Improving Word Callers' Comprehension

Promoting the Shift to More Active, Flexible Thinking About Text

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A Quote on Comprehension…

We keep meaning foremost.
But the children still must know the words.
*It is not a case of words **or** meaning.*
*It is a case of meaning **and** words.*

--Dolch (1960, p. 189)

How can new work on children's thinking & learning help us better understand reading comprehension?

Plan for Workshop

- Word Callers: Who are They & What Do They Look Like?
- Compare & Contrast: Word Callers vs. Skilled Comprehenders
- 5 Insights from Children's Thinking & Learning
- Teaching Active, Flexible Thinking for Better Comprehension
- Assessing Flexible Thinking

Word Callers

Who are they, and what do they look like?

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Word Callers

- Children who engage in "meaningless reading" (Dolch, 1960)
- Poor Comprehenders: children who demonstrate fluent decoding skills with comparably poor reading comprehension (Yuill & Oakhill, 1991)
- Look like "good readers" – decode fluently, but don't understand what they read (Applegate, Applegate, & Modla, 2009)

"She's my best reader, she just can't comprehend!"

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How Many?

- Applegate, Applegate, & Modla (2009)
  - 171 teacher-identified fluent readers; 34% were struggling comprehenders
- Torppa & Colleagues (2007)
  - 1750 Finnish 1st and 2nd graders at risk for reading difficulties; 22% were poor comprehenders
- Catts, Hogan, & Fey (2003)
  - 183 poor comprehenders; 28.8% were good decoders
- Riddle Buly & Valencia (2002)
  - 108 children, failed state reading assessment; 33% word callers
- Shankweiler & colleagues (1999)
  - Across 3 studies of struggling readers: 28% word callers

Word callers comprise 20 to 30 percent of our struggling readers!

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What's the trouble?

- NOT general memory ability and general cognitive ability (Nation, Clarke, & Snowling, 2002; Oakhill, Yuill, & Parkin, 1986; Stothard & Hulme, 1992)
- Word callers have lower
  - awareness of meaningful relations among words (Nation & Snowling, 1999)
  - syntactic awareness (Nation & Snowling, 2000)
  - comprehension monitoring (Ehrlich, Remond, & Tardieu, 1999; Paris & Myers, 1981)

…than their counterparts with better comprehension

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Word callers have trouble…

- constructing meaning from orally presented sentences (Oakhill, 1982)
- inferring word meanings from context (Oakhill, 1983)
- making inferences from text (Cain & Oakhill, 1999; Cain, Oakhill, Barnes, & Bryant, 2001; Cain, Oakhill, & Lemmon, 2005; Oakhill & Yuill, 1986; Oakhill, Yuill, & Parkin, 1986; Yuill & Oakhill, 1991)
- making connections between prior knowledge and text (Dewitz & Dewitz, 2003)
- resolving ambiguities and inconsistencies in text (August, Flavell, & Clift, 1984; Garner & Kraus, 1981; Megherbi & Ehrlich, 2005; Oakhill, Hartt, & Samols, 2005; Yuill & Oakhill, 1988; Yuill, Oakhill & Parkin, 1989; Zabrucky, 1990; Zabrucky & Moore, 1989)

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Word callers have difficulty

- cons… (Oakhill, 1982)
- inf…
- ma… 2001; Cain, Oakh…
- ma… (Dewitz & Dew…
- res… …ll, & Clift, 1984; …Yuill, Oakhill & Parkin, 1989; Zabrucky, 1990; Zabrucky & Moore, 1989)

meaning

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Compare & Contrast

Word Callers vs. Skilled Comprehenders

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Word Callers

- Are inflexible: Limited, decoding-only focus
  (Dewitz & Dewitz, 2003; Gaskins & Gaskins, 1997; Pressley, 2006; Yuill & Oakhill, 1991)
- Need to "unglue from print" in order to focus on comprehension! (Chall, 1996)
- Children must **learn** to "think of words as having both meaning and sound"
  (Stahl, Duffy-Hester, & Stahl, 1998, p. 340)

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Skilled Comprehenders

- Actively and flexibly process many features simultaneously; manage a complex orchestration & integration of features
  (Adams, 1990; Cartwright, 2008; Pressley & Afflerbach, 1995; Pressley & Lundeberg, 2008)

  sounds, syntax and structure, word meanings, text meaning, word parts, strategies, monitoring of understanding…
- "Cognitive juggling" (cognitive flexibility) is critical to comprehension
  (Pressley, Duke, Gaskins, Fingeret, Halladay, Hilden, et al., 2008)

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Marie Clay…

- Emphasized using multiple strategies simultaneously
  (Clay, 1985, 1991, 2001)
- Noted that children "find it easy to attend to separate aspects of reading…tasks but quite difficult to bring two aspects to bear on one bit of solving." (Clay, 2001, p. 61)
- Proficient readers use several aspects of text flexibly & can shift attention between different cues (Clay, 2001)

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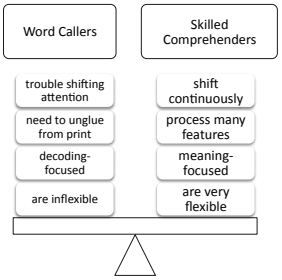
Compare and contrast…



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What might be going on?

- Despite fluent decoding, these children still lack comprehension

An observation…

Fluency does not guarantee comprehension

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5 Insights

Insights from Research on Thinking & Learning

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Insight 1

Young children have trouble thinking about more than one idea at a time (multiple representational ability) (e.g., Flavell, 1988)

Word callers have a one-idea focus on ONLY letter-sound information; they have difficulty thinking of other text elements, too. (Dewitz & Dewitz, 2003; Yuill & Oakhill, 1991)

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Insight 2

Children have naïve theories about how the world works (some accurate, some not) that guide their thinking and learning (Springer & Keil, 1989; Wellman & Gelman, 1992)

ask your students

What do good readers do?

their theories about good reading might surprise you

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"What do good readers do?"

"They get all the words right."

"They don't make mistakes when they read."

"They read the fastest!"

"They get done first!"

Word Callers' theories about reading may lead them astray!!

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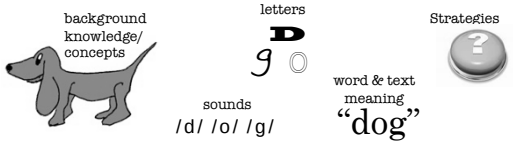
Insight 3

When children acquire knowledge, they view & use it as isolated facts, often failing to integrate information when needed. (diSessa, 2006; diSessa, Gillespie, & Esterly, 2004)



Word callers do not spontaneously connect or integrate elements important for comprehension. (Cain, Oakhill, Barnes & Bryant, 2005; Yuill & Oakhill, 1991)

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Insight 4

Children's ability to think about and guide their own thinking (i.e., metacognition & executive control) promotes academic success (Blair & Razza, 2007; Reiter, Tucha, & Klaus, 2004; St Clair-Thompson & Gathercole, 2006)

But, word callers are significantly worse at reflecting on and deliberately guiding their own thinking! (De Beni & Palladino, 2000; De Beni, Palladino, Pazzaglia, & Cornoldi, 1998; Ehrlich, Remond, & Tardieu, 1999; Oakhill, Hartt, & Samols, 2005)

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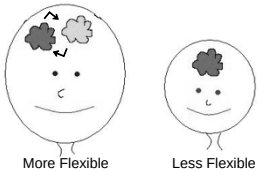
Insight 5

Children vary in cognitive flexibility: the ability to think about 2 or more "things" and actively switch between them (Cartwright, Marshall, Dandy, & Isaac, 2010)

cognitive juggling



Word callers are significantly less cognitively flexible than their peers with better comprehension. (Cartwright & Coppage, 2009; Cartwright, Coppage, Guiffré, & Strube. 2008)

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Flexibility and reading…

- Reading is very complex
- Requires flexible attention to multiple features
  (Adams, 1990; Beck & Carpenter, 1986; Cartwright, 2008; Clay 2001)
  - Text Meaning
  - Word Meaning
  - Sounds
  - Word Parts
  - Print Symbols
  - Strategies
  - And More!

(Ehri, 1992; Nagy, Berninger, Abbott, Vaughan, & Vermeulen, 2003; Perfetti, 1985)

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Teaching Active, Flexible Thinking

For Better Comprehension

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Effective instruction helps word callers…

(Based on insights from thinking and learning)

- Break free from the "one idea" focus
- Change their theories about reading
- "Put the pieces together"
- Become more aware of their processing of meaning
- Become more flexible in their processing of text

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Helping Word Callers Unglue…

Supporting the shift to more meaning-focused work

- Sound-Meaning Flexibility Sorts (Cartwright, 2002, 2006, 2010)
  (sounds and meanings)
- Jokes & Riddles (Yuill, 1996, 2007; Zipke, 2008; Zipke, Ehri, & Cairns, 2009)
  (sounds, spellings, multiple meanings)
- Story Structure Scaffolds (Idol, 1987; Oakhill & Patel, 1991; Rubman & Waters, 2000)
  (support for considering meaning alongside decoding)
- Sound-Meaning Flexibility Assessment (Cartwright, 2002, 2006, 2010)

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Sound-Meaning Flexibility Sorts

Using sorting to engage children with meaning & sound

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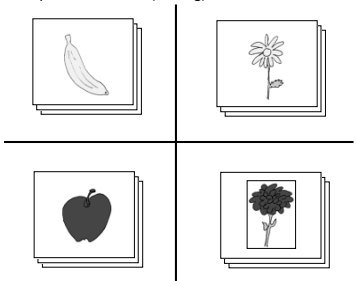
Typical Flexibility Assessment

Multiple Classification (Sorting) Task



Sort four different sets of 12 cards, 2 ways at the same time. Tells us how good students are at thinking flexibly about 2 aspects of a task.

Multiple Classification Task

Requires That Children (& Adults)…

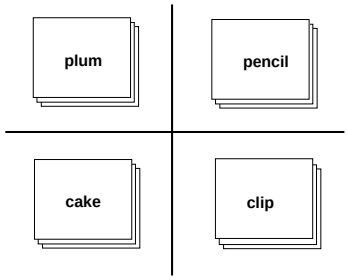
- Sort on both dimensions at once (color & shape)
- Flexibly attend to 2 aspects of cards simultaneously and actively go between them
- Think about each card in multiple ways at the same time
- You try it!

My Research…

- Does cognitive **inflexibility** prevent children from focusing on meaning in addition to letter-sound information?
- Designed reading-specific flexibility task: 2 features of printed words (Cartwright, 2002, 2006, 2007, 2008, 2010)
  - Meaning
  - Sounds

Sound-Meaning Flexibility Assessment

(graphophonological-semantic flexibility)



Sort four different sets of 12 word cards, 2 ways at the same time. Tells us how good students are at thinking flexibly about sounds and meanings.

We'll talk about how to do the assessment at the end – if there is time!

Overview of Flexibility Assessment

- Model & Explain
- Student Sorts 4 different sets of cards
- You Record
  - Sorting time
  - Accuracy
  - Explanation (for corrected sort, if necessary)

Sound-Meaning Flexibility

Is significantly correlated with reading comprehension in

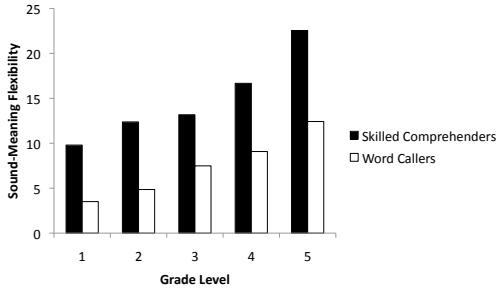
- 1st – 2nd graders (r = .61*) (Cartwright, Marshall, Dandy,& Isaac, 2010)
- 2nd – 4th graders (r = .70**) (Cartwright, 2002)
- college students (r = .58*) (Cartwright, 2007)

* p < .01, ** p < .001

Contributes uniquely to reading comprehension beyond
- fluent decoding (sounds)
- verbal ability (meaning)

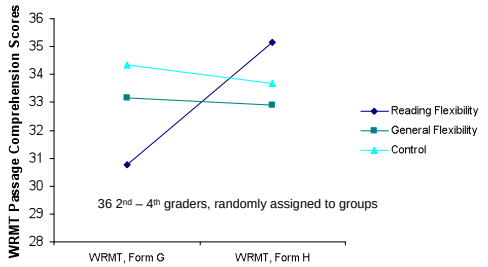
- 1st – 2nd graders (12%) (Cartwright, Marshall, Dandy,& Isaac, 2010)
- 2nd – 4th graders (15%) (Cartwright, 2002)
- college students (8%) (Cartwright, 2007)

Improves with Age



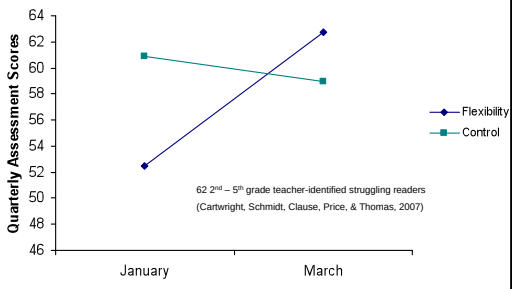
When Taught, Improves Comprehension

Individual Intervention (Cartwright, 2002, 2006)



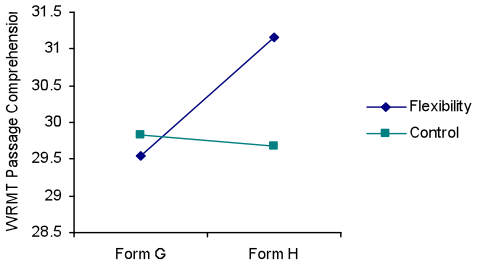
When Taught, Improves Comprehension

Small Group Intervention (School's Quarterly Reading Tests)



When Taught, Improves Comprehension

Small Group Intervention (Woodcock Reading Mastery Test)



Teaching Flexible Thinking

Intervention Format

- Five lessons
  - one per week – small group
  - daily – individual
- Materials
  - Picture and Word cards
    (NOTE: pictures not needed once students understand process)
  - 2 x 2 matrix for matrix completions
  - Chips or Markers to keep track of correct completions

Teaching Flexibility

Essential Intervention Goals

- Thinking about print in more than one way (sounds AND meaning)
  - **Awareness** of both dimensions
  - **Ability to think flexibly** about both dimensions
- Three intervention tasks accomplish this
  - Explanation
  - Single Sorts
  - Matrix Completion (fill-in-the-blank)

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In Each Intervention Lesson

Part 1: Explanation

- Question students about the term "**flexible**" - do you know what flexible means? Use prior knowledge
- Introduce Flexibility
- It's being able to do 2 things at a time, instead of just one thing…Being able to **think about** 2 things at a time!
- **Direct/explicit instruction:** "Today we're going to learn how to be flexible in the way we think about reading. Good readers are flexible thinkers. They can think about words in lots of ways at the same time."
- Might draw on juggling example

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In Each Intervention Lesson

Part 2: Single Sorts

- Set of cards for each student
- Students perform two independent sorts, each along one dimension
  - **Purpose is to highlight the two different dimensions of each set**
  - "Sort these into 2 piles by how they sound"
  - Reshuffle cards and "sort these into two piles by what they mean."
- Alternate order across days
- Verbally explain if errors (seldom occur)
- **NOTE: It's okay to tell a student a word if he or she doesn't know it!**

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In Each Intervention Lesson

Part 3: Matrix Completion

- Each student gets a 2 x 2 Matrix
- Model first with yours and solicit responses to ensure understanding from group.
- Place 3 Cards in 2 x 2 Matrix (mark empty spot with chip)
  - Sorted by Sound One Way
  - Sorted by Meaning the Other Way
- Give Child the Remaining 9 Cards
  - Ask them to "pick a card that goes here"
  - Errors: Demonstrate correct choice and explain, "This one fits better. See, now they are sorted by how they sound and by what they mean"
- **Practice Until Child Gives <u>4 Consecutive</u> Correct Responses**

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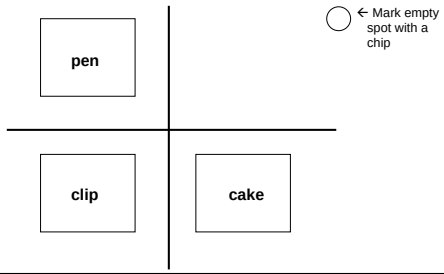
In Each Intervention Lesson

Part 3: Matrix Completion

- "Pick a card that goes here" (need 4 consecutive correct responses)



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"Rules" for Matrix Completions

- Student Goal: To collect FOUR chips in a row
- Student "keeps" chip when correct,
- If student is incorrect, he or she must start over in "chip collecting". YOU get to keep chips, and you should **explain why the choice is incorrect**
- **When a student achieves 4-in-a-row correct, he or she wins the game!**

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Lesson Summary

- Explain Flexibility
- Single Sorts
  - 2 piles on one dimension
  - Reshuffle, then 2 piles on different dimension
- Matrix Completion (fill-in-the-blank)
  - Place 3 cards in matrix
  - Student fills blank spot
  - Continue until 4 CONSECUTIVE correct responses (use markers to keep track)

NOTE: Single Sorts & Matrix Completion occur first with pictures and then with words until students no longer need picture scaffold

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Recording Lesson Performance

Student Name	Picture Single Sort	Picture Completion	Word Single Sort	Word Completion 1	Word Completion 2	Word Completion 3	Word Completion 4
1. Chandler Wilkins	✓	✓	✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓	✓
Notes							

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How Does it Transfer?

- It doesn't
- Changes the way children think by teaching them to coordinate (juggle) sounds and meaning
- ENABLES comprehension

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Jokes & Riddles

Using ambiguous language to foster coordination of sounds, spellings, & meaning

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Jokes and Riddles

What's black and white and red all over?

A duck goes to the pharmacy counter to buy some lip balm. "How would you like to pay for this?" asks the pharmacist…

What did the dinosaur say when he ate a clown?

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Ambiguous language activities

- Purpose: to make students aware of multiple meanings – & sometimes spellings (despite same sounds!)
- Try generating and discussing…
  - Homonyms and homophones (e.g., ball or bare/bear)
  - Compound words (e.g., boardwalk, hotdog)
  - Ambiguous sentences (The keys were found by the dog.)
  - Jokes & Riddles (using the words generated previously)
- Read & discuss texts with ambiguous words

(Yuill, 1996, 2007; Zipke, 2008; Zipke, Ehri, & Cairns, 2009)

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More fun with ambiguous words…

- Homophone detectives
- Homophone hangman

  Clue: a bunny wig ___ ___ ___ ___ ___ ___ ___ ___
- Find the fake (or Make the fake!)
  - bare, bair, bear
  - there, their, thare
  - chepe, cheap, cheep

Text Structure Scaffolds

Enabling consideration of meaning alongside letter-sound information

Providing extra meaning supports

- One lesson sentence pictures (Levin, 1973)
  - Type one sentence per blank page (short story)
- Three-session story pictures (Oakhill & Patel, 1991)
  - 3 days
  - type text from picture book on one page
    - Day 1, 2, 3: Main idea picture (representational picture)
    - Day 1, 2, 3: Four-picture story sequence
    - Day 2, 3: Detail strategy (transformational picture)

Picture books you might use…

- *Caps for Sale* by Esphyr Slobodkina
- *Library Mouse* by Daniel Kirk
- *Max's Words* by Kate Banks
- *Skippyjon Jones and the Big Bones* by Judy Schachner (or any books from the *Skippyjon Jones* series)
- *Sylvester and the Magic Pebble* by William Steig
- *Tacky the Penguin* by Helen Lester (or any books from the *Tacky* series)
- *Sock Monkey Goes to Hollywood* by Cece Bell (or any books from the *Sock Monkey* series)

Providing extra meaning supports

- Group story mapping with prompts (Idol, 1987)
  - Day 1: complete in group (explain questions, then map)
  - Day 2: students complete individually, then complete a group map
  - Day 3: students work independently
- Paragraph restatements (Jenkins, Heliotis, Stein, & Haynes, 1987)
  - Reprint stories with blank lines after each paragraph
  - Day 1: Model & Shared work
  - Day 2: Student practice with lines between paragraphs
  - Day 3: More student practice without lines between paragraphs

To learn more…

Selected References:

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Assessing Flexible Thinking

Sound-Meaning Cognitive Flexibility

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Assessment Procedure

- Materials
  - 5 sets of 12 cards
  - 2 x 2 Matrix
  - stopwatch

- Overview
  - Model with one set
  - Child sorts 4 sets (1 at a time)
  - For each set
    - Time sort
    - Correct if needed
    - Request verbal explanation

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Assessment Procedure

Model Correct Sort and Explanation

DIRECTIONS: "I have some cards for you to sort, and you can sort them two ways at the same time. See, you can sort them by **how they sound** and **what they mean**. I'm going to time you, just to see how long it takes, but you don't have to hurry."

"If you don't know a word, just ask, and I can tell you."

boot	sock
bread	soup

EXPLAIN: "See, I put all the /b/ words here and the /s/ words here; and I put all the clothes here and the foods here."

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Assessment Procedure

Testing

- Record **time** (in seconds) for each sort
- Record **correctness** of sort
- Request an **explanation** for each set of cards

For a correct sort, ask
"Tell me why you sorted them that way."

For an incorrect sort, correct it, then ask
"Why do you think we'd sort them THIS way?"

- Explanations
  - MUST appeal to both dimensions
  - CANNOT focus on one cell at a time

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Assessment Procedure

- For each of the 4 sorts, record
  - Sorting time
  - Correctness of sort
  - Correctness of explanation
- Accuracy scores are assigned as follows

(following Bigler & Liben, 1992; Cartwright, 2002; Golbeck, 1983)

	Correct Explanation	Incorrect Explanation
Correct Sort	3 points	1 point
Incorrect Sort	2 points	0 points

****These will be summed across the four card sets to yield a total.**

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Assessment Scoring

- Composite score
- Reflects speed, accuracy, & explicit awareness

$$\frac{\textbf{Total Accuracy Score}}{\textbf{Mean Sort Time}} \times 100$$

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Average Scores Across Grades

Grade	Strong Readers	Word Callers
1st	9.8	3.51
2nd	12.38	4.86
3rd	13.17	7.49
4th	16.67	9.08
5th	22.55	12.42
College	53.69	44.69