

Free Relatives in Acquisition

A case of over-generalization

Michael Claus

11 September 2015 – GALA 12



To learn a language

What are the goals of a language learner?

- 1 To learn a set of allowable strings and structures
 - ▶ John wrote what (*book) Molly read
 - ▶ John wondered what (book) Molly read
- 2 To learn a set of allowable form-meaning pairs
 - ▶ [what Molly read] corresponds to two meanings
 - ▶ [what book Molly read] corresponds to one
- 3 **The connection between 1 and 2**

Outline

- Free Relatives and Wh Movement
- Systematic Disambiguation
- Experiment
- Syntactic consequences
- Further explorations

Outline

- **Free Relatives and Wh Movement**
 - Key data from adult and child grammars.
- Systematic Disambiguation
- Experiment
- Syntactic consequences
- Further explorations

Free Relative Clauses

Wh-movement has, in much classic syntactic work, been assumed to be essentially a single generalized operation used to derive a number of constructions by moving a Wh operator to the specifier of a clause (Chomsky 1977, etc.)

Wh Constructions

- [_{CP} **What** did John see *t*]
- The thing [_{CP} **which** John saw *t*]
- John is tough [_{IP} **OP** to see *t*]
- It's John [_{CP} **OP** that I saw *t*]

Free Relative Clauses

However, at least on the surface, we can see some apparent differences across constructions in what sorts of Wh expressions can move.

Questions

- What (gift) did Ben bring?
- How much did Ben bring?
- What is it that Ben brought?

Free Relative Clauses

- Molly opened what (*gift) Ben brought
- *Molly drank how much Ben brought
- *Molly wore what it is that Ben brought

Free Relative Clauses

The question for acquisition

What do children know about these restrictions? What can children's knowledge tell us about their source?

The question for syntax:

What is the source for the restrictions on FRCs? To what extent do they come from primitive principles of labeling (Cecchetto and Donati 2010, 2015; Chomsky 2013)?

Free Relative Clauses

I will suggest that the results we observe point to a particular hypothesis:

Children assume a maximally general rule of Move-Wh which avoids certain adultlike restrictions on the form of FRCs

Additionally I will discuss the results in light of a generalization about learning problems in general and generalizations about syntactic patterns:

Language- and Construction-specific rules and patterns exist independently from UG principles

FRCs in Acquisition

Children's knowledge of FRCs has revealed a few key facts:

- Children produce FRCs earlier than other relatives (Flynn and Lust 1980)
- Acquisition of Wh exhaustivity precedes FRC exhaustivity (Roeper and de Villiers 2011, Caponigro et al 2012)
- Children who give medial Wh answers will almost never target Wh words in FRCs for medial answers (Claus 2013, 2014)
 - ▶ Did Billy say [what he fed the Bunny?] → What did Billy feed the bunny
 - ▶ Was [what Molly saw] scary? ↯ What did Molly see?

FRCs in Acquisition

The baseline results from these previous studies are:

- Children know how to produce FRCs from an early age
- Children know that FRCs are semantically distinct from other Wh constructions

Outline

- Free Relatives and Wh Movement
- **Systematic Disambiguation**
 - ▶ The semantic distinction between FRCs and embedded questions.
- Experiment
- Syntactic consequences
- Further explorations

Systematic Disambiguation

Classic observations on FRCs have focused on syntactic forms available across different contexts, predicates which take only clausal complements vs. only nominal complements

Embedded questions

- Ben asked [what (book) Molly read]
- [What (book) Molly read] came as a surprise

FRCs

- Ben wrote [what (*book) Molly read]
- [What (*book) Molly read] was lying open on the desk

Systematic Disambiguation

However, certain frames are surface ambiguous between FRCs and other readings. Verbs which take either nominal or clausal arguments (like 'see') provide such a condition.

Ambiguities

Ambiguous verbs

- Ben saw the book
- Ben saw that Molly wrote the book
- Ben saw what Molly wrote

Systematic Disambiguation

This categorial ambiguity comes with a semantic reflex.

Nominal reading

Ben saw [_{DP} what (*book) Molly wrote]

- True as long as Ben sees a thing with the property of Molly having written it.

Question reading

Ben saw [_{CP} what (book) Molly wrote]

- True only if, by seeing, Ben comes to be able to answer the question, ‘what did Molly write?’

Systematic Disambiguation

Certain situations make this clear.

Ben sees several books laying open. Among them is the book Molly wrote, though he cannot tell which book is which.

- Ben saw what Molly wrote = True
- Ben saw what book Molly wrote = False

Under this scenario only the nominal reading is true, but under the second syntax only the question reading is available.

Systematic Disambiguation

This ambiguity consistently goes away when the constraints on the form of FRCs are violated

Disambiguation

- Ben saw what book Molly wrote
- Ben saw what it is that Molly wrote
- Ben saw how much Molly wrote

We can use this characteristic disambiguation as a metric of children's knowledge of the relevant syntactic constraints

Systematic Disambiguation

First we'll need a sense of what the two possible meanings are for ambiguous sentences. To this end, keep in mind the following rough semantics:

write [what Molly read] \rightarrow the x such that Molly read x
ask [what Molly read] \rightarrow for which x Molly read $x = T$

This is a rough version of the semantics proposed for FRCs by Chierchia and Caponigro (2013)

- FRCs are Definite Descriptions denoting answers to questions;
- To that end they are derived from the questions they answer.

Systematic Disambiguation

These semantics can illustrate the disambiguation with What-NP sequences seen above

Ben saw what Molly read

see [what Molly read]

→ the x such that Molly read x

→ for which x Molly read x = T

Ben saw what **book** Molly read

see [what book Molly read]

↯ the book x such that Molly read x

→ for which book x Molly read x = T

Systematic Disambiguation

This same descriptive formula can be used for some of the other examples we've looked at.

Ben saw how Molly brought

see [how much Molly ate]

↗ the amount x such that Molly ate x

→ for what amount x Molly ate $x = T$

see [who Molly met]

↗ the person x such that Molly met x

→ for which person x Molly met $x = T$

Systematic Disambiguation

This gives us the ingredients we need to examine children's ability to make use of the restrictions on the form of FRCs in truth value judgment tasks.

Outline

- Free Relatives and Wh Movement
- Systematic Disambiguation
- **Experiment**
 - Children do not make use of the Wh-NP constraint in a TVJT
- Syntactic consequences
- Further explorations

Experiment

With the above in mind, I tested the ability of adults and children to use the *Wh-NP rule for FRCs to disambiguate sentences with ambiguous predicates.

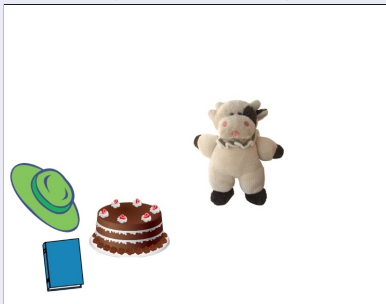
Participants gave Truth Value Judgments for sentences with ‘see what (S)’ vs. ‘see what NP(S)’ based on two types of stories: stories where question readings are false, and stories where question readings are true.

Experiment

Goat brought a gift to Cow's birthday party...

Q-False

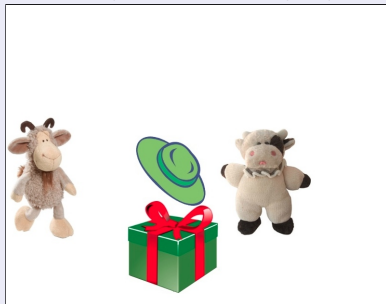
Cow only sees that she
has gotten some gifts



- (a) Cow saw what Goat brought
- (b) Cow saw what gift Goat brought

Q-True

Cow sees Goat and
the gift he is bringing



- (c) Cow saw what Goat brought
- (d) Cow saw what gift Goat brought

Experiment

A study of 16 adult native English speakers and 16 children (ages 5;3 to 6;10, mean 6;4) seems to show that children do not make use of the constraint against Wh-NP in FRCs.

Results

Percentage of 'true' responses by condition (*s.e.*)

	Adult results		Child results	
	Q-False	Q-True	Q-False	Q-True
Wh	68.75% (3.8)	93.75% (2.0)	62.5% (6.2)	81.25% (5.0)
Wh-NP	25% (3.5)	87.5% (2.7)	68.75% (5.9)	81.25% (5.0)

Significant differences between Children and adults in the relevant condition, and between the two story conditions for Wh-NP for adults. Children's answers significantly affected by story type.

Experiment

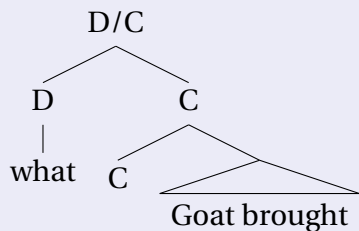
What consequences for the analysis of FRCs could this finding have?
What about for other constraints on FRCs? An examination of the syntactic analysis of FRCs is enlightening.

Outline

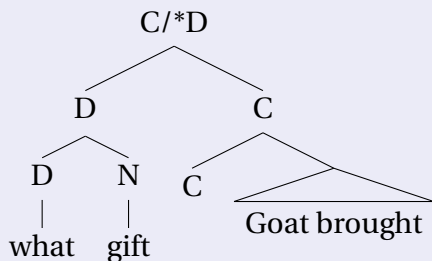
- Free Relatives and Wh Movement
- Systematic Disambiguation
- Experiment
- **Syntactic consequences**
 - Finding the right misanalysis
- Further explorations

Syntactic consequences

A recent approach to the syntax of FRCs has been to take the *Wh-NP effect as a result of a restrictive algorithm for the projection of labels:



D and C are heads, can both project



D is an adjoined phrase, cannot project

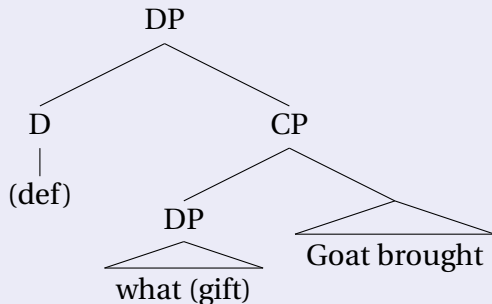
Syntactic consequences

Adopting this analysis (or something like it) puts us in the uncomfortable position of saying children are failing at this labeling algorithm, taken to be a primitive of the grammar.

But, alternate analyses could lead to the sorts of errors we see while still closely resembling adult grammars. Here I consider a couple.

Syntactic consequences

Child Syntax I

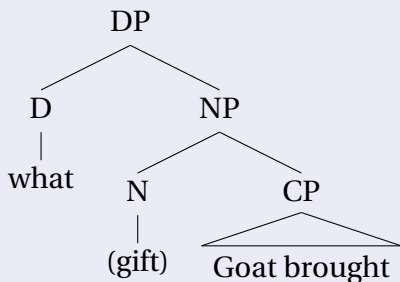


- ▷ D head is silent;
- ▷ Wh movement to Spec-CP;
- ▷ Typical Move-Wh applied.

Based on Caponigro and Chierchia we could call this a "Incomplete Derivation" analysis.

Syntactic consequences

Child Syntax II



- ▷ 'what' is D head
- ▷ Syntax resembles full relative

Based on Battye (1989) we could call this a "Pseudo-Free Relative" analysis.

Syntactic consequences

Both of these analyses account for children allowing What-NP to correspond to nominal readings. But they may predict other differences, which may be examined.

Choosing an analysis

Battye (1989) and Cecchetto and Donati (2015) described ‘whatever’ type relatives as “Pseudo-Free Relatives” and point out several distinctions between these and standard FRCs.

Pseudo-FRCs

a Wh-NP

Molly eats what*-(ever) dish Ben makes

b Absence of clausal component

Molly eats what*-(ever)

c Other Wh items

Molly eats how*-(ever) much Ben cooks

Choosing an analysis

Another such difference is the availability of It-Clefts

Pseudo-FRCs

- a *Molly eats what it is that Ben makes
- b Molly eats whatever it is that Ben makes

Choosing an analysis

Since It-Clefts result in the same systematic disambiguation as What-NP, children's knowledge can be probed in the same way.

- a Ben saw [*CP/DP* what Molly brought]
- b Ben saw [*CP/*DP* what it is that Molly brought]

If children are sensitive to this distinction where they were not to the Wh-NP constraint, it would go against the Pseudo-FRC analysis for children.

The bigger picture

FRCs are a case where a very particular sort of representation gives rise to a number of constraints on form that distinguish it from related constructions, and these constraints are acquired late by children.

This supports a view of acquisition where generalizations of rules and representations are primal, and idiosyncracies of particular constructions are a secondary concern. But what the exact generalization is is a matter for further investigation.

The bigger picture

Both analyses involve a generalization of a pattern that is observed elsewhere in the grammar.

- The Incomplete Derivation analysis generalizes all instances of Wh movement
 - Wh words head DPs which move to Spec-CP
- The Pseudo-FRC analysis generalizes all RCs
 - A Relative Clause involves adjoining CP to N

The bigger picture

The choice between the two in some ways is a choice of level of abstraction in generalization

- The Incomplete Derivation analysis is a generalized analysis of Wh words
 - Wh words head DPs which move to Spec-CP
- The Pseudo-FRC analysis is a generalized analysis of things with Relative Clauses.
 - A Relative Clause involves adjoining CP to N

Understanding what each of these predicts and what which predictions are borne out can inform the study of how grammatical patterns are generalized during acquisition.

Thank You

This (on-going) work owes a tremendous debt to Tom Roeper, Jill DeVilliers, Magda Oiry, Lyn Frazier, Jeremy Hartman, Luiz Amaral, Rajesh Bhatt, the UMass Language Acquisition Research Center, and audiences at BUCLD 39 and the 2015 LSA Annual Meeting.

Questions or complaints can be sent to mclauss@linguist.umass.edu

Outline

- Free Relatives and Wh Movement
- Systematic Disambiguation
- Experiment
- Syntactic consequences
- **Further explorations**
 - ▶ Not-so-pseudo FRCs; 'who' in FRCs; changing the adult analysis

Wh-NP in indefinites

An item effect in the adult experiment reveals an interesting factor.

3/4 of the instances of unexpected “True” responses here were for a single item, which happens to be the one item that used an imperfective verb form.

- Bill **sees** what articles Mary **writes**

Wh-NP in indefinites

This is undoubtedly due to the effect that genericity can have on the availability of certain forms; tense/aspect and plurality both affect this.

- %Bill **edits** what articles Mary writes
- %Bill liked what **books** Mary had on hand

These factors should play a role in analysis of both child and adult patterns, though it's not immediately clear how to implement the former.

General Principles and Disambiguation

The methodology used here makes an assumption:

Children may use general syntactic principles as adults do to eliminate certain potential ambiguities based on general principles of the grammar.

- Ambiguous: Ben saw what Molly wrote
- Unambiguous: Ben saw what book Molly wrote

We may reasonably ask how generally true this is.

General Principles and Disambiguation

In fact we find that children often can.

Attachment site of adjuncts

- Ambiguous

- ▶ Ben learned what to cook {from a book, with a Dutch oven}

- Unambiguous

- ▶ How did Ben learn [what to cook (**t*)] (*t*)?

Subjacency blocks the embedded reading of ‘how’; children will not erroneously give manner-of-cooking answers

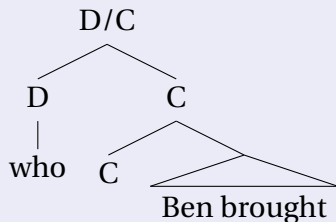
Thus we can assume in general that children will use general principles not only to block ungrammatical sentences, but to illicit readings of licit strings.

Further explorations

A couple issues give rise to possible skepticism to the “Wh-Head Movement” analysis of FRCs in Donati (2006) and work following this. In particular, the marginality-to-badness of ‘who’ in FRCs

- Ben wondered who Molly brought
- %Ben met who Molly brought

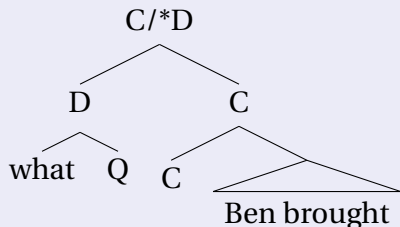
Further explorations



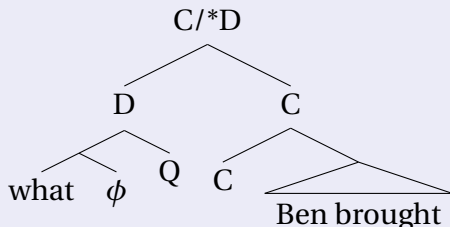
Why should this be blocked? Perhaps because Wh words are more complex than they look.

Further explorations

'What Ben brought'



'Who Ben brought'



In this analysis, all complex Wh things are blocked in the same way. But, Cecchetto and Donati (2015) focus on the importance of wordhood status as critical in the grammar.

Further explorations

The English Wh-NP and 'who' restrictions for FRCs are somewhat idiosyncratic, not necessarily holding cross-linguistically.

Who-FRC crosslinguistically

English

*Who cut the grass was pleased about it

Malagasy (Paul 2000)

Faly [ny manapaka bozaka]

happy DET cutting grass

'(Those) who are cutting grass are happy'

Further explorations

Other patterns seem less peculiar to English, such as the blocking of It-Clefts in RCs. Even across languages with very different clefting and relativization systems, this seems to hold.

Embedded Clefts

English

- (a) The farmer knows who it was that ate the grass
- (b) *The farmer raised who it was that ate the grass

Hindi-Urdu

- (c) *kisān jāntā hai ki voh kaun hai jis-ne ghās khāyī*
farmer knows PRS that it who is COR-ERG grass ate
'The farmer knows what it was that ate the grass'
- (d) **kisān-ne voh pālā voh jo hai jis-ne ghās khāyī*
farmer-ERG it raised it COR is COR-ERG grass ate
'The farmer raised what it was that ate the grass'

Further explorations

Given that the constraint against 'who' in FRCs is also more English specific than the one on Wh-NPs, we might expect an acquisition path something like this:

*Cleft in RC » *Who in FRC » *Wh-NP in FRC

Further explorations

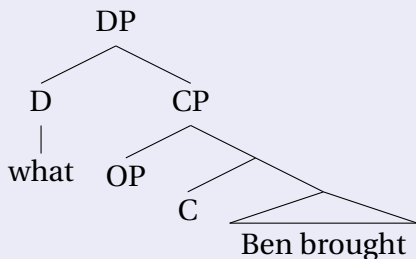
The issue of It-Clefts in “Pseudo-FRCs” actually raises some questions for the standard-RC analysis of them.

- *Ben ate what it is that Molly brought
- Ben ate whatever it is that Molly brought
- *Ben ate {the thing, anything} it is that Molly brought

It-Clefts are blocked broadly in all RCs. There must be some semantic interaction that saves them in -ever type FRCs.

Further explorations

A resolution to this might involve a slightly different analysis for adults' FRCs



FRC 'what' spells out a definiteness operator with a headless RC as its complement

This allows more continuity between adult and child grammars for RCs under either child analysis proposed here.