LANGUAGE UNIVERSALS & UNIVERSAL GRAMMAR

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The structure of the talk: UG

- Universal Grammar is a theory of the initial state of the language faculty, not a list of universal properties of adult languages – although there is considerable overlap.
- For certain scope parameters, the alternative parameter values sometimes generate <sentence, meaning> pairs that are in a subset/superset relationship (asymmetric entailment).
- For such parameters, children acquiring all languages initially adopt a default (subset) value, to avoid potential problems of language learnability in the absence of negative evidence.
- Children acquiring some languages reset these parameters in response to positive evidence.

Linguistic Universals

- Across languages, inverse scope readings are not available when negation is introduced covertly, e.g. in sentences with focus operators. Only surface scope readings are generated in these linguistic structures.
- These unambiguous surface scope readings can differ from the initial value children assign to scope parameters, which can be inverse scope readings (if this is the subset reading).
- Therefore, there are properties of the initial state (UG) that are not found universally across adult human languages.
- UG is not equivalent to the set of linguistic universals.

Scope Parameters

Across languages, negation assumes different scope relations when it combines with words for disjunction and when it combines with words for conjunction.

Scope Parameters

English conforms to classical logic. In classical logic, negation '¬' takes scope over conjunction '∧' in the formula ¬(A ∧ B). This yields a 'not both' reading, as in one of de Morgan's laws:

¬(A ∧ B) entails ¬A ∨ ¬B

Ted didn't order (both) pasta and sushi.

Scope Relations

In Mandarin, negated conjunctions mean 'both not', regardless of the surface word order of the operators.

*Taide **meiyou** dian yidalimianshi **he** shousi.*
Ted **not** order pasta **and** sushi
'As for both pasta and sushi, Ted did not order them.'

*Taide yidalimianshi **he** shousi **dou meiyou** dian*
Ted pasta and sushi **both not** order
'As for both pasta and sushi, Ted did not order them.'

Positive Polarity Items

In Mandarin, conjunction is a positive polarity item (PPI). By definition, a PPI takes scope over negation at the level of logical form.

Surface syntax: NOT … he

Logical Form: he > NOT

NB: There is no violation of de Morgan's laws.

Positive Polarity Items

In English, conjunction is not a positive polarity item (-PPI).

Surface syntax: NOT > and

Logical Form: NOT > and

NB: -PPI is the *in situ* reading of an expression, not an NPI

The Conjunction Parameter

The parameter value on which conjunction takes scope over negation is AND = +PPI. The value where negation takes scope over conjunction is AND = -PPI.

Mandarin: AND = +PPI

English: AND = -PPI

The Conjunction Parameter

English takes the AND = −PPI value of the parameter. This is why this sentence generates a 'not both' reading.

Ted didn't order (both) pasta and sushi.

The Conjunction Parameter

In Mandarin, conjunction (*he*) has the value +PPI.

Taide ***meiyou*** *dian yidalimianshi* ***he*** *shousi.*
Ted **not** order pasta **and** sushi
'As for both pasta and sushi, Ted did not order them.'

Taide yidalimianshi ***he*** *shousi* ***dou meiyou*** *dian*
Ted pasta and sushi **both not** order
'As for both pasta and sushi, Ted did not order them.'

Positive/Negative Evidence

Children 'try out' interpretations that are not permitted in the local language. They speak fragments of a 'foreign language'.

In the absence of negative data, children must have some mental mechanism that rules out otherwise 'reasonable' linguistic forms and meanings, without outside intervention.

If so, the child can add forms and meanings that are initially excluded, on the basis of positive data (e.g., parental input).

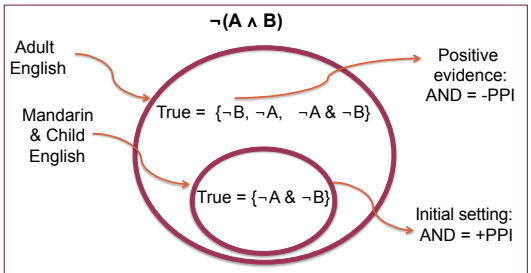
Semantic Subset Principle

Children initially favor the scope interpretation that makes a sentence true in the narrowest range of circumstances.

For conjunction, the 'subset' reading is associated with the AND = +PPI parameter value, as in Mandarin.

Prediction: Children acquiring English speak a fragment of Mandarin.

SSP: The Conjunction Parameter



SSP: The Conjunction Parameter

English-speaking children are expected to initially favour the AND = +PPI analysis of conjunction. So, English-speaking children are expected to interpret

The pig didn't eat (both) the carrot and the pepper.

to mean the same as it does in Mandarin -- that Ted ordered neither pasta nor sushi. This can be paraphrased in English using a cleft sentence:

It's both the carrot and the pepper that the pig didn't eat.

For English-speaking children, it is unlikely that they assign this interpretation based on input from adults, who favour the AND = -PPI value of the Conjunction Parameter.

Experiment: Truth Value Judgement Task

Short vignettes were acted out in front of the child and Kermit the Frog. The vignettes were about different animals who were asked, in turn, if they were happy to eat a carrot and a green pepper.

- If an animal ate both, it received a gold medal
- If it ate only one, it received a blue medal
- If it ate neither one, it received a black cross

With the vegetables removed, Kermit attempted to guess what each animal had eaten, based on the medal it received. On the critical trials, the animal received a blue medal (i.e., it only ate one vegetable). The study replicated Goro and Akiba (2004)

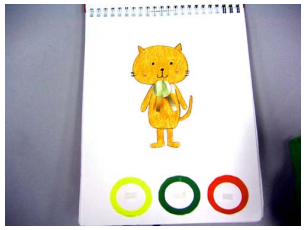
The Experiment

[1] The eating-game: 12 animals are offered 3 kinds of food. Depending on what they eat, they get some kind of reward.

[2] Truth Value Judgment: Kermit the Frog guesses what each animal ate, based on the prize the animal received.

Experimenter: Look! These animals going to play an "eating-game"!!

Experimenter: Here's a piece of cake, a green pepper, and a carrot. All the animals love cake, but they don't like vegetables. Here's the rule of the game: if an animal eats the vegetables, he gets a better prize.



Experimenter: For example, if someone eats cake, and the pepper, and also the carrot… then he gets a gold medal!

Experimenter: If someone eats cake, and either one of the vegetables, but not both… then he gets a blue medal.

Experimenter: If an animal eats only cake, but not the vegetables, then he gets a black cross…

Experimenter: Now, here comes a pig. He will play the game.

Experimenter: The pig first picked up the cake. He loves cake and of course he ate it!

Experimenter: Then he picked up the pepper. He doesn't like peppers… but he managed to eat it all up!

Experimenter: Then he picked up the carrot…Oh no, he couldn't eat the carrot!

Experimenter: So, the pig ate the cake, and he ate the pepper, but he didn't eat the carrot. Which prize does he get? Child: A blue medal!

Experimenter: Yes, a blue medal!

- the "eating-game" continues with 12 animals. Every one eats the cake. 4 eat both vegetables, 4 eat only one vegetable, and 4 eat neither

- After the "game", Kermit produces the test sentences
Kermit: Ok, now I'm gonna guess how well the animals did. The pig…
I don't remember what he ate…oh, but he has a blue medal!

Negated Conjunctions

The pig didn't eat both the carrot and the pepper

Results: Negated Conjunctions

In response to negated conjunctions, 21 English-speaking children (mean = 4;9) rejected the target statements 98% of the time (*The pig didn't eat both the carrot and the pepper).* The English-speaking adults we have interviewed accepted the same statements 88% of the time.

Children justified their rejections by pointing out that the animal in question had eaten one vegetable (hence the blue medal). This indicates that children assigned the 'neither' (AND = +PPI) reading to negated conjunctions, as in Mandarin.

Conclusion: English-speaking children initially adopt the Mandarin setting of the Conjunction Parameter.

Continuity Hypothesis

"All principles and constructs of universal grammar are available at the outset and all child grammars will be 'possible human grammars', in the sense of falling within the patterns of adult grammars (either observed or permitted under the theory). The child's grammar may, however, deviate from that of the language he will ultimately acquire."

(Goodluck 1991)

Child language can differ from the language of adults in the same linguistic community, but only in ways that adult languages can differ from each other.

(Crain 1990)

Interim Conclusions

- Across languages, children appear to initially favour parameter values that generate scope relations that make sentences true in the narrowest range of circumstances.
- This ensures that children will have access to positive evidence if the local language favours the alternative scope possibilities, ones that make sentences true in a broader range of circumstances.
- In the case of the Conjunction Parameter, children's initial parameter setting, across languages, is the +PPI value, i.e., the inverse scope reading.

Properties of PPIs: English *some*

English ***some*** takes scope over negation at Logical Form.

Julia did***n't*** eat ***some*** of the kangaroo.

some of the kangaroo Julia did**n't** eat ~~***some*** *of the kangaroo*~~

Julia did***n't*** eat ***any*** of the kangaroo

Focus Operators

Polarity Sensitivity is cancelled when a PPI appears in the predicate phrase of a **focus operator.**

Only Julia ate ***some*** of the kangaroo

Only Julia ate ***any*** of the kangaroo

some and ***any*** have the same truth conditions

Focus Operators

Children (across languages)
Inverse Scope: *Ted didn't order both pasta and sushi.*
'It's both pasta and sushi that Ted didn't order'

Children and adults (across languages)
Surface Scope: *Only Ted ordered both pasta and sushi.*

Presupposition: Ted ordered pasta and sushi
Assertion: Everyone else didn't order both pasta and sushi

Zhiyou Taide dian le yidalimian ***he*** *shousi.*
Only Ted order Asp pasta and sushi
'Only Ted ordered pasta and sushi.'
只有泰德点了意大利面和寿司.

Conjunction in Focus Structures

Because negation is introduced 'covertly' at the level of Logical Form, negated conjunctions stated in the entailments do not license inverse scope readings; the PPI status of disjunction and conjunction is cancelled.

There are two consequences:

- There should be no cross-linguistic differences in the interpretation of conjunction in the predicate phrase of a sentence with a pre-subject focus operator.
- Entailments should conform to the laws of propositional logic: $\sim(A \wedge B) \Rightarrow (\sim A \vee \sim B)$

Conjunction and Focus in Child English and Mandarin

Participants

- 18 monolingual English-speaking children (mean age 4;3, range 3;5 to 5;1)
- 20 monolingual Mandarin-speaking children (mean age 4;7, range 4;5 to 4;10)

- 13 English-speaking adults
- 20 Mandarin-speaking adults

Procedures

Truth Value Judgment Task (Crain & Thornton, 1998)

Materials

English:
Only *Mickey Mouse chose both a box* ***and*** *a rabbit.*

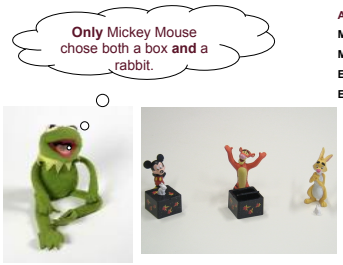
Mandarin:
Zhiyou *Milaoshu xuan-le hezi* ***he*** *tuzi*
only Mickey Mouse choose-ASP box and rabbit
'Only Mickey Mouse chose a box and a rabbit.'

Presupposition: Mickey Mouse chose both a box and a rabbit.

Entailment: Everyone else did**n't** choose both a box **and** a rabbit.

Adult-true Scenario

Adult-true Scenario



Acceptance rates:

Mandarin-speaking adults: 90%

Mandarin-speaking children: 90%

English-speaking adults: 100%

English-speaking children: 90%

Adult-false Scenario

Adult-false Scenario

Rejection rates:

Mandarin-speaking adults: 100%

Mandarin-speaking children: 70%

English-speaking adults: 100%

English-speaking children: 90%

Summary: Conjunction and Focus in English and in Mandarin

- Both English and Mandarin Chinese adhere to the laws of classical logic once the polarity sensitivity of conjunction is cancelled by focus operators

$$\neg(A \wedge B) \longrightarrow \neg A \vee \neg B$$

- These surface scope readings are putative universal properties of human languages.

The Theory of Universal Grammar

- Universal Grammar is a theory of the initial state of the language faculty, not a list of universal properties of human languages – though there is considerable overlap.
- For certain scope parameters, the alternative parameter values sometimes generate <sentence, meaning> pairs that are in a subset/superset relationship (asymmetric entailment).
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Linguistic Universals

- The universal surface scope readings generated in certain linguistic environments can differ from the initial value children assign to scope parameters, which can be the inverse scope reading (if this is the subset reading).
- Therefore, there are properties the initial state (UG) that are not found universally across adult human languages.
- UG is not equivalent to the set of linguistic universals.