

# Evaluation of a Formal Language Test for School-age Children

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# Test of Integrated Curriculum-Related Language Skills (TICLS)

- ▶ Authors: Nickola Wolf Nelson, Nancy Helm-Estabrooks, Gillian Hotz, Elena Plante
- ▶ Paul H. Brookes Publishing Co., Inc.
- ▶ Seeking NIH/STTR Funding
- ▶ Analyzing pilot data (315 Ss in existing national sample)
- ▶ FILA Study “Formal & Informal Language Assessment” (200+ Ss in Mich sample)
  - Evaluating new/revised subtests—Focus on “Direction Following”
  - Classroom Questionnaires--Teacher/Student/Parent

# Goals for Language Assessment Tool

- ▶ Construct validity--Curriculum-*related* language skills
  - Capture developmental advances (younger→older) (IRT)
  - Differentiate typical development (& difference) from disorder
    - ▶ Integrated abilities (listening, speaking, reading, writing, self-regulation/executive function, social interaction)
    - ▶ Index skills (e.g., phonemic awareness, working memory)
- ▶ Reliable
  - Easy to administer ( $\leq 60$  min), score & interpret
  - Internal consistency (Coefficient alpha)
  - Intra- and Inter-rater reliability
- ▶ Concurrent validity
  - Agree with SLP diagnosis of language disorder
  - Agree with "gold standard" test results

## Goals (cont'd.)

- ▶ Predictive validity—literacy development & school success
  - Teacher ratings of literacy ability
  - High-stakes tests (MEAP; other standardized achievement tests)
  - Assessments of ability by those who know student best
    - ▶ Teacher
    - ▶ Parent
    - ▶ Student
- ▶ Helpful in deciding what to address in therapy
  - Strengths to draw on
  - High need areas, most likely to pay off

# Goals for Evaluation Café

- ▶ Focus on analysis of pilot data
- ▶ Focus on subset of overall questions
  - Example subtest analysis: Direction following
  - Relationships of Questionnaire responses (informant perceptions) & samples of language abilities on selected subtests
- ▶ Are we on the right track within the smaller study?
- ▶ Specifically *not* focusing today on:
  - Construct validity, including discrimination ability
  - IRT analysis
  - Reliability questions

# Valid for Identifying Disorder

Hypothetical data: N=136 Dx LI; N=136 Dx LN

$$\text{Sensitivity} = a/a+c$$

$$\text{Specificity} = d/b+d$$

By Gold Standard

+LI  
(SS $\leq$ 85)

+LN  
(SS $>$ 85)

	+LI	+LN
+LI (SS $\leq$ 85)	78 (true positive) Sensitivity .57 a	20 (false positive) (1-Specificity) .15 b
+LN (SS $>$ 85)	58 (false negative) (1-Sensitivity) .43 c	116 (true negative) Specificity .85 d

By New Test

# TICLS Test Model

	Sound/Word	Sentence	Discourse	Nonlinguistic
Listening	3. Phonemic awareness	8B. Following directions (working memory)	6A. YesNoMaybe Listening	
Speaking	2. Vocabulary 4A. Nonsense word imitation 8. Rapid naming (objects, letters)	10. Sentence completion	1. Orientation 5. Story retelling 9. Acting a scene	
Reading	4B. Nonsense word reading	7A. Reading the news	6B. YesNoMaybe Reading	
Writing	4C. Nonsense word spelling		7B. Writing the News	
Nonlinguistic				Graphic relationships

# Sound/Word Level Subtests

## ▶ Phonemic awareness

- Space creature: If we say /dop/, you say it \_\_\_\_\_, the creature will take off the first sound and say \_\_\_\_\_ /op/.
- If we say /glem/, you say it \_\_\_\_\_, the creature will take off the first sound and say \_\_\_\_\_ /lem/.

## ▶ Nonsense word

- Reading: (4) rask...(7) garbing...(13) rebifology
- Imitation
- Spelling

## ▶ Rapid naming (objects in Direction Following)

▶ What Goes Together: dog – cat – bone

▶ Vocabulary of emotions in Acting a Scene

# Sentence Level Subtests

- ▶ Following Directions
- ▶ Reading the News
- ▶ Sentence Completion
  - [Point to picture of three girls of diverse ethnicity all in basketball uniforms.]
  - Say: *This girl is tall. Of all the players, Liz is the \_\_\_\_\_ (tallest).*

# Discourse Level Subtests

- ▶ Writing the News
  - Sentence combining
  - Graphic organizer
- ▶ Story Retelling (auditory→oral)
- ▶ Yes/No/Maybe
  - Listening (+reading) comprehension
  - Reading comprehension
- ▶ Acting a Scene (contextualized discourse comprehension & formulation)
- ▶ Telling a story about a picture (optional)

# Yes—No—Maybe

(listening version/reading version)

One morning Susan missed the school bus. She thought she would be late for school, but her mother got her there on time.

- |                                 |   |   |   |
|---------------------------------|---|---|---|
| a. Did Susan miss the bus?      | Y | N | M |
| b. Was Susan late for school?   | Y | N | M |
| c. Was it raining that morning? | Y | N | M |

# Direction Following Subtest

## ▶ Construct validity:

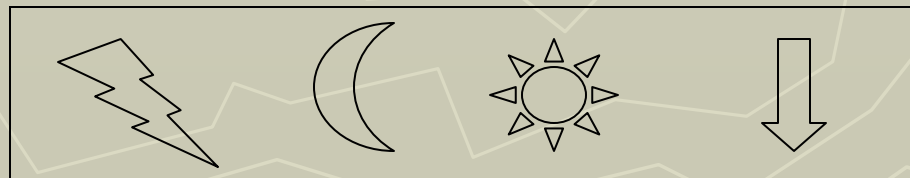
- working memory important variable in language processing
- Curriculum-relevant for following classroom directions

## ▶ Content validity:

- Number of directions
- Known vocabulary (objects, prepositions, letter names)

## ▶ Example item

Draw a line from the lightning bolt over the moon and to the sun. Then draw a circle under the arrow. (repeat) **GO**



# Procedures for FILA Pilot

	Session	Procedures
Dec-Jan	1 (60 min)	Writing original stories
	2 (45 min)	A. Sentence combining D. Direction following E. Spelling
	3 (60 min)	B. Graphic organizer C. Comprehension (YNM; L+R, R only) Student Questionnaires
Apr-May	1 (60 min)	Writing original stories
	2 (45 min)	A. Sentence combining D. Direction following E. Spelling
	3 (60 min)	B. Graphic organizer C. Comprehension (YNM; L+R, R only) Student Questionnaires

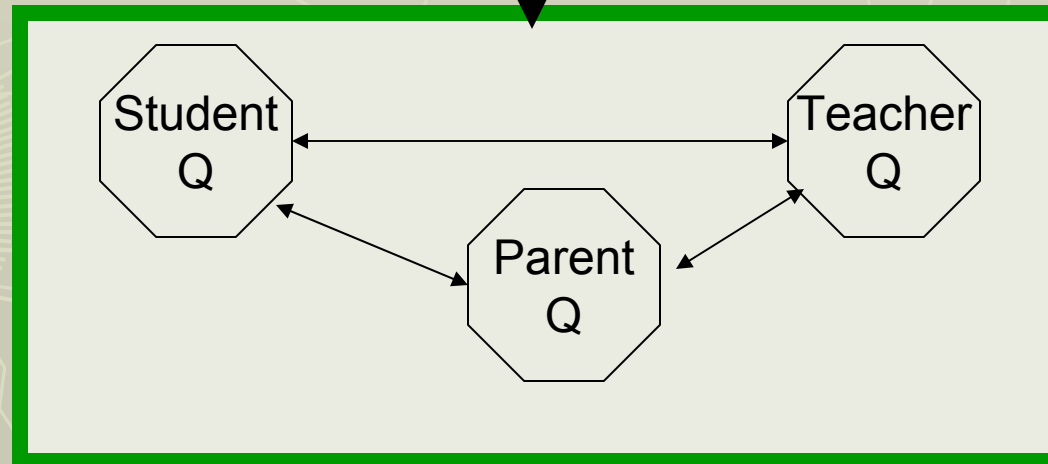
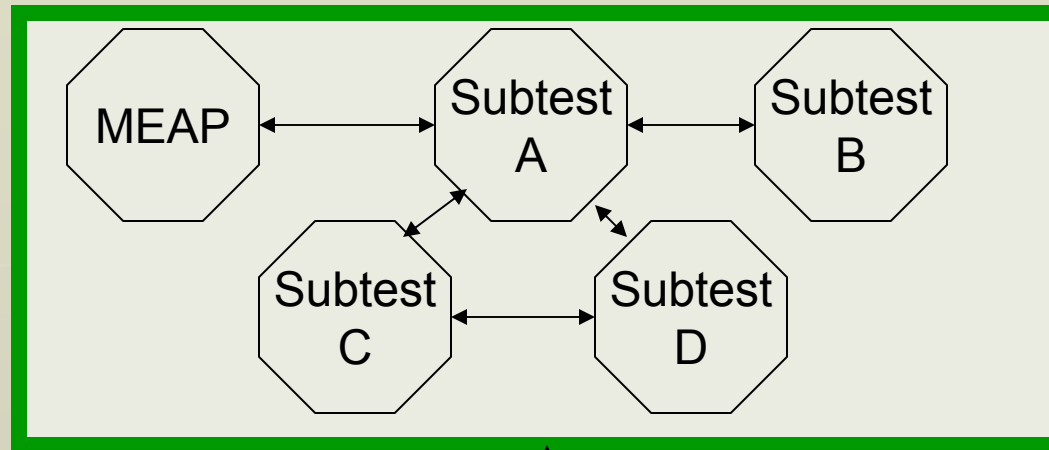
# Independent Variables

- ▶ Sex
  - M, F
- ▶ Grade level
  - 2nd, 4th, 6th, 9th
- ▶ Rural v. urban
  - R, U
- ▶ Race/Ethnicity
  - White NonHispanic: Y, N
- ▶ SES
  - Free/reduced lunch (Y, N)
  - Mother's education (5 levels)
- ▶ Special services
  - Y, N

# Dependent Variables

- ▶ Writing – Discourse/sentence, word level
  - Informal (original stories) (Total possible: 29)
  - Formal subtests in tryout
    - ▶ A. Sentence combining (Total possible: 26, 33, 37)
    - ▶ B. Graphic organizer (Total possible: 21, 21, 25)
    - ▶ E. Spelling (Total possible: 13)
- ▶ Reading – Discourse/sentence level
  - C1. Yes-No-Maybe (listening + reading)  $13 \times 3 = 39$
  - C2. Yes-No-Maybe (silent reading)  $13 \times 3 = 39$
- ▶ Listening – Sentence level (working memory)
  - D. Direction Following (19 possible)

# Analysis: Relationships



# Group Input

Subtest Analysis

# Research Questions for Subtests

## --Example: Direction Following--

### ▶ Do these tests differentiate:

- On the basis of *intended* variables

- ▶ Grade level

- ▶ Disorder or risk status

- And NOT on the basis of *unintended* variables

- ▶ sex, race, urban/rural, free lunch, mother education

- Explore unintended variables: t-tests?

- ANOVA: 4 (grade) x 2 (dis) x others?

# Research Questions for Subtests

## --Example: Direction Following--

- ▶ Will subtest scores correlate highly with:
  - Each other?
  - Teacher ratings (totals and clusters)?
  - MEAP scores?
- ▶ Will pre-post test scores show significant growth?
  - Are subtests sensitive to small changes?
  - If not, are changes in the right direction?

# Group Input

Questionnaire  
Analysis

# Classroom Questionnaires

- ▶ Designed as concurrent measure to assess perspectives of those who know student best
  - Teacher
  - Parent
  - Student
- ▶ Items developed from orthogonal table
  - Language levels (sound/word, sentence, discourse)
  - By modality (listening, speaking, reading, writing)
  - Plus
    - ▶ Social interaction
    - ▶ Self-regulation/executive control
    - ▶ Non-linguistic skills (sports, math computation, drawing)

# Research Questions - Questionnaire

- ▶ Do total scores differ on the basis of child sex, race, urban/rural, SES, grade?
  - Multiple t-tests?
  - ANOVA 2 (sex) x 2 (white/non-Hispanic:Y/N) x 2 (U/R) x 2 SES (free lunch:Y/N)
- ▶ How do 3 informant group scores correlate?
  - With each other?
  - With standardized test scores?
- ▶ Do total scores differ by informant & grade level?
  - ANOVA: 3 (informant) X 4 (grade level)
  - Hypothesis 1: Students and parents scores will be negatively correlated with increasing grade level
  - Hypothesis 2: Correlation between total questionnaire scores and total language test scores may differ by grade

# Questionnaire (cont'd.)

- ▶ Do the theoretical clusters of questionnaire items correlate with subtests intended to measure those constructs?
- ▶ What is the correlational relationship between specific items on the Questionnaire and specific subtests?
  - Listening (10 Q items) & Direction following (19 T items)
  - Reading (8 Q items) & 2 Yes-No-Maybe subtests (39 T items each)
  - Writing (9 Q items) & 3 writing subtests (29, 21-25, 26-37)

Thank you!

