



# **Language Impairment in School-Age Children with Complex Clinical Profiles**

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# Research Interests

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- Social communication

- Language and social behaviors that children use to:
  - enter and maintain conversations
  - resolve conflicts (Timler, Olswang, & Coggins, 2005)
- Problems in social communication affect a number of clinical populations with language learning difficulties:
  - Fetal Alcohol Spectrum Disorder
  - Pervasive Developmental Disorders (PDD)
  - Specific Language Impairment (SLI)
  - Attention Deficit/Hyperactivity Disorder (ADHD)



# Current Work

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- Language Impairment (LI) and ADHD
  - Most common psychiatric diagnosis in children with LI is ADHD
  - Converse is also true
    - Relatively few studies have examined LI and ADHD
- Diagnostic challenge
  - Identify LI in children who are not good test takers
    - Evidence base to inform clinical decision making



# Presentation Overview

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- The late talker: risk factors and predictors of persistent language delay
- Specific language impairment (SLI) in preschoolers and school-age children
- Language abilities in school-age children with ADHD
- Sneak peak at an ongoing study



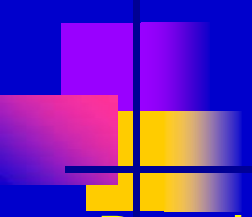
# The Late Talker

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Late Bloomer?

Or

Language Impaired?



# Typical Language Milestones Observed By 24 Months

- Produce an average of five to seven communicative acts per minute
  - (Chapman, 2000)
- “Telegraphic two word utterances”
  - (Nelson, 1973; Roulstone et al., 2002)
- Expressive vocabulary of at least 200 words; receptive vocabulary much larger
  - (Rescorla, et al., 2001)
- Sentence comprehension similar to production skills
  - (Chapman, 1978; Thal & Flores, 2001)



# Late Talker: Possible Profiles

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- Produce fewer than ten words at 18-23 months
- Produce fewer than 50 words at 24 months
- No two-word combinations by 24 to 30 months



# Outcomes for Late Talkers

- 50% will outgrow delays by age 3
  - Linguistic performance in the normal range
  - (Girolametto et al., 2001; Hadley & Holt, 2006; Paul, 2006)
- Clinical challenge
  - How can we identify the two year old “late talker” who will not outgrow language delays?
  - (Olswang, Rodriguez, & Timler; 1998)



# Risk Factors for Continued Language Delay

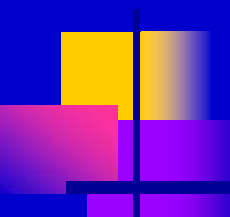
- Prolonged periods of otitis media
- Family history of persistent language, reading, or learning problems
- Low socioeconomic status
- Elevated parental concern
- Parent interaction style: directive rather than facilitative

(Olswang, Rodriguez, & Timler, 1998)

# Predictors Of Continued Language Delay

- Small vocabulary for age with **few verbs**
- Six months or more comprehension delay
- Limited number of consonant sounds
- Few spontaneous imitations of adults
- Limited or absence of pretend play
- Few communicative gestures
- Behavior problems
- Social interaction concerns

(Olswang, Rodriguez, & Timler, 1998)



# Specific Language Impairment (SLI)

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Diagnosis

Academic and Social Characteristics



# SPECIFIC LANGUAGE IMPAIRMENT (SLI)

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- Diagnosis given in late preschool years
- Inclusionary:
  - Linguistic performance 1.5 SD below the mean
  - Nonverbal performance no more than 1.0 SD below the mean
- Exclusionary:
  - Hearing impairments
  - Cognitive impairments
  - Neurological disorders such as autism



# SLI: Diagnosis

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- No gold standard
- Diagnosis is typically ascertained through a combination of:
  - Standardized test performance
    - Diagnosis of disability
  - Assessment of clinical markers
    - Research/Clinical diagnosis of disability
  - Naturalistic observations
    - Treatment Planning



# SLI: Standardized Tests

- Accuracy (Spaulding, Plante, & Farinella, 2006)
  - Examined sensitivity and specificity rates of 43 tests for children ages 3-18
    - Five tests met 80% sensitivity and specificity criteria
      - Clinical Evaluation of Language Fundamentals-4 (CELF-4)
      - Test of Narrative Language (TNL)
      - Test of Early Grammatical Impairment (TEGI)
      - Test of Language Competence-Expanded (TLC-E)
      - Preschool Language Scale-4 (PLS-4)



# SLI: Standardized tests

- Accuracy
  - Size of the mean group differences between SLI and Typical groups
    - Vocabulary measures
      - Mean group differences:  $<1.0$  standard deviation
    - Only ten tests reported differences  $\geq > 1.5$  standard deviations
      - All five of previously mentioned tests were in this category

(Spaulding, Plante, & Farinella, 2006)



# SLI: Clinical Markers

- Three performance indicators in school-age children:
  1. Nonword repetition
    - Meta-analysis revealed performance of LI groups at 1.27 SD below performance of typical peers
    - (Graf Estes, Evans, & Else-Quest, 2007)
  2. Sentence repetition
    - (Conti-Ramsden, et al., 2000; Botting & Conti-Ramsden, 2003)
  3. Tense marking (Rice and colleagues 1996; 2003; 2007)
    - (e.g., She is tall; he is walking, walks, walked, ran)



# SLI in Early Elementary Grades

- Epidemiologic sample of 7,218 children  
(Tomblin, et al., 1996; 1997)
  - LI prevalence rate of 7.8%
  - Follow-up studies examined:
    - 362 typically developing children
    - 208 children with LI
      - SLI=117 children; NLI=91 children



# SLI in Early Elementary Grades

- Children who enter kindergarten with LI:
  - Deficits persist through second and fourth grade
    - (Fey, et al., 2004; Liles et al., 1995; Norbury & Bishop, 2003; Scott & Windsor, 2000)
  - Nature of the deficits change
    - Grammatical errors in oral narratives
    - Grammatical errors in written language
      - True for children who score within the normal range on a second grade standardized test suggesting *pattern of illusory recovery*



# SLI: Academic Outcomes

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- For children who enter Kindergarten with LI
  - If LI persists through second grade, reading outcomes are poorer (Catts et al., 2002)
    - 40% will have reading disorder compared to 8% in control group
    - Grammar composite scores correlated ( $r_s = .67$ ) with reading outcomes
  - Children with NLI are at especially high risk
    - 65% of children will have a dx. of reading disability



# SLI: Social Behaviors

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## ■ Descriptive studies

- Preschoolers with SLI do not enter conversations as frequently as typical peers (Hadley & Rice, 1991)
- Initiate more interactions with adults than with peers (Rice, Sell & Hadley, 1991)
- School-age children produce fewer verbal & nonverbal turns in cooperative work groups (Brinton, et al, 1998)
- Demonstrate “withdrawn” behaviors on the playground (Fujiki, et al, 2001)



# SLI: Social Behaviors

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- Teachers rate children as having more behavior problems and fewer social skills than typical peers (Fujiki, et al., 1999; Redmond & Rice, 1998)
- Rated as less prosocial than typical peers (Fujiki, Brinton, Morgan, & Hart; 1999)
- Longitudinal of sample of 242 adolescents revealed that slightly over one third were identified as regular targets for victimization by their peers (Conti-Ramsden & Botting, 2004).



# SLI: Social Behaviors

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- What social knowledge underlies the verbal and nonverbal behaviors that children use in social situations?
- Differences in prosocial behaviors
  - Language complexity
  - Social knowledge



# SLI: Social Knowledge

- Examination of social knowledge in school-age children with LI (Timler, under review)
- Two groups of twelve children between the ages of 8 and 11 years
- Hypothetical peer conflict situations
  - (Adapted from Chung & Asher, 1996; Renshaw & Asher, 1983; Rose & Asher, 1999)
  - Elicit children's strategies, goals, and predicted consequences for managing the conflict
  - Open-ended and forced choice condition

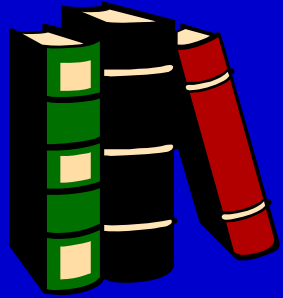


# SLI: Social Knowledge

## ■ Hypotheses

- LI group will generate fewer prosocial strategies (open-ended condition)
- LI group will select as many prosocial strategies as typical peers (forced choice condition)
  - Responses reflect language limitations rather than social knowledge

# Peer Conflict Vignette: Open-Ended Condition



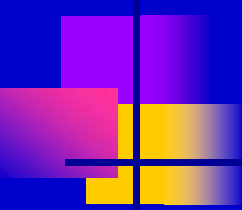
Your teacher tells you to pick a book for reading time.

You go to the bookshelves and look over your choices.

Finally, you pick a book you are excited to look at.

Your **friend** grabs the book out of your hand and says,  
“Hey, I want that book!”

1. What could you say or do here?
2. What would you say or do first if this really happened to you?
3. Then, what would your friend say or do?

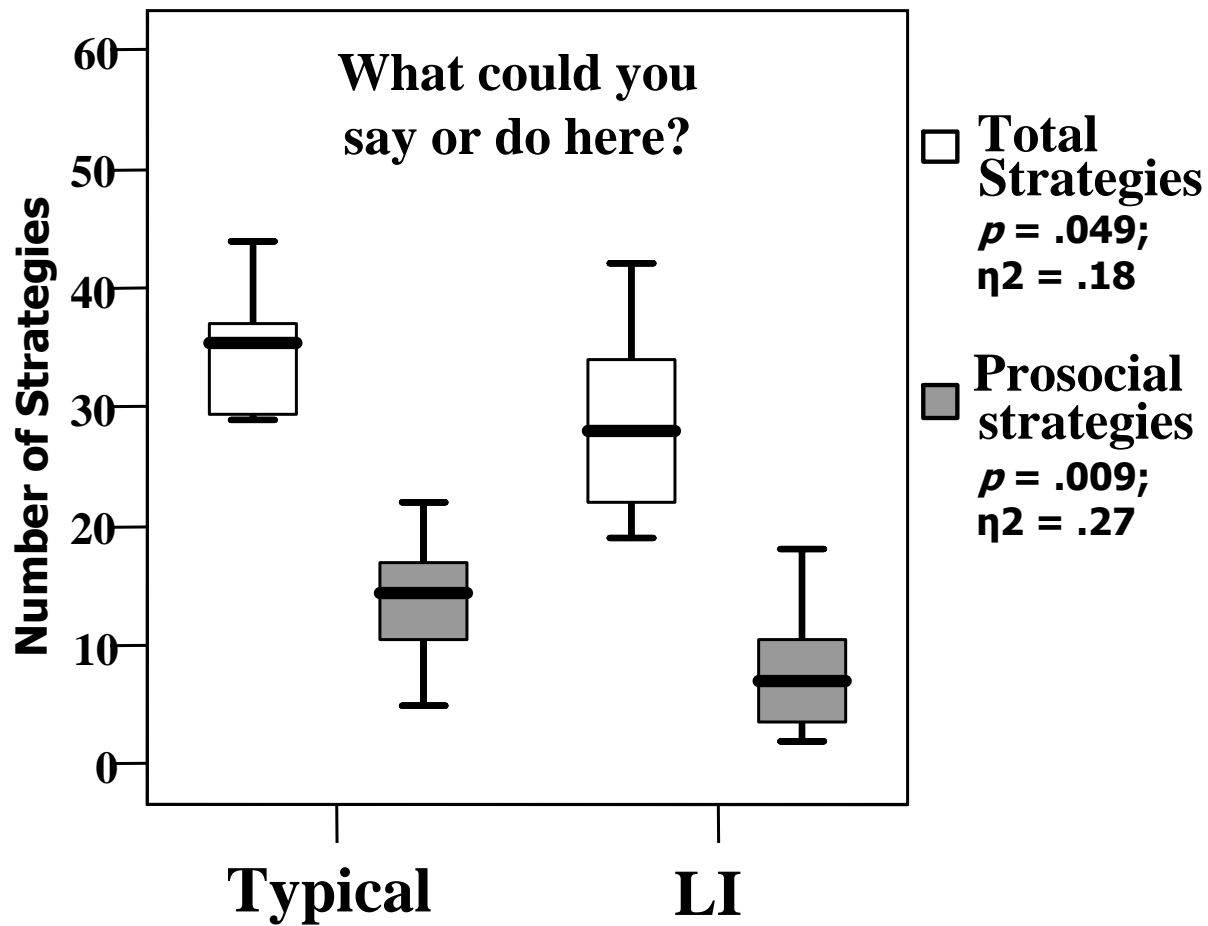


# Peer Conflict Vignette: Forced Choice Condition

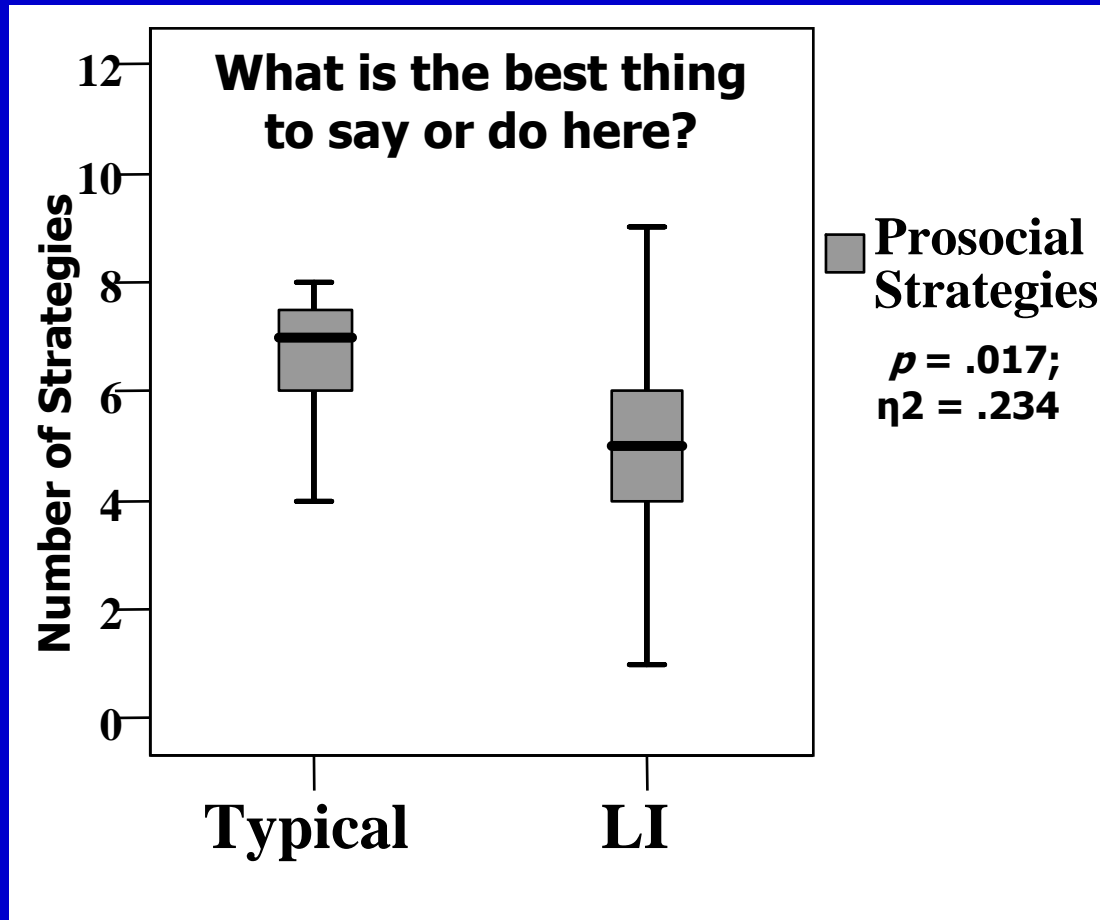
What is the **best** thing to say or do here?

- a. Just let my friend have the book. [**passive**]
- b. Ask the teacher for help. [**adult-seeking**]
- c. Say, "Let's flip a coin to see who can read the book first." [**prosocial**]
- d. Grab the book out of my friend's hand. [**hostile**]
- e. Say, "I saw the book first so you need to give it back to me." [**assertive**]

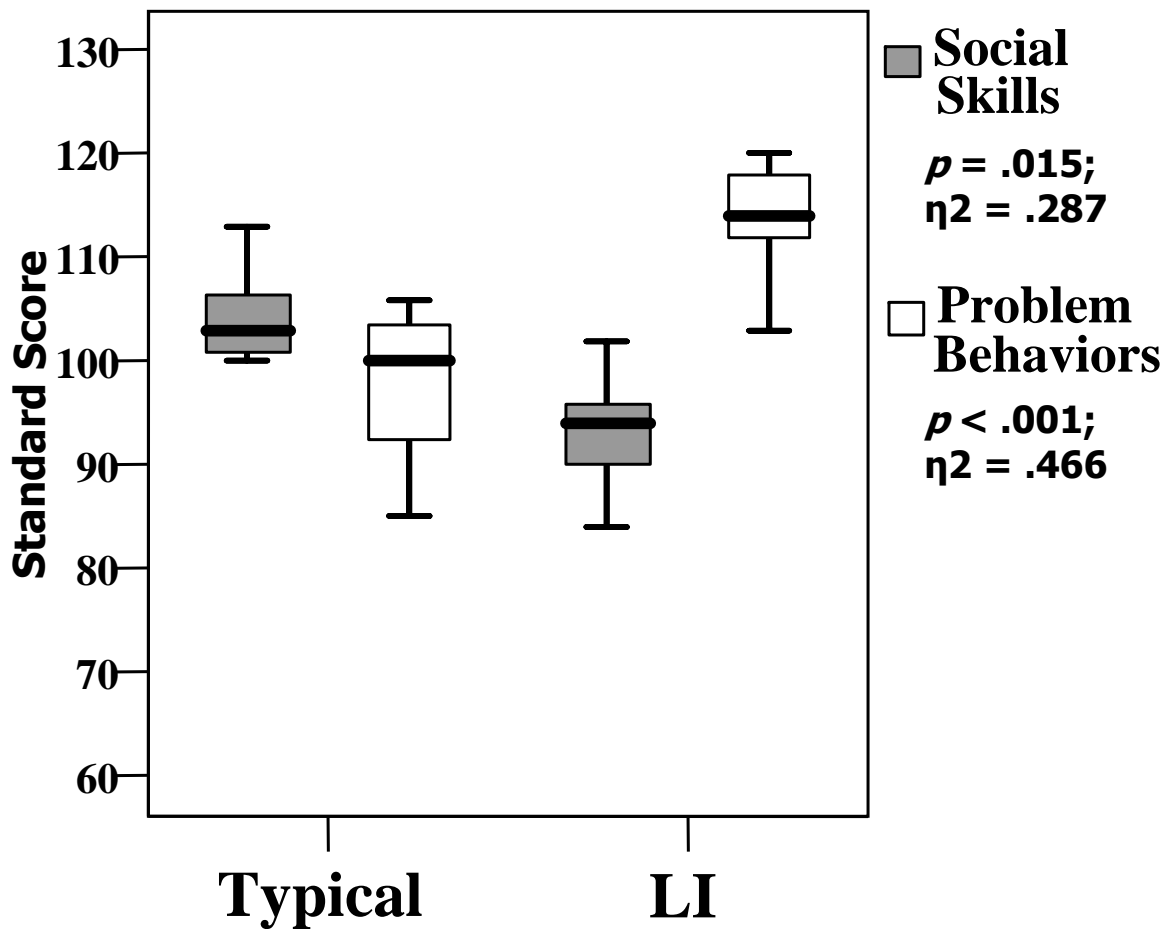
# Open-Ended Condition



# Forced-Choice Condition



# Teacher SSRS Scores





# Summary of Results

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- Children with SLI generated and selected fewer prosocial strategies
- Teacher ratings of children's social skills corroborated performance
  - $r_s = .79$



# Implications

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- Social knowledge in some children with LI differs from typical peers
- Social communication goals should be a focus of language therapy
  - Especially for children not receiving other services (Hadley & Scheule, 1998; Timler et al., 2007)



# SLI: Summary

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- Persists through the school years
- Diagnosed with standardized measures in early school years
- Clinical markers are sensitive measures of SLI in early school years
  - Focus on sentence production measures
  - Nonword repetition
- Important to identify SLI:
  - Reading risks
  - Social consequences



# What about LI in ADHD?

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- ADHD affects 7.8% of school-age children
  - (CDC, 2003)
- Approximately 50% comorbidity rate with LI
  - Standardized assessments
  - Would measures of clinical markers increase the accuracy of diagnosis?



# ADHD: Language Characteristics

- Delayed onset of first words and word combinations
- Poor performance on standardized measures
  - CELF-R Formulated Sentences
    - (Oram, Fine, Okamoto, & Tannock; 1999)
- Pragmatic difficulties
  - Excessive verbal output in spontaneous conversations
  - Decreased verbal output and dysfluencies when confronted with tasks that require planning and organization (for example, narrative tasks)

(See reviews by Redmond, 2005; Tannock, 2000)



# Clinical Markers of LI in ADHD

- To date, only one lab has investigated clinical markers of LI in children with ADHD (Redmond, 2004; 2005)
  - Three groups of school-age children between the ages of 5 and 8
    - SLI group without ADHD (n=10)
    - ADHD group without LI (n=10)
      - Standardized test performance in the normal range
      - No school services
    - Typically developing control group (n=13)



# Clinical Markers of LI in ADHD

- Measures and Results
  - Sentence recall
    - $SLI < ADHD < Typical$
  - Verb tense marking elicited and in conversation
    - $SLI < ADHD = Typical$
  - Mazes in conversation
    - $ADHD > TD = SLI$



# Current Work: Aims

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- Determine the best combination of measures to identify LI in children with ADHD
- Examine standardized test performance and “clinical markers” of LI in children with ADHD
  - Verb tense marking
  - Utterance formulation errors
  - Nonword repetition

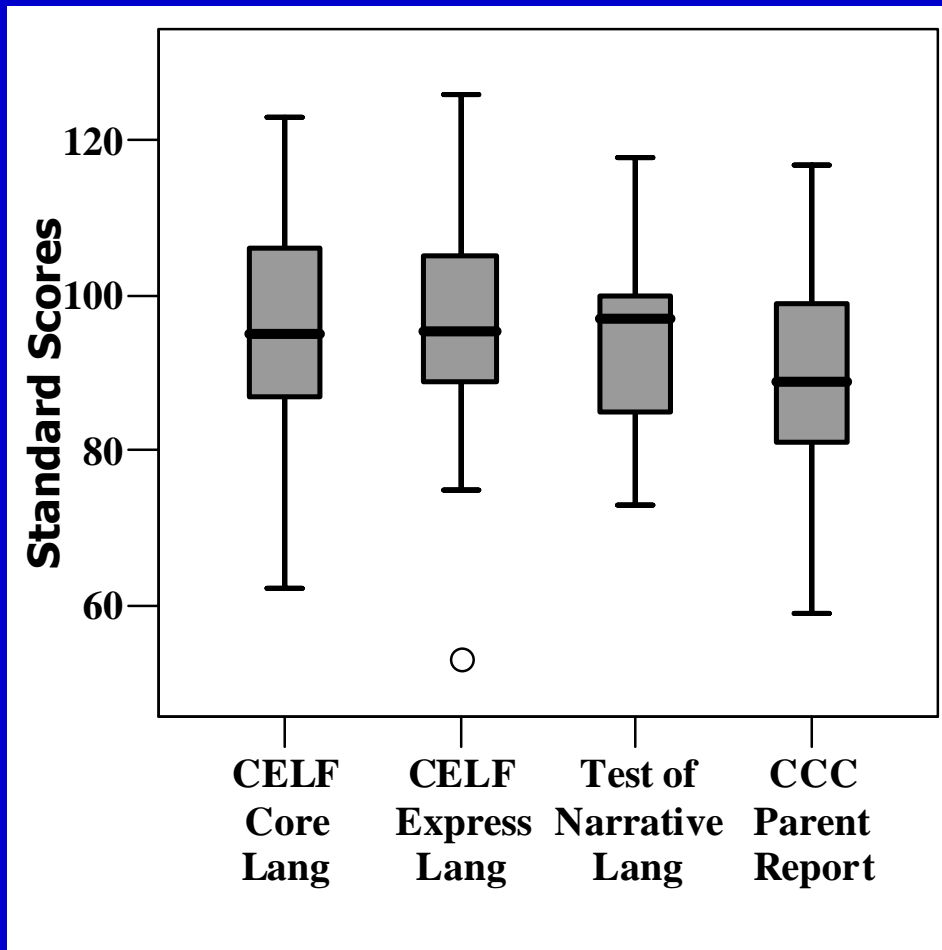


# Current Work: Measures

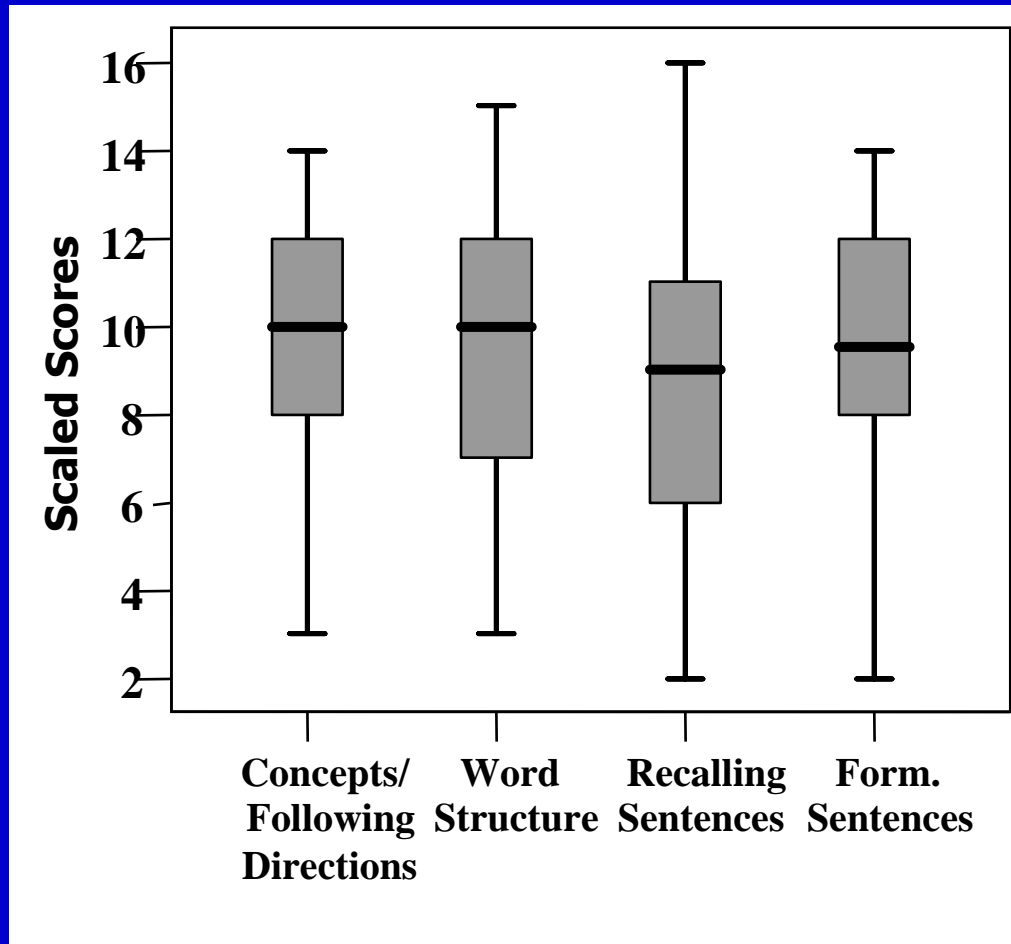
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- CELF-4
- Test of Narrative Language
- Rice-Wexler Test of Early Grammatical Impairment
- Nonword repetition task (Dollaghan & Campbell, 1998)
- Twelve minute conversational sample
- Social knowledge
  - Peer conflict
- Children's Communication Checklist

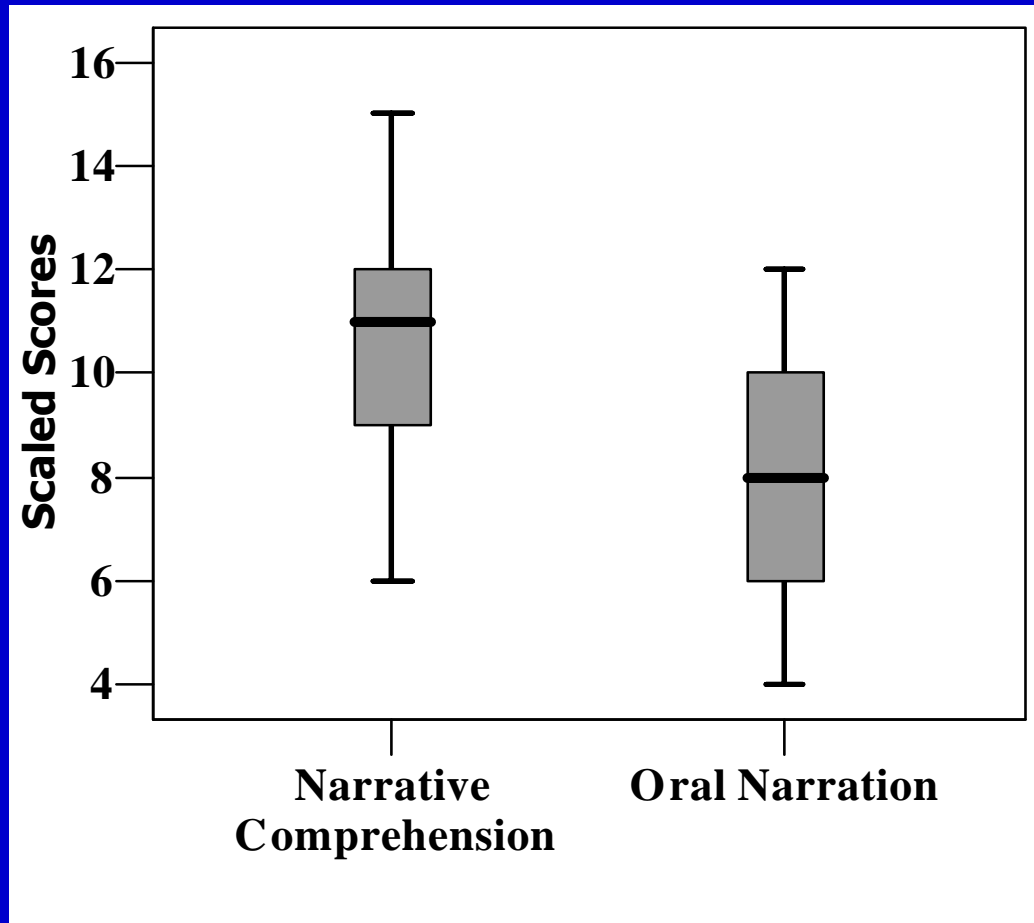
# Composite Performance



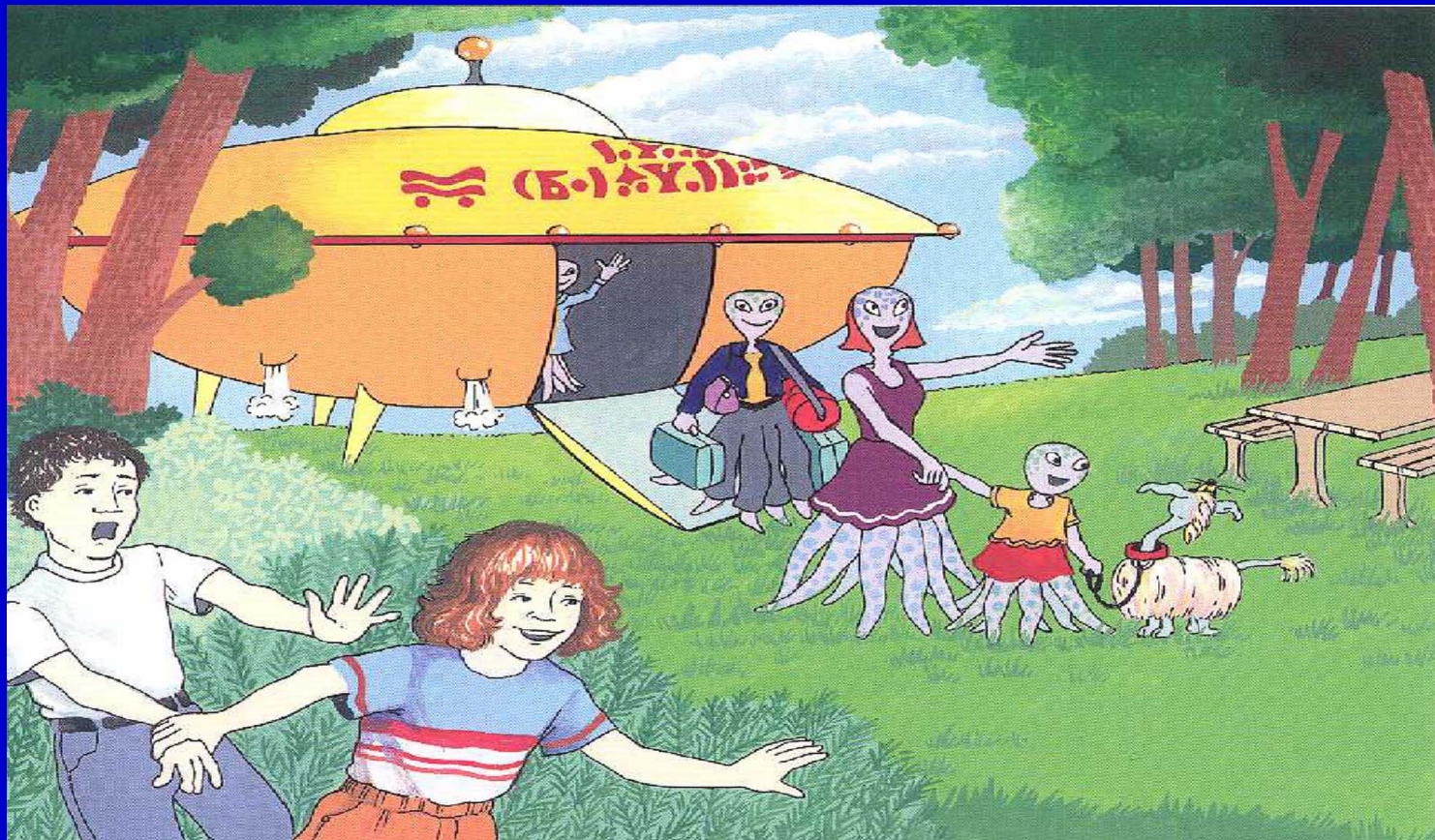
# CELF-4 Subtest Performance



# TNL Subtest Performance



# TNL: Single Picture Task





# TNL: Story Sample #1

**Male age 7;5**

C (um) Some alien/s from space want/ed to move in onto earth.

C And everybody got scared cause of the alien/s.

C Their alien dog, their alien daughter, their alien mother and father, their alien sister, and their alien brother.

C And everybody ran away.

C That/s that.

A And that/s it?

C Can I name them?

A Sure.

C This one/s Frank Junior.

C This one/s Debbie.

C This one/s Diana.

C This one/s Cindy.



# TNL: Story Sample #2

**Male: age 7;3**

- C (Mom) it seem/3s like a mom, a kid and a kid were travel/ing down (the to the place) to a place.
- C (oh they saw a) they saw a ship land/ing.
- C they went where the ship was land/ing.
- C it was alien/s.
- C a dog alien, a kid alien, a mom alien, and a dad alien.
- C the mom said "look at this"!
- C the kid start/ed talk/ing to the dog.
- C the dog walk/ed up to the tree/s.
- C then the rocket ship close/ed up.
- C and they flyed [EO:flew] away.
- C the boy was try/ing to hold the girl (back) back but the girl kepted [EO:kept] on run/ing.
- C the girl said "hi" to (the) the alien/s.
- C and then they went home.
- C (they told mom and dad) We'll it's not in the story but I'm pretend/ing.
- C they went home.
- C and told mom and dad but mom and dad did not believe it.
- C And then she told them.
- C and then she took them to the place.
- C they sawed [EO:saw] them. C and then they went home.



# Future Directions

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- Develop protocols for accurate assessment of LI in children with ADHD
- Contrast this performance with children who are LI only
  - Standardized performance
  - Clinical markers
  - Report measures
- Examine the contribution of LI to social knowledge and performance in children with ADHD

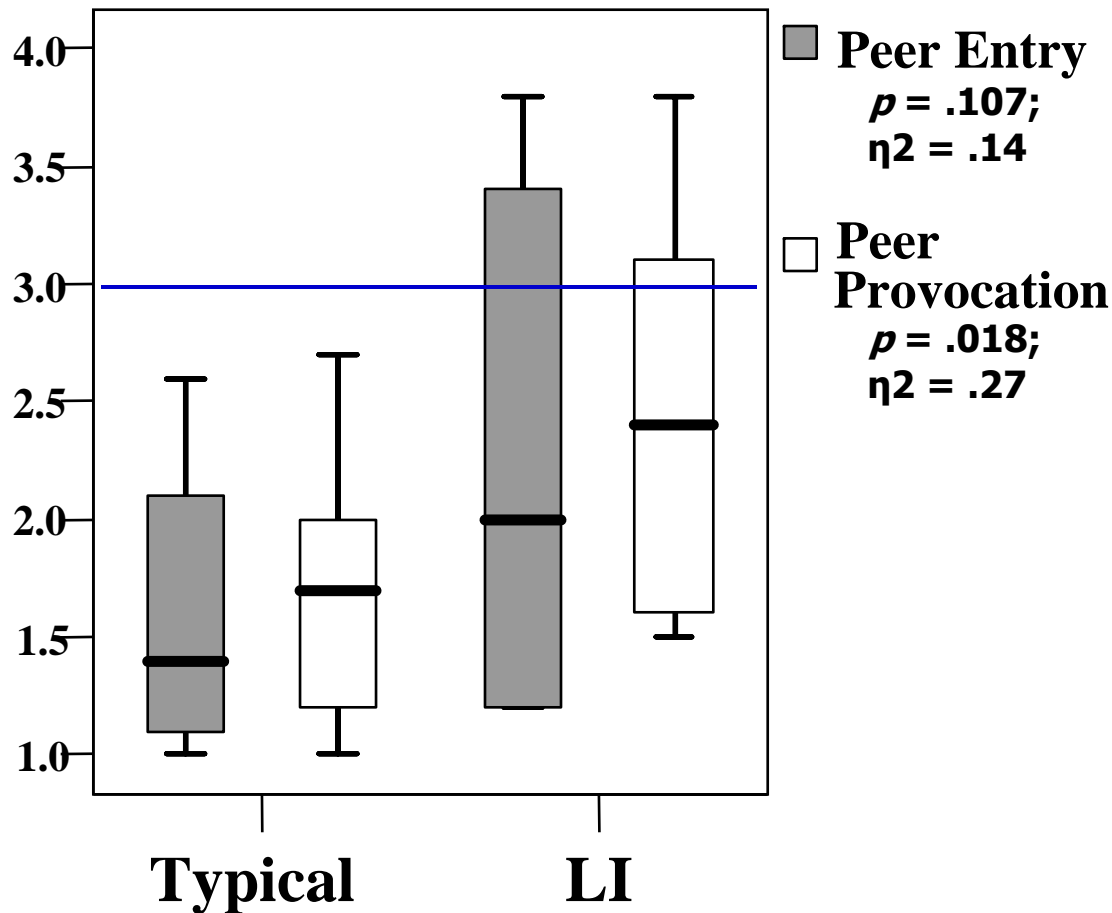


# Questions

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- Email: [grtimler@buffalo.edu](mailto:grtimler@buffalo.edu)

# Teacher Ratings of Problematic Situations





# Drug Effects on Language-Related Tasks

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- Effects are task-dependent
  - Positive effects on inference comprehension (McInnes, Bedard, Hogg-Johnson, & Tannock, 2007)
  - No effects on narrative length but positive effects on aspects of story grammar
    - (Francis, Fine, & Tannock, 2001)
  - No effects on auditory performance
    - (Tillery, Katz, & Keller, 2000)