

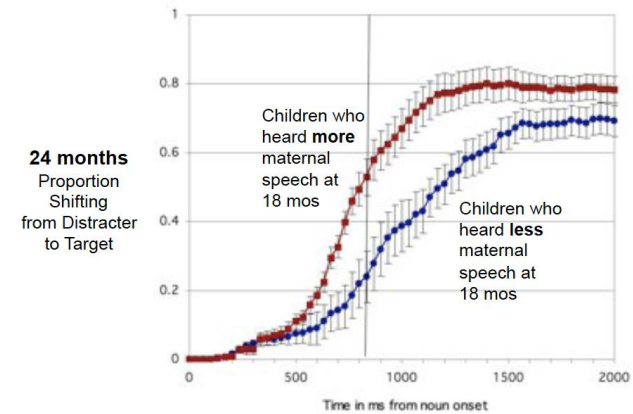
# The **amount** of input also affects processing efficiency!

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)

# 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 learn words for things and events that interest them

- L. Bloom's Principle of Relevance
- Babies attach labels to interesting not boring objects
  - Pruden, Hirsh-Pasek, Golinkoff & Hennon (2006)
- Evidence from babies and toddlers in joint attention
  - Akhtar, Dunham & Dunham (1991); Tomasello & Farrar (1986)

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# What counts as sensitive and responsive interactions?

- Talking *with* not talking *at*
- Expanding on what the child says and does
- Noticing what the child finds interesting and commenting
- Using a label that goes with what you are looking at
- Asking questions rather than just making demands

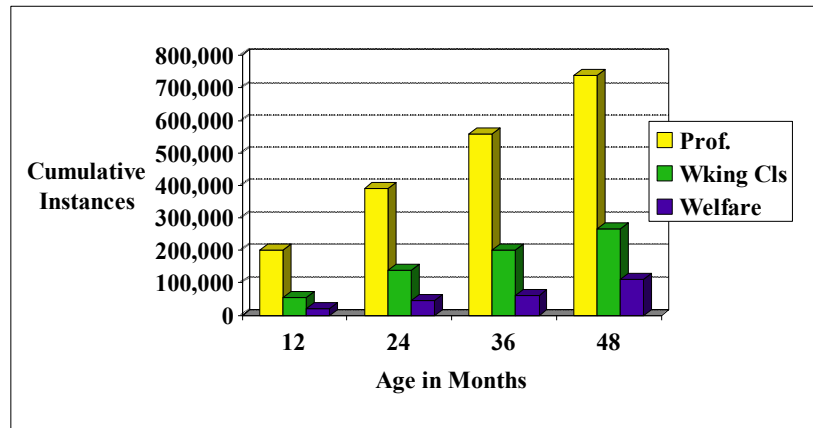
# Learning from 10-week old Ellie



# Evidence 1: Back to Hart and Risley

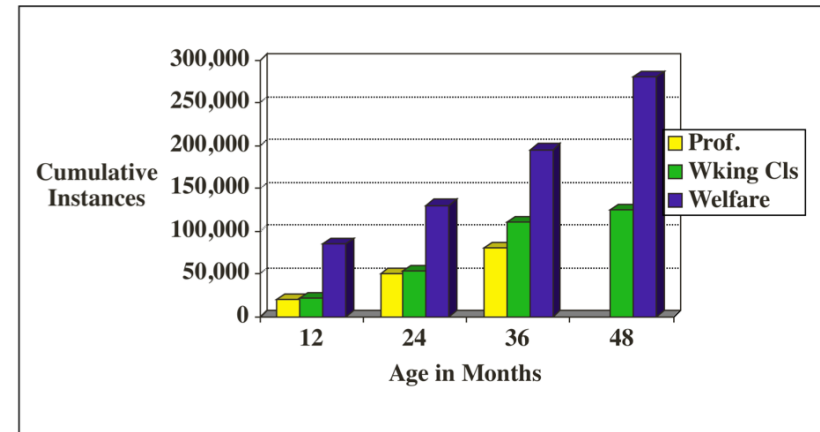
## Encouragements

(Praising, Affirmations)



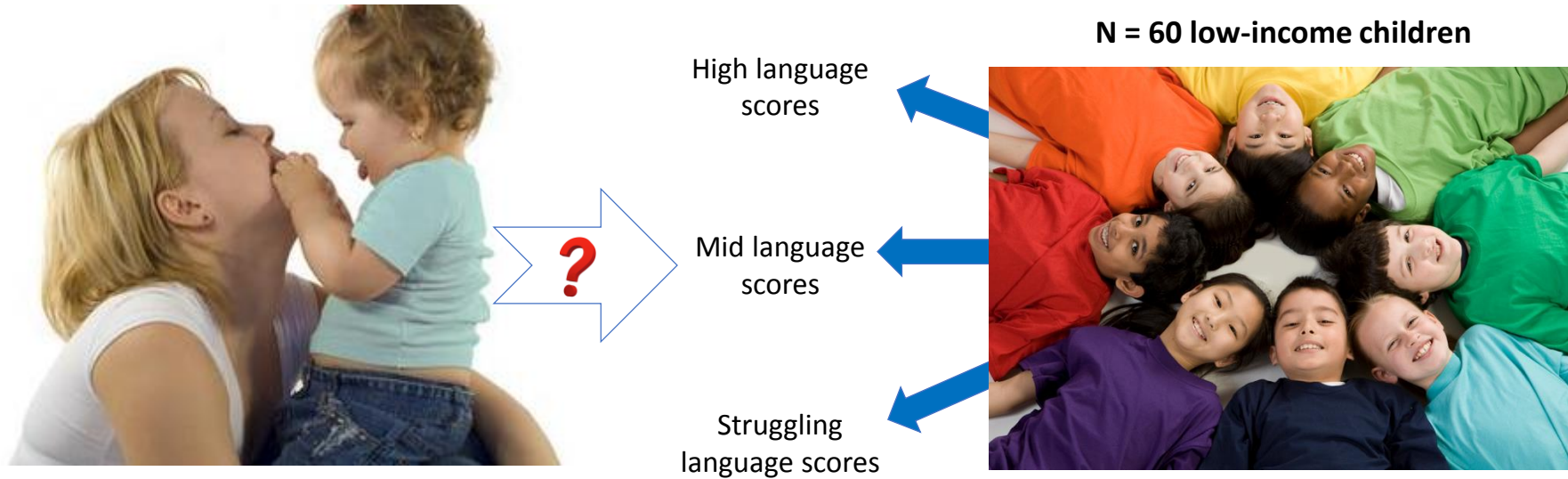
## Discouragements

(Prohibitions, negative evaluations)



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

## Evidence 2: Examining the quality of a Foundation for Communication during parent-child interaction



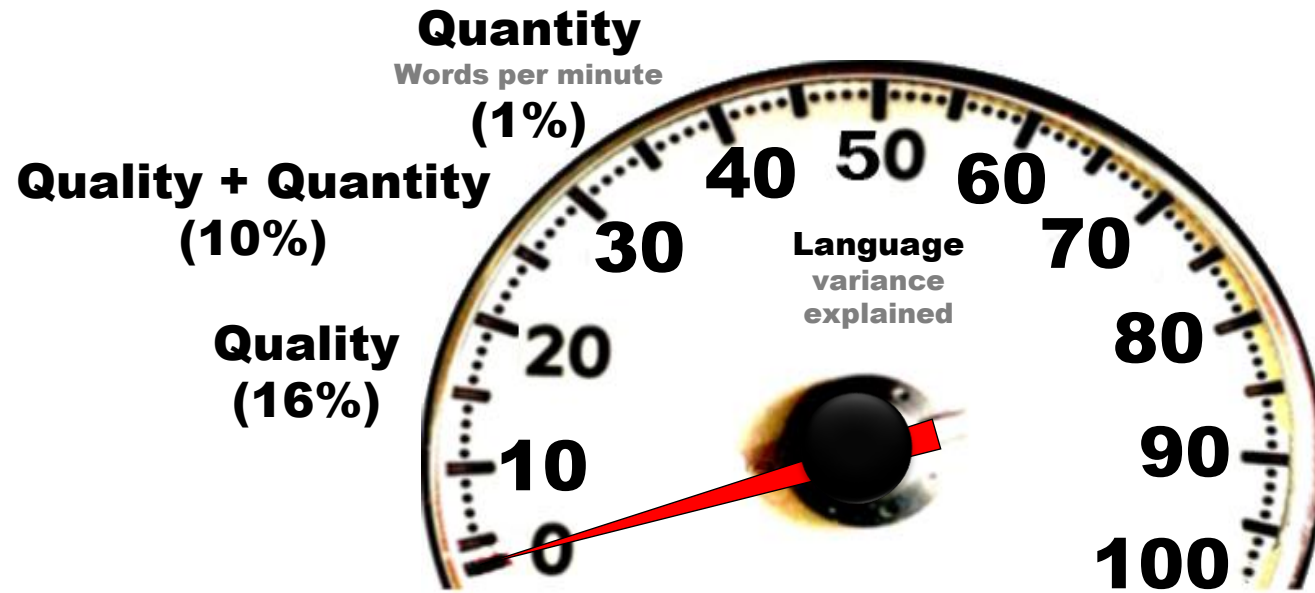
**Quality =**

- 1) Symbol infused joint engagement (gesture and words)**
- 2) Fluid and connected exchanges (verbal and non-verbal)**
- 3) Playful routines and rituals**

**Quantity = number of mother's words per minute**



# Findings and Implications



1. Quantity of input (amount) and Quality of Foundation for Communication are both important for language growth but “communication foundation” matters more.
2. In our study, it’s not about poverty.
3. Fluid and connected conversations – “Conversational duets” require serve and return, and return and return and return. ...it can’t be a solo performance.
4. It’s “filling the gap” + “building the foundation” – a new metaphor for intervention

# Evidence 3: Focus on Hirsh-Pasek & Burchinal (2005) using the NICHD ECCRN Database

Figure 1: Child experienced *maternal* sensitivity: Trajectory groups

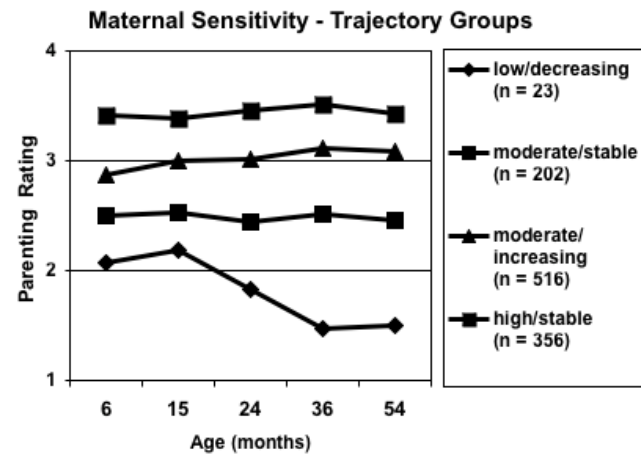
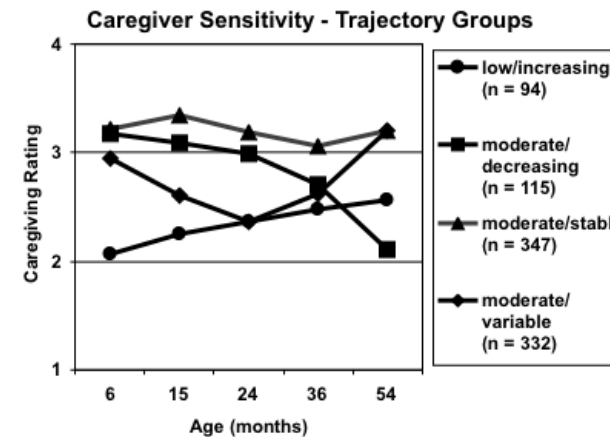


Figure 2: Child experienced care provider sensitivity: trajectory groups



The type of sensitivity pattern children experienced over time related to 54 month outcomes in language and in academic achievement (e.g., reading).

# Evidence 4: Video chats vs. TV

Roseberry, Hirsh-Pasek and Golinkoff (2014)

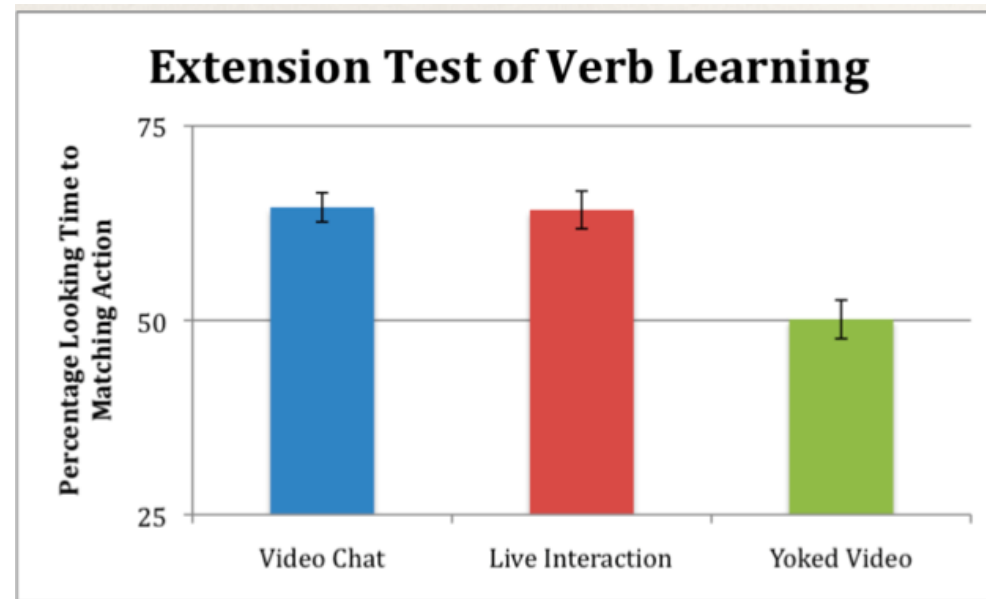
Word learning in 24- to 30-month-olds using:

- **Video Chat Training**
  - (responsive and contingent but 2D)
- **Live Interaction Training**
  - (responsive and contingent 3D)
- **Yoked Video Training**
  - (a pre-recorded video not responsive or contingent)



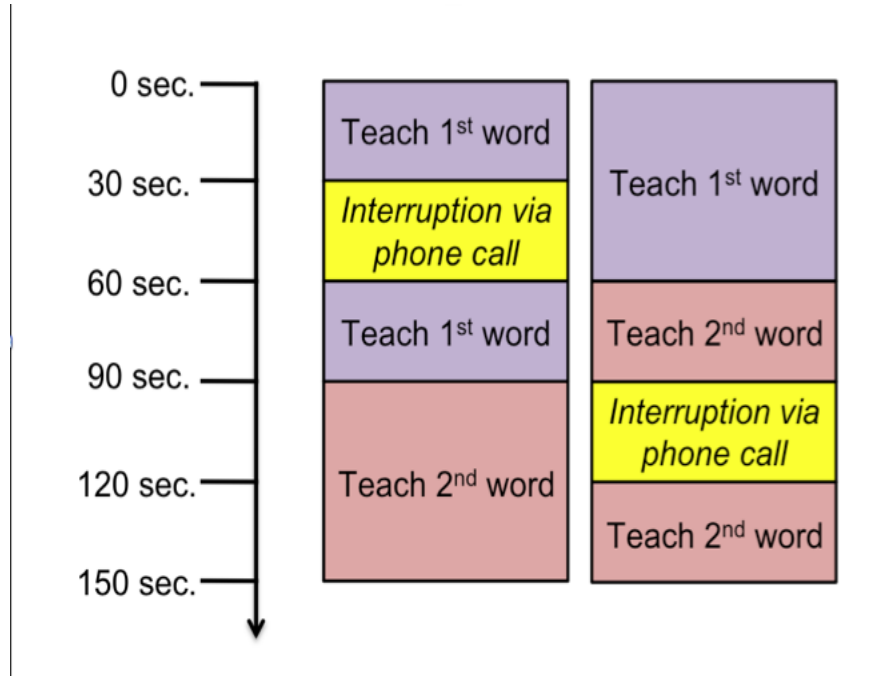
# Results – How did children respond to video chats compared to live interactions?

Learning from video chats was more like LIVE than like TV



## Example 5: The cell phone study

And what happens to word learning when we BREAK the interaction?



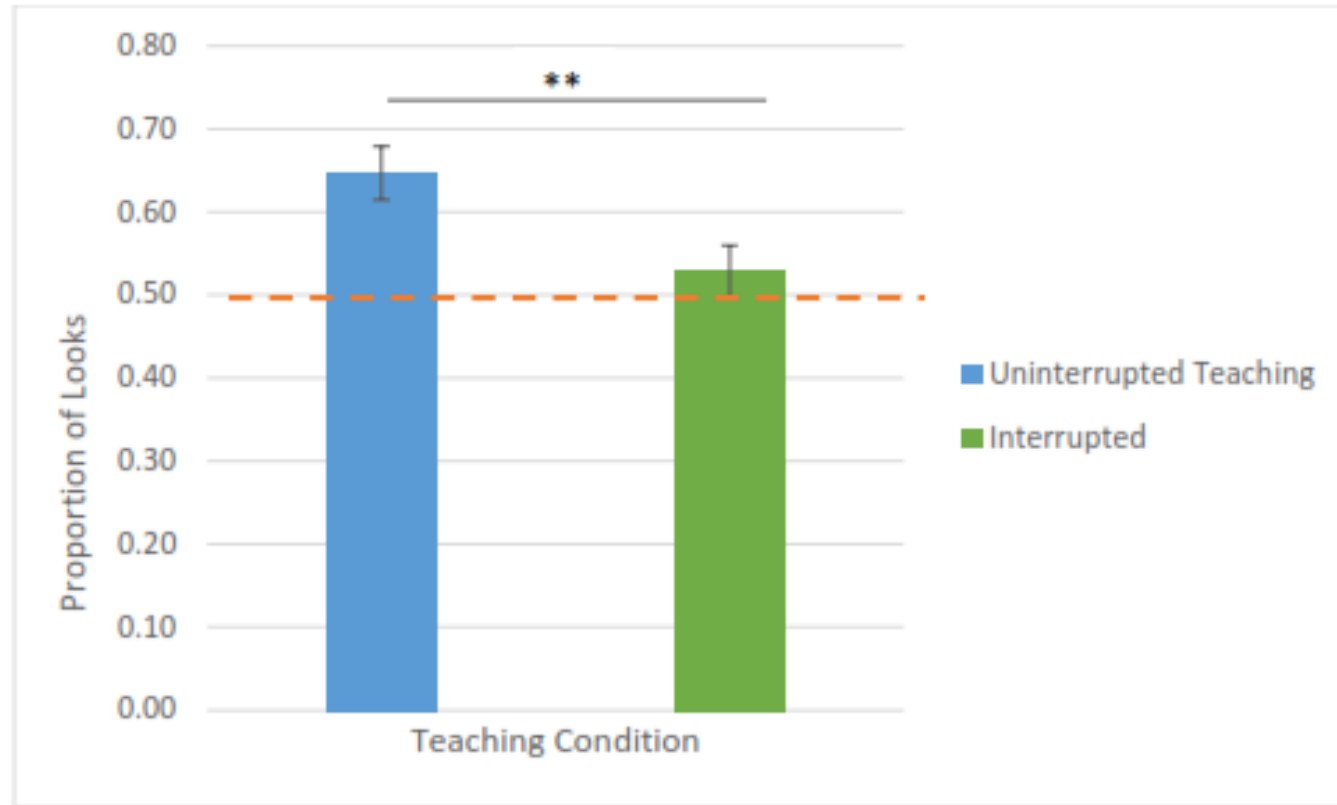
# The interruption condition





# Results?

Jessa Reed



*Note: \*\*  $p < 0.01$ . Only the *uninterrupted teaching* condition is significantly different from chance,  $t(36) = 4.56, p < 0.001$ .*

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Vocabulary and grammatical development are reciprocal processes



# The evidence: Children learn best in meaningful contexts

Children learn richer vocabulary in playful learning where the information is meaningful than they do in direct instruction methods devoid of meaningful engagement.

- Studies on shape learning with 4-year-olds
  - Fisher, Hirsh-Pasek, Newcombe & Golinkoff (2013)
- Spatial language through block play with 4-year-olds
  - Ferrara, Hirsh-Pasek, Newcombe, Golinkoff, & Lam (2011)



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

- Amount and diversity of verbal stimulation (and gesture-gesture/gesture word combinations) fosters early and rich language outcomes
  - Beebe, Jaffee & Lachman (1992); Snow (1986); Tamis-LeMonda & Song (2012); Rowe (2012); Goldin-Meadow et al. (2014)
- Children's vocabulary performance in kindergarten and later in second grade related to occurrence of sophisticated lexical items at age 5, predicted 50% of the variance in children's second grade vocabulary
  - Weizman & Snow (2000); Huttenlocher et al. (2002)

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# **The Evidence: Vocabulary and grammatical development are reciprocal**

- **Words and grammar are “developing in synchrony across the first few years of life”**
  - (Conboy & Thal, 2006; p.209)
- **In a bilingual sample, the amount of English words predicts English grammar and amount of Spanish words predicts the onset of Spanish grammar**
  - (Conboy & Thal, 2006)
- **There is a reciprocal relationship between words and grammar: sometimes grammar allows children to learn words**
  - (Naigles, 1990; Gillette, Gleitman, Gleitman & Lederer, 1999; Imai, Li, Haryu, Hirsh-Pasek, Golinkoff, & Shigematsu, 2008; Fisher & Song, 2006)

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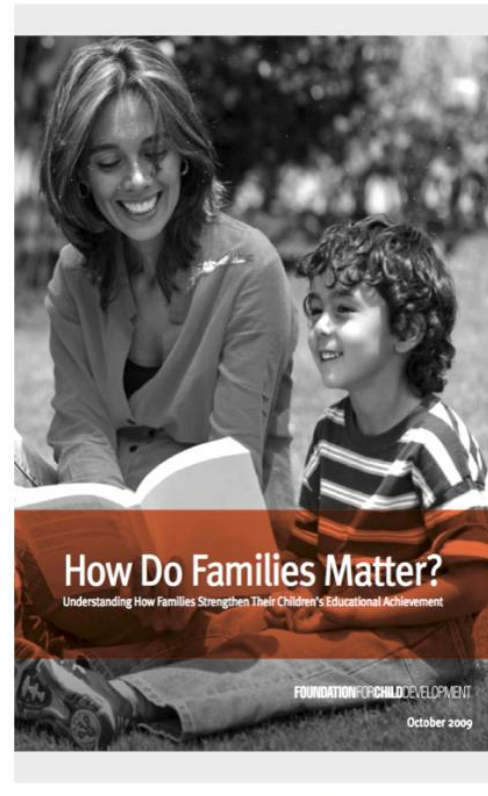
Vocabulary and grammatical development are reciprocal processes

And these hold whether you are learning one language or two!

# A Talk in 2 parts

- 6 Evidence-based principles of language learning that support reading
- **Implications and outreach**

# The practical challenge: The 6 Principles in practice



## Three Mothers and an Eggplant

Foundation for Child Development (2009)





## The 6 Language principles in two language styles

	<b>Mother 3</b>	<b>Mother 1</b>
✓ Children learn what they hear most	• yes	no
✓ Children learn words for things and events that interest them	• yes	maybe
✓ Interactive and Responsive environments build language learning	• yes	no
✓ Children learn best in meaningful contexts	• yes	no
✓ Children need to hear diverse examples of words and language structures	• yes	maybe
✓ Vocabulary and grammatical development are reciprocal processes		