

# CAS LX 540

## Acquisition of Syntax

Episode 8.  
The trouble with Principle B

# The trouble with acquiring constraints

## 1. Every bear is washing her face.

- Bunch of bears washing Goldilocks' face.
- Bunch of bears cleaning their own faces.

## 2. Every bear is washing her.

- Bunch of bears washing Goldilocks' face.
- Based on what evidence would kids conclude that the second context is *not* described by the second sentence?

# Onset of Binding Theory?

- If Binding Theory is part of UG, not learned, we'd expect that kids start out already knowing it. (or maybe it matures, but let's hold off on that possibility until we need it)
- **Caveat: Of course, the kids need to know what is a pronoun and what is a reflexive before they can use Binding Theory.**
- **However: We expect to find that the first available evidence should show that kids know Binding Theory.**

# Onset of Binding Theory

- But it doesn't seem to turn out as we'd expect...
- Several experiments seem to show that while kids show early evidence of knowing Principle A/C, they (appear to) consistently *fail* to observe Principle B—even up to (and beyond) 6 years old.

# Chien & Wexler (1990)

- Explored the question of whether kids know Principles A and B from the outset or not.
- First three experiments show:
  - Kids correctly require *local* antecedents for reflexives (Principle A) early on
  - Kids are significantly delayed in requiring *non-local* antecedents for pronouns (Principle B).

# C&W90: Experiment I

- Tests Principle A (reflexives require a local antecedent) by providing sentences with two possible antecedents (one local, one not). “Simon says” act-out task. (156 kids, mean 4;6)
  - **Kitty** says that **Sarah** should point to herself.
  - **Kitty** says that **Sarah** should point to her.
  - **Kitty** says that Adam should point to her.

# C&W90: Experiment II

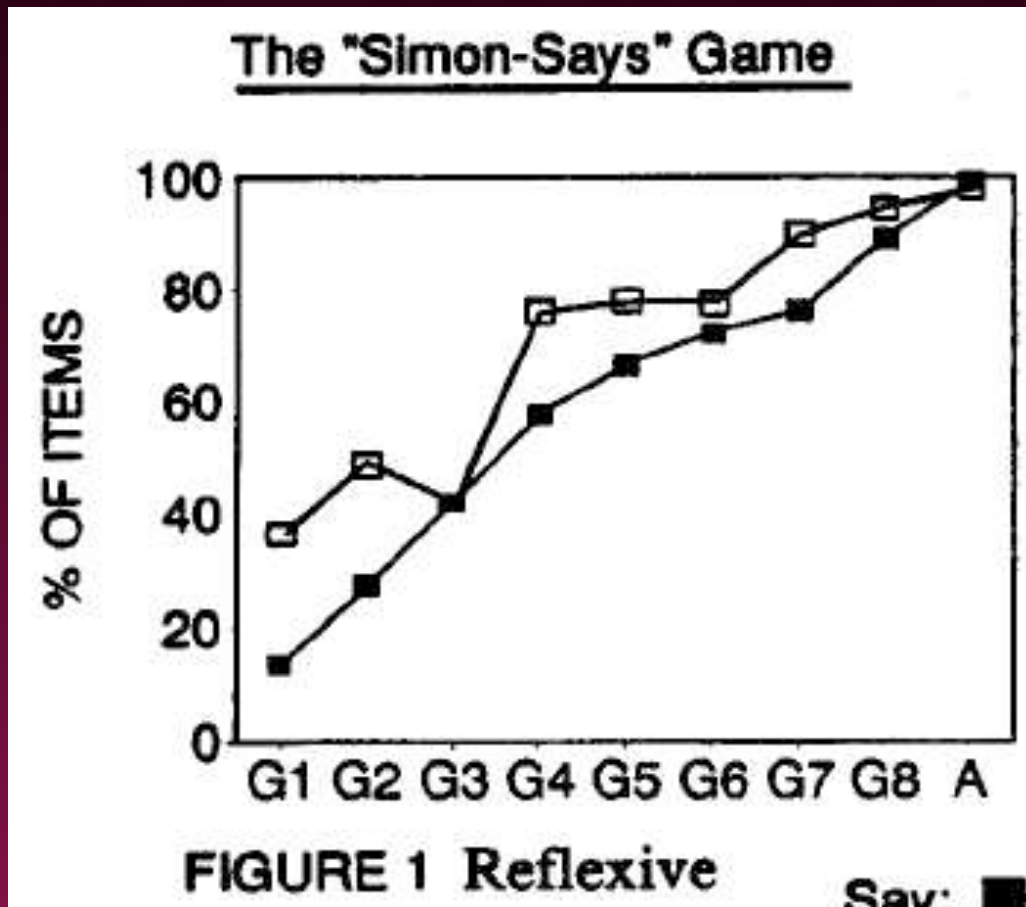
- Checking the effects of finiteness and also setting up a gender control on reflexives.  
(142 kids; mean 4;5)
- **Kitty** wants **Sarah** to point to herself.
- **Kitty** wants **Sarah** to point to her.
- **Kitty** wants Adam to point to her
- Snoopy wants **Sarah** to point to herself.

# C&W90: Experiment III

- Increased the number of conditions to test for pragmatic strategies and to replicate the results with a different task. (174 kids; mean 4;5)
- (Previous task was “Simon [Snoopy/Kitty] says...”, this task was “Party game” which involved giving objects to people/puppets sitting at a table. This might, if anything, introduce a self-bias, because it’s fun to get toys. *Kitty says that Sarah should give herself a car.*)



# C&W90: Experiments I-II



Say: ■—■  
Want: □—□

- Kids from 2.5 to 6 showed a steady increase (from about 13% correct to about 90%) in requiring *herself* to take a local antecedent.
- G1=2;6-3;0
- G2=3;0-3;6
- ...
- G8=6;0-6;6

# C&W90: Experiments I-II

The "Simon-Says" Game

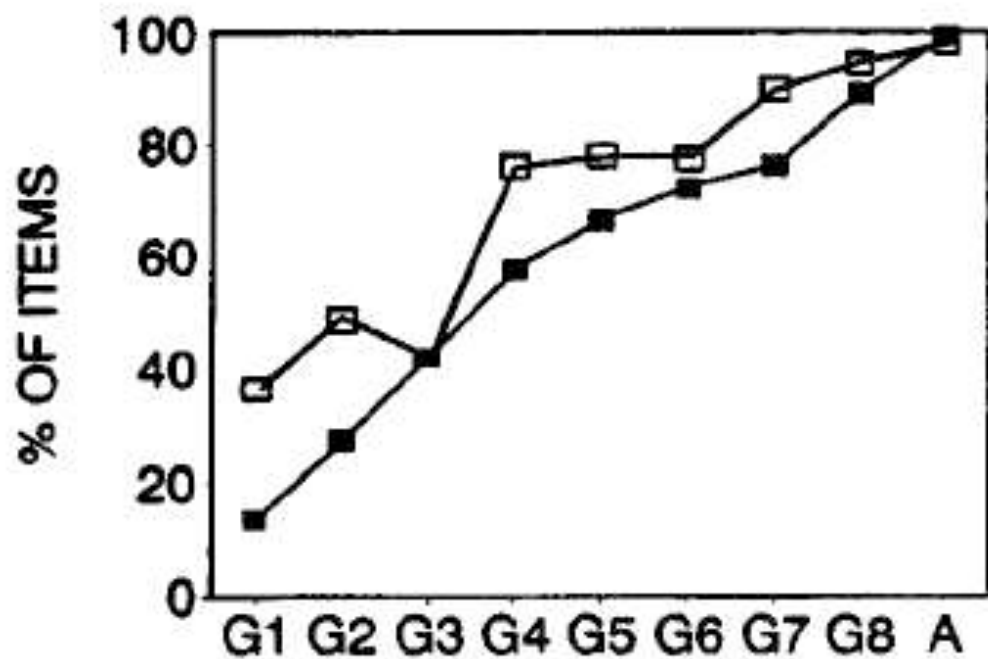


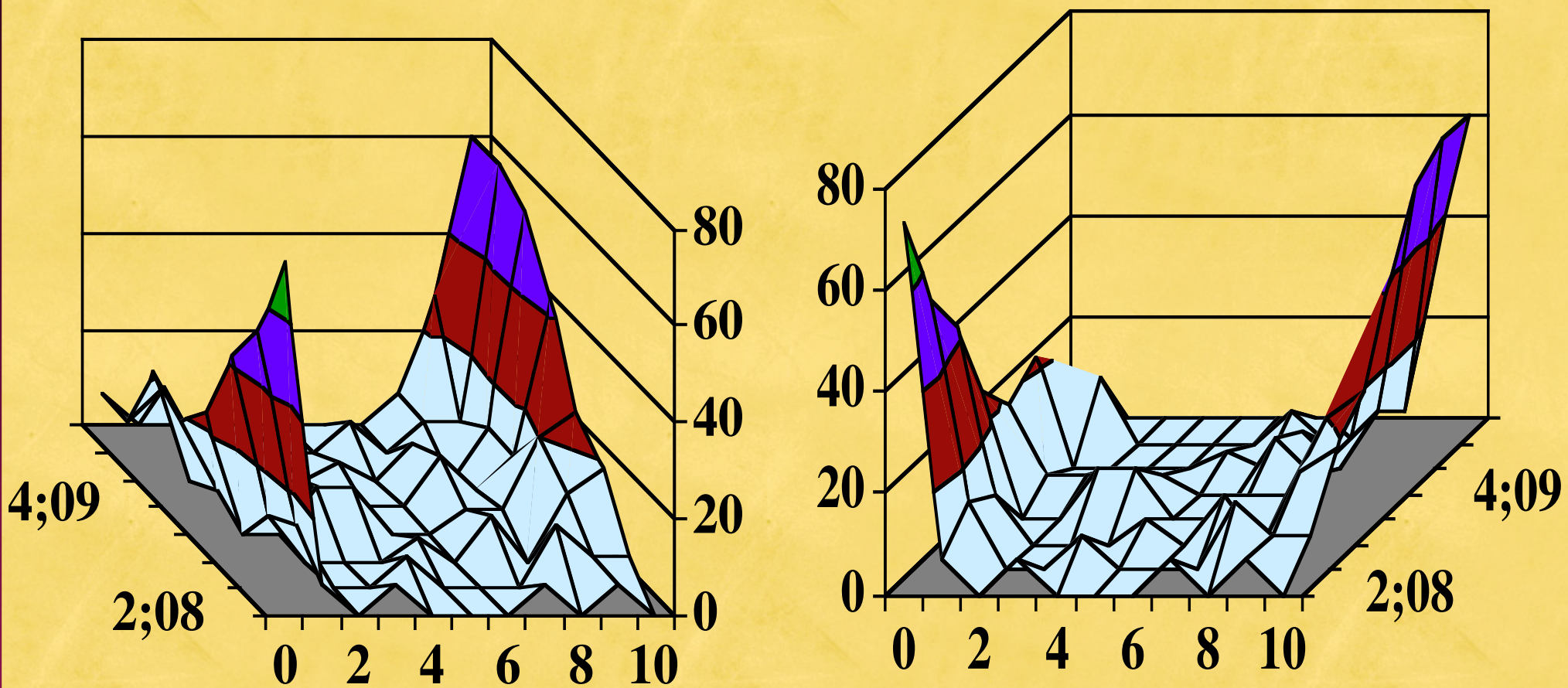
FIGURE 1 Reflexive

Say: ■—■

Want: □—□

- For some reason, kids seemed to perform better with nonfinite verbs (*want*); C&W have no particular explanation.

# C&W90: Appendix I reflexives



# C&W90: Experiments I-II

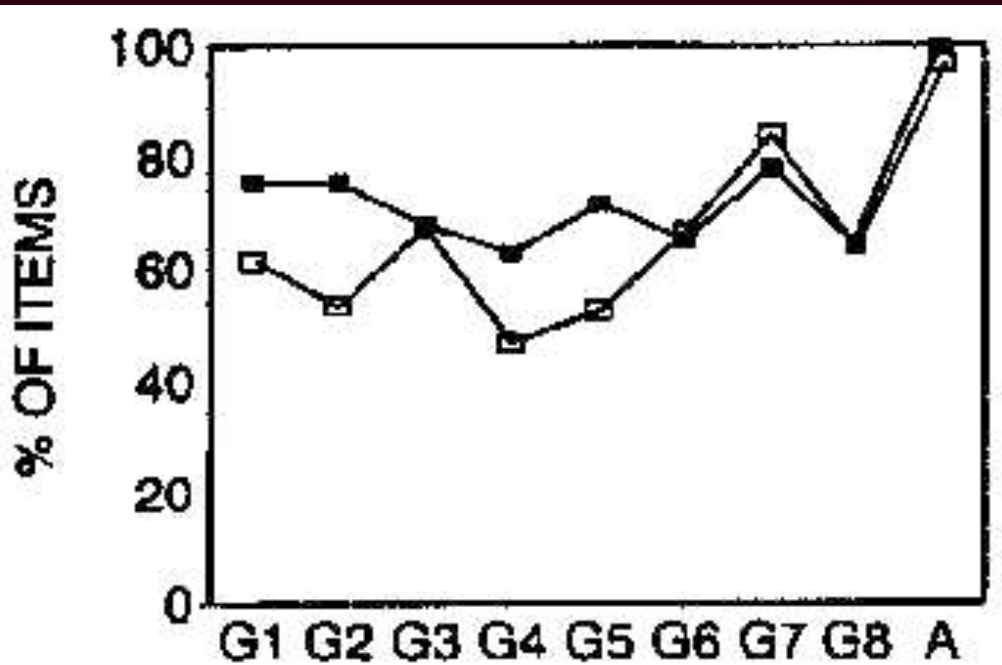
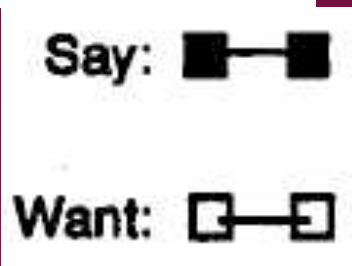
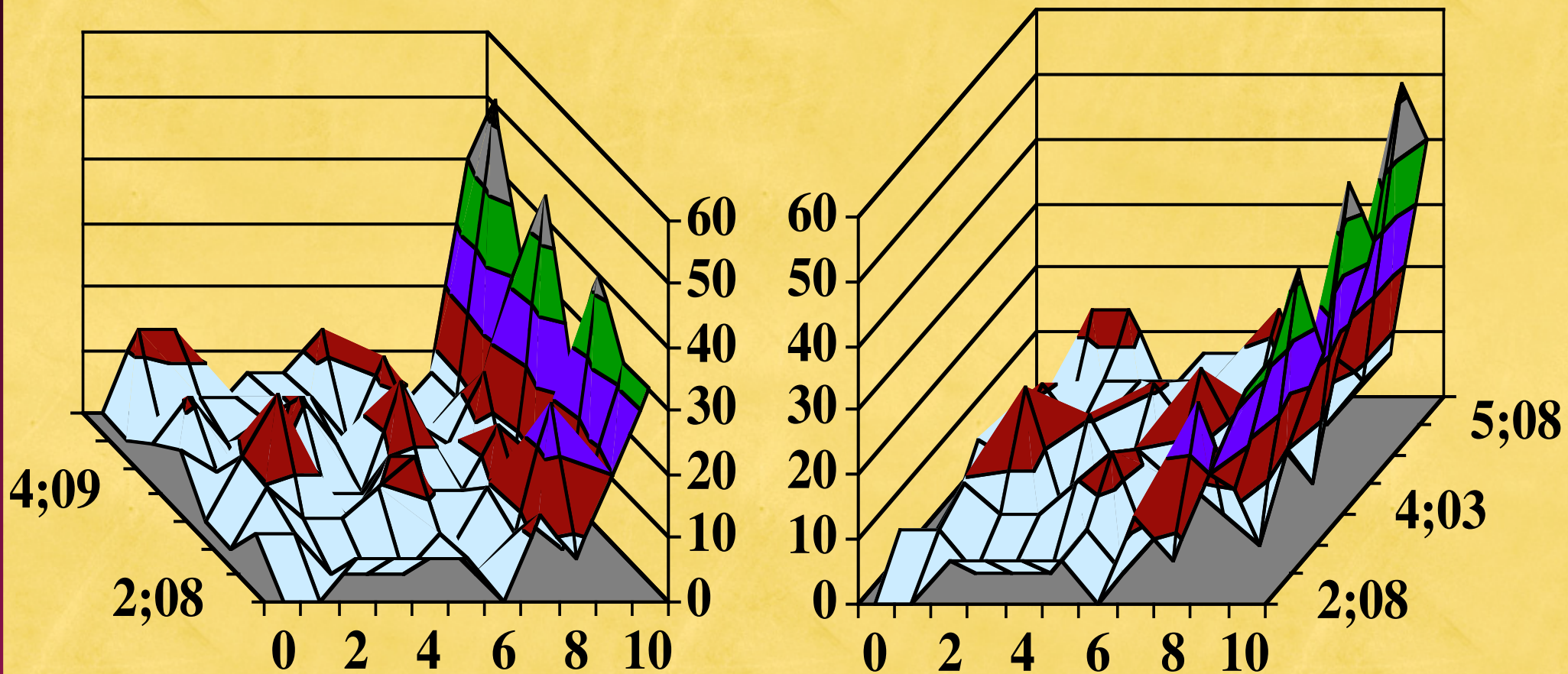


FIGURE 3 Pronoun



- Kids showed *no* significant development in requiring *her* to take a *non-local* antecedent (about 75% across the board). Most of the errors treated *her* as taking a local antecedent.
- *Kitty says that Sarah should point to her.*

# СФВ90: Appendix I пробы воды



# C&W90: Experiments I-II

- Gender cues for non-local pronoun brought kids' performance up to near-perfect. Had little effect on reflexives.

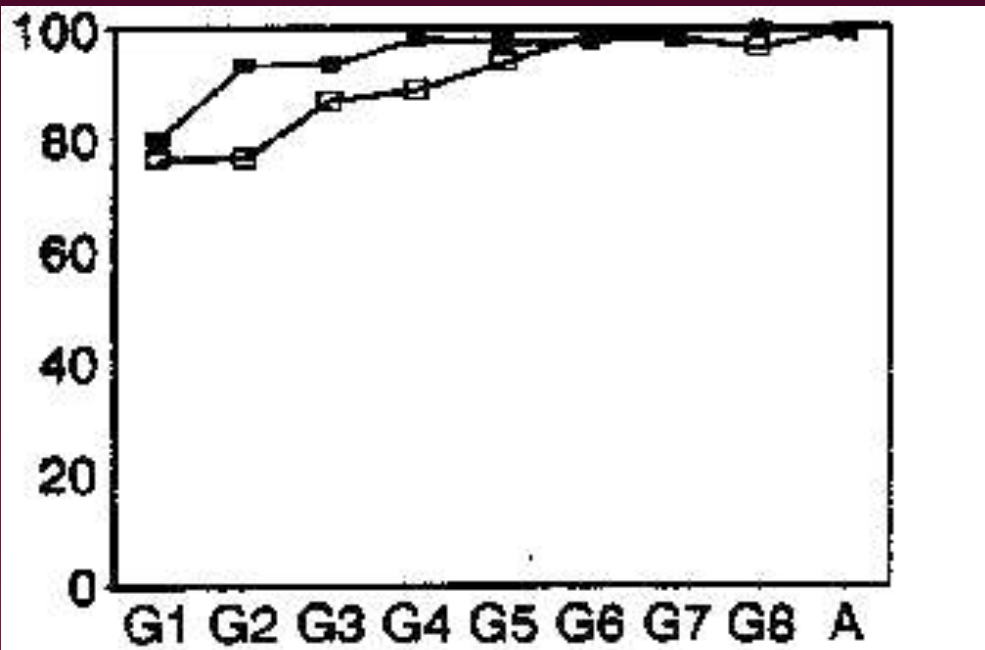


FIGURE 4 Gender Control Pronoun

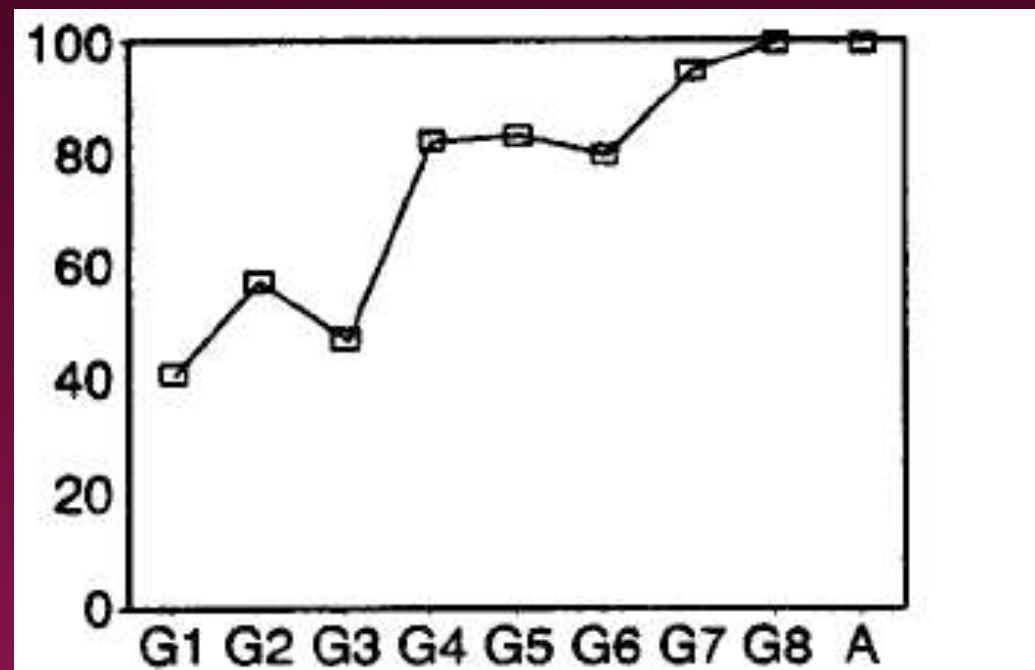


FIGURE 2 Gender Control Reflexive

# C&W90: Experiment III results

- Previous results replicated for new task.
- Young kids did better (operated at chance) for Principle A (meaning that they don't have a systematic *non-local coreference* principle they are following—cf. Experiment I result showing them at 13% correct). Who knows what it was, but it wasn't grammar.

# C&W90: Possibilities so far...

- Kids have to *learn* Principle B, and it takes a while.
  - But how on positive evidence alone?
- *Her* is harder to learn than *herself*.
  - But kids use pronouns first (*I saw him* sentences indicate that they're pronouns).
- Principle B matures (constraints enforcing coreference before those prohibiting coreference?)
  - \*UG-constrained maturation
- “Principle B errors” aren’t Principle B problems.



# Chien & Wexler (1990)

- Kids do know the difference between pronouns and reflexives (they aren't treating them *all* as reflexives).
- E.g., *I saw him*, \**I saw himself*.  
Kids say sentences like *I saw him* often enough, but they do seem to know that reflexives need a local antecedent.

# So what's wrong with Principle B?

- Chien & Wexler (1990): Nothing is wrong with Principle B. Kids know and respect Principle B all along.
- Consider what adults can do:
  - That must be John — or at least he looks an awful lot like him
- So do *adults* violate Principle B?

# Coindexation

- Principle B says that *coindexation* between a pronoun and an antecedent is prohibited if the antecedent is too close.
- Assuming adults obey this, that previous sentence must have been:
  - *That must be John—or at least he<sub>i</sub> looks an awful lot like him<sub>j</sub>.*
- ...where *i* and *j* are *accidentally coreferent*.

# Coindexation

- If two noun phrases share the same index, they necessarily share the same referent. **Coindexation implies coreference.**
- If two noun phrases do *not* share the same index, does this mean they *can't* share the same referent? **Does contraindexation imply non-coreference?**

# Coindexation

- The idea behind the Chien & Wexler account of the Principle B “delay” is that *adults* know the pragmatic Principle P, but *kids* are unable to use it right away.
- **Principle P**  
Contraindexed NPs are non-coreferential unless the context explicitly forces coreference.

# Coindexation

- So, when a kid agrees that...
  - Mama Bear is pointing to her.
- ...meaning 'Mama Bear is pointing to herself', what the kid really agreed to was
  - Mama Bear<sub>*i*</sub> is pointing to her<sub>*j*</sub>.
- ...ok by Principle B, but violating Principle P (by allowing *i* and *j* both to refer to Mama Bear).

# How could we ever tell?

- But how can we tell if it's *Principle P* that kids don't obey and not *Principle B*, given that they both seem to allow *Mama bear is pointer to her '...herself'*?
- **Answer:** Principle B *also* governs the use of bound pronouns, which Principle P has nothing to say about.

# Bound pronouns

- A bound pronoun is like *his* in:
  - Every boy<sub>i</sub> is looking for his<sub>i</sub> keys.
- ...and these are subject to Principle B, but they do not have a fixed referent, so accidental coreference is not an option here.
  - \*Every boy<sub>i</sub> admires him<sub>i</sub>.



# Prediction

- So, if found that kids accept
  - **Mama bear points to her** (*her = Mama Bear*)
- ...but refused to accept
  - **Every bear<sub>i</sub> points to her<sub>i</sub>**. (*her = each bear in turn*)
- ...then kids know Principle B (and what they lack is probably Principle P).

# Chien & Wexler (1990)

- First three experiments established that Principle B appears to be delayed with respect to Principle A.
- Fourth experiment establishes that kids obey Principle B when coindexation would be forced by a bound variable interpretation.

# C&W90: Experiment IV

- Principle B (but not Principle P) applies also to bound pronouns—if the kids know Principle B and not Principle P, we expect to see kids getting *bound pronouns* right (unlike *referring pronouns*, as previous three experiments showed).

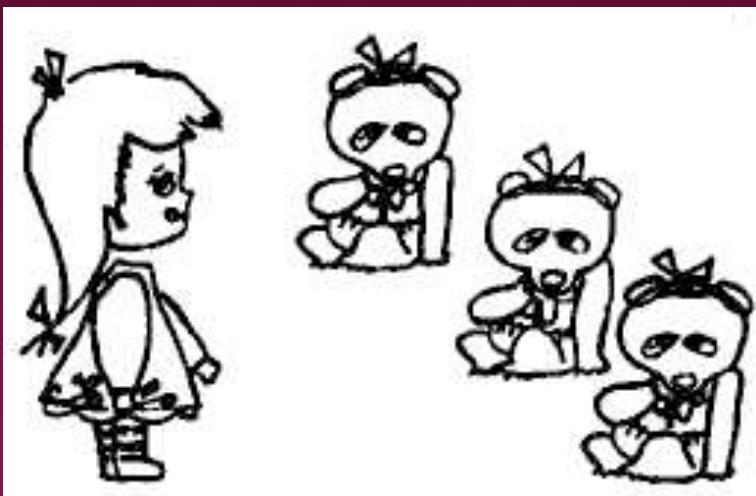
# C&W90: Exp. IV items

- Name-reflexive
  - Is Mama Bear touching herself?
- Name-pronoun
  - Is Mama Bear touching her?



# C&W90: Exp. IV items

- Quantifier-reflexive
  - Is every bear touching herself?
- Quantifier-pronoun
  - Is every bear touching her?



# C&W90: Exp. IV controls

- Name-name

- Is Mama Bear pointing to Goldilocks?

- Every-name

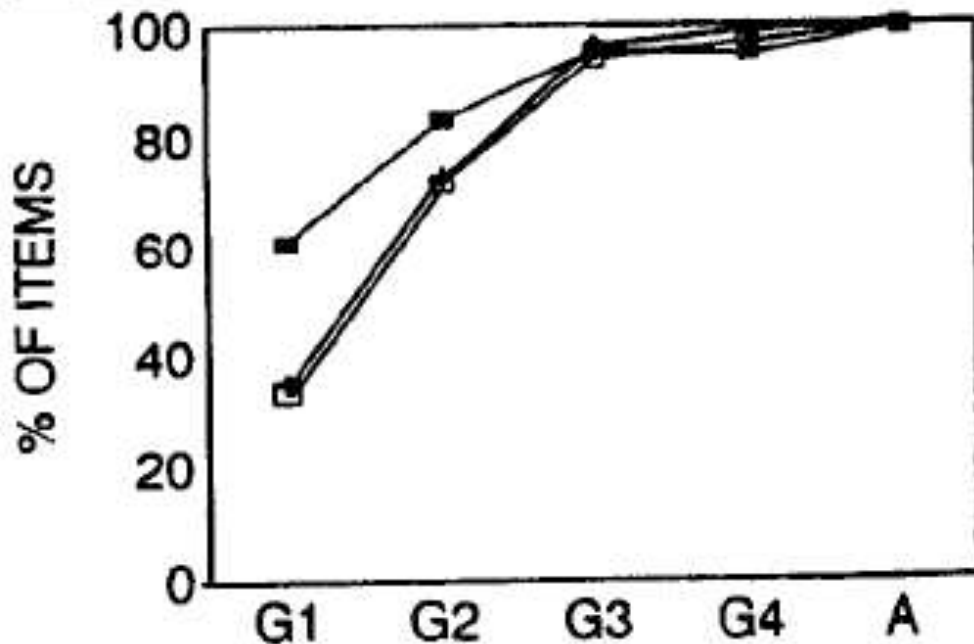
- Is every bear pointing to Goldilocks?

- All-name

- Are all of the bears pointing to Goldilocks?

# C&W90: Exp. IV control

The Results of the 3 Mismatch Conditions



Name-Name: ■—■

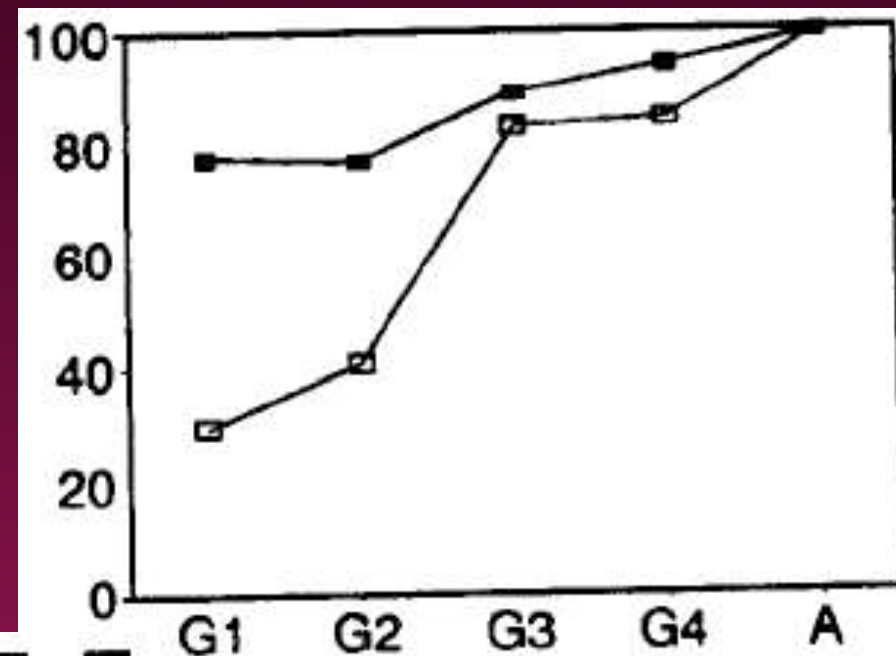
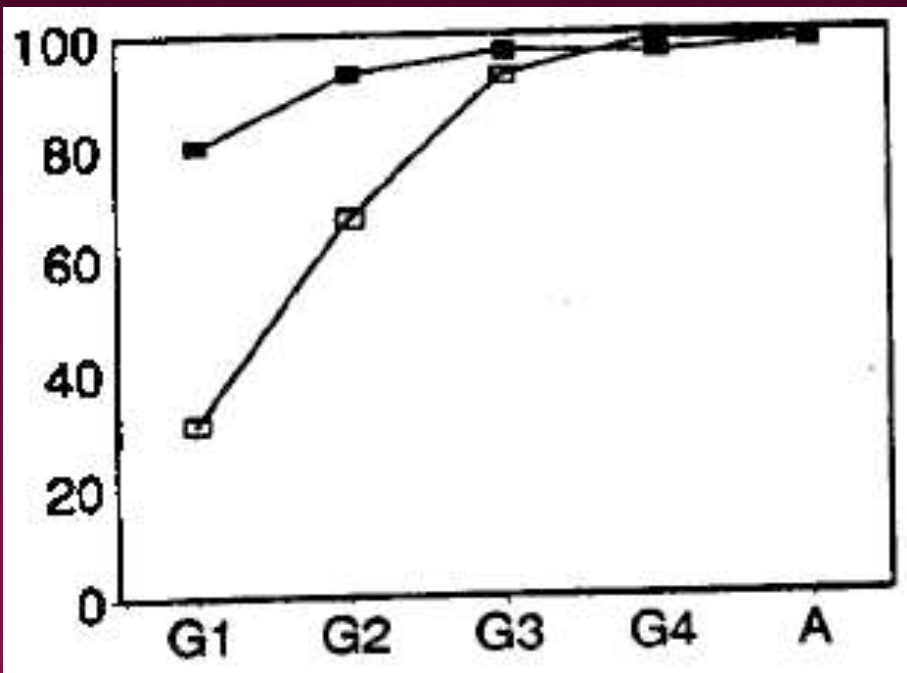
Q "every" - Name: □—□

Q "all" - Name: +—+

- Kids under 5 did poorly on the mismatch ("no") condition for *every* and *all*; they did less poorly on the mismatch condition for names.
- Kids under 5 haven't quite mastered quantifiers. (So we can't test Principle B with them) (with this task)
- G1= $\leq 4$ (48); G2=4-5(45); G3=5-6(44); G4=6-7(40)

# C&W90: Experiment IV

- Kids over 5 did near-perfect with respect to Principle A (name-reflexive and quantifier-reflexive match/mismatch).



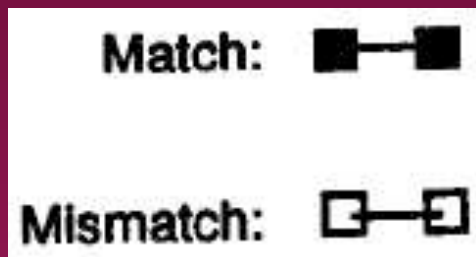
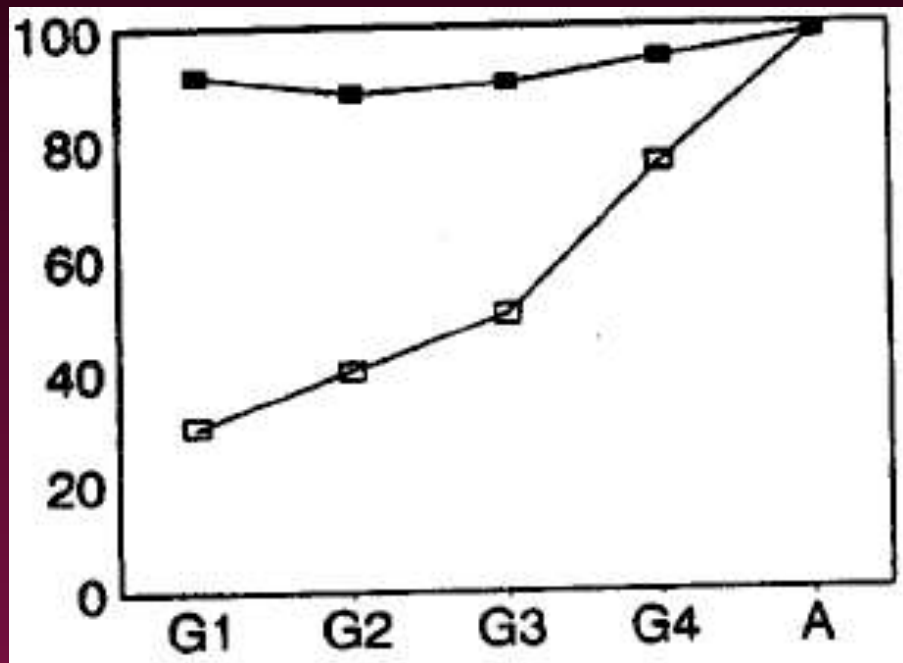
Match: ■—■

Mismatch: □—□



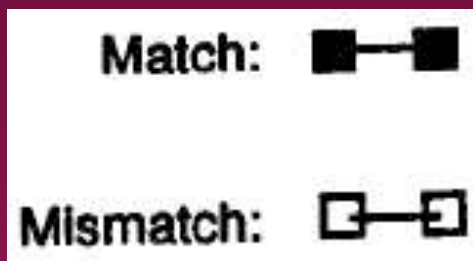
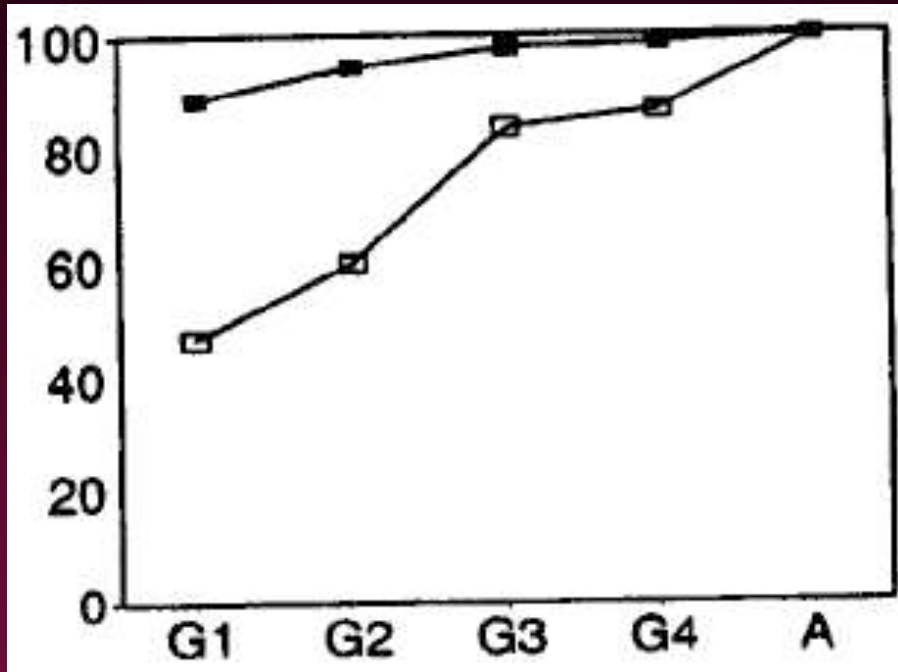
# C&W90: Experiment IV

## name-pronoun



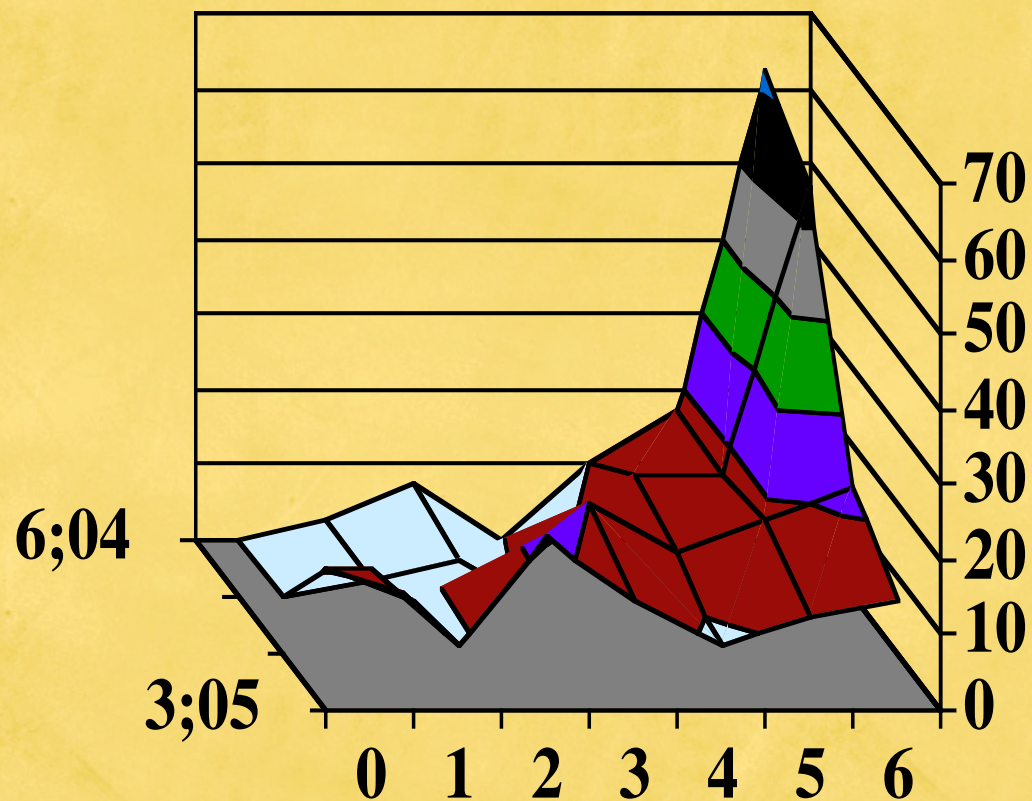
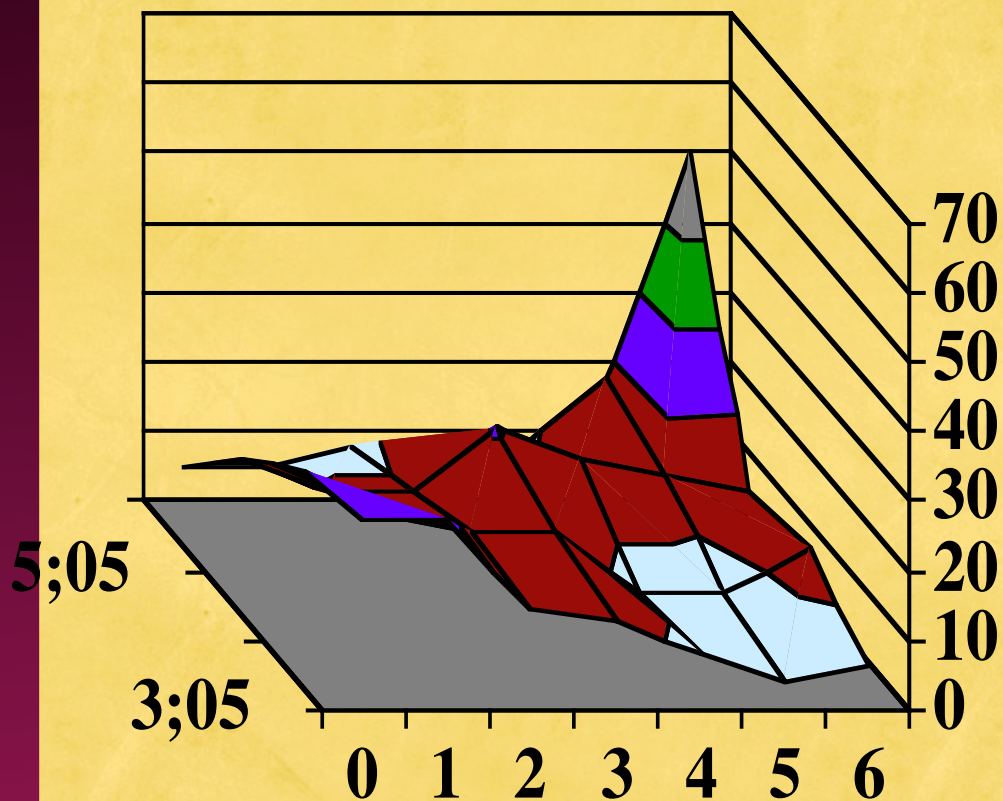
- Kids did badly on the name-pronoun mismatch cases, steadily rising from about 70% wrong to about 25% wrong between 4 and 7.

# C&W90: Experiment IV



- Under 5, kids were operating around chance (they don't understand how quantifiers work yet)
- Over 5, they were at 80% correct and above—in particular, better than on the name-pronoun condition; **they seem to know Principle B.**
- (G3 went from 50% to 80%)

# СФМ90: Appendix I, E4: name-rtbn & quant-



# Chien & Wexler (1990)

- By the time kids understand quantifiers like *every* and *all*, pronouns, and reflexives, they apply Principle B.
- Where accidental coreference is possible (despite violating Principle P), kids will allow it about half of the time.

# Thornton & Wexler (1999)

- What pragmatic knowledge do children lack? Broadly speaking, children appear to have difficulty evaluating other speakers' intentions... As speakers, children fail to distinguish between their knowledge and that of listeners... [c]hildren use pronouns without first ensuring that a referent has been introduced into the conversational context... As listeners, children appear to assign interpretations to other speakers' utterances that require special contextual support to be felicitous for adults... (pp. 14-15)