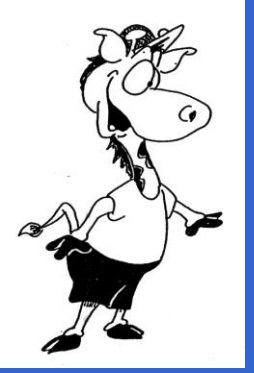
Using the ENNI for narrative assessment or norm development

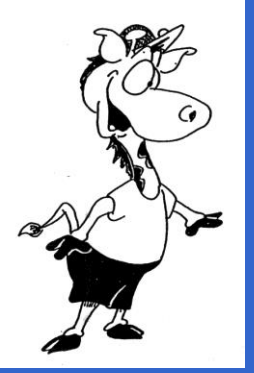
Phyllis Schneider, University of Alberta
Rita Vis Dubé, Toronto District School Board
Denyse Hayward, University of Alberta

This research was supported by grants from the Children's Health Foundation of Northern Alberta and the Natural Sciences and Engineering Research Council (NSERC).



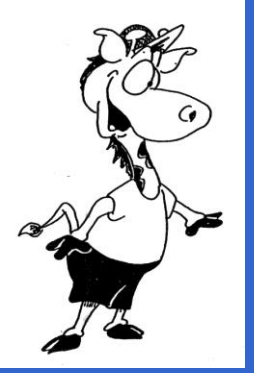
Goal for this talk

- To introduce the Edmonton Narrative Norms Instrument
- To present examples of scoring and interpretation of transcripts and provide practice
- To discuss how it can be used to collect local norms



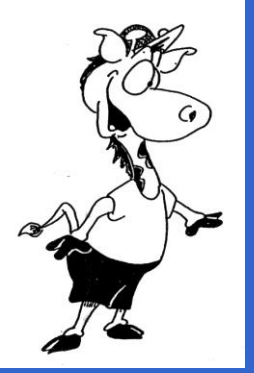
Why a narrative instrument?

- Narratives predict later language status and academic achievement (including reading)
- No good test of narratives existed at the time for preschool-to-school-aged children*
- No narrative instrument with norms for Canadian children existed



Choosing a model for storytelling

- In the ENNI, children formulate stories themselves from pictures
- They do not hear a model story first that we could compare their stories to
- We needed a model that would involve types of information that should be included in a ‘good’ story
- We chose the Story Grammar model (Stein & Glenn, 1979)



Characteristics of the Story Scripts

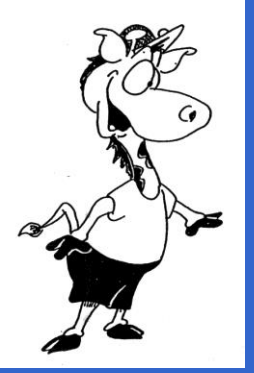
Two story sets (A and B), 3 stories in each set

Main characters are the same within each set

- 1st story in each set has only the 2 main characters
- 2nd story adds one additional character
- 3rd story adds 4th character

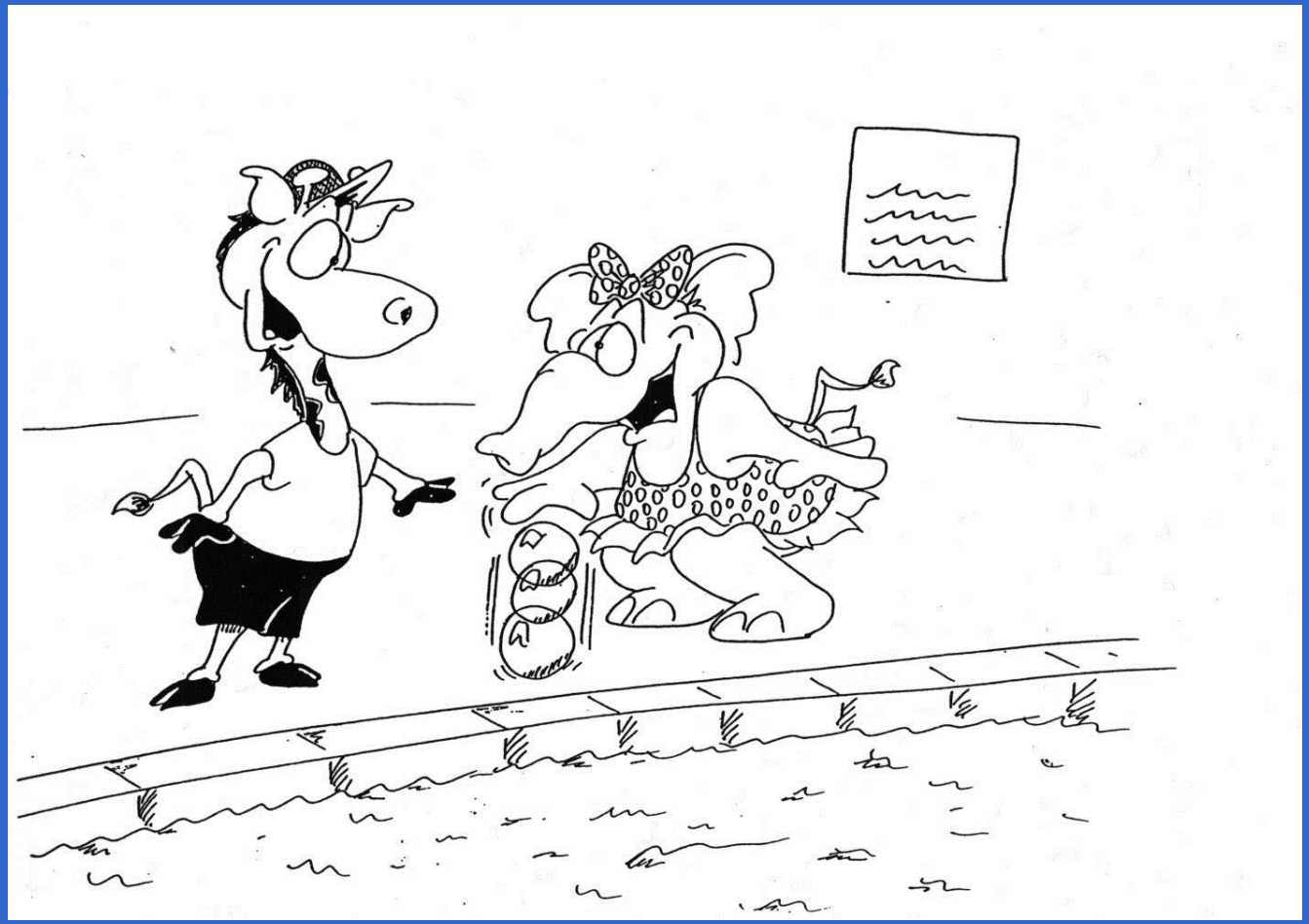
Amount of story information increases across stories

Thus stories increase in difficulty within each set

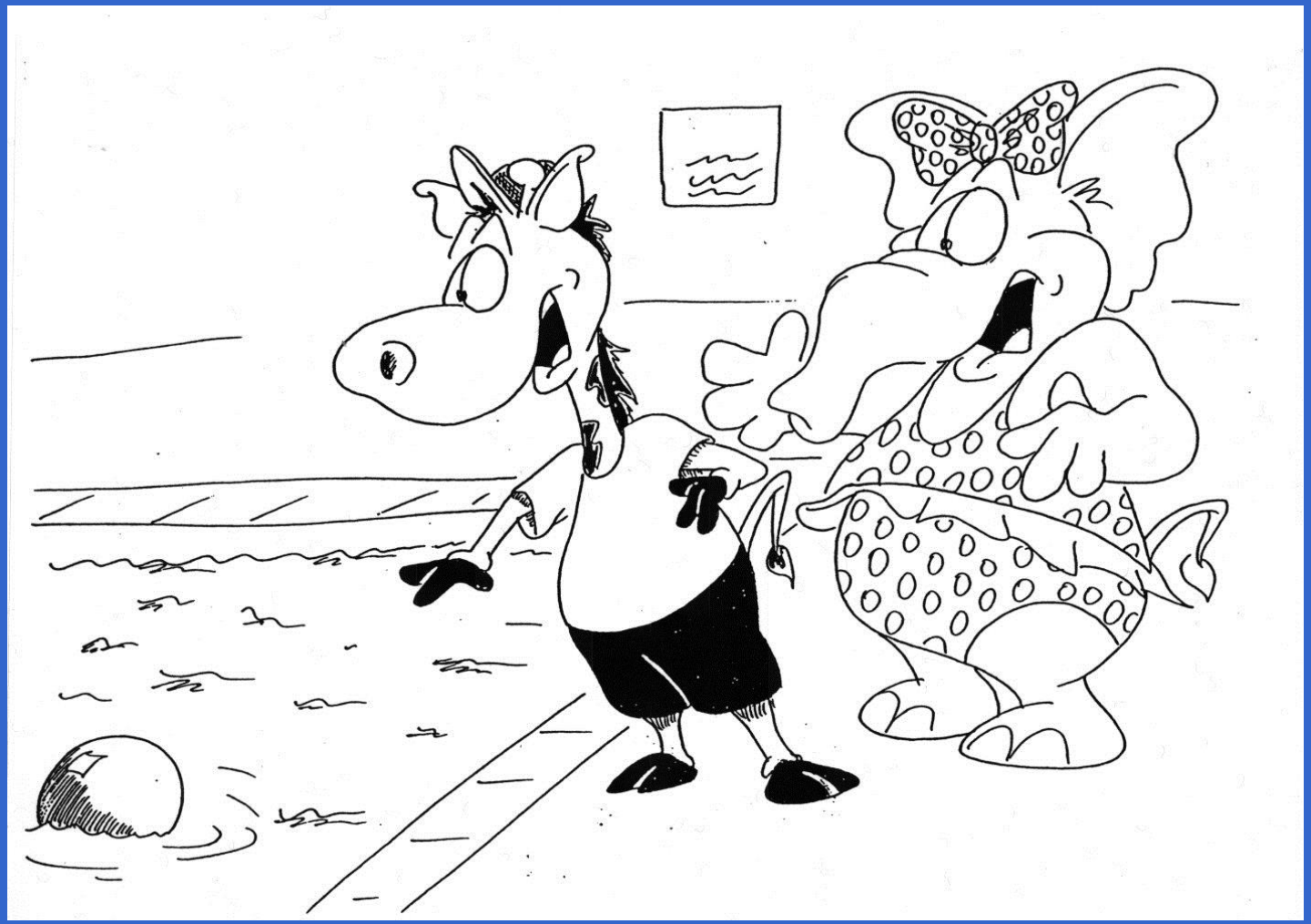


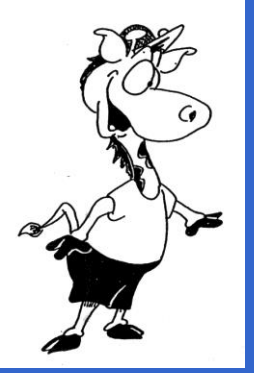
Example: Simple story

SETTING

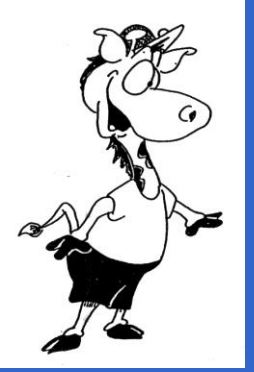


INITIATING EVENT + INTERNAL RESPONSE, PLAN

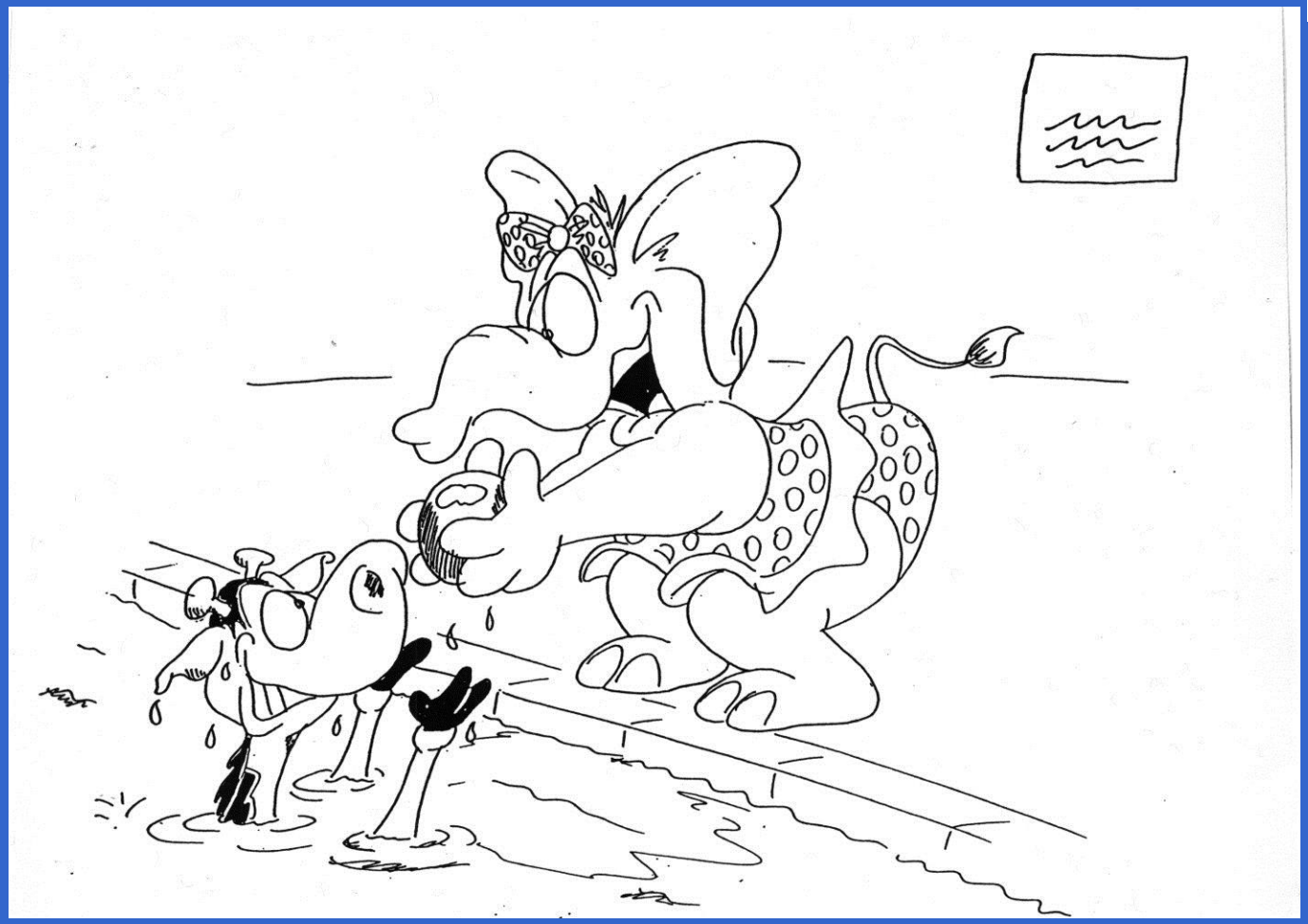




ATTEMPT

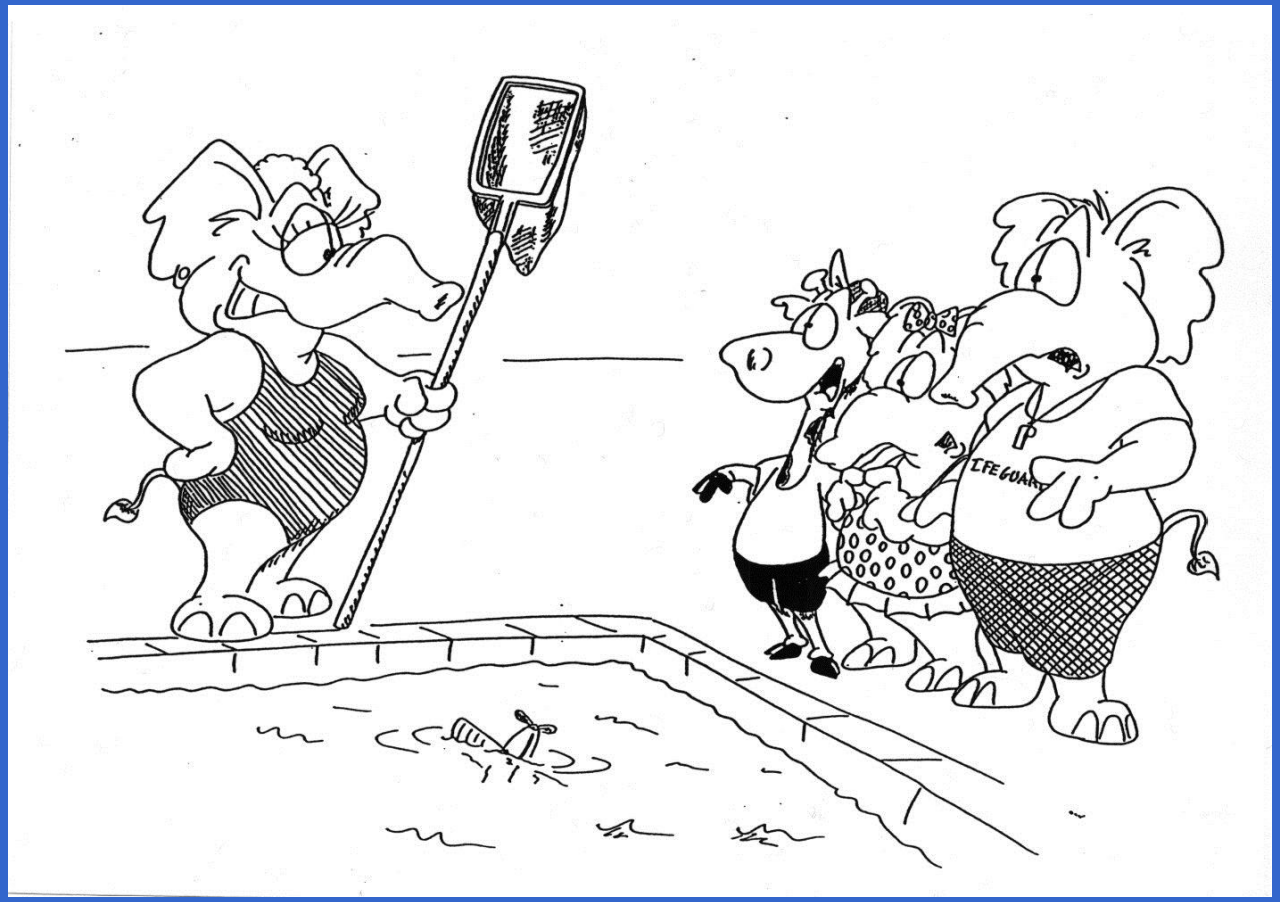


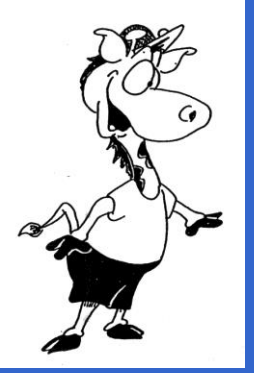
OUTCOME



REACTIONS

Picture from complex story in set A

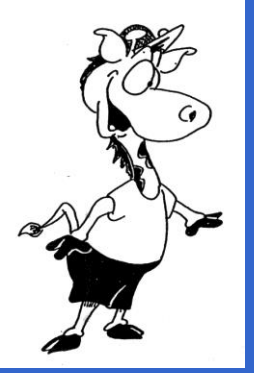




Story set B characters

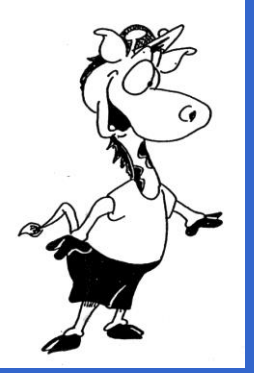
Normative sample

- 377 children, ages 4-9
- 50 children with no known disorders per age group (Typically Developing or TD)
  - Half boys, half girls
- ~15 children with *specific language impairment* (SLI) per age group (total 77)
  - Gender left free to vary (more boys)
- Children attended 34 schools and 13 preschools and daycares in Edmonton



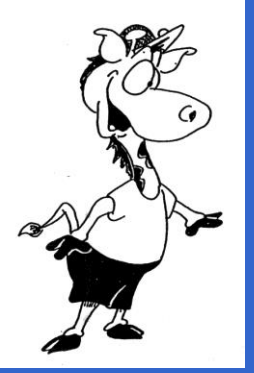
Other information collected

- All children with SLI and 15% of TD children were tested on the Clinical Evaluation of Language Fundamentals (CELF-P or 3, depending on age)
  - All other children were tested on 2 subtests
- Parents' occupations and child's ethnic background information were collected



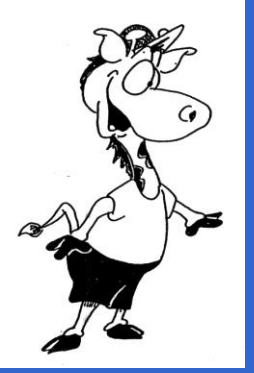
Methods

- Children were seen individually in their schools, preschools, or daycares
- Each child participated in two sessions:
  - First: storytelling from pictures
  - Second: story question task and standardized testing

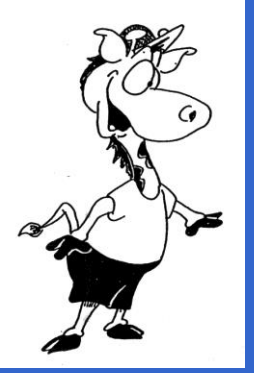


Training story

- Each child first told a training story from a separate set of 5 pictures
  - We recommend use of the training story when using the ENNI clinically
- Story set presentation was counterbalanced (half heard A stories first, half B stories first)

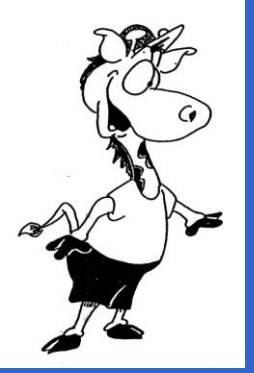


Procedure



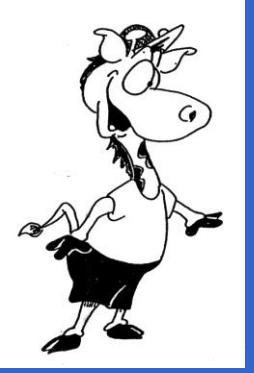
Transcription and Coding

- All stories were transcribed and scored using the CHILDES system
- Files have also been converted to SALT format – will eventually be available for comparison using SALT profiler
- The online transcription manual contains instructions for CHILDES and SALT transcripion



Information on-line

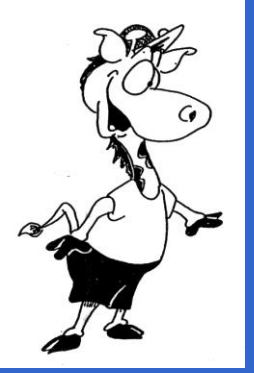
- We have a website to share the ENNI (address is on your handout)
- Everything needed to administer, score and compare results to the norms is available
- SES and ethnic data are presented in relation to Statistics Canada information (to describe sample only)
- Information on concurrent validity will soon be available (good conc. val. with CELF)



Measures

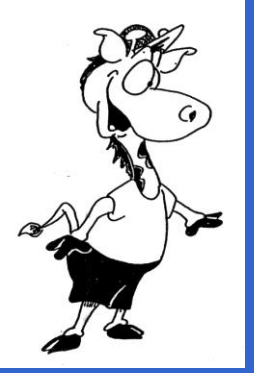
We developed a number of measures from the ENNI stories:

- Story Grammar: The amount of important information included
- First Mentions: The way that characters and selected objects are introduced
- Standard language sample measures – MLCU, Number of Words, Number of Different Words...



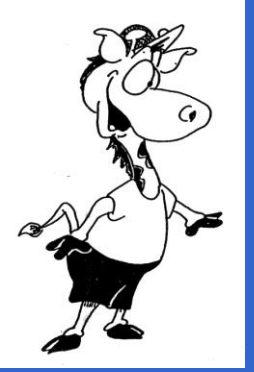
Story Grammar scoring

- We developed a scoring sheet to make scoring easier and more reliable
- The scoring sheet specifies what can count as each SG unit
- There are scoring sheets for two stories from Set A:
  - A1: simple (1 episode, 2 characters)
  - A3: complex (3 episodes, 4 characters)

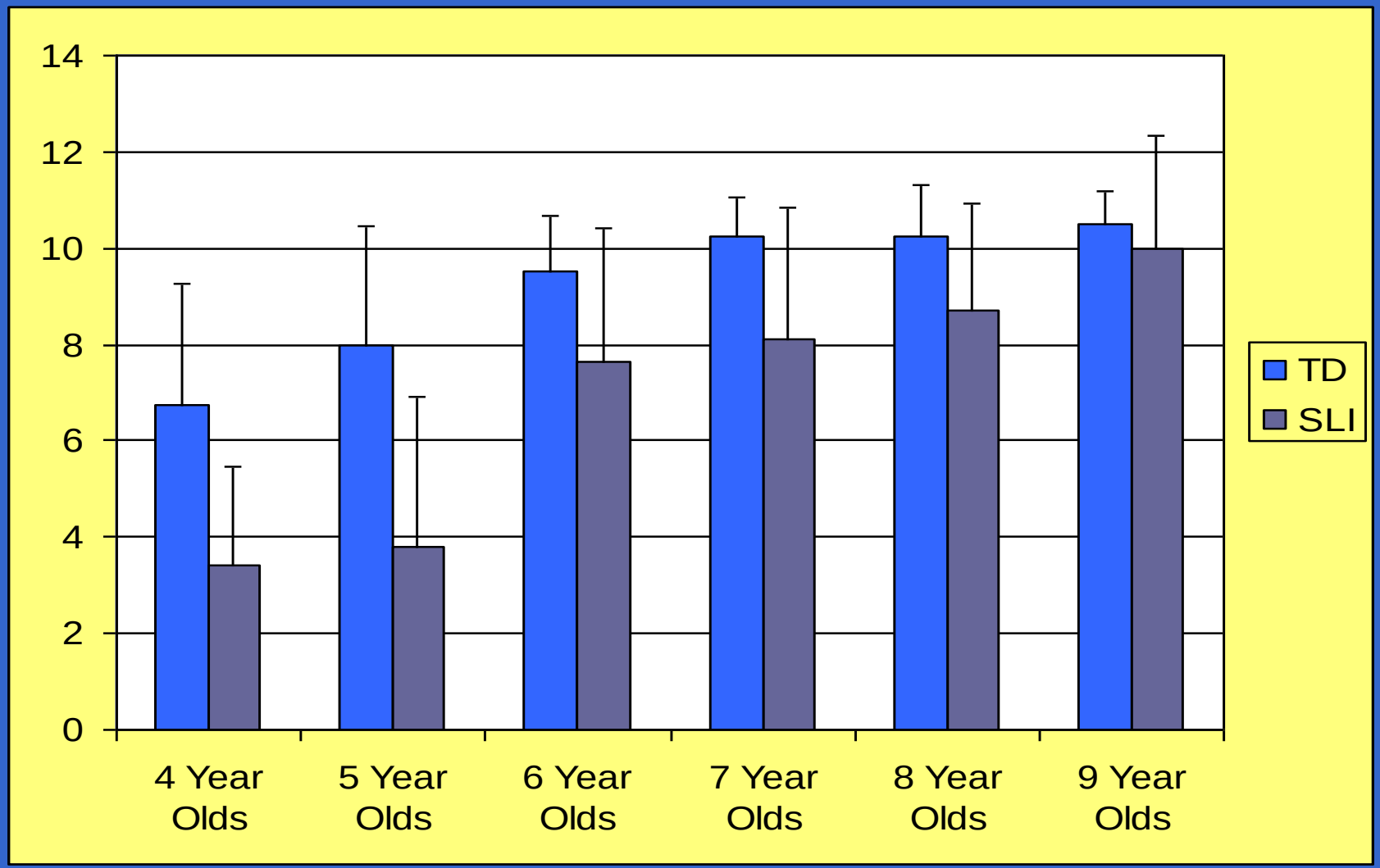


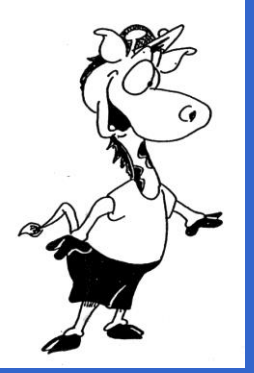
Excerpt from SG Scoring Sheet for Simple Story

SG Unit	Acceptable	Score
Char. 1	giraffe / male / boy (or other animal) NOT: pronoun	0 1
Char. 2	elephant / female / girl [...]	0 1
Setting	swimming pool / had a ball / playing with ball / want to play ball	0 1
Initiating Event	ball goes in water/pool/sand/ mud	0 2

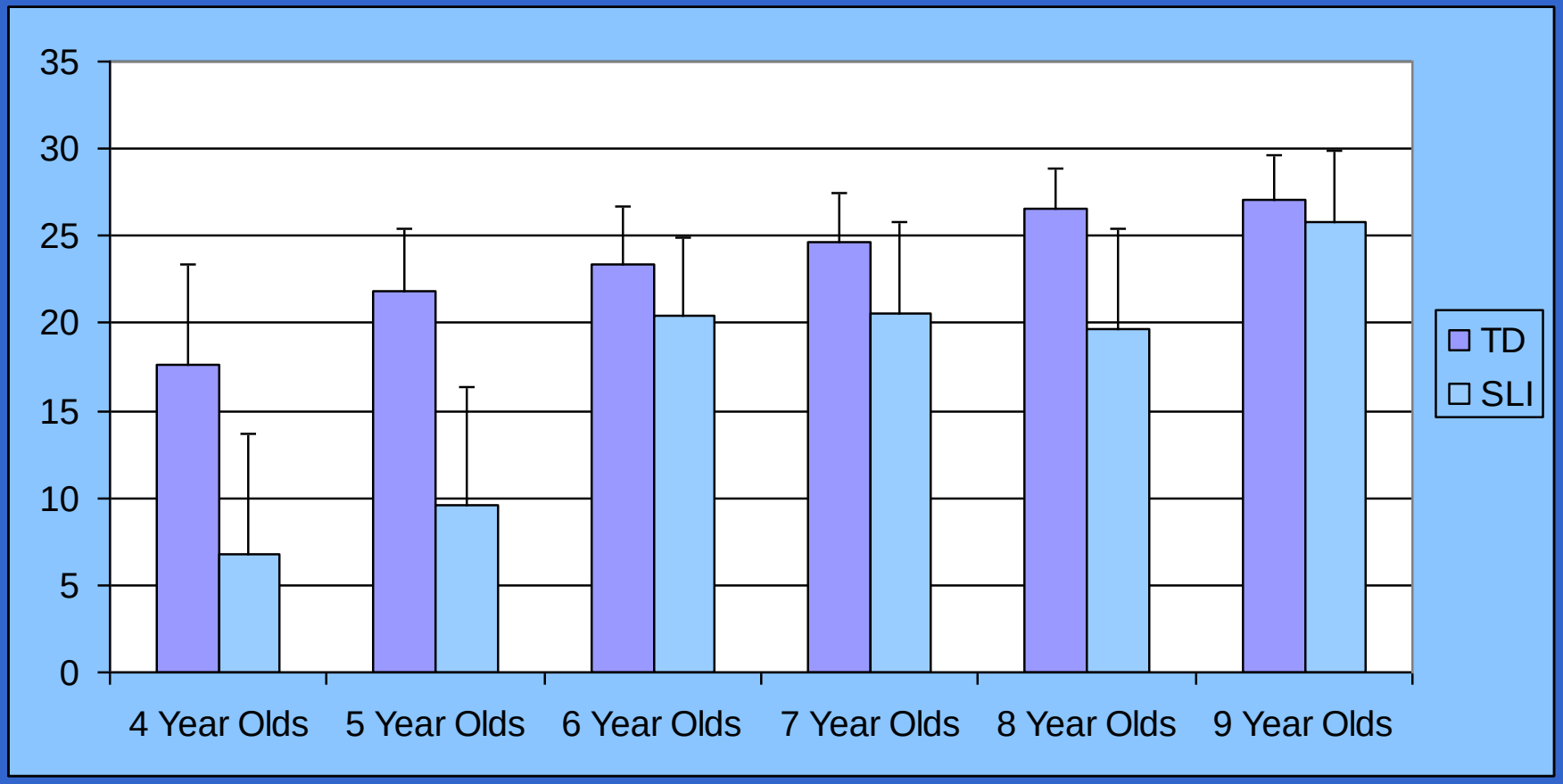


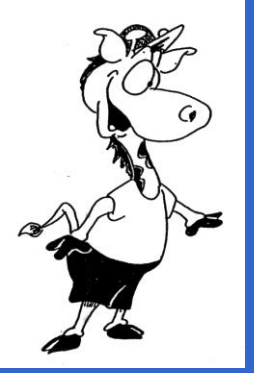
Simple story – Story Grammar Score





Complex story – Story Grammar Score



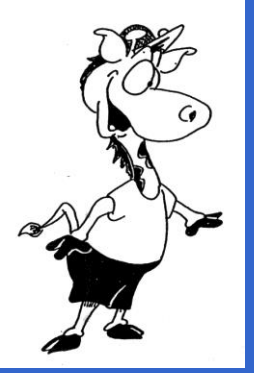


Story grammar results

- Story grammar scores are higher for typically developing children than children with SLI at each age except 9
- The scores discriminate between groups well for ages 4-8

First Mentions scoring

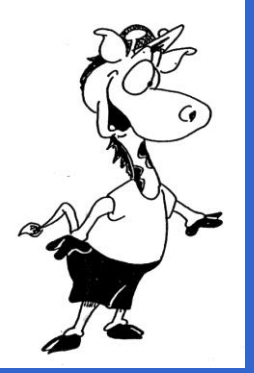
- Scoring criteria and sheets were designed for First Mentions
- The criteria specify how to score first mentions of all 8 characters and 6 objects
- Each FM can score up to 3 points



Example of FM criteria: Giraffe

Score as **3**:

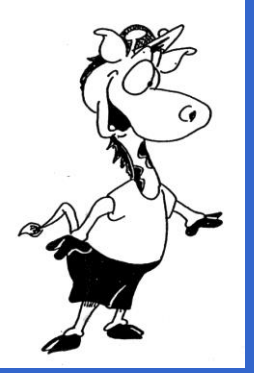
- **a/this** _____ (e.g., *a giraffe, this cow*)
- **name** (e.g., *Gerry, Geegee*)
- **possessive + noun** (e.g., *her friend* if 'she' already introduced)
- **another animal** (if one or more animals were already introduced)
- **the other animal** (if C mentioned 2 animals and one animal was mentioned separately previously)



Example of FM criteria continued

Score as **2**:

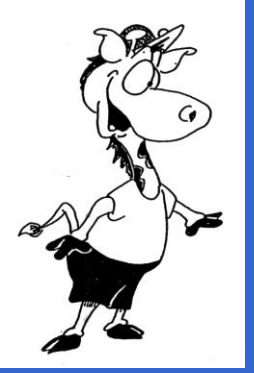
- **the/that** _____ (e.g., *the giraffe*)
- **a [invented word],** e.g, *a geegee*
- **someone / somebody**
- **possessive + noun** (e.g, *her friend)* if other character not yet introduced
- **another/the other** _____ (e.g., *the other animal)* if no animal mentioned previously



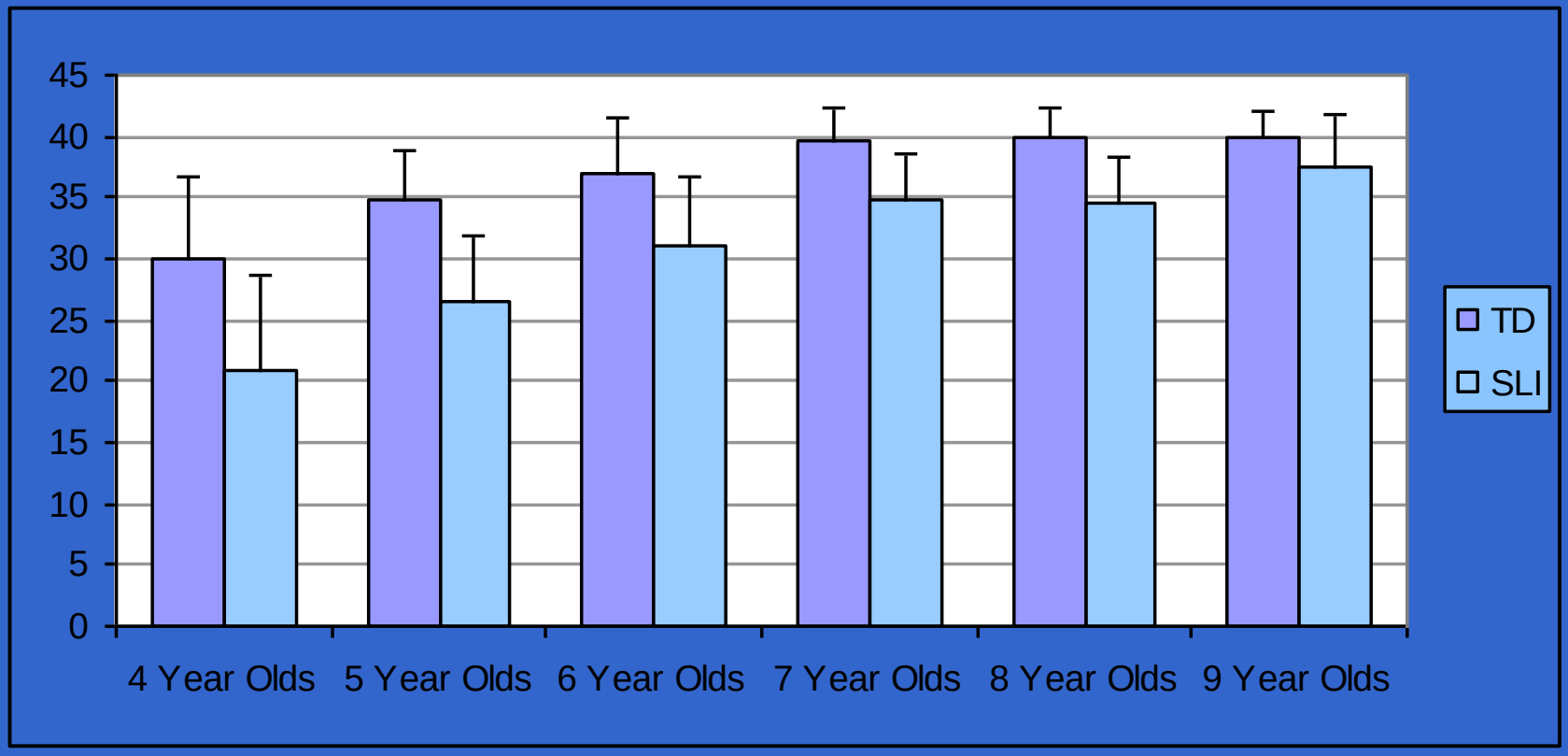
Example of FM criteria continued

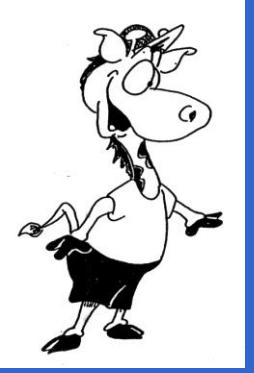
Score as **1**:

- **pronoun** (*he, she, it, they*)
  - Exception: if child puts self in story, "I" as FM would be scored 3
- **Demonstrative pronoun** (*this*, *that*)
- **the [invented word]**, e.g., *the geegee* (an invented **name** would be scored as 3)



First Mentions scores

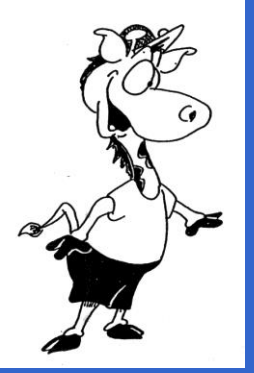




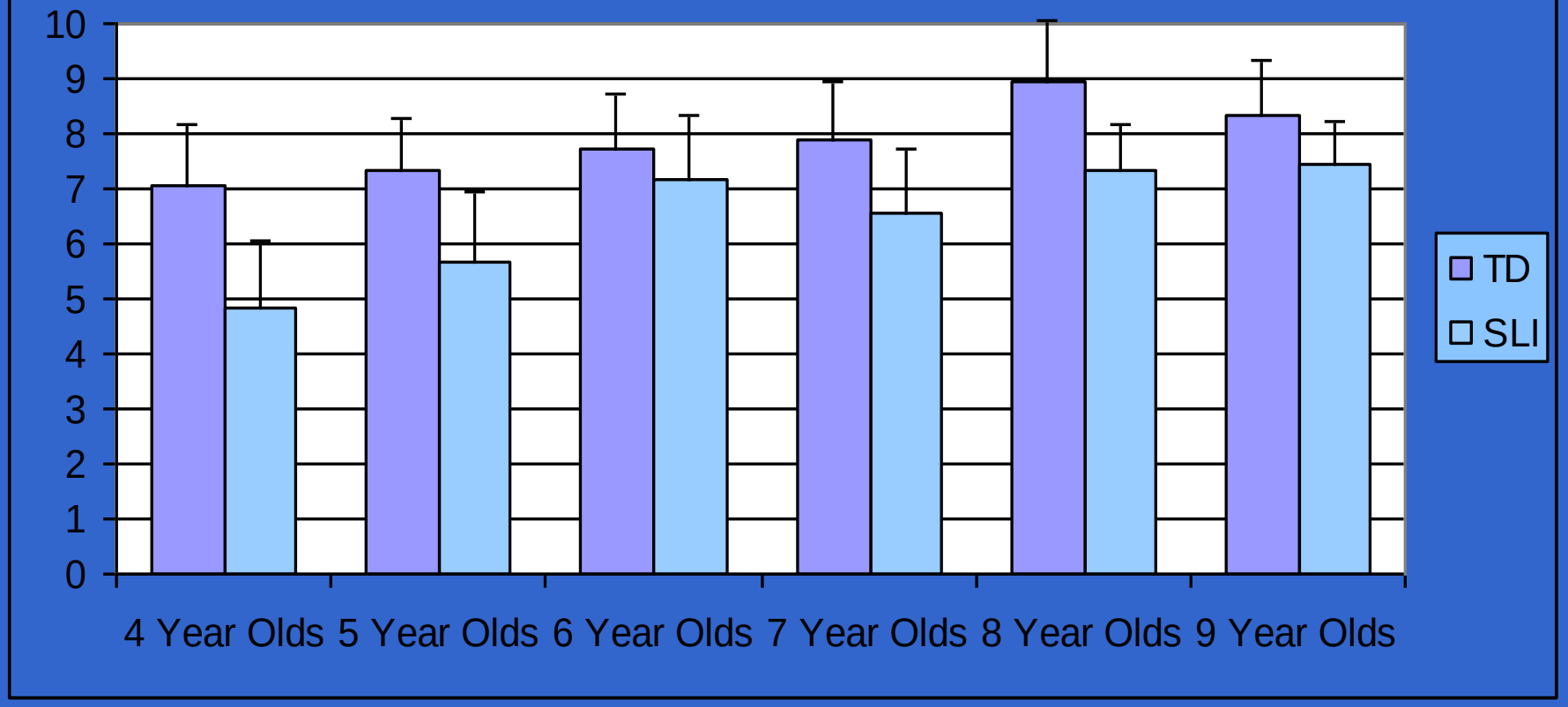
Standard Analyses

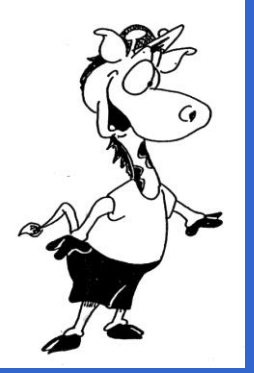
We also have looked at some commonly-used language sample measures

- Mean Length of Communication Unit (MLCU)
- Complexity Index (Main+dependent clauses divided by main clauses)
- (and others)

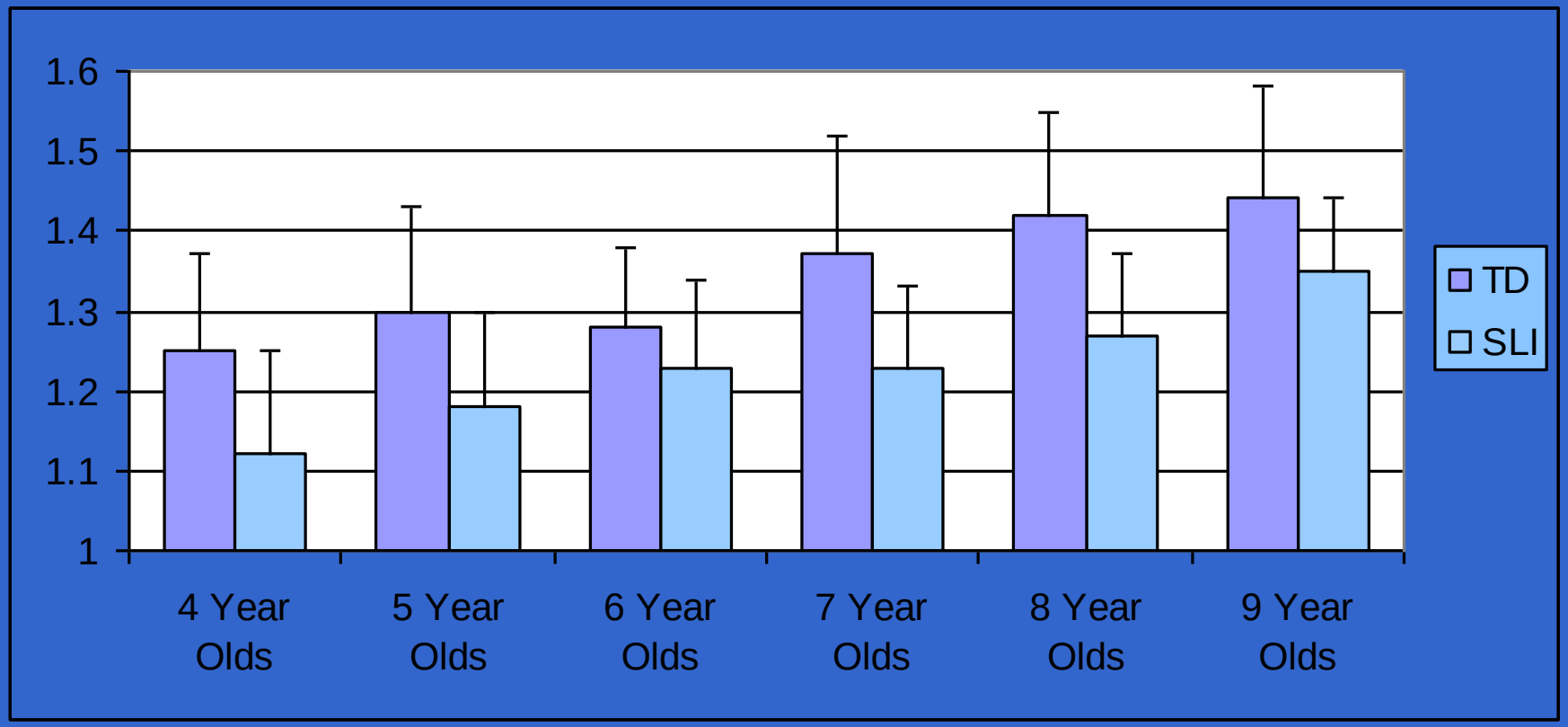


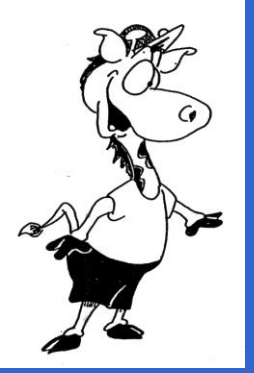
MLCU


10
9
8
7
6
5
4
3
2
1
0
4 Year Olds
5 Year Olds
6 Year Olds
7 Year Olds
8 Year Olds
9 Year Olds
TD
SLI



Complexity Index
(Measure of sentence complexity)

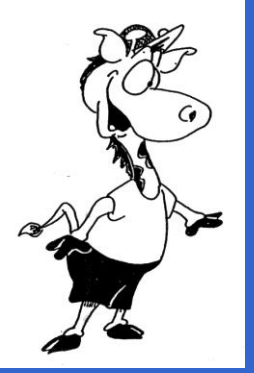




Summary of Analyses

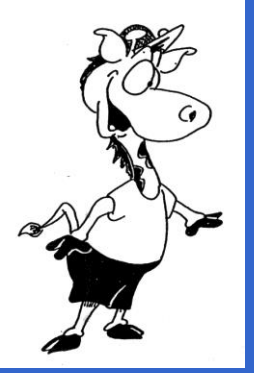
There appears to be a developmental trend and good discrimination for:

- Number of SG units
- First Mentions scores
- Many standard language analyses, except that syntactic measures do not discriminate at 6 years
  - Scarborough: “illusory recovery” for children with LI?



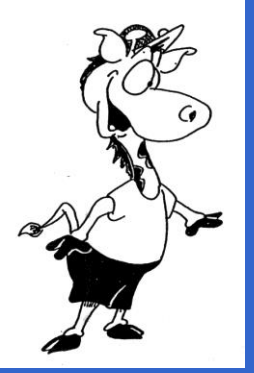
4 year old (#410)

C the elephant and the cow.
E umhm {long pause} so you have told me what is in the picture. can you tell me a story about it ?
C (cow) : (elephant) cow and a elephant.
E umhm {long pause} what is happening?
C they are trying to find each other.
C the elephant and the cow had a accident with the ball.
C and (the eleph) the cow got in there.
C and the elephant got it.
C and the cow is still in there.
C (and : the cow) and (the) the cow is dripping.
C and she : has the ball.

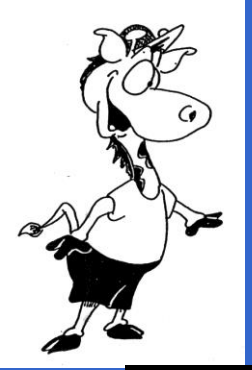


SG scoring for 410

Char. 1: The cow	1
Char. 2: The elephant	1
Setting (no setting information)	0
IE: ..had an accident with the ball	2
IR, IP (none)	0
Attempt: no credit given (*the cow got in there* does not provide enough information for the listener to understand)	0

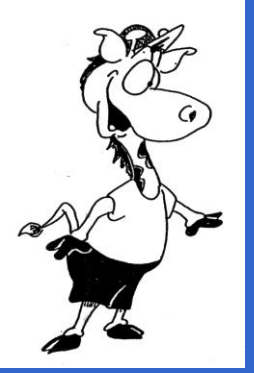


Outcome: no credit given (*the cow got it* – got what?)	0
The cow is still in there – doesn't correspond to any SG unit	0
Reaction: The cow is dripping	1
The cow has the ball – not scored as Outcome because it was not clear that they did not have the ball at any point	0



FM scoring for 410

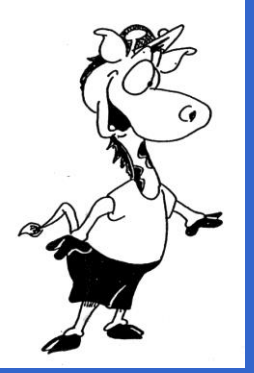
Character 1	The cow	2
Character 2	The elephant	2
Object 1	The ball	2
Character 3 (in story A2)	Not mentioned	0
Object 2	A airplane	3
Character 4 (A3)	she	1
Object 3	A net	3



Results for 410

- A1 Raw score: 5, Standard score: 8
- A3 Raw score: 17, Standard score: 10
- MLCU: 6.78, Standard score 10
- Complexity Index: 1.19, SS 9

- Mean for all standard scores=10, SD=3
- All scores are within 1 standard deviation



4 year old (#427)

C: Is playing bubbles.

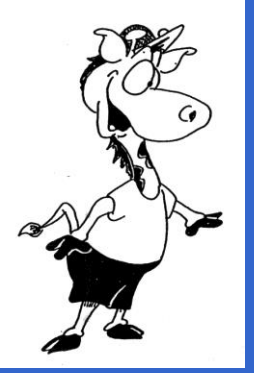
C: it big bubbles coming.

C: is throw them down.

C: is : say thank you.

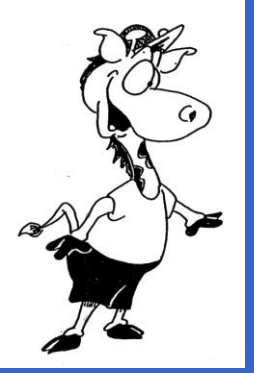
C: happy.

C: the end.



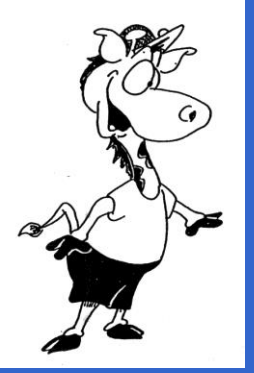
SG scoring for 427

C:	Is playing bubbles.	[Setting]
C:	it big bubbles coming.	0 – not clear
C:	is throw them down.	0 – not clear
C:	is : say thank you.	
C:	happy.	[Reaction]
C:	the end.	



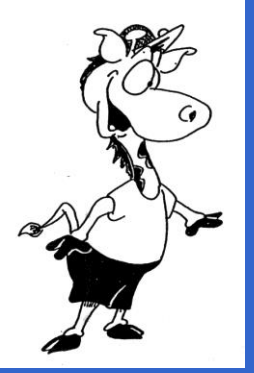
FM scoring for 427

- The only credit given for referring expressions in A1 was bubbles (=3 points)
- This child omitted most subjects of sentences and thus got 0
- Total raw score for all 6 stories was 11, SS=2



Score summary for 427

- A1 Raw score: 2, Standard score: 5
- A3 Raw score: 3, Standard score: 3
- MLCU: 3.36, Standard score: 2
- Complexity Index: 1.00, SS: 4



8 year old (#809)

C Once there was a giraffe named George and an elephant named Martha.

C and they were best friends.

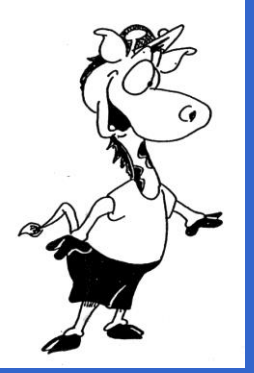
C one day they were playing ball.

C and the ball fell into a swimming pool.

C George went to the swimming pool and swimmed and got the ball.

C Martha was very happy : to get her ball back.

C and then they played for the rest of the day and talked.



SG scoring for 809

C Once there was a giraffe named George and an elephant named Martha. [characters]

C and they were best friends.

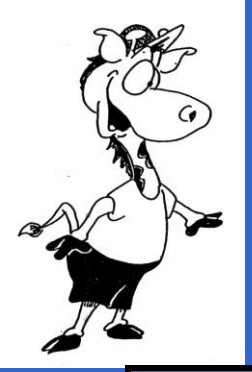
C one day they were playing ball. [setting]

C and the ball fell into a swimming pool. [IE]

C George went to the swimming pool and swimmed and got the ball. [Attempt, Outcome]

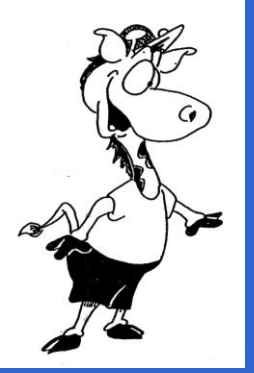
C Martha was very happy : to get her ball back. [Reaction]

C and then they played for the rest of the day and talked. [not scored]



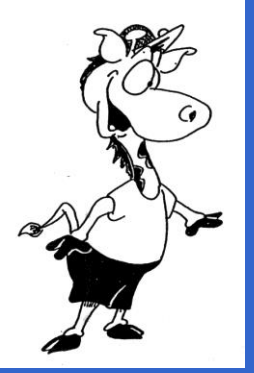
FM scoring for 809 (Set A)

Character 1	A giraffe	3
Character 2	an elephant	3
Object 1	Their ball	3
Character 3 (in story A2)	The lifeguard (Note: pool was mentioned)	3
Object 2	George's airplane	3
Character 4 (A3)	Another lifeguard	3
Object 3	A net	3



Summary for 809

- SG A1 raw score: 10, Standard score 10
- SG A3 raw score: 27, Standard score 10
- FM raw score: 42, Standard score 13
- MLCU: 8.79, Standard score 10
- Complexity Index: 1.43, Standard score 10



8 year old (#825)

C here he comes.

C oh hi giraffe.

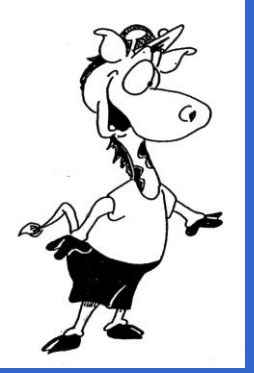
C how are you?

C I will get your (ba um) ball elephant.

C oh do not drowned.

C oh thank you giraffe.

C I like you giraffe.



SG scoring for 825

C here he comes.

C oh hi giraffe. [character 1]

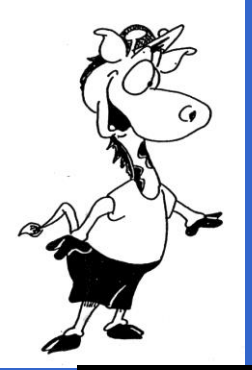
C how are you?

C I will get your (ba um) ball [internal plan] elephant. [character 2]

C oh do not drowned.

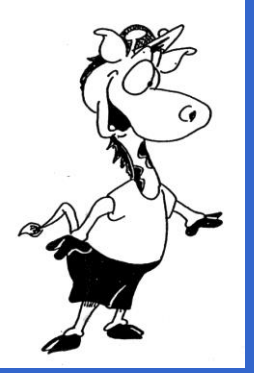
C oh thank you giraffe. [Reaction char. 2]

C I like you giraffe.



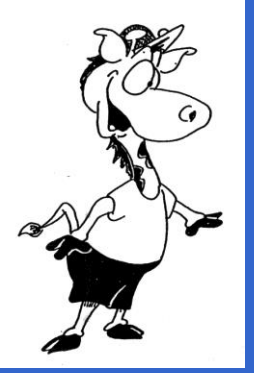
FM scoring for 825 (Set A)

Character 1	he	1
Character 2	Elephant (name)	3
Object 1	your ball (Elephant)	3
Character 3 (in story A2)	The lifeguard (swimming was mentioned)	3
Object 2	my airplane (not clear who is speaking)	2
Character 4 (A3)	I	1
Object 3	My net	3



Summary for 825

- SG A1 raw score: 4, Standard score <1
- SG A3 raw score: 10, Standard score <1
- FM raw score: 33, Standard score 4
- MLCU: 6.14, Standard score 3
- Complexity Index: 1.28, Standard score 7



Developing goals for intervention

SYNTACTIC GOALS:

- Use of increasingly complex sentences (verb structures, conjoined or dependent clauses)

SEMANTIC GOALS:

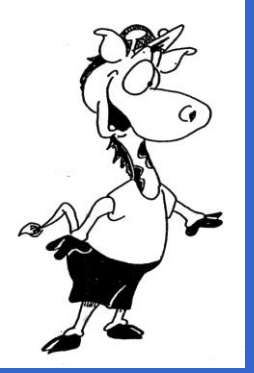
- Increase range of vocabulary
- Increase use of descriptive vocabulary

NARRATIVE GOALS:

- Increase use of story grammar structure
- Increase adequacy of referring (first mentions)

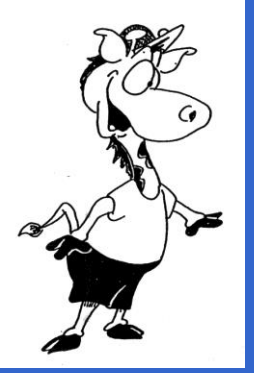
Curriculum-Linked Programming Suggestions

1e49: Use familiar classroom vocabulary and oral language structures in conversations with their teacher and peers.	To use the following grammatical structures appropriately: To develop expression of the following grammatical structures: a. present progressive tense (e.g. He *is playing*) b. regular past tense (e.g. He was, they were) c. plurals **[choose specific targets relevant to student]**	• Use of peer models • Model correct production of grammatical morphemes • Use of patterned stories and books • Barrier games with peers • Provide visual cues and related print (combine with colour coding in print) to emphasize word endings, word sequence, etc. • Role playing dramatic parts where language is provided
2e55: use appropriate vocabulary and oral language structures to express emotions in a variety of situations.	To develop comprehension/ expression of vocabulary related to the curricular thematic unit, written texts and social interactions. To develop improved comprehension/expression of various sentence structures.	• Preview vocabulary new to units/reading material and review previous vocabulary in context • Incorporate math vocabulary terms; explicitly have visual representation available to link operations with language terms • Use semantic webbing • Reinforce processing/expression of increased length of utterances • Use visual cues and print related to oral sentences
2e49: Retell stories and recount personal experiences, presenting events in a coherent sequence.	To re-tell a short story using story grammar and appropriate vocabulary.	• Story mapping • Reinforce idea of beginning, middle and end • Role playing and modeling • Use picture cues • Use of story frames, story mapping, story webbing, and cloze activities • Peer conferencing and group activities with explicit instructions • Allow increased opportunities for structured verbal conversational interactions and in group discussions using positive reinforcement • Think-alouds



Collecting local norms

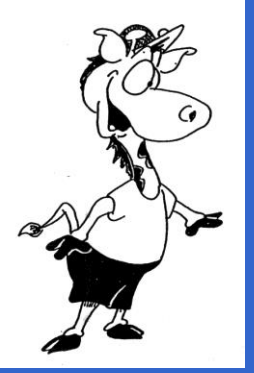
- Recommended N: 100 per age group
- We found that school boards would not agree to help with that large an N
- For the ENNI, we had to obtain permission from the public and separate school boards to participate
- We had support from SLP consultants on the boards, who recommended approval



The SLI sample

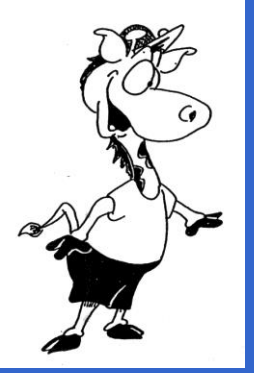
We obtained the participants with SLI mainly from two sources:

- A school for children with language/ learning disabilities
- Community SLPs



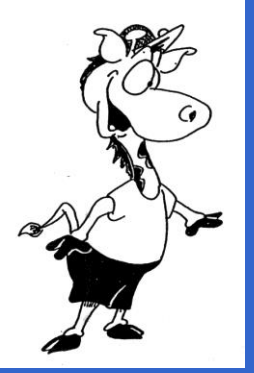
Preparation of norms

- Children with SLI were ‘oversampled’
  - That is: the proportion of children who had SLI was greater than their proportion in the population
  - There is a great deal of variation in the SLI population
  - If a proportional number were sampled, they might not be representative of the range of language impairments



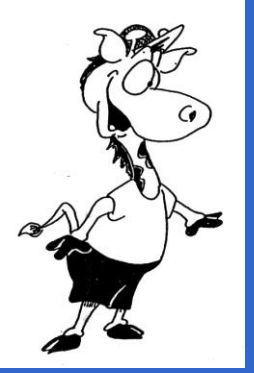
Adjusting for oversampling

- When calculating age means, it was necessary to adjust for this over-representation of children with SLI
  - Otherwise, since their scores were lower than those of typically developing children, the means for each age group would be lower than would be the case in the general population



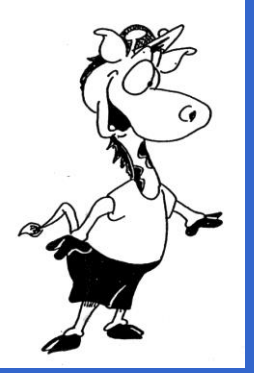
Adjusting for oversampling (continued)

- The scores of children with SLI were weighted
  - Estimate of prevalence in population was obtained from previous research (7.4%; Tomblin et al.)
  - A formula was created to obtain a multiplier for SLI data: $(N_{Total} * .074) / N_{SLI}$
- Result: SLI results were about 7.4% of norm sample



Converting raw scores to standard scores

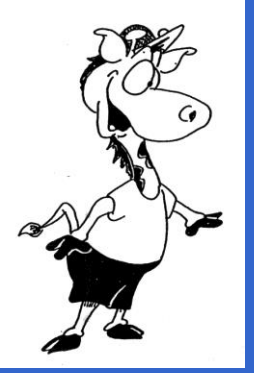
4 Year Olds	Story A1	Mean	6.48	SD	2.66
Raw score	z score	Standard Score			
		(M=10, SD=3)			
0	-2.44	3			
1	-2.06	4			
2	-1.68	5			
3	-1.31	6			
4	-0.93	7			
5	-0.56	8			
6	-0.18	9			
7	0.20	11			
8	0.57	12			
9	0.95	13			
10	1.32	14			
11	1.70	15			
12	2.08	16			



To calculate a standard score

First, calculate the z-score for the age group

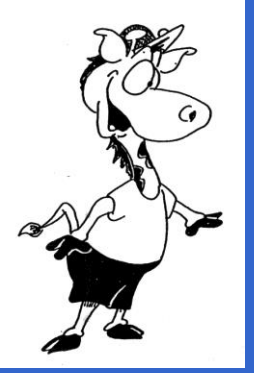
- Z-scores have a mean of 0 and SD of 1
- Formula: raw score minus age group mean divided by standard deviation for age group
- Example: for the 4 year olds, the mean = 6.48 and SD = 2.66; for a raw score of 5, (5-6.48)/2.66 = -0.56



To calculate a standard score (continued)

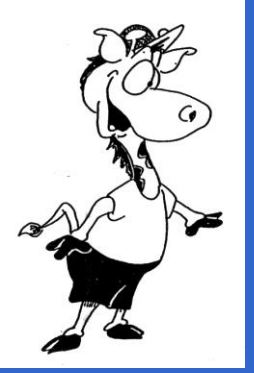
- Next, convert to the desired standard score
- Standard scores can have any mean and standard deviation; we used a mean of 10 and SD of 3.
- Formula: SS mean + SS SD / z-score
- Example: for a raw score of 5 at age 4, the SS would be: 10 + 3 / -0.56 = 8.15

  (rounded to 8 in the norms chart)



Conclusions

- The ENNI can be used to collect information on an individual child's storytelling skills relative to Edmonton children aged 4-9
- It can also be used to collect norms for other regions of Canada or elsewhere
  - Contact the first author if you would like to discuss this in more detail
- The results of an ENNI administration can be very helpful in planning interventions that will be relevant to the child's curriculum



Contact information

- General questions; questions about local norming: phyllis.schneider@ualberta.ca
- Planning intervention: rita.dube@tdsb.on.ca
- Comprehension questions: dhayward@worldgate.ca
- Website: http://www.rehabmed.ualberta.ca/spa/enni