The Development of Subject Positions in Early English

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Outline

OE subjects can be placed variably

- Subjects can occur in four distinct positions in the clause:

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High subject position illustrated

(1) **min God** [me] asende to _ sona his engel
my God me sent to soon his angel
'My God sent his angel to me at once'
(coaelhom,ÆHom_22:326.3470)

OE subjects can be placed variably

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  1. **High**: (i) the position also occupied by non-subject constituents in V2 clauses; (ii) sometimes labelled the TOPIC position of the clause; (iii) identifiable through scrambled non-subject pronouns
  2. **Canonical**: (i) a pre-verbal position; (ii) identical to the canonical Modern English subject position; (iii) often immediately adjacent to the finite verb; (iii) normally host of the first heavy argument in the clause

Canonical subject position illustrated

(2) [Ælcere tide] [an cyrcan], ægðer ge folc ge preostas
each time in church both folk and priests
sceolon healice swigan healdan
shall high silence hold
'People and priests alike shall always be quiet in church'
(cochdrul,ChrodR_1:59.1.771)

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  3. **Low**: (i) a clause-medial position; (ii) often post-verbal; (iii) often subsequent to another heavy argument

Low subject position illustrated

(3) [Ealle ðas getimbrunge] geendode se cyning Xerxes
all theses buildings ended the king Xerxes
binnon ðrim gearum
within three years
'King Xerxes finished all these buildings within three years'
(cocathom2,ÆCHom_II,_38:287.266.6499)

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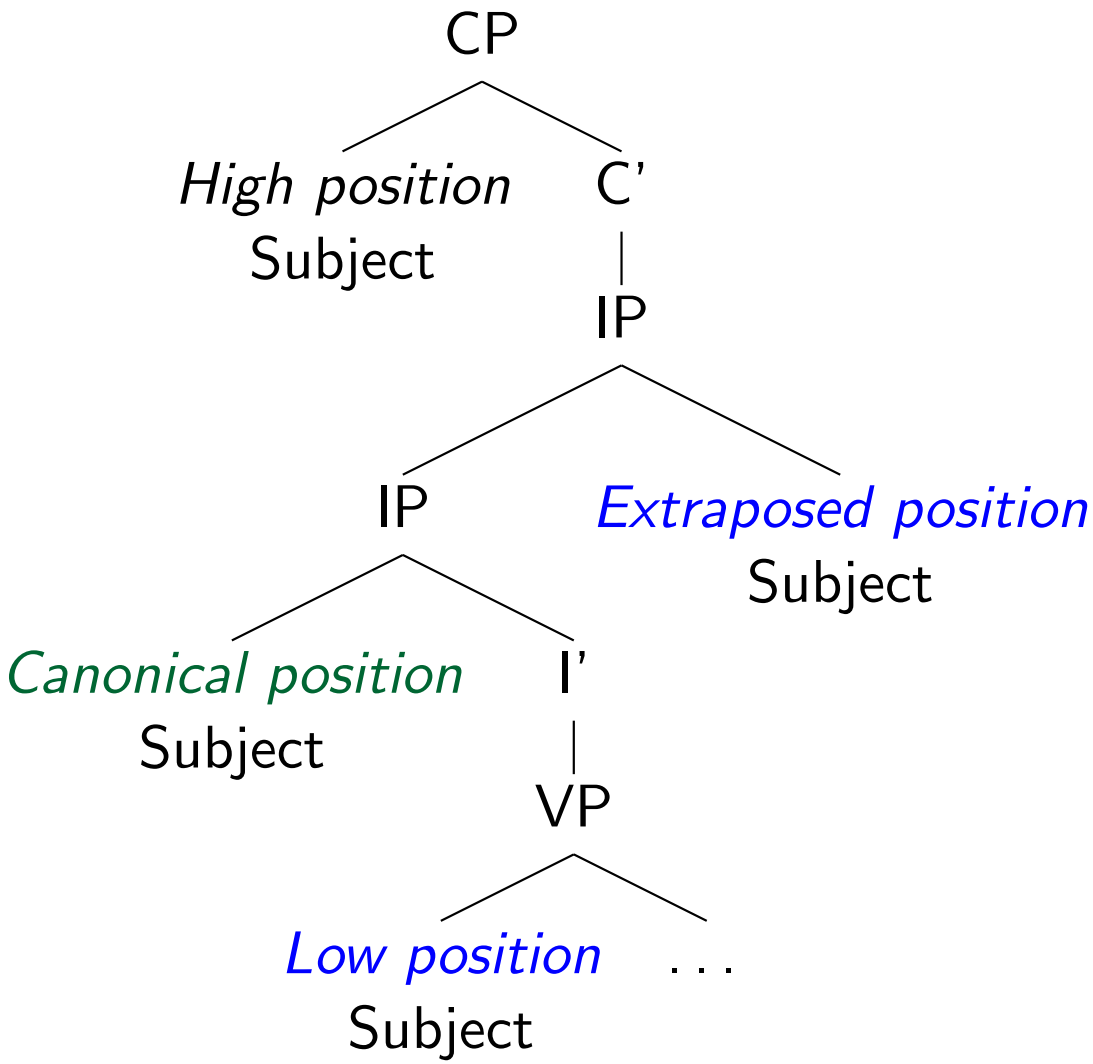
  3. **Low**: (i) a clause-medial position; (ii) often post-verbal; (iii) often subsequent to another heavy argument
  4. **Extraposed**: (i) a clause-final position; (ii) far removed from its predicate

Extraposed subject position illustrated

(4) On ðone ylcan dæg ðrowade martyrdom for Criste
on the same day suffered martyrdom for Christ
Sanctus Arthemius
St. A.
'On the same day, Saint Arthemius suffered a martyr's death for Christ'
(comart3,Mart_5_[Kotzor]:Ju2,C.1.922)

Phrase marker labels for subject positions

(5)



Information structure as a contextual factor

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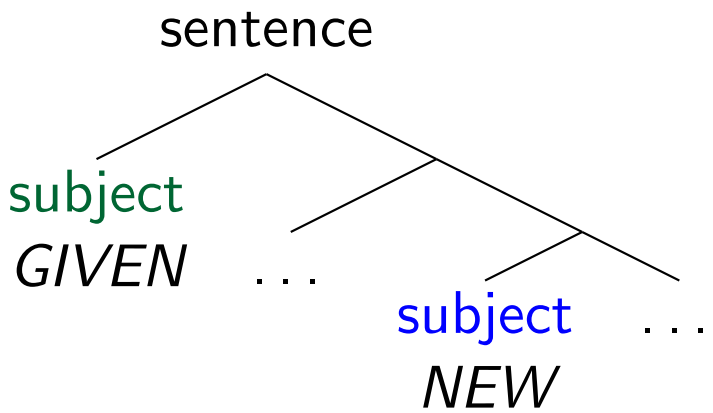
- generalization:



Measuring the rise of the canonical subject position

Automated studies - overview

- automated search queries for data extraction and definition of variables, (i) subject position and (ii) information status

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- Definition of information status by definiteness:
  - given $\approx$ definite
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    (noun with none of the above items)

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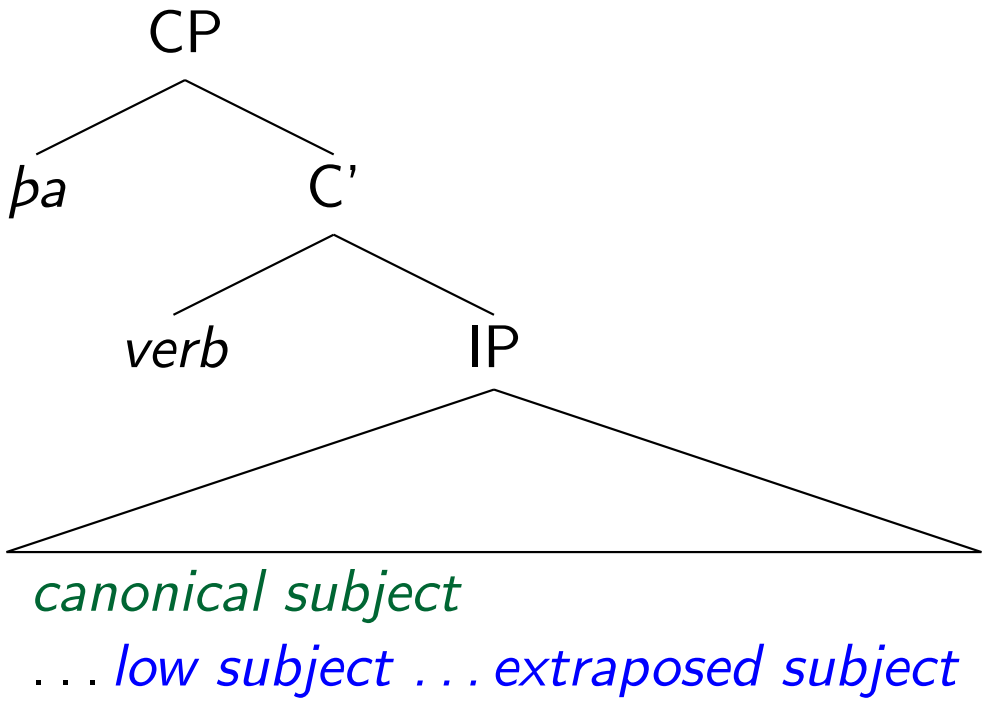
- (6) a. se ylca cyning
    the same king (cobede,Bede_4:27.356.26.3595)

  b. sum cild
    some child (coboeth,Bo:38.122.1.2428)

Study 1 (operator adverbs) - Methodology

- 

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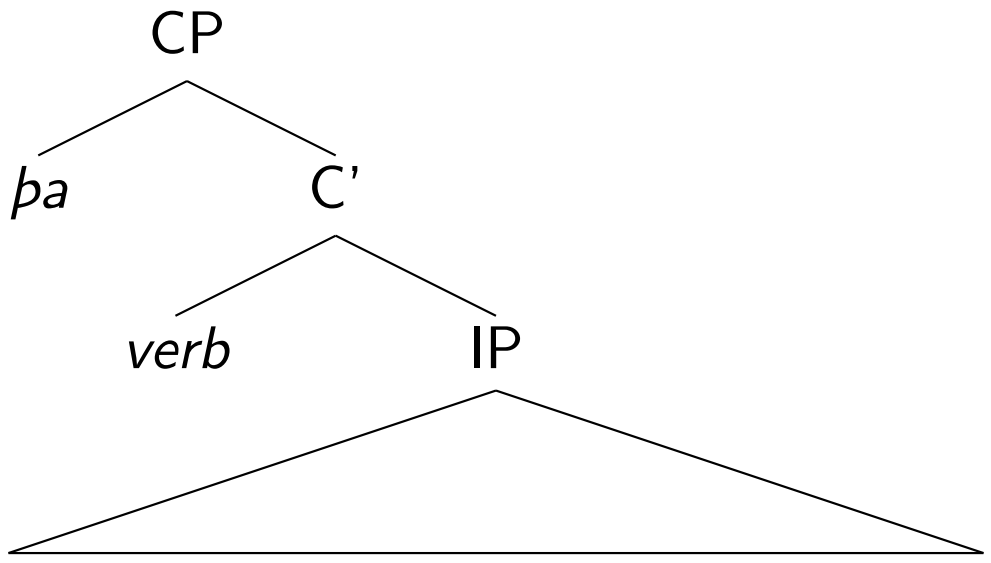
- 

- dependent variable:

  þa - verb - subject ... x (canonical subject)

  þa - verb ... x ... subject (low / extraposed subject)

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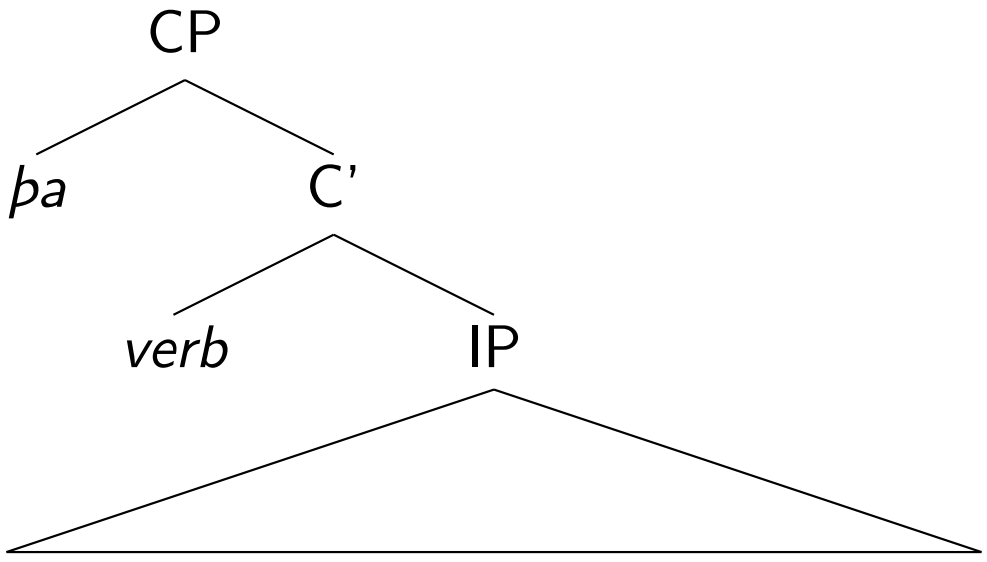
- 

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- independent variables: (i) subject definiteness (ii) period

Study 1 (operator adverbs) - Examples

(7) a. *þa - verb - subject ... x*

ða ongunnon þa windas eft weaxan
then began the winds again grow

'Then the winds grew stronger again'
(coalex,Alex:30.9.373)

b. *þa - verb ... x ... subject*

ða cwoman us þær on ðæm wege
then came us there on the way
twegen ealde men togeanes.
two old men towards

'Then, two old men came there on the way towards us'
(coalex,Alex:32.1.399)

Study 1 (operator adverbs) - Results

- The canonical subject position is more common with definite (given) subjects

	canon.	low / extrap.
DEF	3018	417
INDEF	173	264

canon.	low / extrap.
95%	5%
61%	39%

χ^2=619.93, df = 1, p<0.001***

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- The *þa + verb* structure is overall more likely with definite (given) subjects

main clause ratio DEF : INDEF (23,187 definite subjects : 5,143 indefinite subjects) = **4.5 : 1**

þa + verb ratio DEF: INDEF (3,435 definite subjects : 437 indefinite subjects) = **7.9 : 1**

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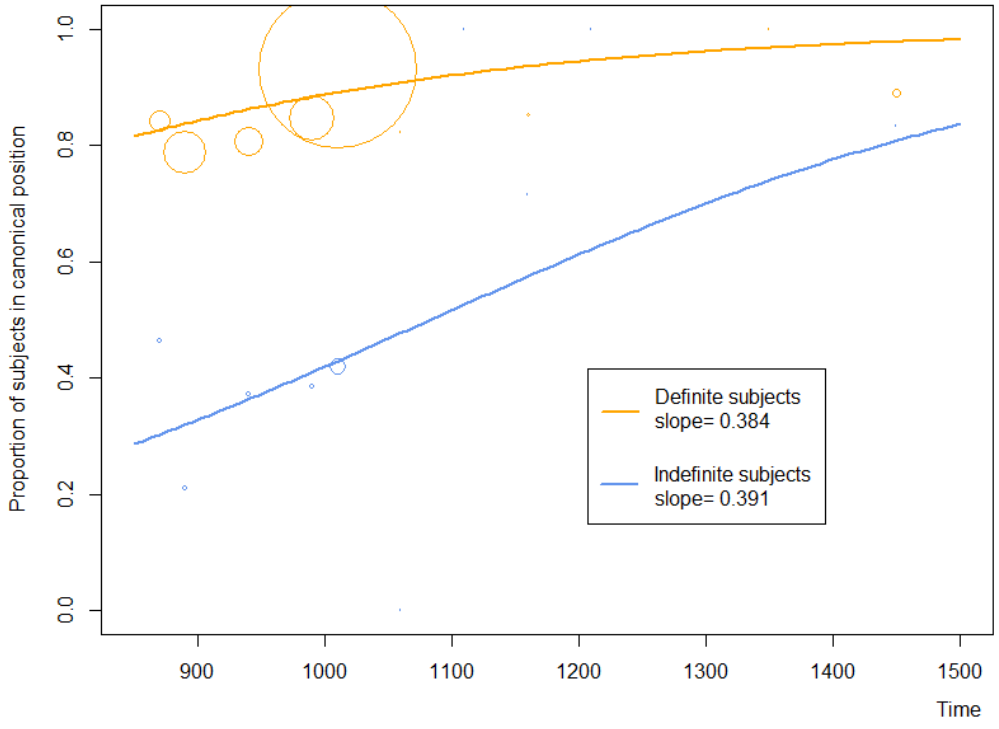
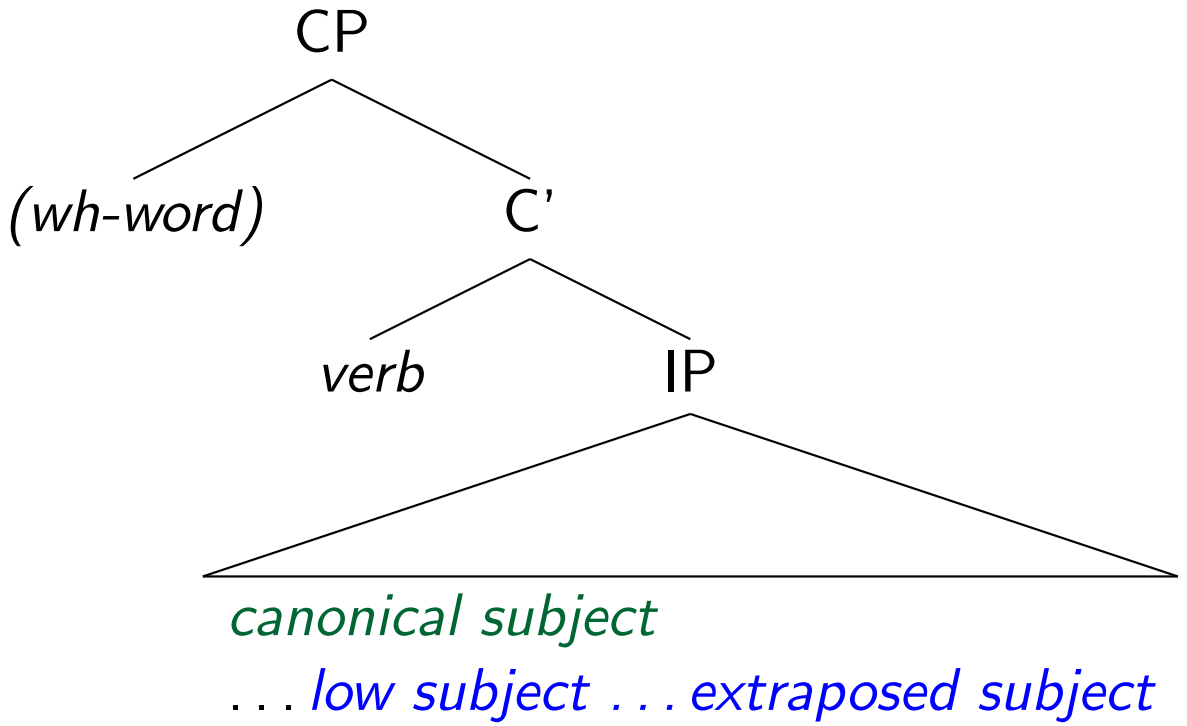


Factor	Df	Deviance	Df Resid.	Residual Deviance	*p*
NULL			20	614.33	
Period	1	53.90	19	560.43	<0.001***
Definiteness	1	462.06	18	98.37	<0.001***
Period:Definiteness	1	0.00	17	98.36	0.961

Study 2 (direct questions) - Methodology

- 

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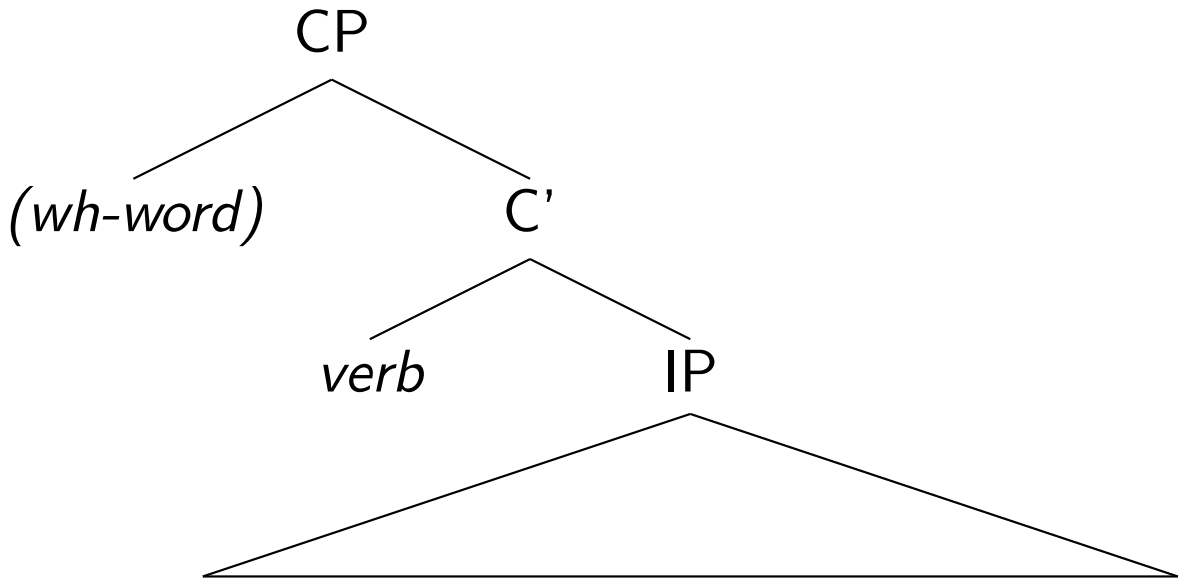
- 

- dependent variable:
  (wh-word) - verb - subject ... x (canonical subject)
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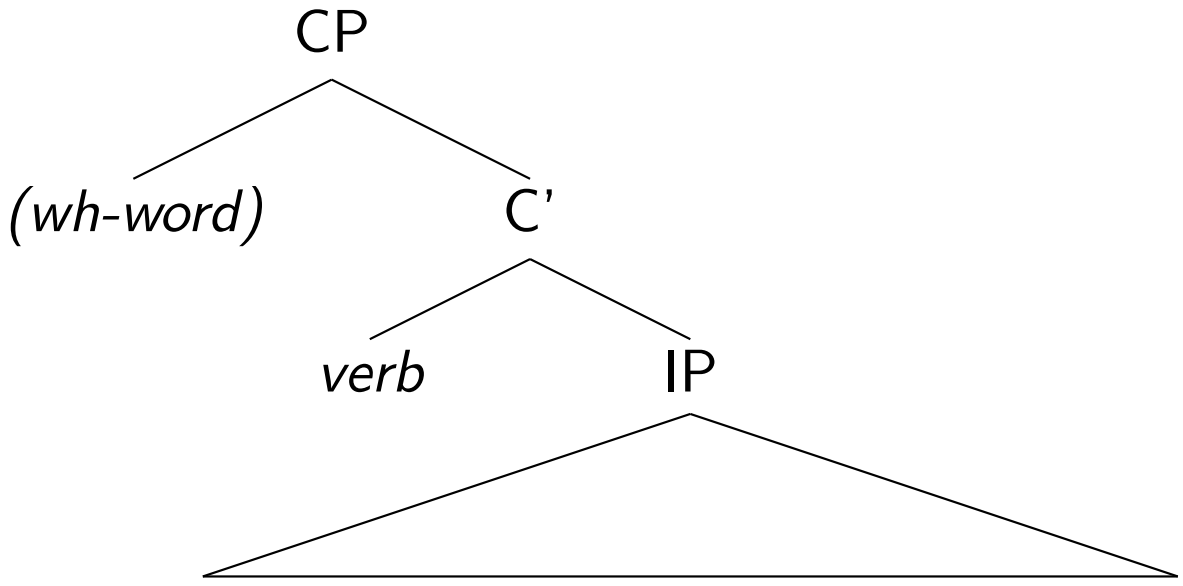
- 

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Study 2 (direct questions) - Examples

(8) a. *(wh-word) - verb - subject ... x*

Hwæt is se hehsta wysdom æalles?
What is the highest wisdom else

'What else is the highest wisdom?'
(cosolilo,Solil_2:58.13.767)

b. *(wh-word) - verb ... x ... subject*

þurh hwæt sceal Godes þeowum and Godes
through what shall God's servants and God's
þearfum frið and fultum cuman?
needy peace and help come

'Through what shall peace and help come to God's servants and God's needy?'
(coinspolX,WPol_2.1.1_[Jost]:12.16)

Study 2 (direct questions) - Results

- There is no significant influence of definiteness (giveness) of the subject

	canon.	low / extrap.
DEF	193	86
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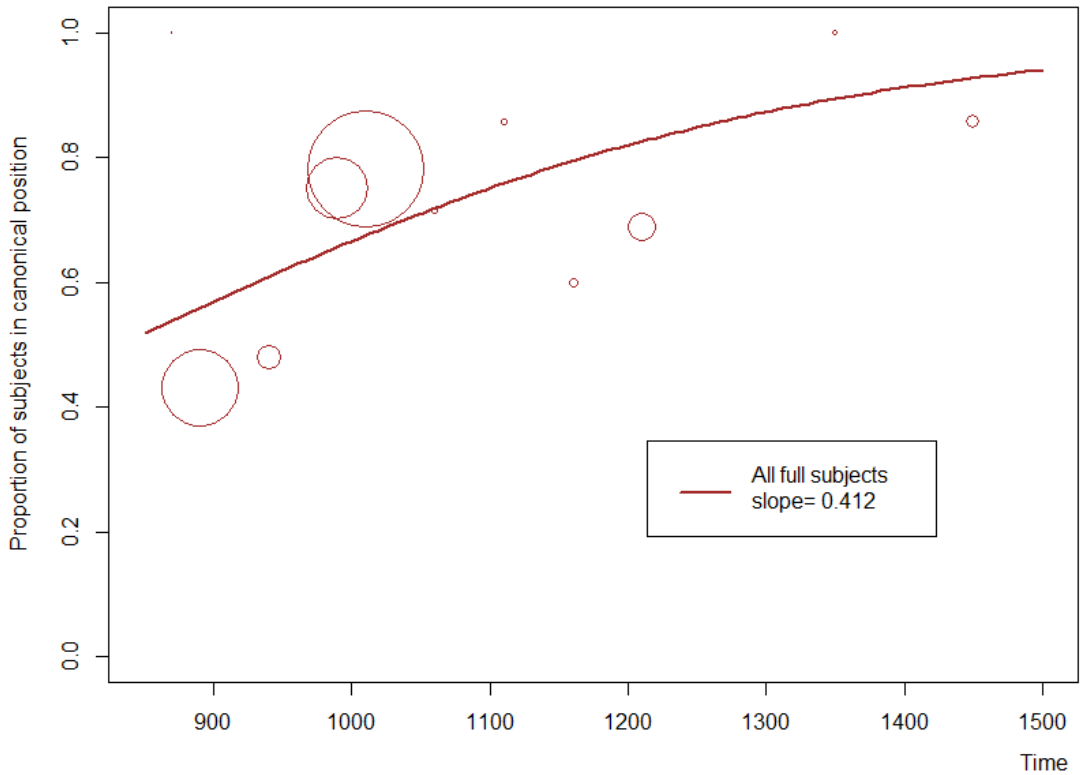
- Direct questions have a relatively large number of indefinite (new) subjects

main clause ratio DEF : INDEF (23,187 definite subjects : 5,143 indefinite subjects) = **4.5 : 1**

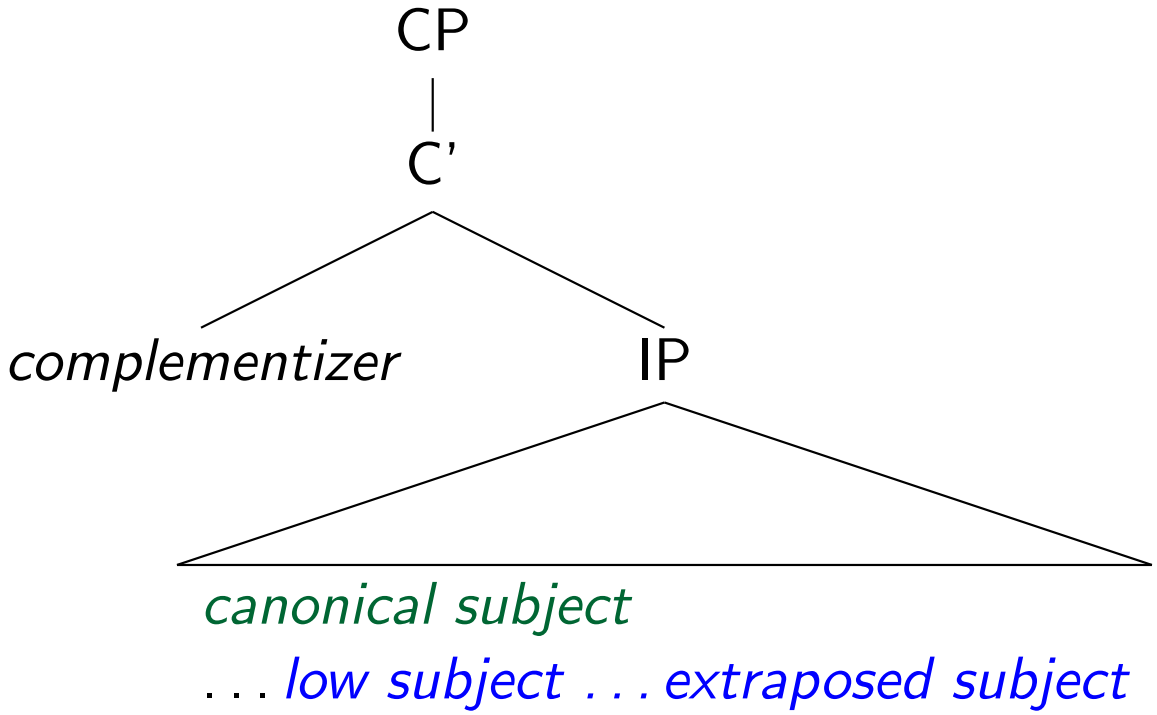
direct questions ratio DEF: INDEF (279 definite subjects : 81 indefinite subjects) = **3.4 : 1**

Study 2 (direct questions) - Results



Factor	Df	Deviance	Df Resid.	Residual Deviance	*p*
NULL			20	60.81	
Period	1	16.10	19	44.71	$<$0.001***
Definiteness	1	2.40	18	42.31	0.121
Period:Definiteness	1	0.28	17	42.03	0.597

Study 3 (subordinate clauses) - Methodology

- 

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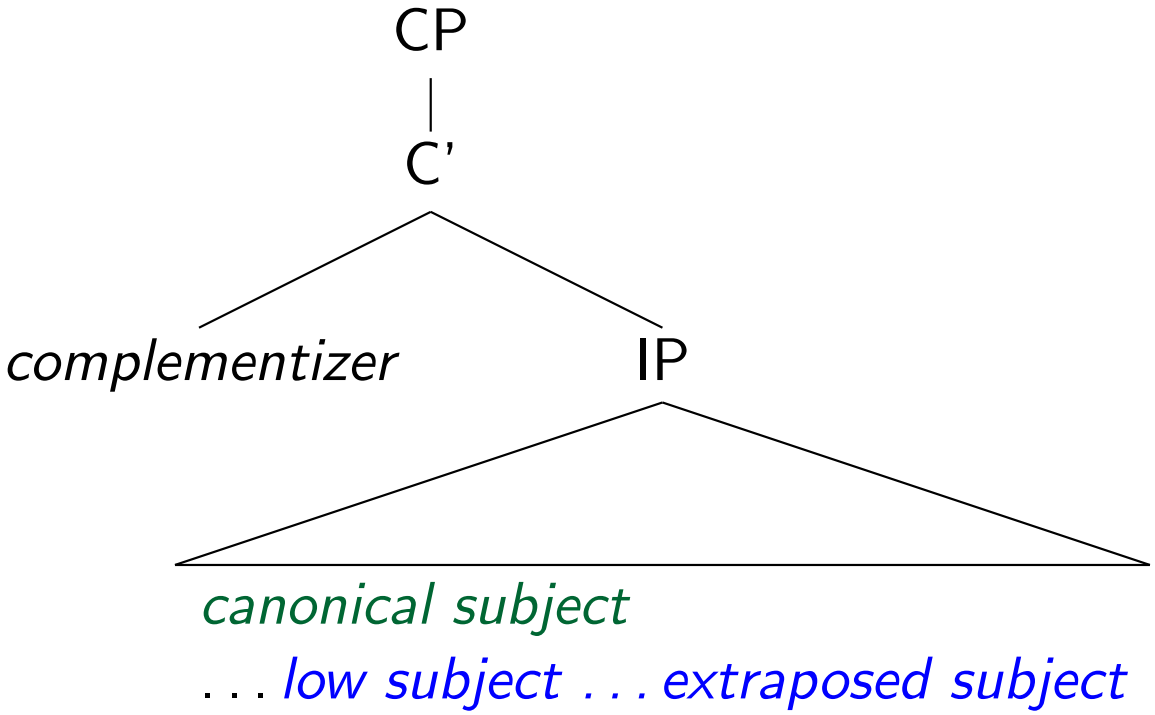
- 

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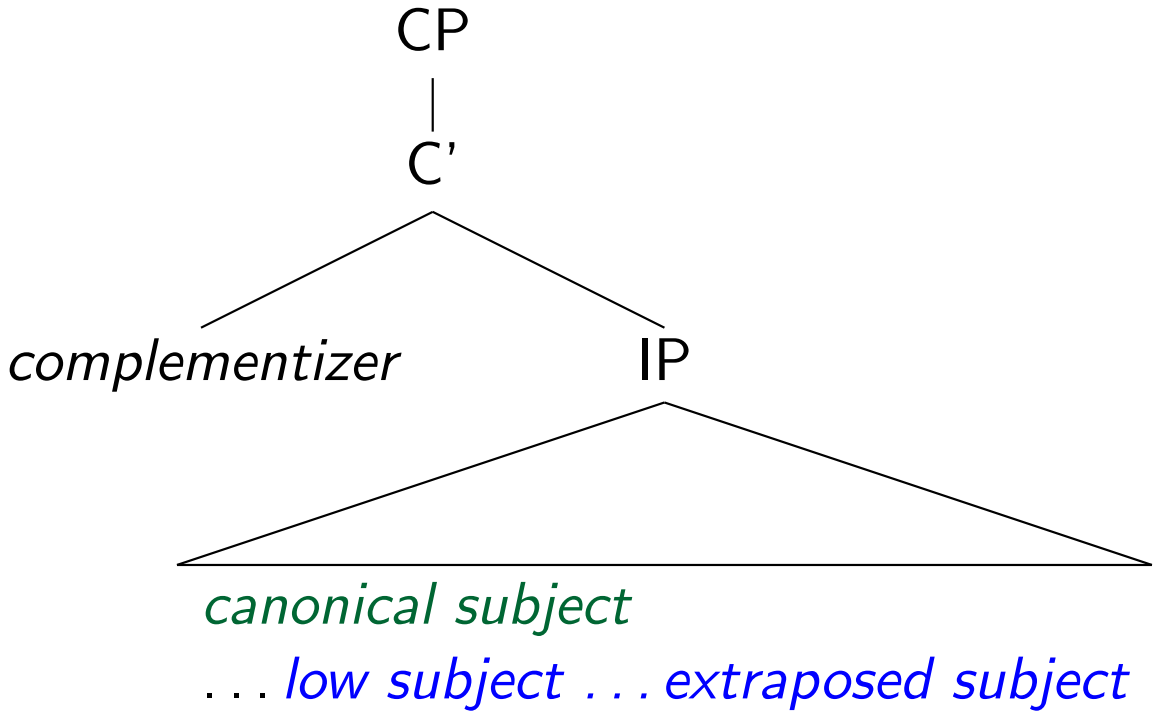
- 

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  C - subject ... x (canonical subject)
  C ... x ... subject (low / extraposed subject)
- independent variables: (i) subject definiteness (ii) period

Study 3 (subordinate clauses) - Examples

(9) a. *C - subject ... x*

... hweþer se weardmann wære æfre gefullod
... whether the watchman was ever baptized

'...whether the watchman was ever baptized'
(coaelive,ÆLS[Forty_Soldiers]:293.2671)

b. *C ... x ... subject*

... hwæðer on ðam cwarterne wæron ænige
... whether in the prison were any
cristene menn for Godes geleafan belocene
Christian men for God's faith locked

'...whether any Christian men were incarcerated in that prison for their faith to God'
(coaelhom,ÆHom_24:122.3840)

Study 3 (subordinate clauses) - Results

- Significant definiteness effect

	canon.	low / extrap.
DEF	9665	1166
INDEF	2405	877

canon.	low / extrap.
89%	11%
73%	27%

χ^2=516.68, df = 1, p<0.001***, Cramer's V =0.19

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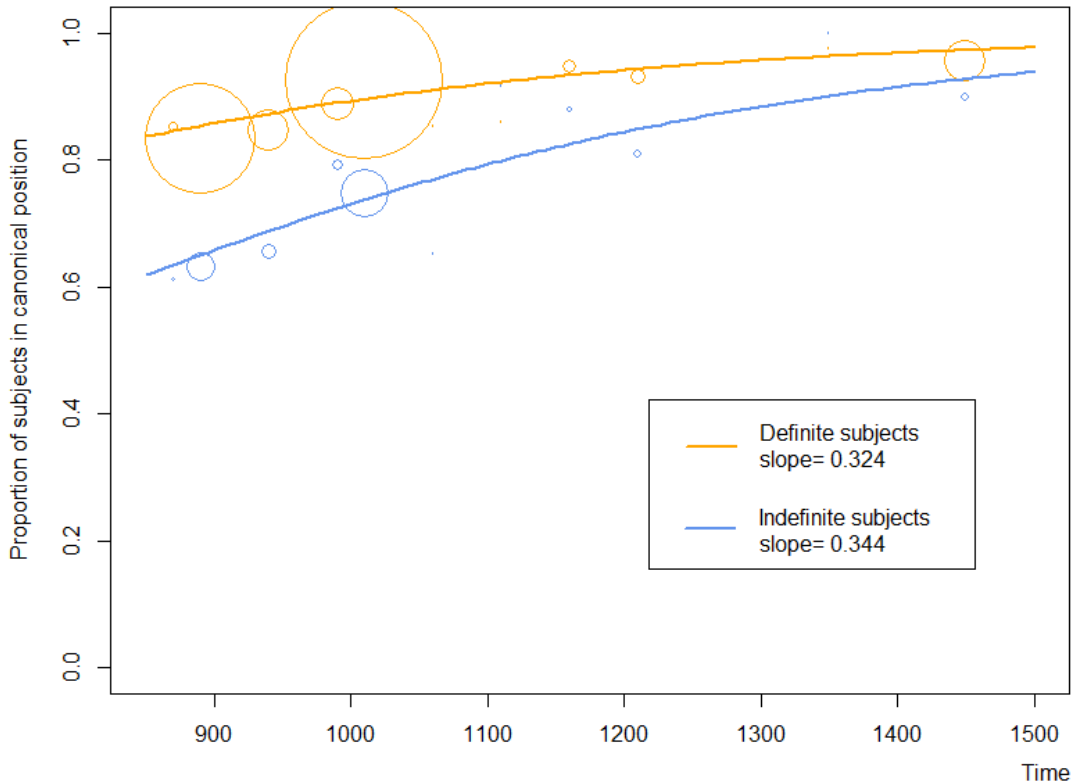
- Subordinate clauses have a relatively large number of indefinite subjects

  main clause ratio DEF : INDEF (23,187 definite subjects : 5,143 indefinite subjects) = **4.5 : 1**
  subordinate clauses ratio DEF: INDEF (10,831 definite subjects : 3282 indefinite subjects) = **3.3 : 1**

Study 3 (subordinate clauses) - Results



Factor	Df	Deviance	Df Resid.	Residual Deviance	*p*
NULL			21	842.62	
Period	1	274.19	20	568.43	<0.001***
Definiteness	1	467.59	19	100.84	<0.001***
Period:Definiteness	1	0.19	18	100.66	0.665

Automated studies - Summary

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- Information structure (measured by definiteness) behaves like an ordinary contextual factor. **Constant Rate Effect** - the rate of change is identical in the two contexts "definite subjects" and "indefinite subjects" (Kroch 1989).

Study 4 (adverbial clauses) - Methodology I

- Reasoning: Possible source of error from equation of morpho-syntax (definiteness) with information status.
  The measurable increase in definite subjects in the canonical position may be due to a mismatch: All low definite NPs could really be new.
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  Manual evaluation of information structure needed.
- Material: Adverbial subordinate clauses to avoid CP recursion (Kemenade 1997).
  Subjects contain a nominal head (nominative noun or proper name) to better assess their information status.
  Bede N=256
  Ælfric's Lives of Saints N=340

Study 4 (adverbial clauses) - Methodology II

- dependent variable: subject position with 5 variants:
  1. Canonical position (Spec,IP)
  2. Canonical position or Low position (Spec,IP or Spec,VP)
  3. Low position (Spec,VP)
  4. Low position or extraposed (Spec,VP or IP-adjunction)
  5. Extraposed (IP-adjunction)

  (categorized not just on the basis of post- or pre-verbal position, but an algorithm determining the most likely parse of a clause)

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- for time reasons, focus on subject's Information Status

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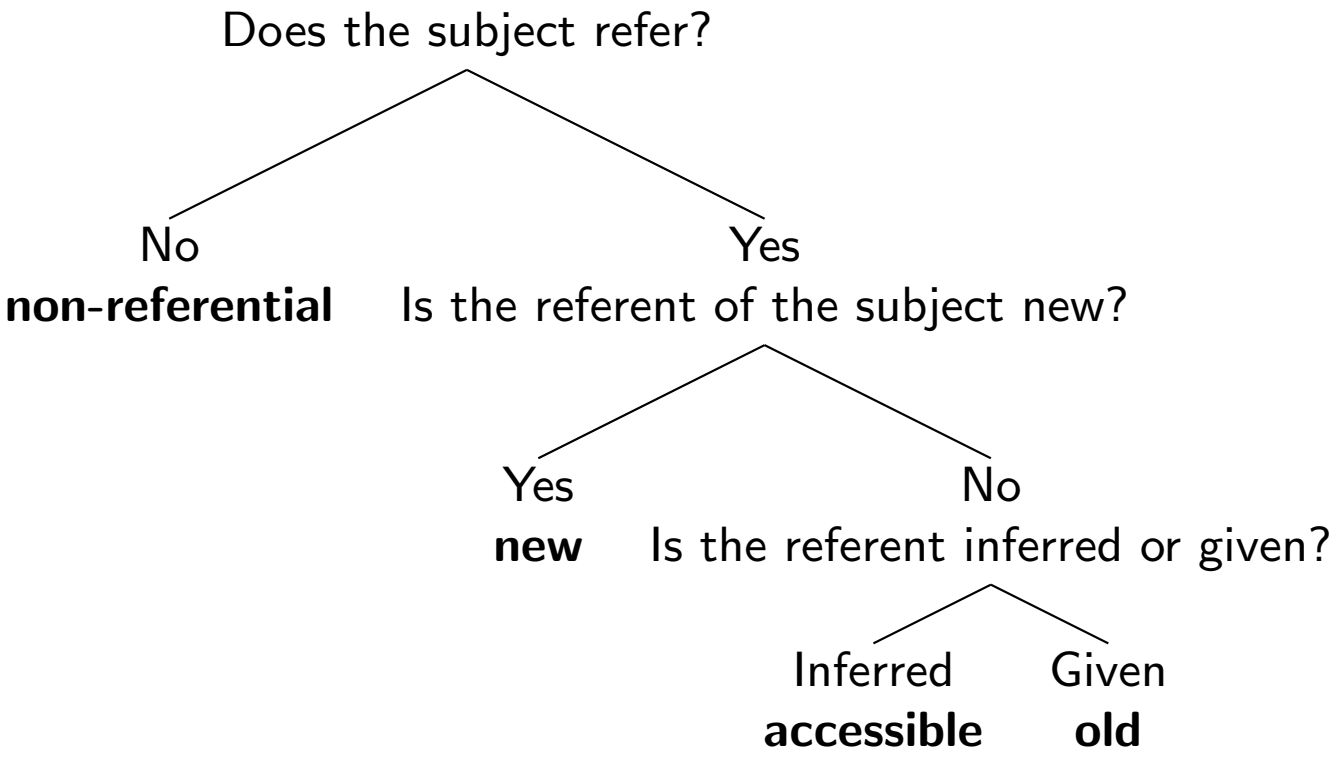
- 

Non-referential

(10) Hibernia Scotta ealond ge on brædo his stealles ge on
Ireland Scots' island both in breadth its condition and in
halwendnesse ge on smyltnesse lyfta is bettere mycle
wholesomeness and in mildness airs' is better much
þonne Breotone land
than Britain island
swa þæt ðær seldon [**snau**] leng ligeð þonne ðry dagas.
so that there rarely [**snow**] longer lies than three days
'Ireland, the island of the Scots, is much better than Britain both in the breadth of its conditions and in its wholesomeness and the mildness of its air, so that [**snow**] rarely lies there more than three days'
(cobede,Bede_1:1.28.30.218)

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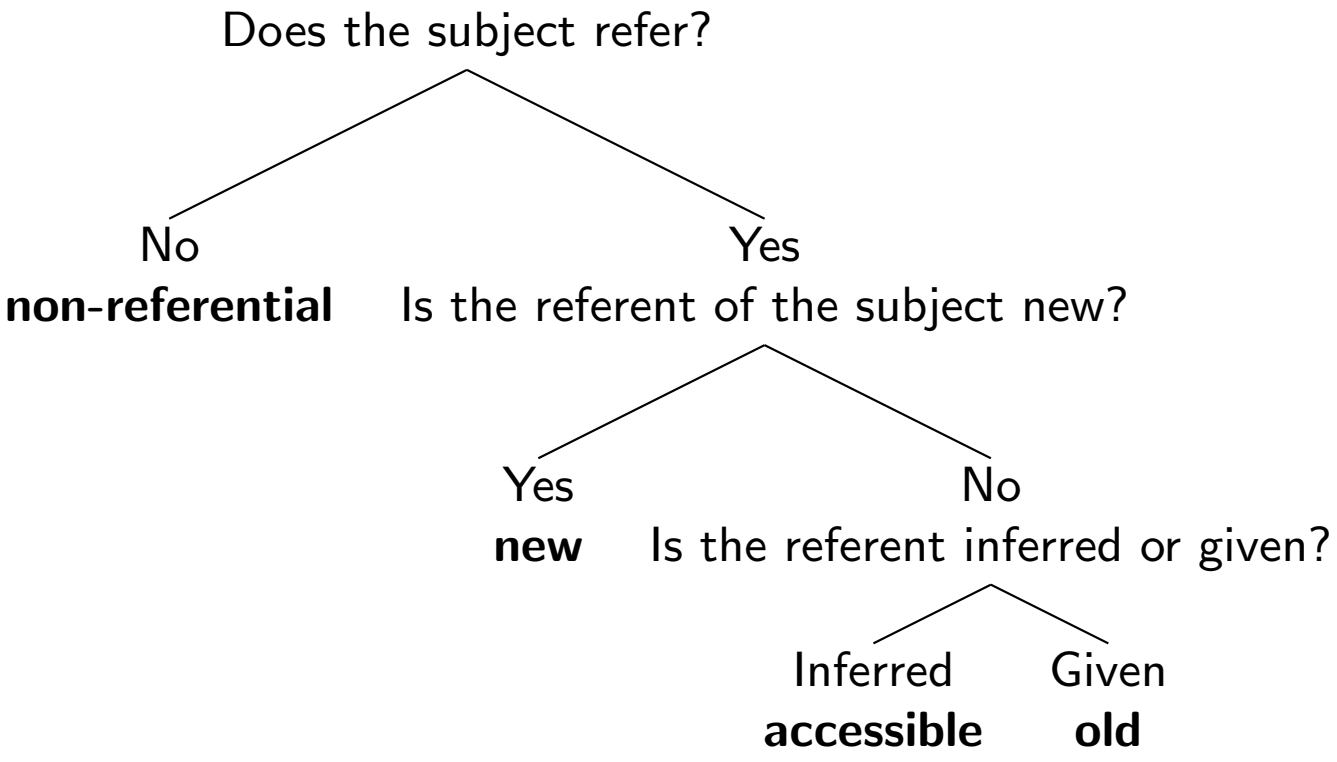
- 

Accessible

(11) Eac swilce þa ðry cnihtas [...] wurdon for ðan soðan
likewise the three youths [...] were for the true
geleafan on [**þam byrnendan ofne**] gebundene.
faith in **the burning oven** bound.
Ac him sona cydde god hwylcne geleafan hi hæfdon,
But them soon revealed God which faith they had
þa ða [**se lig**] ne moste furðon heora fex forswælan on
when **the flame** not could even their hair burn in
þam ade.
the pyre

'Likewise, the three youths [...] were bound in **the burning oven** for their true faith. Buth God at once revealed to them what faith they had, when **the flame** could not burn even their hair in that pyre'
(coaelive,ÆLS_[Memory_of_Saints]:71-76)

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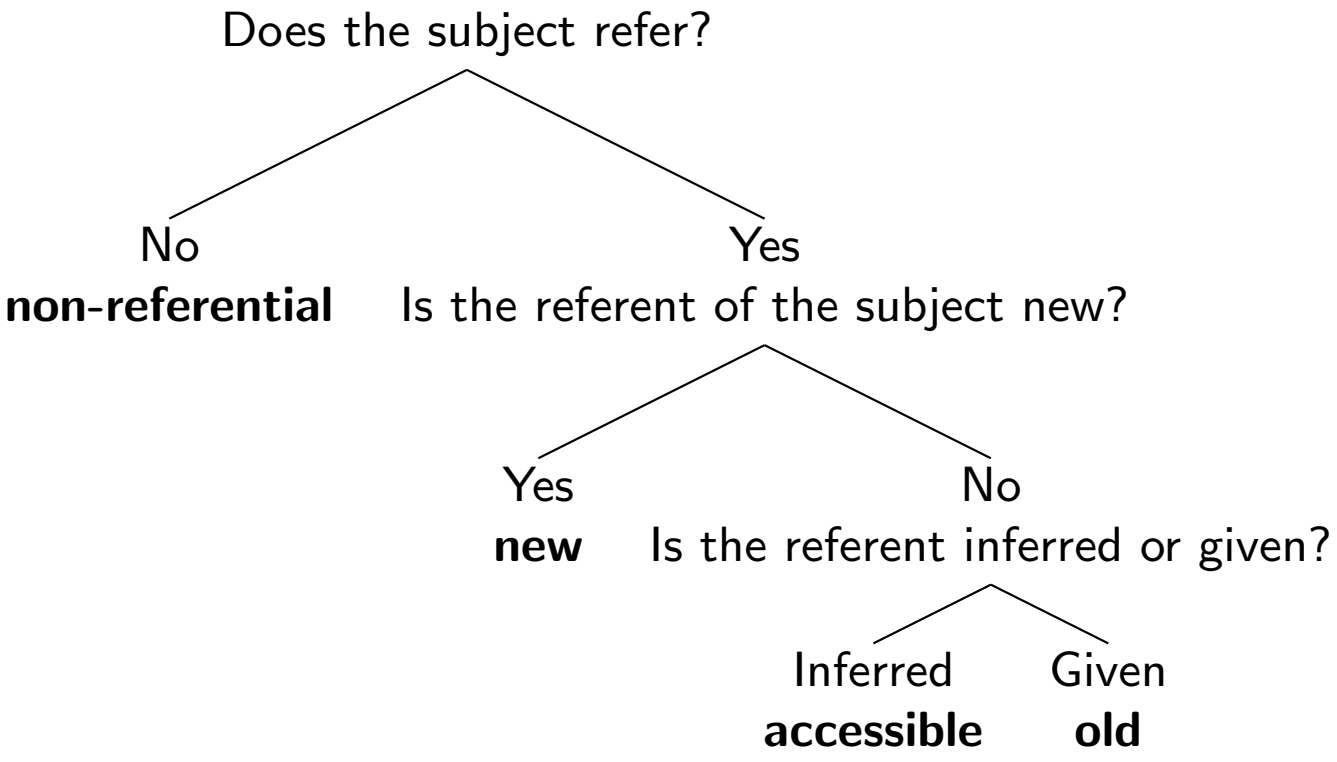
- 

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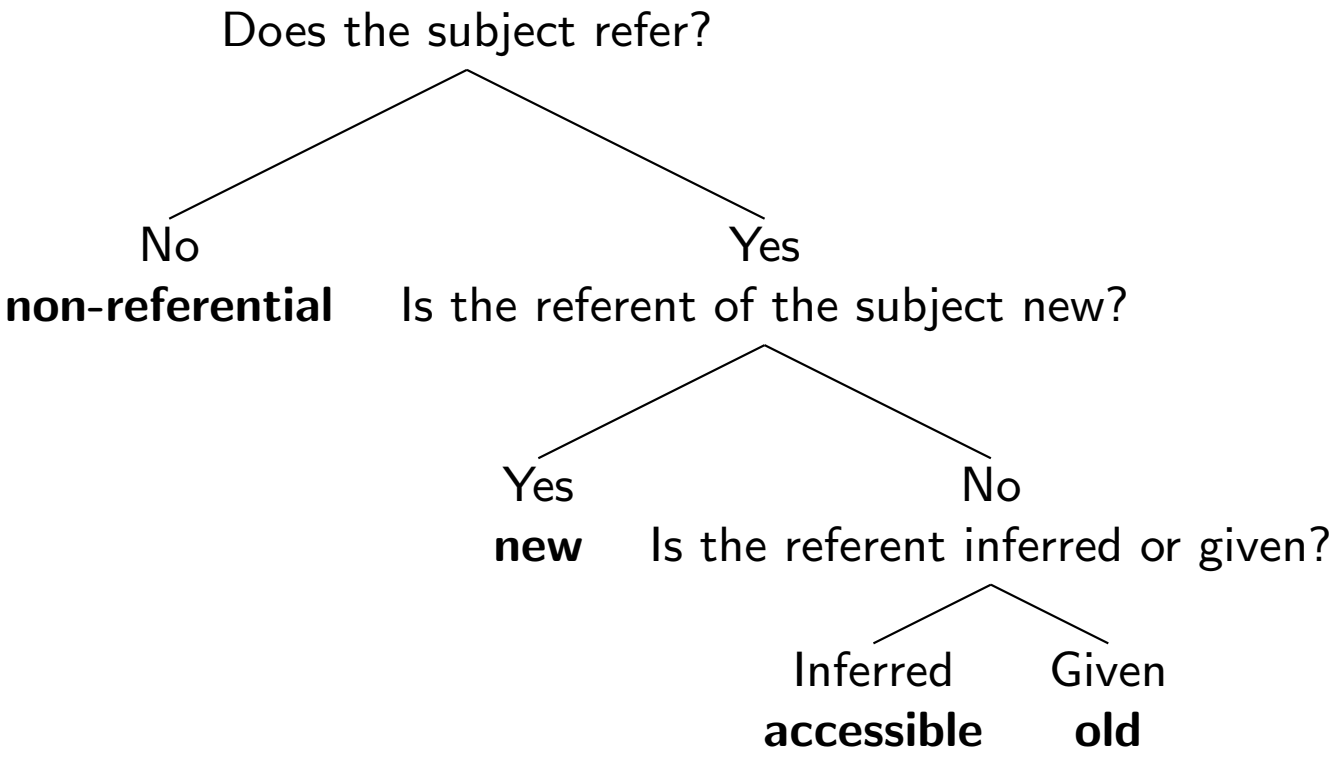
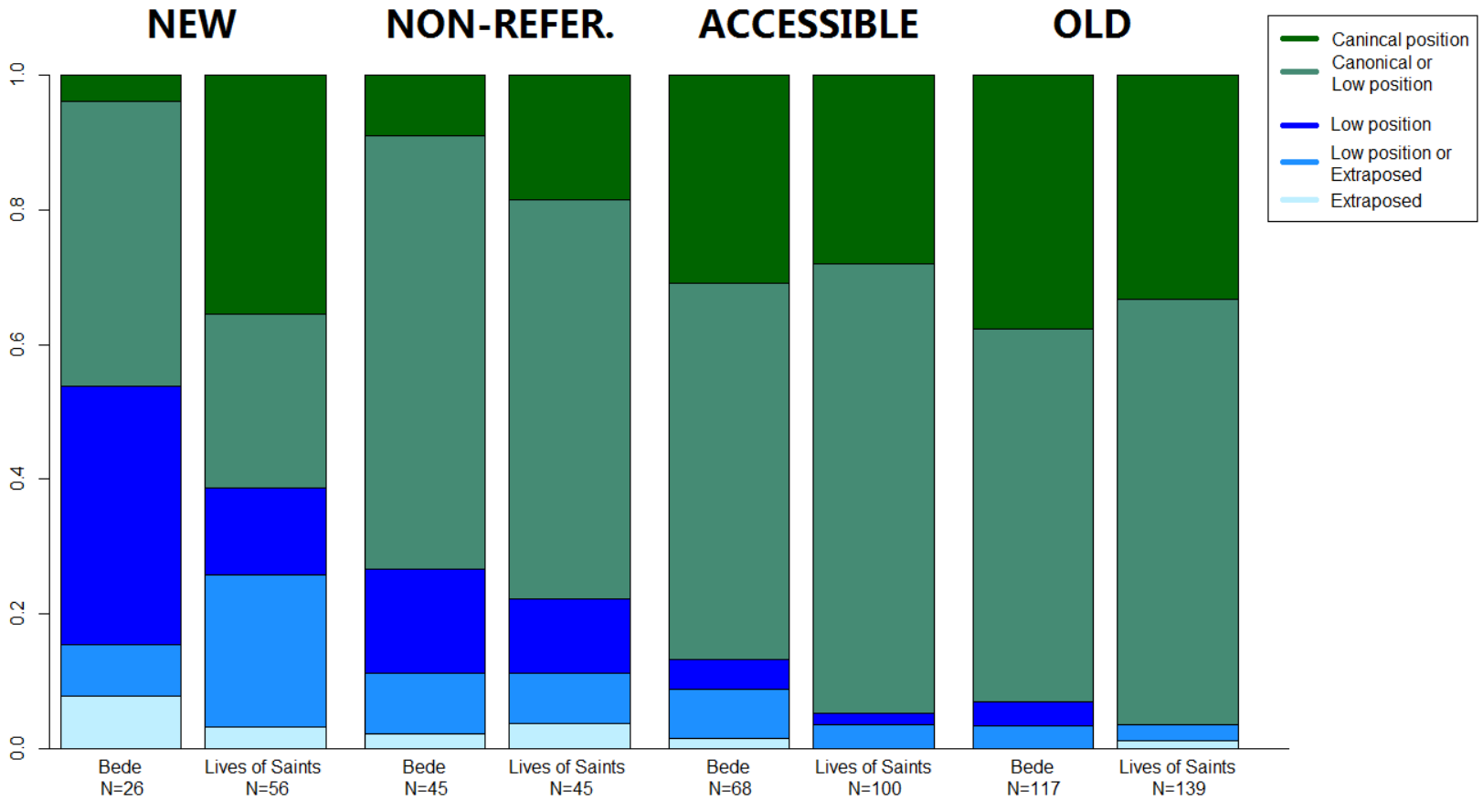
- 

- A randomized sample from *Bede* showed inter-annotator agreement in 21/25 cases (84%)

Study 4 (adverbial clauses) - Results



Manual studies - Summary

- Manual study confirms the findings from automated studies:
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  - Information structure behaves like an ordinary contextual factor. It does not drive the increase in canonical subjects.
- Finding shows that mophosyntax can be used as a proxy for information structure.

Where do contextual effects come from anyway?

Two general explanations for contextual factors

- processing ease
- functional contraints
- general cognitive principles
- third factors

Example 1: German V2 and verb-final by 'clause type'

- (12) a. ... dass Peter Maria ein Buch gibt.
  ... that P. M. a book gives
  '...that Peter gives Mary a book'

  b. *... dass Peter gibt Maria ein Buch.

  c. Peter gibt Maria ein Buch
  P. gives M. a book
  'Peter gives Mary a book'

  d. *Peter Maria ein Buch gibt.

- Speakers of German *know* that the verb position depends on the contextual factor "clause type", [+/- subordinate clause].

Example 2: French indirect, pronominal, animate objects by 'verb semantics'

- (13) a. je pense à lui
  I think of him
  'I think of him'
  b. *je lui pense.

  c. je lui parle
  I him talk
  'I talk to him'
  d. *je parle à lui.

- Speakers of French *know* that cliticization depends on the contextual factor "verbal semantics", [+/- verb of thinking].

Example 3: Topic-drop by 'register'

- (14) a. *_ Must try harder. (narrative, discourse)
  b. _ Must try harder. (school report)
  (Haegeman 1990)
- Do speakers of English annotate a Topic-drop rule with a feature [+/- school report]? Probably not.

Example 4: Postposition by 'phonological weight'

- (15) a. The astronomer [gazed [into the dark sky] [through his effective but unwieldy telescope]]
  (27 examples in Hawkins' sample of 117 clauses with instrument and direction PP)
  b. ?The astronomer [gazed [through his effective but unwieldy telescope] [into the dark sky]]
  (2 examples in Hawkin's sample of 117 clauses with instrument and direction PP)
  (Hawkins 2000)
- Do speakers of English annotate a postposition rule with a phonological feature like [+/- heavy]? Probably not.

Where do information structure effects come from?

competence	not competence
-German verb position is conditioned by clause type -French cliticization is conditioned by verbal semantics	-Topic-drop acceptability is conditioned by register -Heavy XP shift is conditioned by phonological weight

- Which category should information structure belong to?

"**[C]lause structure incorporates and encodes information structural considerations** in such a way that [...] old material is separated from focused, new material by an adverb functioning as a discourse particle." (Kemenade et al. 2008, 8)

"**[O]rdering old information before new information can facilitate both production and comprehension.** Old information is more accessible [...] and therefore should be easier to produce early in the utterance." (Wasow and Arnold 2003, 152)

Arguments in favour of a processing explanation

- Information structural constraints are soft / probabilistic. There are exceptions to the expected generalizations.

Unambigous low, and yet old, subject

(16) a. [The saint] went one day on business to a distance from the monastery; and **one of the brethren was his companion** and went with him. Now, when they had completed the journey, they turned back home. And when they drew near to the monastery and saw the buildings rising and towering up and high, suddenly the man of God became gloomy, and began to weep hot and bitter tears, and by the expression of his face revealed and made known the sorrow of his heart.

b. þa þæt þa **se his gefera** geseah &
when that then the his companion saw and
ongeat, þa frægn he hine
understood, then asked he him ...
'When his companion saw and understood this, he asked him ...' (cobede,Bede_4:26.352.22.3553)

Arguments in favour of a processing explanation

- Information structural constraints are soft / probabilistic. There are exceptions to the expected generalizations.
- Similar information structure effects show up in different domains, in various studies and cross-linguistically.

Taylor & Pintzuk 2011: Objects and Information Structure

"[W]e have investigated the relation between syntactic change and information status on alternations in O[ld] E[nglish] and E[arly] M[iddle] E[nglish] verb object order, OV vs. VO. [...] This change is not in any way triggered by or related to changes in information structure. Rather, the effects of information structure remain constant over time." (Taylor and Pintzuk 2011, 92)

Text	Total VO	Total OV	New VO	New OV
Orosius (c. 890 A.D.)	21	71	9 (42.9%)	16 (22.5%)
Catholic Homilies I (c. 990 A.D.)	84	58	36 (42.9%)	14 (24.1%)
Trinity Homilies (c. 1190 A.D.)	46	0	21 (45.7%)	-

Frequency of total and new VO and OV order in AuxV clauses. Adapted from Taylor & Pintzuk 2011, tables 8, 9.

Wallage 2013: Negation and Information Structure

"The given/new distinction underpins the distribution of *ne* and *ne...not* in Middle English. The Middle English data do not provide evidence for pragmatic unmarking of *ne...not* as it competes with *ne*. Therefore, the increase in frequency of *ne...not* during the 12^{th}-14^{th} centuries is independent of these particular pragmatic constraints on its use." (Wallage 2013)

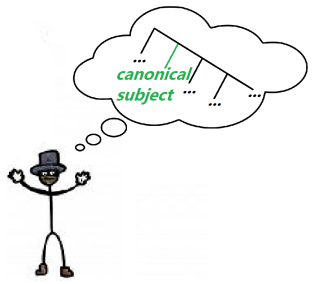
	1150-1250	1250-1350
Input probability of *ne...not*	.359	.870
Discourse Function		
Statement of inference (old)	.899	.880
Discourse-new	.234	196

VARBRUL analysis of "Discourse Function" as a significant predictor for negation with *ne* or *ne...not* in Middle English. Adapted from Wallage 2013, table 3.

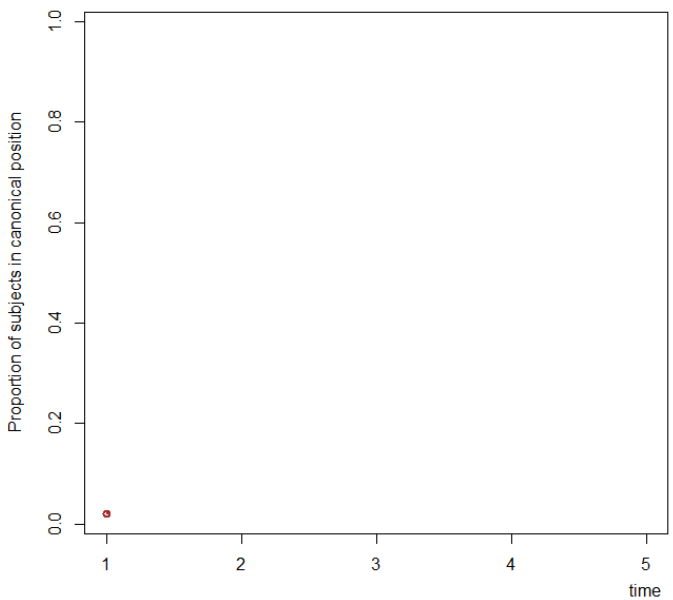
Arguments in favour of a processing explanation

- Information structural constraints are soft / probabilistic. There are exceptions to the expected generalizations.
- Similar information structure effects show up in different domains, in various studies and cross-linguistically.
- A non-competence based origin of information structure effects may offer an explanation of the Constant Rate Effect.

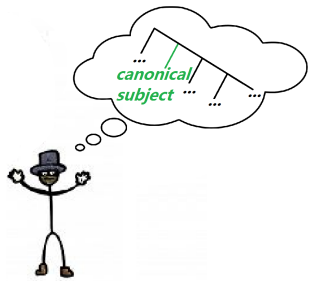
One specific change



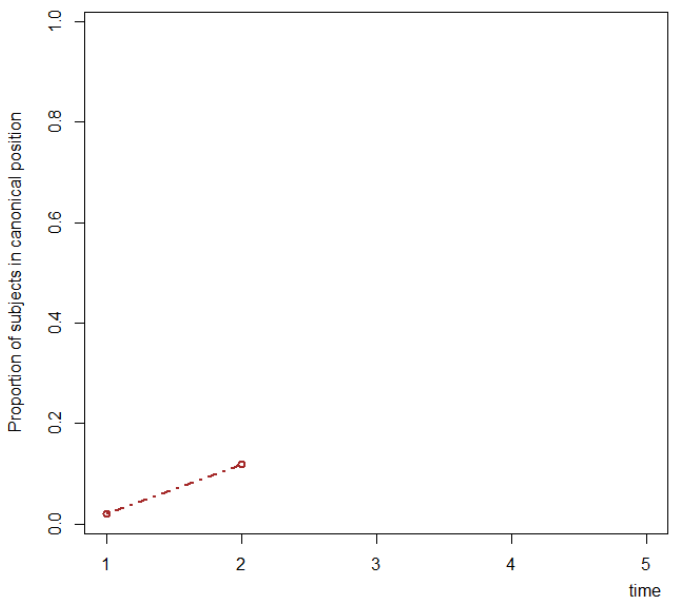
P(Canonical subject)
$= 0.01$



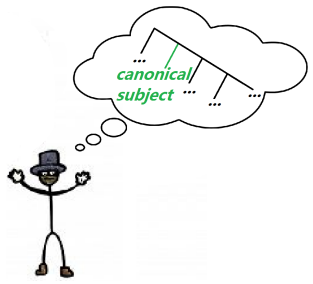
One specific change



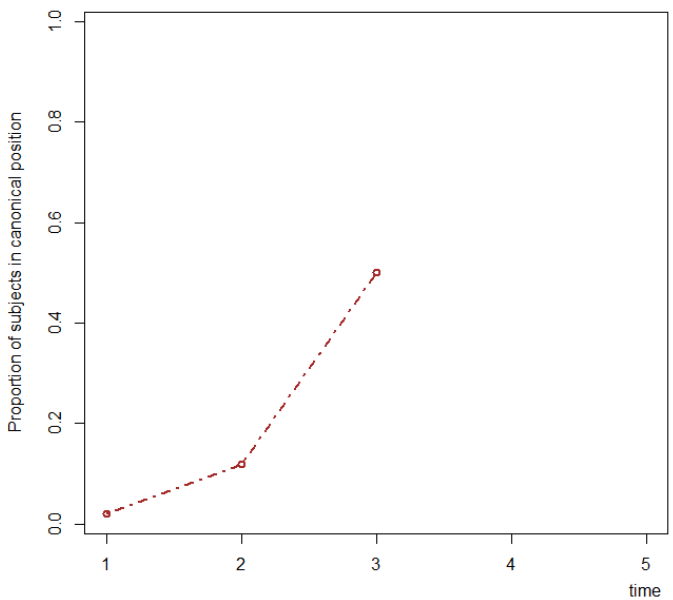
P(Canonical subject)
$= 0.1$



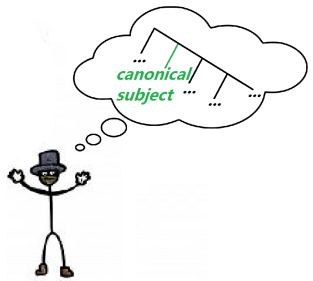
One specific change



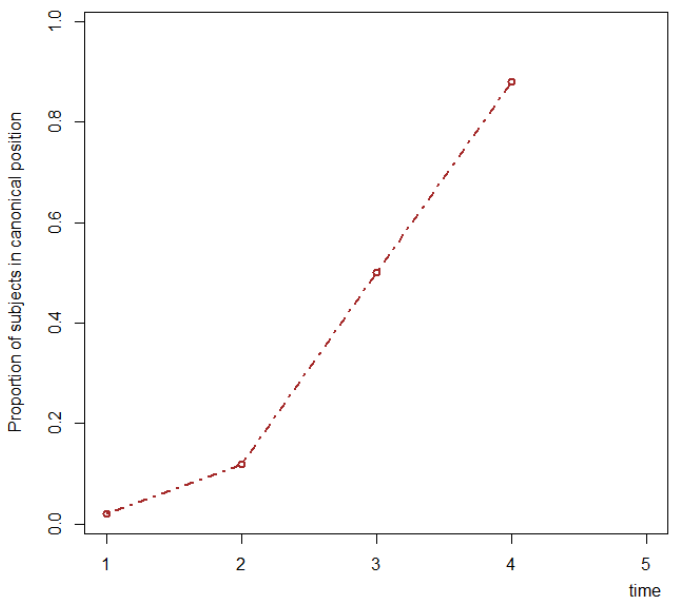
P(Canonical subject)
$= 0.5$



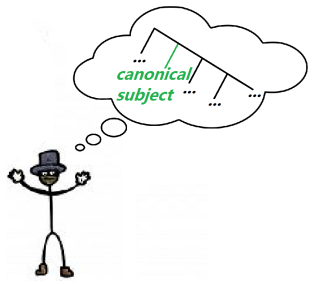
One specific change



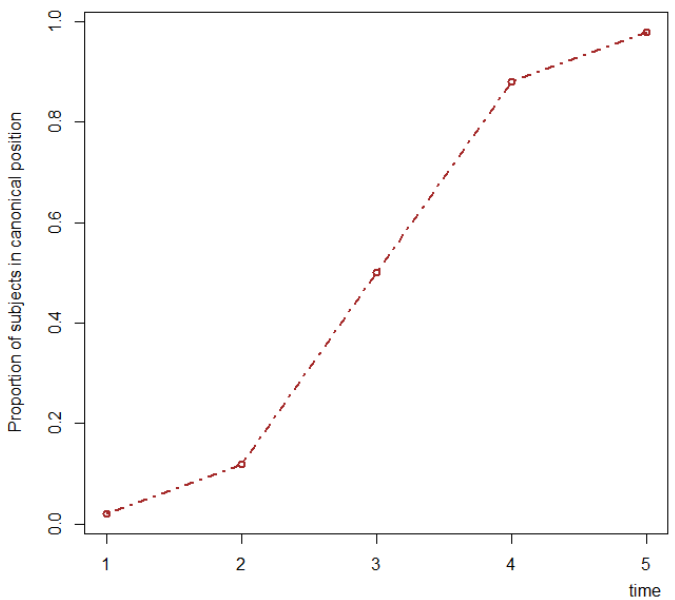
P(Canonical subject)
$= 0.9$



One specific change



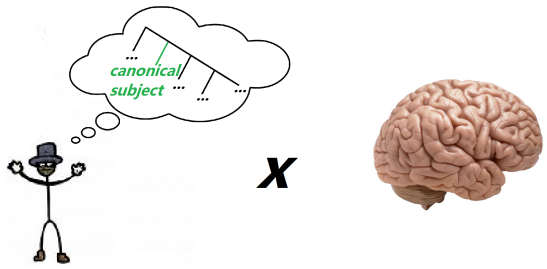
P(Canonical subject)
= 0.99



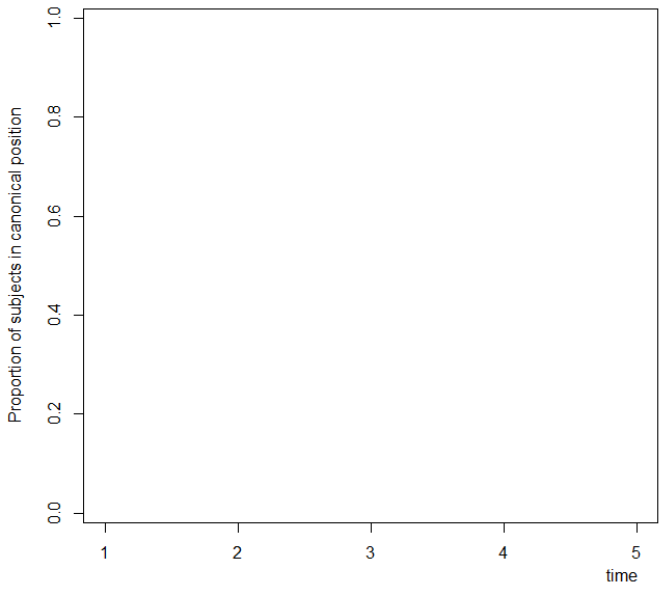
A general processing constraint

- The 'Given before New Prinicple' (Gundel 1988)
- In general, high elements tend to be discourse-given
  - P(Old | early in the clause) = relatively high, say 0.8
    P(New | early in the clause) = relatively low, say 0.2
- In general, low elements tend to be discourse new
  - P(Old | late in the clause) = relatively low, say 0.3
    P(New | late in the clause) = relatively high, say 0.7

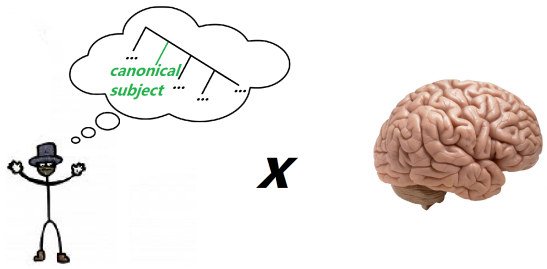
One specific change and a general processing constraint



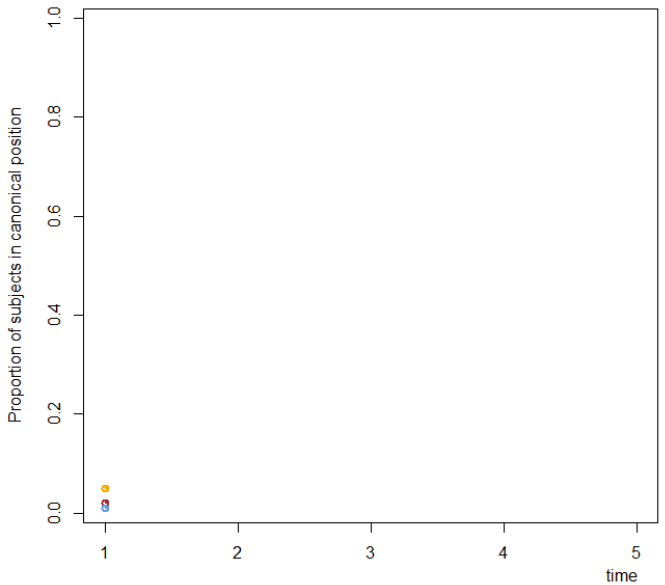
$$P(\text{Cano. subject} \mid \text{Old}) = P(\text{Cano. subject}) \times P(\text{Old} \mid \text{Cano. subject})/P(\text{Old})$$
$$P(\text{Cano. subject} \mid \text{New}) = P(\text{Cano. subject}) \times P(\text{New} \mid \text{Cano. subject})/P(\text{New})$$



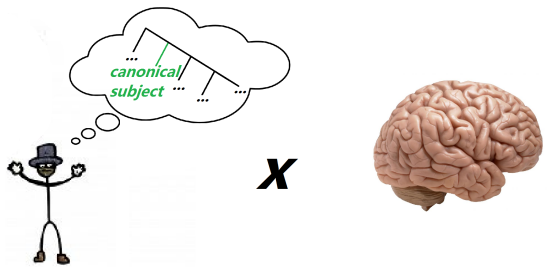
One specific change and a general processing constraint



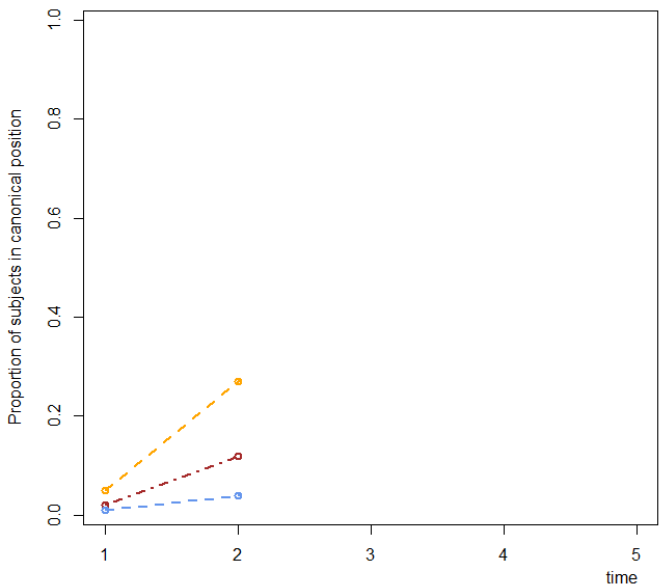
P(Canonical subject | Old) = P(0.01) x P(0.8) / P(Old) = 0.03
P(Canonical subject | New) = P(0.01) x P(0.2) / P(New) = 0.00



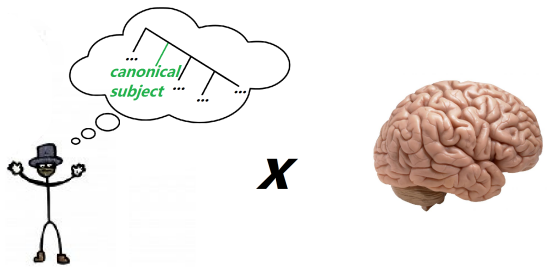
One specific change and a general processing constraint



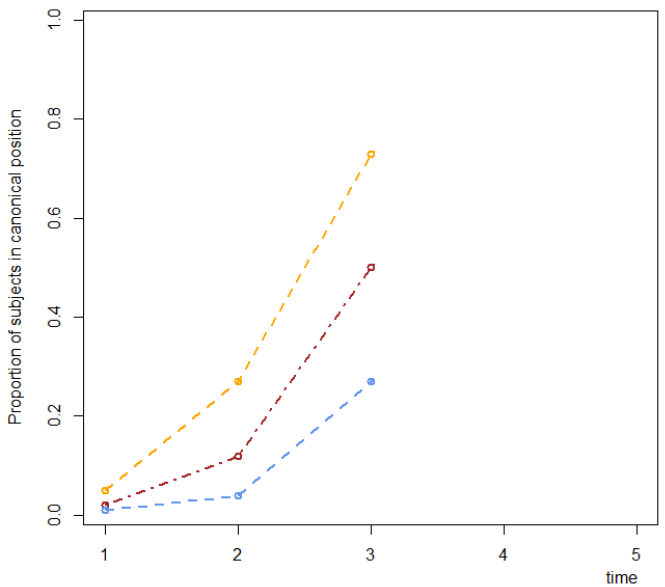
P(Canonical subject | Old) = P(0.1) x P(0.8) / P(Old) = 0.23
P(Canonical subject | New) = P(0.1) x P(0.2) / P(New) = 0.03



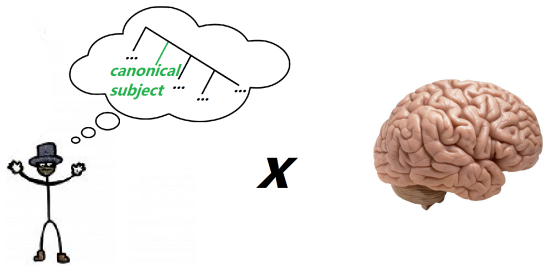
One specific change and a general processing constraint



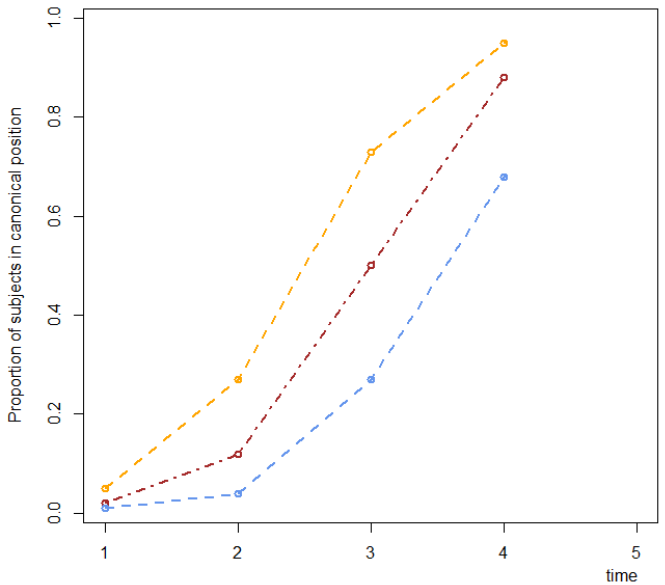
P(Canonical subject | Old) = P(0.5) x P(0.8) / P(Old) = 0.73
P(Canonical subject | New) = P(0.5) x P(0.2) / P(New) = 0.22



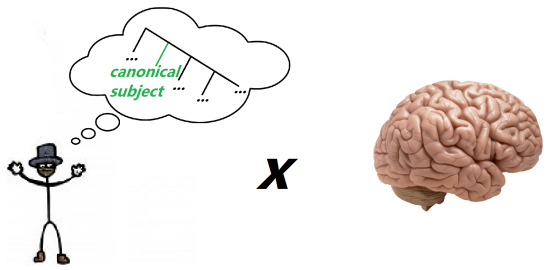
One specific change and a general processing constraint



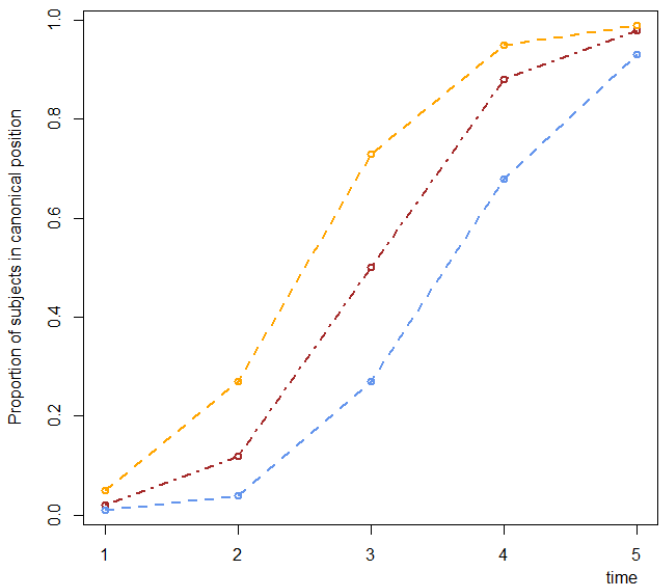
P(Canonical subject | Old) = P(0.9) x P(0.8) / P(Old) = 0.96
P(Canonical subject | New) = P(0.9) x P(0.2) / P(New) = 0.72



One specific change and a general processing constraint



P(Canonical subject | Old) = P(0.99) x P(0.8) / P(Old) = 0.1
P(Canonical subject | New) = P(0.99) x P(0.2) / P(New) = 0.97



Conclusion

- Increase in canonical subject position can be acurately measured with both automated and manual data collections

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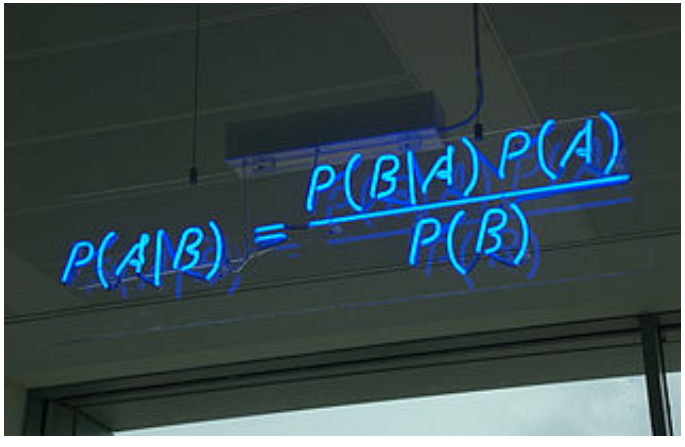
- Increase in canonical subject position can be acurately measured with both automated and manual data collections
- Information structural difference should be thought of as a general processing constraint, not part of linguistic knowledge. "[C]hange proceeds at the same rate in all contexts, and [...] disfavoring contexts acquire new forms no later than favoring ones. [...] [T]he pattern of favoring and disfavoring contexts [...] reflects functional effects, discourse and processsing, on the choices speakers make. [...] [T]hese effects remain constant" (Kroch 1989, 243)

Conclusion

- Increase in canonical subject position can be acurately measured with both automated and manual data collections
- Information structural difference should be thought of as a general processing constraint, not part of linguistic knowledge. "[C]hange proceeds at the same rate in all contexts, and [...] disfavoring contexts acquire new forms no later than favoring ones. [...] [T]he pattern of favoring and disfavoring contexts [...] reflects functional effects, discourse and processsing, on the choices speakers make. [...] [T]hese effects remain constant" (Kroch 1989, 243)
- Bayes' Theorem can be used to model these insights: The prior reflects one variant of the changing linguistic knowledge; the likelihood is a constant that indicates certain processing preferences. Constant Rate Effects follow.

Bayes' Theorem - good for all sorts of things...



Thank you very much for your attention!

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Appendix 1: Formalization

Conservative toy grammar

(17)

IP → DP I'
(↑ TOPIC) = ↓

IP → I'

IP → DP IP
(↓ PRED)='PRO'

I' → ... VP ...

VP → DP V'
(↑ SUBJECT) = ↓

Illustration of conservative system

(18) Romwalus and Reumwalus, twœgen
Romulus and Remus, two
gibroþær, **afœddæ hiæ wylif**
brothers, nourished them she-wolf
in Romæcæstri
in Rome
'Romulus and Remus, two brothers were fed by a she-wolf in Rome'
(Frank's Casket, c. 700 A.D.)

The left panel of *Frank's Caseket*, depicting Romulus and Remus

Innovative toy grammar

(19)

IP → DP I'
(↑ TOPIC) = ↓

IP → DP I'
(↑ SUBJECT) = ↓

IP → I'

IP → DP IP
(↓ PRED)='PRO'

I' → ... VP ...

VP → DP V'
(↑ SUBJECT) = ↓

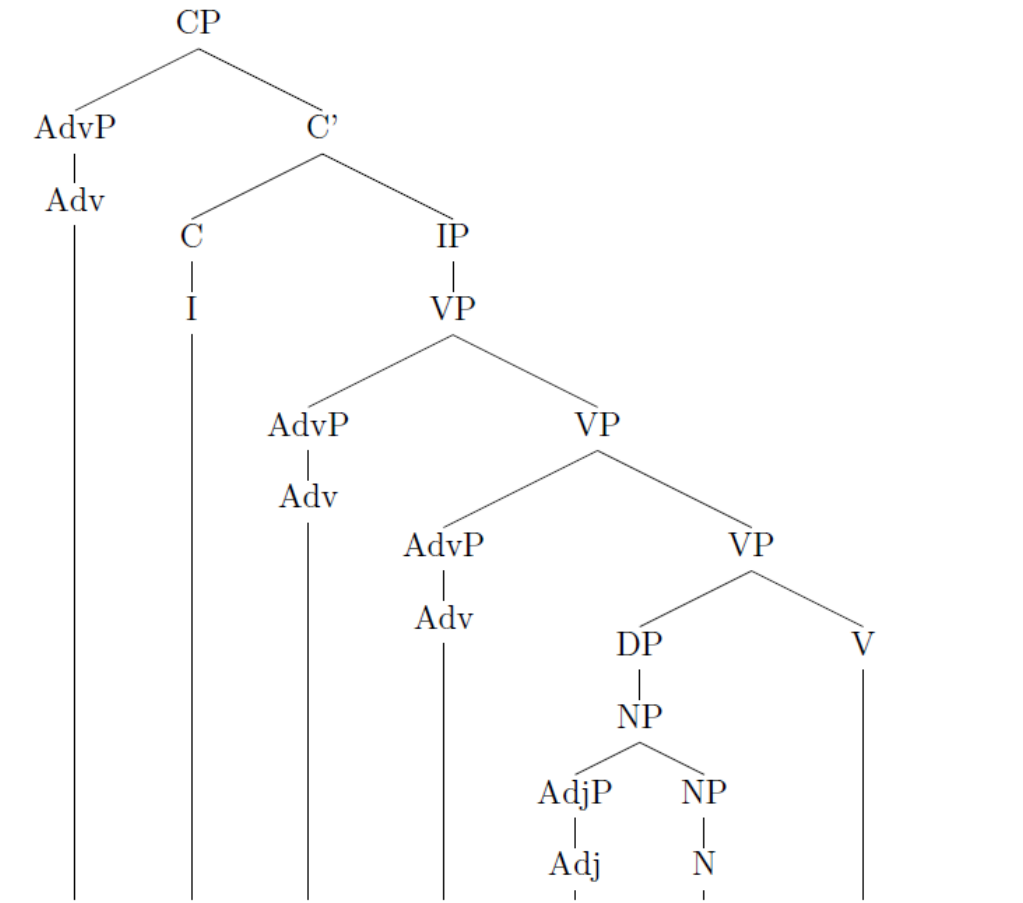
Appendix 2: Reasoning behind automated studies

Example parse

þa	wearð	þa	hrædlice	[**micel mennisc**]	geweaxen.
then	was	then	quickly	much	human	grown

'Then men began to multiply'
(cocathom1,ÆCHom_I,_1:184.177.181)

Example parse



'Then men began to multiply'
(cocathom1,ÆCHom_I,_1:184.177.181)

Appendix 3: Determination of subject positions

Algorithmic determination of subject positions

- Does the subject occur before or after the verb?
  - before (Spec,IP or Spec,VP)
  - after (Spec,VP or extraposed)
- What is the headedness of IP?
  - initial (if before verb and initial, Spec,IP)
  - ambiguous
  - final (if after verb and final, extraposed)

- If pre-verbal:
  What is the first element in the clauses?
  - subject
  - heavy XP, dem., *there* (Spec,VP)
  - pronoun, light element
- What is the element between subject and finite verb?
  - adverb, adjunct (if subject initial, Spec,IP)
  - pronoun, demonstrative, complement, nothing

- If post-verbal:
  What is the most salient element that follows the subject?
  - subject is last
  - diagnostic, nonfinite verb (Spec,VP)
  - other
- Is there an intervening element between verb and subject?
  - none
  - adjunct
  - complememnt (extraposed)