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### What Every 5-year-old Should Know: Syntax, Semantics and Pragmatics.

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#### **Part 1: Peter de Villiers**

##### **Goals of the Seminar:**

1. "What every 5-year-old should know", NOT "Everything a 5-year-old should know".
2. Pragmatics cannot be divorced from the syntax and semantics needed for particular communicative functions.
3. We are looking at pragmatic skills for which there are varying semantic and syntactic forms that are typically mastered over the period between 3 and 6 years, so we could assess how the child utilizes her syntactic and semantic knowledge by the age of 6.
4. Pragmatic, semantic, and syntactic skills necessary for fluent reading and writing.
5. We have devised a variety of techniques to evaluate production and comprehension of these forms and functions.

##### **Four central pragmatic skills needed as the child approaches schooling:**

###### **1. Question-answer mapping – Asking and answering the right question for specific information.**

- Age 3 to 4: What? Where?  
Age 4 to 5: Who? Why? How?  
Age 5+: Double Wh-questions – Who is wearing what?

##### **Eliciting production of specific questions for information:**

Picture-based game – the child needs to find out specific missing information.

###### **2. Uniquely specifying referents – which X am I talking about.**

- Age 3 to 4: Adjectives and prepositional phrases  
Age 5+: Relative clauses

##### **Eliciting production of reference specification:**

Barrier/screen type games with picture description – the child needs to communicate to an "ignorant" listener which referent to choose.

###### **3. Linking meaning across referents and events – discourse cohesion in extended turns.**

- Age 4 to 5+: Articles and pronouns  
Age 5+: Temporal and causal links specified between events.

##### **Eliciting production of discourse cohesion:**

Carefully designed picture sequences – explicitly depicted causal and temporal relationships in scenarios.

###### **4. Point of view – taking on more than one perspective on events. --having a "theory of mind"**

- Age 3 to 4: Verbs of communication, perception, and desire  
Age 4 to 5+: Verbs of cognitive state – thinking, believing and knowing.

##### **Eliciting production of point of view:**

Reporting what someone is saying/telling.  
Videotape clips or picture sequences of mistakes, goofs, and deceptions.

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#### **Part 2: Thomas Roeper**

##### **I. Introduction:**

- a. Intellectual goal: bring insights from L1 to Speech Pathologists
- b. Problem: data is complex, assessment equally complex
- c. Possibility: introduction of core ideas, seek partnership in their use =>
  1. dynamic assessment,
  2. gradual introduction to systematic assessment

##### **General Idea:**

1. Child has: connection between possible grammar and communication
2. Reference to particular contexts is intricate

##### **II. Semantics/Pragmatics of conversation (Question/Answer Mapping)**

Claim: 5yr old => Has triggered certain mathematical properties

##### **who went home?**

- => John went to his home  
=> Billy went to his home

##### **A. Distributivity => Who = a set of people\**

- => each goes to a different home  
= set of people distributes across set of homes

Home Study (Perez and Roeper (to appear))

- \*ADA: Kitty go home (ADAM01)  
\*ADA: Joshua home (ADAM01)  
\*ADA: This is my home (ADAM11)  
\*ADA: He likes flowers and take it in the home (ADAM32)  
\*ADA: I'm busy a[?] home (ADAM11)

Type I Story: "go home", "go to bed", "go to work".

The sheep lives in the barn and the chickens in the chicken coup. Grover lives in the house, and he loves to play with his animal friends. Some days they play outside, other days they play at Grover's house. Today they played outside until it started to rain. Grover said: 'lets play at my house for a little longer'. Then:

##### **a. Everybody went home.**

##### **b. Everybody went to his home. Can you show me?**

- Distributed response  
Grover ---> G's home  
Sheep ---> S's home  
Chickens ---> C's home  
Single or deictic response  
everybody => **G's home**  
Sheep =/> S's home  
Chickens =/> C's home

Type I: home => everybody (distributed)/his home => free

63% OF 3YR olds => distributive set in anti-pragmatic scene

Conclusion: home is a distributive set,

See work by Roeper and deVilliers (1993), Philip (1995), Avrutin and Thornton (1994 )

Conclusion: A. Children exhibit distributivity for "home"

**B. Set-distributivity => Exhaustivity linked to wh-question**

"Who was at the party?" => "Johnny"  
"and who else" Billy

Who => requires a set answer  
=> the set is unbounded or infinite

Answer => must be exhaustive

Example: who was in the car the night of the murder

[Actuality: John, Bill, Fred]

Answer: "John and Bill"

=> failure to be exhaustive = perjury

**C. Paired Distributivity: x-y, z-w, q-r.....**

Scene:

FATHER => EATS APPLE  
BOY => EATS BANANA

Who ate fruit => "family"  
"the father and the boy"

••**who ate which fruit** => father ate apple (x,y)  
boy ate banana (z,w) etc.

Wrong: \*they ate the fruit  
\*they ate an apple and a banana  
\*the boy and father ate an apple and banana  
\*the boy and father ate that fruit (pointing)

Grammar requires: exhaustive pairing of two sets

Table 1 Paired readings to wh-questions (de Villiers & Roeper (1993))

17 "old" children aged 4-6 years, 10 "young" children aged 2-3.11 years.

	Who ate which fruit?	Who ate fruit?	The family ate what?
Old:	78.1%	32%	30.3%
Young:	32%	57.1%	9%

Trigger: Evidence underdetermines child's conclusions  
[Experience does not force exhaustivity]

**D. Accommodation = add context restriction**

1. John looked in the room. Everyone was dancing  
=> everyone (in the world) was dancing

=> everyone (in the room) is dancing

2. Obscure for children? In principle or in fact?

Class: half the children stay in for gym  
other half go out sledding

Teacher: looking indistinctly at those going out

"Did you all bring warm coats?"

Child staying for gym says:

"No my coat is not warm"

Teacher: I just meant those going out to sled.

Problem: implied accommodation: you all (who are going out to sled)

Teacher conclusion: child is

- a) not smart
- b) not paying attention
- c) ego-centric

3. Not only children:

"Every person must have his own passport" USA: small children on adult's passport

Adult: is it alright for my child to be on my passport? => "yes, only adults must have their own."

Hidden accommodation: every (adult) person....

Cultural knowledge entailed, but Principle of accommodation may be present.

**III. Discourse: Anaphoric Principle => very early**

1. Part/ Whole (Schafer and de Villiers, 1999)

Child told brief story snippets e.g.:

"Adrienne got a pet hamster for her birthday and put it in a nice cage.

It tried to escape so she quickly closed something - What did she close?"

Adult Response = 100% 'the-N' e.g. "the door"

Age:	3.5	4	4.5	5-6
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% Same as Adult Response: 'the-N'

	96	84	86	90
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2. Pronominal:

[scene: Grover plays basketball. Bert catches a baseball.]

Grover played basketball. Did he catch a baseball?

"no" (because he = Grover)

Roughly 70% correct for 11 4yr olds

3. Discourse Cohesion: Locative anaphora

Mother told Johnny to put his hat in the corner of the closet in his room.

Then she told him to put his glove there too.

there = in the corner of the closet in his room

Problem: distinguish there-expletive from there-anaphor

Expletive-Anaphor study. 74 children, 1;10 - 6;1; 10 adults

Task: arranging felt objects on felt board

Now the garden has a wateringcan in it,

a. and a dog is there.

OR b. and there's a dog.

Results of Comprehension Study

N	Age group	% placement in or near LL	
		anaphoric condition	non-anaphoric condition
23	1;10-2;11	29.7%	29%
18	3;0-3;11	52.9%	28.3%
12	3;0 -3;10	<b>65.7%</b>	25%
18	4;0-4;11	73.6%	33.3%
17	5;0-6;1	78%	40%
10	Adults	90%	43.3%

There is a main effect by condition for the three, four and five year olds and adults significant at the .0001 level.

4. Definite Reference: (I. Krämer (1999))

[Picture 1: Children going to zoo.]      Picture 2: Other children not going ]

" Here are some children going to the zoo. A boy feeds an elephant."

Anaphor and accommodation:  
A boy (from this group) feeds elephant

98% of adults take (boy from this group)  
35% of 6 yr olds take a different boy (picture 2)

Fail to determine: uniquely specified reference when both anaphor and accommodation needed

**Conclusion: by 5yrs all children show--**

- a. locative-anaphor present (there)
- b. a/the part-whole relation present
- c. a/the anaphor+accommodation not present
- d. wh-pairing present

**III. Conclusions: Normal 5yr olds exhibit**

- A. Triggered Concepts: Set  
Distributivity  
Exhaustivity  
Accommodation

- B. Learned connections:  
which words engage sets?  
quantifiers (every)  
articles (a)  
questions (who, which, what)

- C. Possible Disorders?  
a. Could these abilities fail  
b. Failure to construct discourse  
c. Failure to compute accommodations [cultural, point of view]

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**Part 3: Jill de Villiers**

**Remember four skills:** 1) Question-answer mapping 2) Uniquely specifying referents  
3) Discourse cohesion 4) Multiple points of view.

Peter de Villiers discussed the interface between **syntax and pragmatics**, namely, how to use structures for given purposes, and how we might assess that in each case.

At the interface between **semantics and pragmatics**,

- Tom Roeper** a) elaborated ideas of exhaustivity and sets (from 1)  
b) elaborated ideas about discourse connections and accommodation (from 3)

Now I will pick up 2) and 4), elaborating the interface between **syntax and semantics**.

Consider the syntax and semantics of **Relative clauses** (the focus in 2) versus **Verb Complements** (the focus in 4)

**Some syntactic similarities:**

Relative clauses and complements both contain embedded clauses:

RELATIVE CLAUSE: with a head of any common noun  
She saw **the man who stole the book**  
**The chair that the woman bought** was green

VERB COMPLEMENT: under a verb  
She thought **the cat was lost**  
The man said that **he left the door open**

**Some differences: Syntax**

Only some verbs take complements, all common nouns can take RC's  
\*the man sat that **he left the door open**  
\*She ate that **the cat was lost**  
Which verbs?  
Verbs of mental state and communication

Extraction (e.g. wh-question movement) possible from Verb Complement:

- When did he say he left the door open?  
a) when the cops asked him  
b) when he went out to the garage

This latter is a question relating the "when" to the content of the complement clause

- Why did she think the cat was lost?  
2 meanings: a) because she couldn't see it  
b) because it didn't know the neighborhood

This latter is a question relating the "why" to the content of the complement clause

But try Relative Clauses:

- How did she see the man that stole the book?  
a) through her window  
b) \* by stuffing it in his jacket  
Why was the chair that the woman bought green?

- a) someone had painted it
- b) \*she needed an extra one for Thanksgiving

That is, in the b) cases we cannot connect the wh-question to the content of the relative clause.

**Finding:**

**Children know these extraction differences by at least age four years.**

**General procedure** (Story+questions) detailed in de Villiers and Roeper (1996).

**Story** (has pictures!):

These two brothers went to the circus. The clown came and tickled the little boy on the nose with a feather! He sneezed very hard and blew the clown's wig right off! After the circus they were very thirsty and they went to buy some milk. The little boy drank his milk with a straw but the big brother drank his milk straight from the carton.

**How did the boy who sneezed drink the milk?**

Data from de Villiers and Roeper, 1995: t indicates site of wh-question

Cross-sectional study: 23 children aged 3.1-6.1 years

**Subject relatives**

How did the boy who sneezed	t*	drink the milk	t ?
4-5 yr olds	0%		94%*
3-4 yr olds	0%		58%

**Object relative**

How did the woman help the man	t	who won the race	t*?
4-5 yr olds	91.5%		0%
3-4 yr olds	61%		0%

In contrast: **verb complements**:

de Villiers, Roeper & Vainikka (1990)

25 children aged 3.7-6.1 years

When did the boy say	t	he hurt himself	t ?
	50%		44%

**Semantically:**

Relative clauses specify referents in the shared world between two speakers

Verb Complements describe relation of thinker or speaker to a world-maybe not the one shared by the hearer

Clause under RC must be true, clause in verb complement could be false:

She saw **the man who stole the book**

If the man stole the book is false, so is the sentence as a whole

BUT:

She said the man stole the book

If the man stole the book is false, the sentence as a whole could still be true.

3 and 4 year olds fail to grasp this semantic property of verb complements, and assume complements are true. In a short story, suppose a man in fact bought bread, but a woman said he bought a book. When a child is asked:

What did the woman **say** the man bought?

Younger children say "bread", when the answer should be "a book".

By 5, know truth differences and answer "a book".

Complements introduce **multiple points of view**

- allows child to represent not just one world but possible worlds in someone's mind
- and then predict how others will act - this opens door to adult "Theory of Mind".

- Children who lack this understanding of complements, also fail ToM tasks both normally developing children <4 years, and delayed oral deaf children even at 7 years.

New study: Hale and Tager-Flusberg, (1999): if train young children on verb complementation, the new skill facilitates performance on false belief tasks, but if train on relative clauses, no facilitation on false belief tasks. This result reinforces idea of a specific connection between structures in language and the structures needed for reasoning about other minds.

**What other ramifications?**

Consider again specificity of reference, focussing now on **the lexicon** itself

- a thing can be called by many names: a rose, a flower, a plant,
- child is at 5 organizing vocabulary into **hierarchies of relatedness** and using the word appropriate for a given occasion
- Waxman & Hatch (1992) and de Villiers and Wagner (in progress) on verbs. Multiple ways to refer flexibly organized for particular purposes.

**But there's one other essential**

- you have to keep track of who knows what name, i.e. **what's in other minds**.

Take case of silver box, that contains candy, that is meant as a birthday present.

Any one of the following sentences is true:

She took down the silver box from the shelf

She took down the candy from the shelf

She took down the birthday present from the shelf

But I can't use reference with a **mental verb and complement** as casually:

"She knew there was candy on the shelf"

I have to pay attention to what **she** knows about the referent.

**Conclusion:** Language at five is more than knowing certain words, construction types and speech acts. We have highlighted four essential skills at age five, interconnecting deep principles of syntax, semantics and pragmatics: our assessment techniques need to reflect the sophistication of the underlying grammar.

**References**

Apperley, I. & Robinson, E. Children's mental representation of referential relations. *Cognition*, 1998, 67, 287-309.

Avrutin, S. and R. Thornton (1994) Distributivity and binding in child grammar. *Linguistic Inquiry* 25:1 165-171

de Villiers, J.G. and Wagner, L. (in progress) Tapping organization in the verb lexicon.

de Villiers, J.G. & de Villiers, P.A. (in press) Linguistic determinism and false belief. In P. Mitchell & K. Riggs (eds) *Children's Reasoning and the Mind*. Hove, U.K.: Psychology Press.

de Villiers, J.G. & de Villiers, P.A. (1999) Language development. Chapter in M. Bornstein and M. Lamb (eds) *Developmental Psychology: An Advanced Textbook*. (second edition) Lawrence Erlbaum.

de Villiers, J.G., de Villiers, P.A. & Hoban, E. (1994). The central problem of functional categories in the English syntax of oral deaf children. In H. Tager-Flusberg (ed.), *Theoretical approaches to atypical language*. Hillsdale, NJ: Erlbaum.

de Villiers, J.G. & Pyers, J. (1997) Complementing cognition: the relationship between language and theory of mind. In *Proceedings of the 21st annual Boston University Conference on Language Development*, Somerville, MA: Cascadilla Press.

de Villiers, J.G. & Roeper, T. (1996) Questions after stories: supplying context and removing it as a variable. In D. McDaniel, H. Cairns and C. McKee (eds) *Methodology in child language research*. Hillsdale: Erlbaum.

de Villiers, J.G. & Roeper, T. (1995) Relative clauses are barriers to Wh-movement for young children. *Journal of Child Language*, 22, 389-404.

de Villiers, J.G., Roeper, T. & Vainikka, A. The acquisition of long distance rules. In L. Frazier and J. G. de Villiers (ed) *Language Processing and Acquisition*. Dordrecht: Kluwer, 1990.

- de Villiers, P.A. (1988). Assessing English syntax in hearing-impaired children: Eliciting production in pragmatically-motivated situations. In R. Kretschmer & L. Kretschmer (Eds.), *Communication assessment of hearing-impaired children: From conversation to classroom*. Journal of the Academy of Rehabilitative Audiology, Monograph Supplement, Vol. 2.
- de Villiers, P.A. (1991) English literacy development in deaf children: directions for research and intervention. In J. Miller (ed) Research on Child Language Disorders: a decade of progress. Austin, TX: Pro-ed.
- Fitneva, S. (1996) Language and mind: an inquiry into the opacity of events and reference. B.A. Honors thesis, Smith College.
- Hale, C. and Tager-Flusberg, H. (1999) Will training on language influence theory of mind development? Paper presented at the BU conference on Language development, November.
- Krämer, I. (1999) "Indefinite Subject Noun Phrases and Negation in the Interpretation of Dutch Children" Proceedings of the Center for Language Studies, eds. H. Strating-Keurentjes and J. Veenstra Max Planck Institute
- Perez, A. and T. Roeper (to appear) "Scope and the Structure of Nominals" LINGUISTICS (See also briefer version in Boston University Language development Proceedings, volume 22)
- Philip, W. (1995) Event Quantification and the Acquisition of Language. PhD dissertation, Linguistics dept., Umass, Amherst.
- Roeper, T. & de Villiers, J.G. (1993) The emergence of bound variable structures. In E. Reuland & W. Abraham (eds) Knowledge and Language: Orwell's Problem and Plato's Problem.
- Roeper, T. & de Villiers, J.G. (1994) Lexical links in the Wh-chain. In B. Lust, G. Hermon & J. Kornfilt (eds) Syntactic Theory and First Language Acquisition: Cross Linguistic Perspectives Volume II: Binding, dependencies and learnability. Lawrence Erlbaum.
- Schafer, R. & de Villiers, J. (1999) Imagining Articles: What *a* and *the* can tell us about the Emergence of DP. Paper presented at the Boston University Conference on Language development, November.
- Wagner, L. and T. Roeper (in preparation) "Anaphora in Discourse".
- Waxman, S., & Hatch, T. (1992). Beyond the basics: preschool children label objects flexibly at multiple hierarchical levels. Journal of Child Language, 19, 153-166.