Assessment of Narratives in School-age Children

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Disclosure

- Ron Gillam receives royalties from the sale of the Test of Narrative Language - 2, which is distributed by Pro-Ed.

Today’s Presentation

1. Summarize key issues in measuring narrative comprehension and narrative production
2. Explain the differences between a norm-referenced test of narration (TNL-2) and a narrative progress monitoring tool (MISL)
   a. Purposes
   b. Methods
   c. Reliability and validity
   d. Use of scores
3. Clinical applications
Story Example (Child with DLD)

(Um um the leaf) the leaves is coming out. Think it was fun (because because) because she just need to want to play leaf. And then she jump in the leaf. And (they) she was trash X. And then she play in the> (A a girl) a girl don’t know that she want to go to the (um) leafs. And then (and then and then) the (trees) trees coming. And then she jumping. And then she will get it a little down.

What is Narration?

- Type of discourse involving orderly accounts of real or imagined events
- Coherent sequences of utterances with a common theme
- Characters, actions, complications, resolutions
- Actions occur in temporal order
- Causal relationships between characters and actions
- Character’s responses, reactions, feelings, thoughts

Overview of Narration

- What are the component parts of a narrative?
  - Macrostructure (story grammar + causal framework)
    - Episode structure and complexity
  - Microstructure
    - Language used to convey the information in the story
      - Cohesion
      - Sentence Complexity
Macrostructure

- Character
- Setting
- Time & Place
- Internal Response
- Feelings
- Plan
- Actions
- Attempts
- Consequence

Episode structure

Some robbers entered the Chicago Bank & Trust. They demanded money and started shooting their guns in the air. Wonder Woman happened to be driving by when she heard shots coming from the bank. She knew the people inside needed her help. She decided to change into her Wonder Woman suit and get over there. She climbed up the back wall of the bank and went into an upstairs window. Once she got into the bank, the robbers started shooting at her.

She used her magic arm bracelets to knock away the robbers’ bullets. Then she used her magic lasso to round them up until the police came. The police came and took the robbers to jail. The bank employees were grateful to Wonder Woman for saving their lives. Once again, Wonder Woman saved the day and showed that crime does not pay.
Analysis of Rocket Boy

Rocket Boy lived in the year 2550 on the planet Zigvol. As he was flying to school one day, his rocket pack started to sputter. Rocket Boy was scared because he didn’t want to be late for school. He thought, I’d better check the pluger hose. He reached back and found the problem - a hole in the pluger hose. Rocket Boy took some gum out of his mouth and covered the hole in the hose. His rocket pack roared to life. Luckily, he made it to school just before the bell rang. Rocket Boy was relieved. He thought, “That’s why my parents always say to check the hoses on my rocket pack every day.” From that day on, he checked his pack carefully before he went anywhere.

Episode Complexity

- Descriptive Sequence – description with no actions
- Action Sequence - chronology of actions
- Incomplete Episode - IE, A, or C missing
- Basic Episode - IE, A, C
- Complex Episode - multiple P, IE, or A with a complication
- Embedded Episode - multiple episodes
  -(often C of 1 is the IE of 2)

Episodic Development

- 3 - 4, Descriptions - Setting/characters
- 4 - 5, Action Sequence - string of actions
- 5, Basic Episode
  - Initiating Event, Attempt(s), Consequence
- 6, Complete Episode
  - Internal responses, Plans, Reactions, and Endings begin to appear
- 7 - , Complex Episodes and Multiple Episode Stories
Story 1

There's a lot of kids and parents at the beach.
They're trying to find sea shells.
And they're getting wet.

Story 2

So once upon a time there were all of these men and they were on a bike race in Cache Vilosa. And so they decided to get on their bikes and wait for the signal to drop down for them. So that's what they did. So they got on their bikes and started racing down the road track. And that's my very best story.

Story 3

Once upon a time there was a boy named Rylan and he was in a helicopter in the afternoon time. He decided to jump in his best blue helicopter and got in it and flew away into the sky. So that's what he did. He was going to fly in the helicopter until it was lunchtime. But uh oh, his helicopter fuel gauge said that his gas was about to get dead so he decided to land at a helicopter gas station. So that's what he did. He landed at a helicopter gas station. He got gas and went back into his helicopter. He went to his house, ate lunch, and had biscuits and gravy for lunch. He felt pleased that he was finally full.
Microstructure of literate language

• Complex sentences
  • Coordinated conjunctions
    • FANBOYS (for, and, nor, but, or, yet, so)
  • Subordinating (adverbial conjunctions)
    • Before she stole the candy, she made sure nobody was looking.
    • You have to snowboard fast down the hill if you want to catch Alex.
  • Infinitives
    • I ran to look at the beautiful sunset.
    • I want you to come with me to see that sunset.

More complex sentences

• Clausal Complements
  • I knew she wouldn’t eat dinner with him after the argument.
• Relative Clauses
  • Subjective: The boy who told on you doesn’t have many friends.
  • Objective: I saw the boy who told on you.

Microstructure

• Literate language
  • Elaborated noun phrases
    • The mean, old goat...
  • Adverbs
    • When, after, if, since
  • Metalinguistic verbs
    • Said, screamed, yelled, hollered, whispered
  • Metacognitive verbs
    • Thought, decided, wanted, planned
Microstructure

- Linguistic markers for transitions and elaboration
  - Temporal – first, next, before, after, when, while
  - Causal – because, since, so
  - Words that indicate a comparison – also, but, however, as well as
  - Adverbs – quickly, luckily, warmly

- Linguistic markers for mental and communicative functions
  - Mental – thought, wondered, worried, hoped
  - Communicative – said, yelled, whispered, told,

Narrative Comprehension

- Construction Integration Model (Kintsch, 2004, 2013)
  - Construct a textbase – literal representation of what the text says
    - Microstructure – links between words in sentences
    - Macrostructure – hierarchical (temporal and causal) relationships between key elements of the story
  - Integration – for a situation model (interpretation of what the text means)
    - Textbase + background knowledge in LTM
    - Requires inferences
      - Local – connections among concepts (temporal and causal)
      - Global – links between characters, initiating events, internal responses, plans, actions, consequences, and reactions

Narrative ability predicts

- Oral language skills in general (Bishop & Edmunson, 1987; Fazio, Naremore & Connell, 1996)
- Language comprehension (Bishop & Adams, 1992; Gillam, Fargo & Robertson, 2009)
- Reading (Cook & O’Brien, 2014; Lapp, Flood & Farman, 1989; Vandewalle et al., 2012; Zucker et al., 2013)
- Reading comprehension (Barton-Husey, Sevcik & Romski, 2017)
- Writing (Bain, Ballet & Moats, 1991; Koustsoftas & Gray, 2012; Montague, 1990; Scott & Windsor, 2000)
Cultural Differences

- Contexts for social use
- Content
  - Moral code
  - Concern with authority
  - Autonomy and self-determination
  - Aggression
  - Emotional expressiveness
- Structure
  - Similar propositions, different arrangement

Children with Language Impairments

- Macrostructure Level
  - Greater variability across contexts
  - Incomplete references to characters and story contexts (Garnet, 1986)
  - Fewer story grammar propositions related to character plans, actions, complications, and reactions (Dollaghan & Campbell, 1992; Gillam & Johnston, 1992; Klecan-Aker & Kelly, 1990; Paul et al., 1996)
  - Lower holistic scores (McFadden & Gillam, 1996)

- Microstructure Level
  - Restricted vocabulary (Garnet, 1986; Greenhalgh & Strong, 2001)
  - Fewer complex sentences (Dollaghan & Campbell, 1992; Gillam & Johnston, 1992; Riley et al., 2004)
  - More grammatical errors (Gillam & Johnston, 1992; Liles, Duffy, Merritt, & Purcell, 1995; Scott & Windsor, 2000; Riley et al., 2004)
  - Fewer or problematic cohesive ties (Boudreau & Chapman, 2000; Paul et al., 1996; Strong & Shaver, 1991)
## Purposes of Assessment

<table>
<thead>
<tr>
<th>TOOL</th>
<th>PURPOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norm-referenced Tests</td>
<td>Determine to which extent a child differs from same age peers; assists with diagnosis</td>
</tr>
<tr>
<td>Developmental Scales</td>
<td>Establish baseline function</td>
</tr>
<tr>
<td>Interviews/Questionnaires</td>
<td>Identify goals for intervention</td>
</tr>
<tr>
<td>Criterion-Referenced Procedures</td>
<td>Proximal measures of changes that are related to treatment</td>
</tr>
</tbody>
</table>

It is not valid to use tools for purposes for which they were not designed (e.g., standardized tests should not be used for monitoring treatment)


### Norm-referenced Assessment

Test of Narrative Language - 2

### Norm-referenced tests of narration

- Renfrew Bus Story (Cowley & Glasgow, 1994)
- Expression, Reception & Recall of Narration Instrument (ERRNI – Bishop, 2004)
- Edmonton Narrative Norms Instrument (ENNI – Schneider, Dube’ & Howard, 2004)
- Test of Narrative Language – 2 (TNL-2 – Gillam & Pearson, 2018)
Renfrew Bus Story

- 3:0 – 6:11
- Retell a story from a picture book
- Information score (amount of information included from original story)
- MLU (mean of 5 longest utterances)
- Complexity score (number of sentences containing relative or subordinate clauses)

Expression, Reception & Recall of Narration Instrument (ERRNI)

- 4 – adult
- Tell and then retell the Fish Story or the Beach Story with picture cues
- Measures:
  - Story Content Recalled
  - Grammatical Complexity
  - Comprehension
  - Forgetting

Edmonton Narrative Norms Instrument
http://www.rehabresearch.ualberta.ca/enni/

- 4:0 – 9:11
- Generate stories from pictures (2 story sets of 3 stories each)
- Measures:
  - Story Grammar
  - First Mentions
  - Language sample measures: MLCU, Syntactic Complexity Index, No. of Words, No. Different Words
  - Norms for 2 measures on 377 children from Edmonton, Alberta, Canada
  - Available in French
### Test of Narrative Language-2

- **Ages 4-15**
- **Components of Language - Language Use**
- **Formats:**
  - Script-like story
  - Personal narratives (sequence pictures)
  - Fictional narratives (single picture of a scene)
- **Modality:**
  - Comprehension & Production

- **No transcription - scored while listening to audiotape**
- **Test-retest reliability**
  - Comprehension score - 85
  - Production score - 82
  - Total Score (combined) - 93

### Comprehension: Script-like narratives

- **McDonalds Story**
  - examiner tells a script-like story
    - unsolved problem at the end
    - respond to literal and inferential questions
    - solve problem
Literal Questions

- Text: On Tuesday, Lisa and Raymond ran in and threw their backpacks on the floor
- Question: What day of the week was it?

Inferential Questions

Lisa finally made up her mind. She told the clerk, “I’ll have chicken nuggets, a Coke, and an ice cream cone.” Lisa’s mom paid the clerk and went to sit down. When she looked up, Lisa was standing there with a big brown stain down the front of her shirt and skirt. Lisa started crying and said, “Look what I did!”

Local: What did Lisa order?
Elaborative: What kind of ice cream cone did Lisa order?
Explanatory (causal): Why was Lisa crying?
Predictive: How will Lisa’s mom get the stain out?

Production: Script-like narrative

- Child retells the McDonalds Story
- Scored for
  - Content
    - Setting, Motivating events, Actions, Consequences
  - Temporal and Causal Conjunctions
  - Grammaticality
  - Dialogue
  - Coherence
  - Complexity
Comprehension: Personal Narrative

- Shipwreck
  - Sequence of 5 pictures
  - Examiner reads a story – 1 episode
  - Child answers literal and inferential questions about the story

Production: Personal Narrative

- Late for School
  - Sequence of 5 pictures about a boy who is late for school.
  - Child creates a story.
  - Elaborative inference required

Comprehension: Fictional Narrative

- Dragon Story
  - Fantasy picture (single scene) about a dinosaur in a cave.
  - Examiner tells a complex story
  - Child answers literal and inferential questions
Production: Fictional Narrative

- Aliens story
- Fantasy picture with Alien family
- Child creates story

Reliability

<table>
<thead>
<tr>
<th>Type of reliability coefficient</th>
<th>TNL-2 values</th>
<th>Coefficient alpha</th>
<th>Test-retest</th>
<th>Scorer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehension</td>
<td>81</td>
<td>85</td>
<td>99</td>
<td></td>
</tr>
<tr>
<td>Production</td>
<td>87</td>
<td>82</td>
<td>99</td>
<td></td>
</tr>
<tr>
<td>Narrative Language Ability</td>
<td>90</td>
<td>95</td>
<td>99</td>
<td></td>
</tr>
</tbody>
</table>

Sources of test errors

- Content heterogeneity
- Time sampling
- Interscorer differences


Content Validity

<table>
<thead>
<tr>
<th></th>
<th>Comprehension</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microstructure</td>
<td>Literal questions</td>
<td>Grammaticality and Sentence Complexity</td>
</tr>
<tr>
<td>Macrostructure</td>
<td>Gap-filling Inferential Questions</td>
<td>Story Elements, Completeness, and Complexity</td>
</tr>
</tbody>
</table>
Construct Validity

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Language Score</td>
<td>.51 (a)</td>
<td>.56 (b)</td>
<td>.81 (a)</td>
<td>.81 (b)</td>
</tr>
<tr>
<td>Sentence Repetition</td>
<td>.84 (a)</td>
<td>.51 (5)</td>
<td>.81 (a)</td>
<td>.81 (b)</td>
</tr>
<tr>
<td>Reading Comprehension</td>
<td>.44 (f)</td>
<td>.23 (5)</td>
<td>.41 (f)</td>
<td>.41 (b)</td>
</tr>
<tr>
<td>Oral Expressions</td>
<td>.22 (5)</td>
<td>.41 (f)</td>
<td>.41 (f)</td>
<td>.41 (b)</td>
</tr>
<tr>
<td>Writing</td>
<td>.22 (5)</td>
<td>.41 (f)</td>
<td>.41 (f)</td>
<td>.41 (b)</td>
</tr>
<tr>
<td>Cognitive Measures</td>
<td>.54 (d)</td>
<td>.50 (l)</td>
<td>.50 (l)</td>
<td>.50 (l)</td>
</tr>
</tbody>
</table>

Research Report

Children with specific language impairment: an investigation of their narratives and memory

Krissy Dochell and Edith L. Berin
School of Psychological Science, La Trobe University, Victoria, Australia
Construct Validity: Comprehension Production

Construct Validity: Developmental Sensitivity

Construct Validity: Diagnostic Accuracy

Sensitivity - accuracy at diagnosing disorder
Specificity - accuracy at diagnosing non-disorder
### Construct Validity: Diagnostic Accuracy

<table>
<thead>
<tr>
<th>Cutoff Index Score</th>
<th>SD</th>
<th>Percentile Rank</th>
<th>Sensitivity Index</th>
<th>Specificity Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>-2</td>
<td>2</td>
<td>.14</td>
<td>1.0</td>
</tr>
<tr>
<td>82</td>
<td>-1.2</td>
<td>12</td>
<td>.43</td>
<td>1.0</td>
</tr>
<tr>
<td>85</td>
<td>-1</td>
<td>16</td>
<td>.55</td>
<td>.98</td>
</tr>
<tr>
<td>90</td>
<td>-0.7</td>
<td>25</td>
<td>.78</td>
<td>.95</td>
</tr>
<tr>
<td>92</td>
<td>-0.5</td>
<td>30</td>
<td>.92</td>
<td>.92</td>
</tr>
</tbody>
</table>

### School Diagnosis

<table>
<thead>
<tr>
<th>School Diagnosis</th>
<th>LLD</th>
<th>non-LLD</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>LLD</td>
<td>47$^a$</td>
<td>21$^b$</td>
<td>68</td>
</tr>
<tr>
<td>TNL-2</td>
<td>236$^c$</td>
<td>240</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>51</td>
<td>257</td>
<td>308</td>
</tr>
</tbody>
</table>

Note: Sensitivity index = 47/51 = .92; specificity index = 236/257 = .92; classification accuracy = (47 + 236)/308 = .92

$^a$ True positive; $^b$ False positives; $^c$ False Negatives; True Negatives.

### Norm referenced tests of narration

- Should measure comprehension and production
- Comprehension items should include both literal and inferential questions
  - Inferences: text-connecting, gap-filling
    - predictive, explanatory (causal), elaborative (associative)
- Score both macrostructure and microstructure elements
- Reliability – item, test-retest, scorer
- Validity – content, construct (developmental, diagnostic accuracy)
Clinical Applications

Delphi study Bishop et al., 2016
- Consensus-building method
- 59 experts rated statements
- Comparison of ratings
- Re-rate statements
- Predominantly UK
  - Australia, Canada, Ireland, New Zealand, USA

(10-11) Combine information from multiple sources: caregiver report, observation, standardized tests, language learning context.
(12-13) Language ability is continuous, with a sharp cut-off between normality and impairment.
(14) Use staged approach: initial assessment that taxes both expressive and receptive skills, then more specific.
(15-16) Different aspects of language vary in sensitivity to social and language background, but it is unrealistic to see language profile as being either social vs. biological origins.
(17-18) Measures of language learning can complement static tests of knowledge/skill.
(19) Pragmatics/social communication should be assessed alongside other aspects of language.
Diagnostic criteria

- Performance <81 (-1.25 SD) on a Global Language Test
- CELF-5, CASL, TOLD-P
- Observations – child at risk for disvalue in important conversational/academic settings
- Interviews – level of concern among parents and teachers

Review

Specific language impairment: a convenient label for whom?

Sherna Bailly, Bruce Tomblin, James Laws, Carina McKean, Fiona K. Menzies, Angela Morgan, Sharan Goldfield, Jon M. Nicholson and Melissa Wake
[Monash Children’s Research Institute, Royal Children’s Hospital, Parkville, VIC, Australia]
[Department of Paediatrics, University of Melbourne, Parkville, VIC, Australia]
[University of Iowa, Iowa City, IA, USA]
[Newcastle University, Newcastle upon Tyne, UK]
[Parenting Research Centre, Victoria Parade, East Melbourne, VIC, Australia]

Epidemiological Studies

Table 1. Summary of the Early Language in Victoria (ELIV) and Iowa epidemiological studies including participant numbers, sample characteristics, and language and non-verbal measures

<table>
<thead>
<tr>
<th>Study</th>
<th>Author</th>
<th>Sample size</th>
<th>Age (years)</th>
<th>Language measure</th>
<th>Non-verbal measure</th>
</tr>
</thead>
</table>

Note:
- ELIV = Early Language in Victoria
- ELIV = Early Language in Victoria
- WASI = Weschler Abbreviated Scale of Intelligence
Epi-SLI Multivariate Assessment System

- 2 or more Composites: -1.25 SD (81)
- Overall score: -1.11 SD (83)

<table>
<thead>
<tr>
<th>Test Name</th>
<th>Receptive</th>
<th>Expressive</th>
<th>Composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocabulary</td>
<td>TOLD:P Picture Identification</td>
<td>TOLD:P Oral Vocabulary</td>
<td>Vocabulary Composite</td>
</tr>
<tr>
<td>Grammar</td>
<td>TOLD:P Sentence Understanding</td>
<td>TOLD:P Grammatic Completion and Sentence Initiation</td>
<td>Grammar Composite</td>
</tr>
<tr>
<td>Narrative Comprehension</td>
<td>Narrative Recall</td>
<td>Narrative Comprehension</td>
<td></td>
</tr>
<tr>
<td>Receptive</td>
<td>Expressive</td>
<td>Receptive Composite</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2. Language composite scores plotted against non-verbal IQ for 609 eight-year-old children in the Iowa study.
Gillam studies

<table>
<thead>
<tr>
<th></th>
<th>Acquisition</th>
<th>Expression</th>
<th>Composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocabulary</td>
<td>CREV/Receptive</td>
<td>CREV/Expressive</td>
<td>CREV/Composite (z-score)</td>
</tr>
<tr>
<td>Grammar</td>
<td>CASL – Sentence Comprehension, Grammatical Judgment</td>
<td>CASL – Syntax Construction, Grammatical Morphemes</td>
<td>Average Z score</td>
</tr>
<tr>
<td>Narration</td>
<td>TNL – Comprehension</td>
<td>TNL – Production</td>
<td>TNL – Narrative Language Ability Index</td>
</tr>
<tr>
<td></td>
<td>Average z-score</td>
<td>Average z-score</td>
<td></td>
</tr>
</tbody>
</table>

Z Score Transformations

- (Score – Mean)/Standard Deviation
- Deviation Quotient (M = 100, SD = 15)
  - (83 – 100) / 15 = 1/15 = .13
  - (81 – 100) / 15 = 1/15 = .13

- Scaled Score (M = 10, SD = 3)
  - 7 – 12 / 3 = –1/3 = –1.0
  - 6 – 10 / 3 = –2/3 = –1.33

Summary: Language Impairment Phenotype

- Unusual difficulties understanding or using language
- Don’t use nonverbal IQ as exclusionary criteria
- More likely to normalize in preschoolers than school-age children
- Co-occurs with other problems – motor skills, literacy, mathematics, socialization, behavior, information processing skills
- Is persistent after age 5 (about 70% of children diagnosed at age 5 still have language deficits at 19)
Atypical Narrative Discourse Abilities

- Home cultures may value different types of narratives than the ones used in school.
- Children may have less experiences listening to and telling stories or with elaborative language.
- Children may be poor language learners

Differentiating Language Difference from Language Disorder (Laing & Kamhi, 2003)

- Standardized tests are nearly useless for differential diagnosis when culture or experience is an issue.
- Linguistic and Content Bias
- Representation of Minorities in Normative Samples
- Observation may not readily reveal whether problems are related to lack of experience or lack of language learning abilities.
- "Watch and See?"

Processing dependent measures (NWR, CLPT) or interactive assessment procedures such as dynamic assessment may be useful.

Pretest – Posttest

<table>
<thead>
<tr>
<th>Study</th>
<th>Participants</th>
<th>Design</th>
<th>Effect size</th>
<th>Description</th>
<th>Measured</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. G. Glenn, E.-M., &amp; Gillam, 2014</td>
<td>Children at Risk for Language Learning Difficulties</td>
<td>Whole class, 2 sessions per week, 6 weeks, one experimental and one comparison class</td>
<td>.33 (moderate)</td>
<td>Explicit training for SRL, explicit and implicit instruction in metacognition, using wordless books and literature, and instruction only</td>
<td>TNAL/Composite Score</td>
</tr>
<tr>
<td>2. G. Glenn, E.-M., &amp; Gillam, 2017</td>
<td>Children with Language Impairment</td>
<td>Small group, 35-40 minutes, 6 weeks, groups of 3</td>
<td>1.45 (large)</td>
<td>Explicit training for SRL, explicit and implicit instruction in metacognition, using wordless books and literature, and instruction only</td>
<td>TNAL/Composite Score</td>
</tr>
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Progress Monitoring

Monitoring Indicators of Scholarly Language (MISL)

Comprehensive Progress Monitoring Tool

- Monitoring Indicators of Scholarly Language (MISL)

- Spontaneously generated narratives elicited from a single picture.

- Designed to measure growth in macrostructure (character, setting, initiating event, internal response, attempts, consequence, internal response) and microstructure (coordinating and subordinating conjunctions, adverbs, mental/linguistic verbs, elaborated noun phrases).

- Easy to score

Transcribe the story into C-units

Listen for pauses and sentence ending intonation (rising pitch on questions or falling pitch on statements) as clues for utterance boundaries.

Segment into utterances that contain an independent clause plus its modifiers.
C-units can be incomplete
For example:
- The dog asked him, "Where's the cat?"
- "Over there."
- "Oh, okay."

C-units can be single clause utterances
For example
- John wanted that ball.
- Susan wanted it too.

---

Coordinating Conjunctions
- If a subject is stated or restated after the coordinating conjunction segment the utterance just before the conjunction
  - John was yelling. And Susan was laughing at him.

- If no subject is stated after the coordinating conjunction, do not segment the utterances until the next main clause appears
  - Susan was laughing and crying at the same time. John couldn't understand that.

---

A C-unit can contain any number of dependent clauses.
- Subordinating conjunction - My dog jumped on her because she wanted to.
- Adverbial clause - My dog jumped on her right after she came in.
- Clausal complement - She thought, I don't even like dogs.
- Relative clause - The dog that my brother found jumped up on my friend.
- Infinitives - My dog likes to jump up on people.
Try segmenting this story into C-units

When Jennifer was 8 years old her mom helped her build a ship for a school project when Jennifer was taking it to school she dropped it in a mud puddle her ship was broken and dirty Jennifer was very sad and she started crying then she said to herself crying won’t help I’m going to fix my ship at school when she got to her classroom she cleaned off the mud and taped the boat back together when her teacher came over she was surprised to see a dirty half-broken ship that was held together with tape Jennifer explained what had happened Jennifer’s teacher said you deserve an A for trying your best to solve a problem that made Jennifer very happy.

Story 1

There’s a lot of kids and parents at the beach. They’re trying to find sea shells. And they’re getting wet.

Story 2

So once upon a time there were all of these men and they were on a bike race in Cache Vilosa. And so they decided to get on their bikes and wait for the signal to drop down for them. So that’s what they did. So they got on their bikes and started racing down the road track. And that’s my very best story.
Story 3

Once upon a time there was a boy named Rylan. And he was in a helicopter in the afternoon time. He decided to jump in his best blue helicopter and got in it and flew away into the sky. So that’s what he did. He was going to fly in the helicopter until it was lunchtime. But uh oh, his helicopter fuel gauge said that his gas was about to get dead. So he decided to land at a helicopter gas station. So that’s what he did. He landed at a helicopter gas station. He got gas and went back into his helicopter. He went to his house, ate lunch, and had biscuits and gravy for lunch. He felt pleased that he was finally full.
We never give credit for elements that are not stated explicitly. The MISL is tied to our intervention. We teach the elements that are tested.

If you give credit for what you think the child meant, there is no way to document progress when the child actually states what s/he means.

Reliability and Validity

- Reliability
  - Internal Consistency: Cronbach’s alpha = .79
  - Inter-rater: 95%

- Validity
  - Construct Validity
    - Macrostructure and Microstructure dimensions
    - Confirmatory Factor Analysis
      - overall model fit: χ²(df = 53) = 81.27; p = .006; χ²/df ratio = 1.53; CFI = .99; TLI = .98;
      - RMSEA = .06, and the average WRMR = .82.
Story 1

- There's a lot of kids and parents at the beach.
- They're trying to find sea shells.
- And they're getting wet.
Story 2

So once upon a time there were all of these men and they were on a bike race in Cache Vilosa. And so they decided to get on their bikes and wait for the signal to drop down for them. So that’s what they did. So they got on their bikes and started racing down the road track. And that’s my very best story.
Story 3

Once upon a time there was a boy named Rylan. And he was in a helicopter in the afternoon time. He decided to jump in his best blue helicopter and got in it and flew away into the sky. So that's what he did. He was going to fly in the helicopter until it was lunchtime. But uh oh, his helicopter fuel gauge said that his gas was about to get dead. So he decided to land at a helicopter gas station. So that's what he did. He landed at a helicopter gas station. He got gas and went back into his helicopter. He went to his house, ate lunch, and had biscuits and gravy for lunch. He felt pleased that he was finally full.
Story 4

The kid is waking up. He had to hurry for he get late. He tied his shoes but it brake. He had to get in school bus. But it's too late.

C He ran to it.
C But no use.
C When he walked teacher is very mad at him.
C That's because he got late.
C Yep the bell ring/ed.
C But he/’s too late.
C Too late.
Story 5

- C Max and Bob were at the foothills and they have two horses for their ride.
- C And then one night a wolf (was) was nearby and they were scared because the horses were their ride.
- C Their plan is to get, (I mean) guard the horses.
- C The first thing they do they guard the horses.
- C Second they look out for the wolf then the wolf was running to the horses but then both of them scared the wolf and the wolf ran to the rocky mountains.
- C Now Max and Bob were calm because now the wolf is not gonna get their horses again.
- C The end.

<table>
<thead>
<tr>
<th>Character</th>
<th>Joe</th>
<th>Joey</th>
<th>Obwee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting</td>
<td>Back yard</td>
<td>During the day, Last night, That day</td>
<td></td>
</tr>
<tr>
<td>Initiating Event</td>
<td>Playing in mud</td>
<td>Mom brought breakfast and discovered kids had mud all over them</td>
<td></td>
</tr>
<tr>
<td>Internal Response</td>
<td>Thought they'd get from mud (before to not mud (Plan in 2nd episode))</td>
<td>They decided to go take a bath</td>
<td></td>
</tr>
<tr>
<td>Plan</td>
<td>Thought they'd get from mud (before to not mud (Plan in 2nd episode))</td>
<td>Decided they'd hit the faucet (Finn in 2nd episode)</td>
<td></td>
</tr>
<tr>
<td>Attempt</td>
<td>Said they had to take bath</td>
<td>Water wasn't running (hit the faucet)</td>
<td></td>
</tr>
<tr>
<td>Consequence</td>
<td>They decided to go take a bath</td>
<td>Got clean</td>
<td></td>
</tr>
<tr>
<td>Reaction</td>
<td>Happy they got a bath</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Microstructure**

<table>
<thead>
<tr>
<th>Coordinating</th>
<th>Then, and then, and, but, or</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subordinating</td>
<td>what, Before</td>
</tr>
<tr>
<td>Mental</td>
<td></td>
</tr>
<tr>
<td>Linguistic</td>
<td>said, like</td>
</tr>
<tr>
<td>Adverbs</td>
<td>before, so, All of a sudden, before</td>
</tr>
<tr>
<td>ENP</td>
<td>His friend</td>
</tr>
</tbody>
</table>
Clinical Focus

Improving Narrative Production in Children With Language Disorders: An Early-Stage Efficacy Study of a Narrative Intervention Program

Sandra L. Gillam, Abbie Otzweksl, Katie Squires, Katie Wolfs, Timothy Stocum, and Ronald B. Gillam
<table>
<thead>
<tr>
<th>Participant</th>
<th>Baseline Avg</th>
<th>T1 Session Avg</th>
<th>T2 Session Avg</th>
<th>Percent Change</th>
<th>PRO</th>
<th>Tau-U</th>
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</thead>
<tbody>
<tr>
<td>NML Set 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 - Breck</td>
<td>20.67</td>
<td>66</td>
<td>128</td>
<td>95%</td>
<td>.92**</td>
<td></td>
</tr>
<tr>
<td>2 - Sam</td>
<td>43.18</td>
<td>147.67</td>
<td>228</td>
<td>85%</td>
<td>.71**</td>
<td></td>
</tr>
<tr>
<td>NML Set 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 - Paul</td>
<td>16</td>
<td>35.67</td>
<td>123</td>
<td>84%</td>
<td>.81**</td>
<td></td>
</tr>
<tr>
<td>5 - Jenn</td>
<td>12.21</td>
<td>56.33</td>
<td>363</td>
<td>90%</td>
<td>.74**</td>
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<tr>
<td>NDL Set 1</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1 - Breck</td>
<td>11.67</td>
<td>25</td>
<td>97%</td>
<td>100%</td>
<td>1.00**</td>
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<tr>
<td>2 - Sam</td>
<td>16.16</td>
<td>25.67</td>
<td>59%</td>
<td>70%</td>
<td>.81**</td>
<td></td>
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<tr>
<td>NDL Set 2</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 - Paul</td>
<td>10.33</td>
<td>19</td>
<td>94%</td>
<td>52%</td>
<td>.46</td>
<td></td>
</tr>
<tr>
<td>5 - Jenn</td>
<td>6.71</td>
<td>24.33</td>
<td>263</td>
<td>87%</td>
<td>.61**</td>
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</tr>
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</table>
Summary

- Key issues in measuring narrative comprehension and production

<table>
<thead>
<tr>
<th></th>
<th>Comprehension</th>
<th>Production</th>
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<tbody>
<tr>
<td>Microstructure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Macrostructure</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Monitoring Indicators of Scholarly Language (MISL) total score, percent nonoverlapping data (PND), and percent improvement over baseline (PIB) for each participant.

<table>
<thead>
<tr>
<th>Participant</th>
<th>Baseline M (SD)</th>
<th>Treatment M (SD)</th>
<th>PND (%)</th>
<th>PIB (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rosa</td>
<td>17.20 (4.44)</td>
<td>27.58 (6.40)</td>
<td>71</td>
<td>86</td>
</tr>
<tr>
<td>Jack</td>
<td>13.67 (6.18)</td>
<td>26.64 (5.30)</td>
<td>77</td>
<td>116</td>
</tr>
<tr>
<td>Violet</td>
<td>19.00 (3.46)</td>
<td>24.90 (5.51)</td>
<td>58</td>
<td>46</td>
</tr>
<tr>
<td>Set 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bob</td>
<td>3.00 (1.41)</td>
<td>16.56 (6.18)</td>
<td>95</td>
<td>822</td>
</tr>
<tr>
<td>Gary</td>
<td>2.00 (1.15)</td>
<td>9.69 (4.73)</td>
<td>81</td>
<td>433</td>
</tr>
</tbody>
</table>
Norm-referenced vs. Progress Monitoring

- Purpose
- Methods
- Reliability
- Validity
- Clinical decisions

Examples

- TNL – 2
  - Content
  - Constructs
  - Psychometrics
- MISL
  - Content
  - Constructs
  - Psychometrics