscillatory activity over the visual cortex in the brain (visual processing area) is enhanced.

Language may have an effect in promoting analysis and categorization of the environment (Gliga et al., 2010). Implication?

**Less language --→ less visual analysis**

# Why Language Input Matters:

## 4. Language teaches concepts

*Language is not just about vocabulary and sentence structure!*



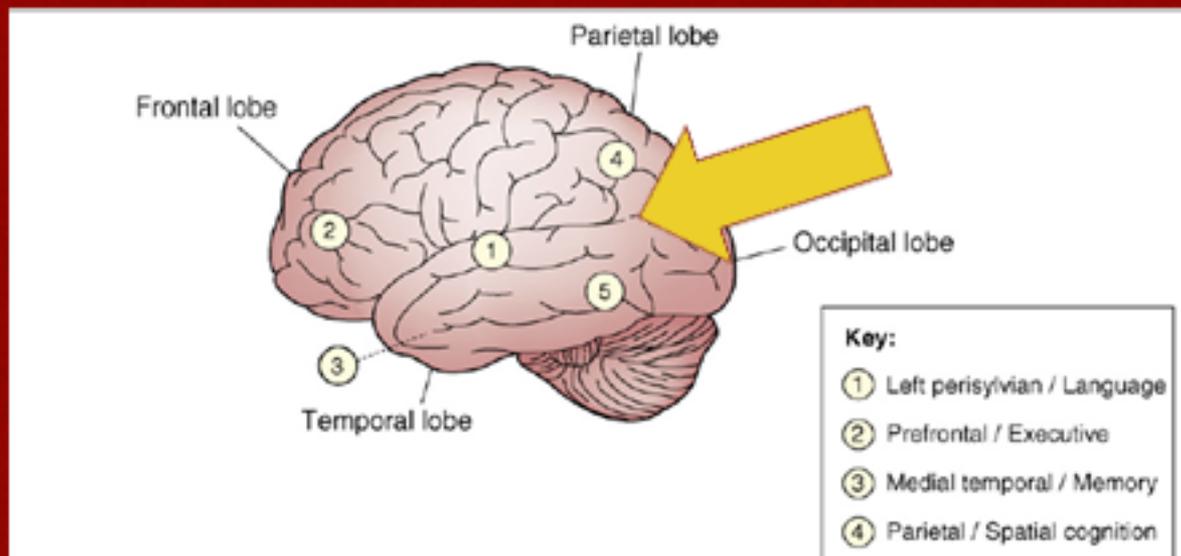
**Language is a vehicle:** We *explain* through language, call attention to the environment, and help children form categories, e.g., “That’s a hippo; it’s a kind of animal.”

Numerous papers show that category formation is facilitated when children hear names for things and for events (e.g., Waxman, Plunkett, Song, Golinkoff & Hirsh-Pasek, Lupyan).

# Why Language Input Matters:

## 5. Brain development

*SES is an important predictor of neurocognitive performance, particularly of language and executive function. SES differences are found in neural processing **even when performance levels are equal** (Hackman & Farrar, 2010).*



# The good news?



To create good readers, we need to change the language (and experiential) trajectory for poor children.

Language is malleable!

Main message of the Hart & Risley work!



How should we intervene so that *all* children grow up with strong language skills that enable grade level reading by third grade when L  $\rightarrow$  R becomes R  $\rightarrow$  L?

Do we actually KNOW enough about the course of language development to make recommendations??



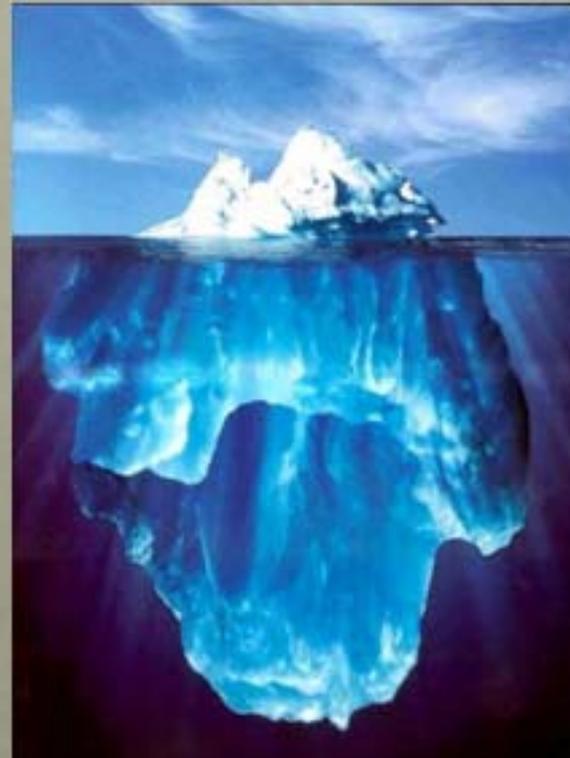
# Psychologists have learned that we don't need to wait to hear language to study its development!



We have developed a host of methods to “trick” babies into showing us what they about language before they say a single word!

Like the proverbial iceberg, there is much more to language development than meets the eye!

How old would you have to be to learn two new words in one session?



# A demonstration from Pruden et al. (2006)



# **Part 2:**

**Lessons from the crib: 6 principles of  
language learning**

# The 6 principles

1. Children learn what they hear most-- frequency matters
2. Children learn words for things and events that interest them
3. Interactive and responsive environments build language learning
4. Children learn best in meaningful contexts
5. Children need to hear diverse examples of words and language structures
6. Vocabulary and grammatical development are reciprocal processes

And now the evidence for each!

Drum roll please



# 1. Children learn what they hear most-- frequency matters

- Hart & Risley (1995)
- Amount of speech is important for statistical learning (Saffran et al., 1996)
- Amount of speech is important for speed of processing (Fernald, 2009)

# The 6 principles

1. Children learn what they hear most
- 2. Children learn words for things and events that interest them**
3. Interactive and Responsive environments build language learning
4. Children learn best in meaningful contexts
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6. Vocabulary and grammatical development are reciprocal processes

# Children learn words for things and events that interest them

- **Babies attach labels to interesting not boring objects**

- Pruden, Hirsh-Pasek, Golinkoff & Hennon, 2006

- **Joint attention:**

**When adults talk about what *baby* is interested in, baby is more likely to learn a word than if adults try to change the child's focus of attention**

- Akhtar, Dunham & Dunham, 1991; Tomasello & Farrar, 1986

# Introducing the 6 principles

1. Children learn what they hear most
2. Children learn words for things and events that interest them
- 3. Interactive and responsive environments build language learning**
4. Children learn best in meaningful contexts
5. Children need to hear diverse examples of words and language structures
6. Vocabulary and grammatical development are reciprocal processes

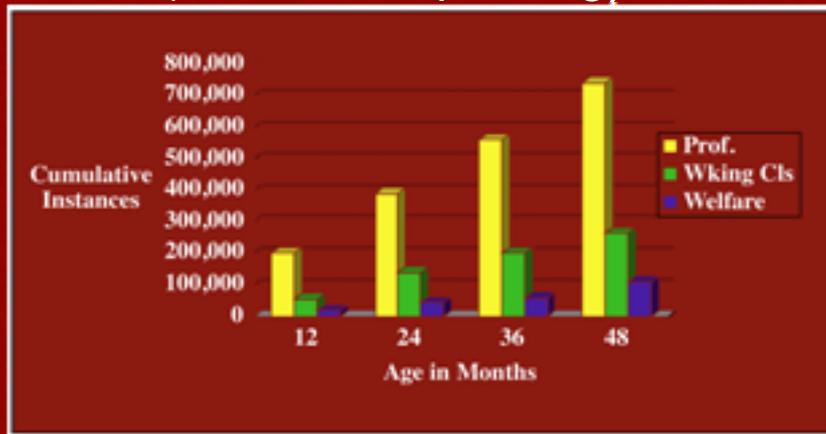
# Interactive and responsive environments build language learning

- What counts as sensitive and responsive language?
  - Talking *with* not talking *at*
  - Expanding on what the child says
  - Noticing what the child finds interesting and commenting
  - Asking questions rather than just making demands

# Evidence: Back to Hart and Risley – In addition to differences in *quantity*, the *quality* of utterances to children differed

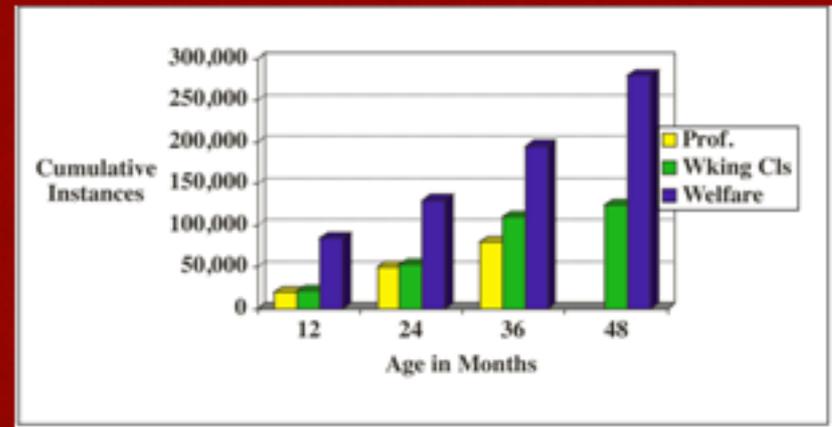
## Encouragements

(Affirmatives, praising)



## Discouragements

(Prohibitions, negative evaluations)



There is wide variability in the sensitivity and responsivity  
parents – and teachers -- show to child language

# Responsive parenting starts *before language emerges* and has effects long after!

## ■ FINDING:

Number of child gestures at 14 mo. predicts language at 54 months! (Rowe & Goldin-Meadow, 2009)

Research shows that early gestures turn into words, e.g., babies first point to dog; then say “dog” soon after.

Mothers who gesture to their children, and pay more attention to children’s gestures, have children who gesture more.

It’s not SES per se; it’s parental sensitivity to children’s gestures (and then to their language) that builds better language learners.

# The 6 principles

1. Children learn what they hear most
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- 4. Children learn best in meaningful contexts**
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6. Vocabulary and grammatical development are reciprocal processes

# The evidence: Children learn best in meaningful - and often playful - contexts

Recent studies from our lab suggest that children learn richer vocabulary in **playful learning situations** where the information is meaningful than in direct instruction which minimizes meaningful engagement.

This has been found in...

- Spatial language through block play with 4-year-olds
- Playful teaching of vocabulary



# Focus on playful learning with blocks

Ferrara, Shallcross, Hirsh-Pasek, Newcombe & Golinkoff, in press



*Research supported in part by Mega Bloks*

*See also Levine, Huttenlocher, Cannon, Pruden, Ratliff & Saunders, 2008*

# Research Questions

- Do parents talk more about space when they play with blocks?
- Do parents talk more about space in certain play situations over others? (using words like *above*, *on top of*, *beside*...)
- These spatial words are hard for young children but necessary for understanding relationships in text

# Our design....

- 3-to 5-year-olds participated with a parent.
- They differed on which condition they had **first**.
- For their **first** experience they either had:
  - **Free play** ( “Here are some blocks, do what you will”)
  - **Guided play** (“Can you build a heliport/ garage like this picture?”)
  - **Preassembled play** (“Here’s a heliport! Have fun”)

**All groups had GUIDED PLAY for their second experience.**

“Can you build a heliport/ garage like this picture?”

# Play Situations



Pre-assembled Play



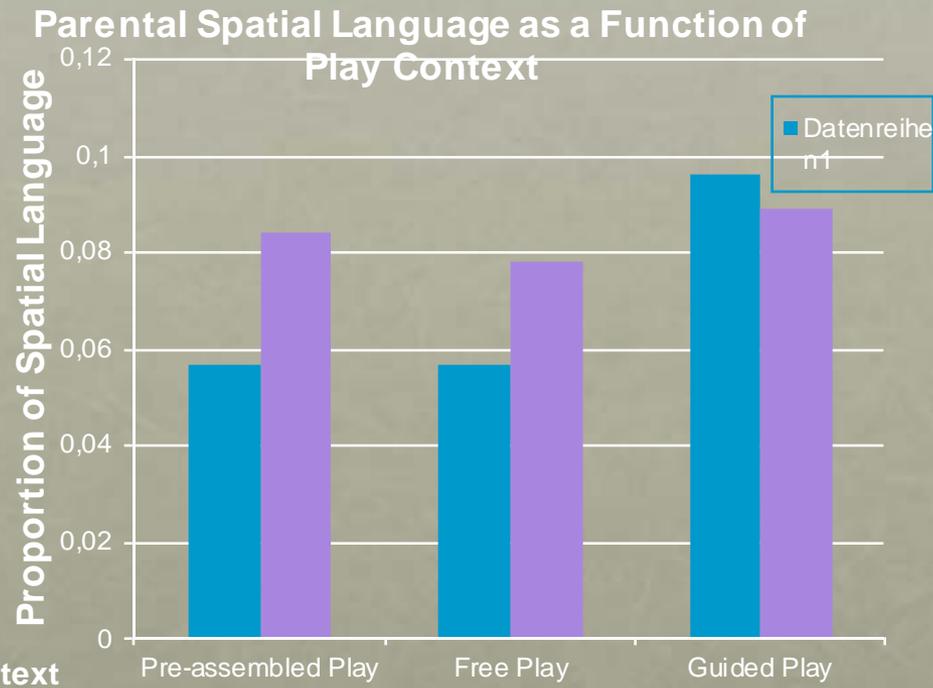
Free Play



Guided Play

- **So what condition prompted the most spatial language from parents?** Words like *above, around, over, through....*
  - Preassembled play?
  - Free play?
  - Guided Play?
- And did playing with blocks offer any advantage for hearing spatial language over playing with other toys?

# YES!! Spatial Language Results

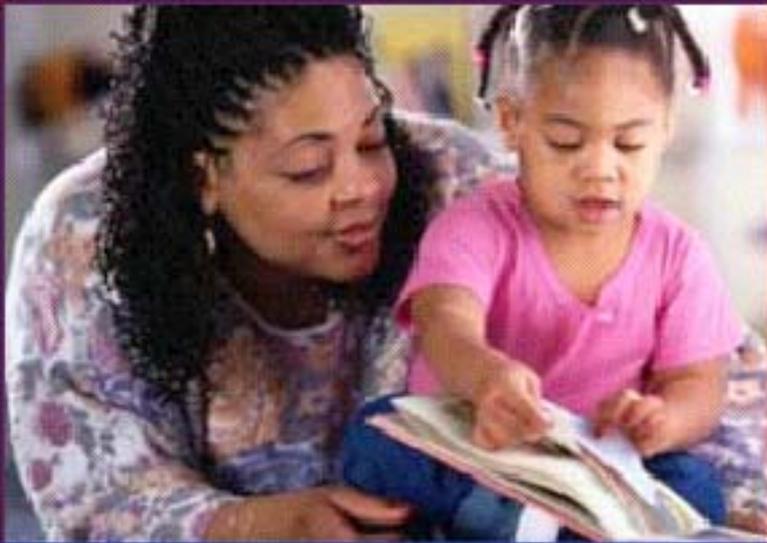


- **First, block play promotes spatial language!**
  - In non-block play contexts, parents use only 3 - 6% of spatial terms
- **Second, play context makes a difference!**
  - In guided play, 10% or 1 in 10 words were spatial

# What does this mean?

- Interactive play and conversation with traditional toys like blocks is educational and promotes spatial language
- Spatial language and the concepts encoded --→ feed into children's rich vocabulary
- Rich vocabulary -→ children's understanding of text

# What makes for good language and good readers?



- Telling stories
- Word play
  - (what rhymes with “hat”?)
- Singing songs
- Joint, dialogic reading
- Reading product labels
- Engaging conversations
- Dramatic play (Christie)

But where is phonics?  
Where is explicit vocabulary  
instruction?

# Lessons from *No Child Left Behind* and *Reading First*

- **Reading has two components: Code breaking and comprehension**
- Which do you think is easier?
- **Drop off in poor kids occurs at about 3<sup>rd</sup> grade. Why?**
- **Language and comprehension skills lag**
- **REMEDY?**
  - Language, language, and more language**
  - **Between teachers and children - need one-on-one talk**
  - **Between peers during play**
  - - **Between parents and children in talk and book reading**

# Vocabulary learning works best when its playful!

Han, Vukelich and Buell (in press)

## Results!

- 49, low-performing 4- and 5- year-olds from Head Start classrooms

- Random assignment study:

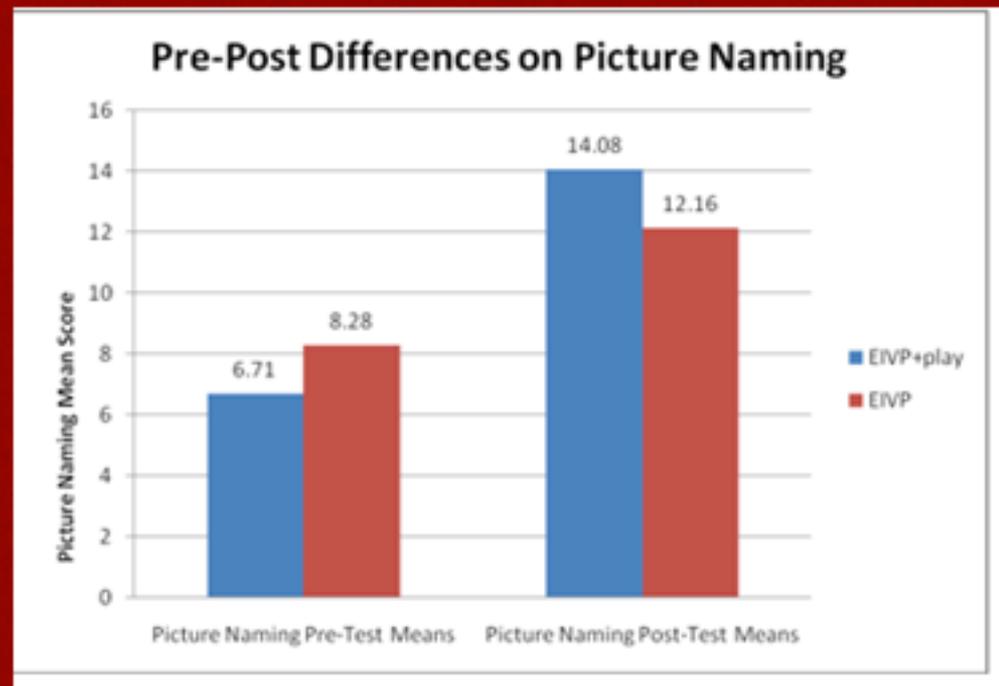
-Half in Explicit Instruction Vocab Protocol (EIVP);

-Half in EIVP + play

- 30 min, 2 X per week for 4 mo

- Both used picture books

- Taught 64 new words in total



Target words better in EIVP + play

# In sum,

**Playful learning -- and in particular guided play  
-- builds strong vocabulary skills**

Principle 4: Children learn  
best in meaningful (and  
playful) contexts

# The 6 principles

1. Children learn what they hear most
2. Children learn words for things and events that interest them
3. Interactive and responsive environments build language learning
4. Children learn best in meaningful contexts
- 5. Children need to hear diverse examples of words and language structures**
6. Vocabulary and grammatical development are reciprocal processes

# The evidence: Children need to hear diverse examples of words and language structures

- **From the home: Amount and diversity of verbal stimulation fosters early and rich language outcomes**
  - Beebe, Jaffee & Lachman, 1992, Snow, 1986. Tamis-LeMonda, in preparation; Weizman & Snow (2000); Dickinson
- **From the classroom**
  - **With other variables accounted for, the relation between the proportion of complex sentences in preschool teachers' speech and children's syntactic growth is  $r = .51$** 
    - Huttenlocher et al (2007)

# The 6 principles

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4. Children learn best in meaningful contexts
5. Children need to hear diverse examples of words and language structures
- 6. Vocabulary and grammatical development are reciprocal processes**

# The evidence: Vocabulary and grammatical development are reciprocal processes

- **In a bilingual sample, the number of English words predicts English grammar and number of Spanish words predicts the onset of Spanish grammar** (Conboy & Thal, 2006)
- **There is a reciprocal relationship between words and grammar: grammar helps children to learn words by giving clues to meaning** (e.g., Naigles, 1990; Gillette, Gleitman, Gleitman & Lederer (1999) Imai, Li, Haryu, Hirsh-Pasek, Golinkoff, & Shigematsu (2008); Fisher & Song (2006)
- Example: John blorked Mary ; John is a blork.

# Reprise: The 6 principles

1. Children learn what they hear most
2. Children learn words for things and events that interest them
3. Interactive and responsive environments build language learning
4. Children learn best in meaningful contexts
5. Children need to hear diverse examples of words and language structures
6. Vocabulary and grammatical development are reciprocal processes

# Recapping the argument....

## Learning to Read Rests on a Foundation of Language Skill

And when *code breaking* – the first step in becoming a skilled reader -- turns into *meaning making*, children must be prepared with

- rich vocabularies
- diverse sentences structures
- and concepts and experiences that help them relate to the text.

Parents and caregivers are their children's best 'toys,' providing much language input in play contexts where child is engaged

# In a nutshell...



**“Talk may be cheap but it is priceless  
for young developing minds”**

(Neuman & Dwyer (2009, p.384)

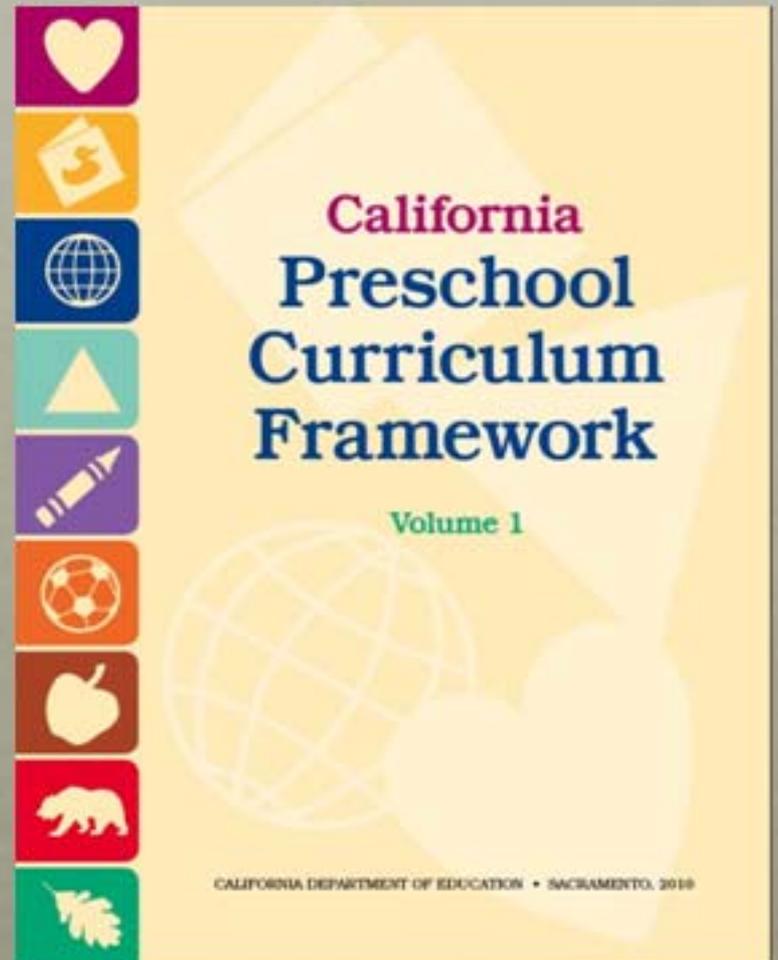
# Part 3:

**Transforming trajectories for low  
SES children**

## We know *how* to change trajectories:

The 6 evidence-based principles in the *California Preschool Curriculum -- Language and Literacy* (Golinkoff, Hirsh-Pasek, & Schickedanz, 2010).

Bathe children in rich language that links up to their lives and talk about what interests them.





**How do we help  
parents and  
caregivers facilitate  
language  
development?**

**‘It takes a village to  
raise a child’**

Ancient African Proverb



# For success: Make it a community wide effort!

- **Pay child care professionals a decent wage to attract the most educated and sensitive interaction!**
- **Educate** – child care professionals about best practices in early language development; give away *How Babies Talk* and start reading groups
- **Parent programs** – Influence parents, grandparents, relatives – about the importance of talking and reading with children.
- **Outreach** - Go where parents and children go to spark the conversation: malls, supermarkets, clinics – Come up with catchy slogans, e.g., *Strive for Five!*; give away books (Reach out and Read); model dialogic reading!

- **Model** - good language and interaction skills
  - Use churches, libraries, educational TV
  - Engage retirees and grandparents
  - Engage high school, college students for service projects to read to kids
- Use **out-of-the box techniques** to spark the 6 principles in practice – in homes and daycares
- Send home topics for parents and children to discuss, e.g., how to make a sandwich; what comes out at night?
- Adopt a day care or preschool classroom! Would allow trips to the zoo, the park, children's museums -- all the places middle class kids go! Build a foundation of concepts and experiences!
- 97% of neonates in USA are screened for hearing problems. Why not screen for potential language problems based on maternal questionnaire? Then design interventions; don't wait!

# Whoever said the American expression

“Children should be seen and not heard” didn’t know much about the crucial importance of language skill for learning to read and success in school!

