Control structures in Korean: Syntax and processing

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Introductory remarks

Control

A dependency between two argument positions in which the referential properties of the overt controller determine the referential properties of the silent controllee:

Craig Venter$_i$ tried [____$_i$ to capture the code of life]

controller controllee

Subject Control

Craig Venter$_i$ tried [_____$_i$ to escape]

controller controllee

subject subject

Object Control

Venture capitalists persuaded

Craig Venter$_i$ [_____$_i$ to capture the code]

controller controllee

object subject

Prevalent theoretical assumptions

- (Overt) controller is structurally higher than (silent) controllee

- Base-generated analysis of control, with an invisible subject or no subject at all in the complement clause (depending on the theory)

Traditional analyses predict that…

(at least) the following structures are impossible:

(1) ____$_i$ tried [Craig Venter$_i$ to capture the code…]
(Backward control)

(2) Craig Venter$_i$ tried that he$_i$ captured the code…
(Copy control)

Traditional analyses too restrictive

Empirically attested:

(1) ____$_i$ tried [Craig Venter$_i$ to capture …]

controllee controller

(Tsez, Malagasy, Jakaltec, Zapotec)

(2) Venture capitalists persuaded ____$_i$ [Venter$_i$

controllee controller

to work on the code of life]

(Brazilian Portuguese, Malagasy, Korean)

Backward control is empirically possible

What's the source of the problem?

- These new data are misanalyzed:

  Apparent cases of backward control are amenable to an account that maintains the base-generated analysis of control

- The theory needs to be changed

Roadmap of the talk

- Two (2.5) object control constructions in Korean and their properties
- Two possible analyses of Korean control
  - Syntactic control
  - Semantic control
- Which analysis is superior?
  - Structural evidence
  - Processing evidence
- Conclusions and outstanding questions

Object control in Korean

Korean object control

- Complement clause headed by the complementizer -*tolok* (Kim 1978, 1984), embedded under such verbs as ‘persuade’, ‘order’
- Apparent controller is in the accusative (or dative) case (ACC)
  - Controller precedes the complement clause (ACC1)
  - Controller follows the complement clause (ACC2)
- Apparent controller is in the nominative case (NOM)

Korean object control

Controller in the accusative case:

(1) Chelswu-ka Yenghi-lul [~~Yenghi-ka~~ ACC1
Chelswu-NOM Yenghi-ACC Y-NOM
hakkyo-lul ttena-tolok] seltukhayssta
school-ACC quit-COMPL persuaded

(2) Chelswu-ka [~~Yenghi-ka~~ hakkyo-lul ACC2
Chelswu-NOM Yenghi-NOM school-ACC
ttena-tolok] Yenghi-lul seltukhayssta
quit-COMPL Yenghi-ACC persuaded
'Chelswu persuaded Yenghi to quit school.'

Korean object control

Controller in the nominative case

(3) Chelswu-ka ~~Yenghi-lul~~ [Yenghi-ka NOM
Chelswu-NOM Y-ACC Yenghi-NOM
hakkyo-lul ttena-tolok] seltukhayssta
school-ACC quit-COMPL persuaded
'Chelswu persuaded Yenghi to quit school.'

(3') Chelswu-ka [Yenghi-ka hakkyo-lul
Chelswu-NOM Yenghi-NOM school-ACC
ttena-tolok] ~~Yenghi-lul~~ seltukhayssta
quit-COMPL Y-ACC persuaded
'Chelswu persuaded Yenghi to quit school.'

The difference between the base and scrambled positions is unclear

The scope of alternation

- A number of predicates participate in the alternation between ACC and NOM

- Corpus data (Seejong corpus 2002)

Representative predicates

kangyohata	'force'
kwunyuhata	'recommend'
kwuenhata	'recommend'
myenglyenghata	'order'
pwuthakhata	'ask (as a favor)'
selthukhata	'persuade'
yokwuhata	'ask, request'
congyonghata	'recommend/encourage'
cisihata	'order'
thailuta	'implore'
pwuchwukita	'encourage'

Properties of the constructions

Properties relevant for both ACC and NOM:

- Evidence of the control relation
- Evidence that the structure is biclausal, with a matrix control verb
- Evidence of obligatory control

Properties of the constructions

Properties relevant for both ACC and NOM:

- Evidence of the control relation
- Evidence that the structure is biclausal, with a matrix control verb
- Obligatory control

Evidence of control

- selectional restrictions

#Chelswu-nun tol-i/ul tteleci-tolok seltukha-ess-ta
Chelswu-TOP rock-NOM/ACC fall-COMP persuade-PAST-DECL
('Chelswu persuaded the rocks to fall.')

- idiom chunks impossible

#sin-un pal ep-nun mal-i/mal-ul chenli
God-TOP *feet* *not.exist-REL* *horse-NOM/ACC* *10000km*
ka-tolok myenglyenghaessta
go-COMP *ordered*
('God ordered the news to travel fast (lit.: … the footless horse to go 10,000 km).')

Properties of the constructions

Properties relevant for both ACC and NOM:

- Evidence of the control relation ✓
- Evidence that the structure is biclausal, with a matrix control verb
- Obligatory control

Biclausal structure

- event quantification
- scrambling patterns
- NPI licensing (will be discussed later)
- (ellipsis: control complement is treated as a constituent)

Biclausal structure: Event quantification

- event quantification

ACC1/ACC2:

Yesterday John persuaded Mary-ACC
[to leave tomorrow]

NOM:

Yesterday John persuaded
[Mary-NOM to leave tomorrow]

Biclausal structure: Scrambling

- scrambling patterns: ACC

Chelswu-ka Mary-lul [nayil hakkyoey ka-tolok] seltukhaessta
Chelswu-NOM Mary-ACC tomorrow to.school go-COMP persuaded
'Chelswu persuaded Mary to go to school tomorrow.'

Chelswu-ka Mary-lul [hakkyoey nayil ka-tolok] seltukhaessta

*Chelswu-ka Mary-lul [hakkyoey ka-tolok nayil] seltukhaessta

*Chelswu-ka nayil Mary-lul [hakkyoey ka-tolok] seltukhaessta

Biclausal structure: Scrambling

- scrambling patterns: NOM

Chelswu-ka [Mary-ka nayil hakkyoey ka-tolok] seltukhaessta

Chelswu-NOM Mary-NOM tomorrow to.school go-COMP persuaded

'Chelswu persuaded Mary to go to school tomorrow.'

Chelswu-ka [Mary-ka hakkyoey nayil ka-tolok] seltukhaessta

Chelswu-ka [hakkyoey Mary-ka nayil ka-tolok] seltukhaessta

*Chelswu-ka [Mary-ka hakkyoey ka-tolok] nayil seltukhaessta

*Chelswu-ka [nayil hakkyoey ka-tolok] Mary-ka seltukhaessta

Properties of the constructions

Properties relevant for both ACC and NOM:

- Evidence of the control relation ✓
- Evidence that the structure is biclausal, with a matrix control verb ✓
- Obligatory control

Obligatory control

Does the silent element obligatorily take a unique antecedent?

- Obligatory control: yes
- Non-obligatory control: no

  (Williams 1980, Koster 1984, Hornstein 2003, Jackendoff and Culicover 2003, and many others)

Obligatory control

- these constructions instantiate obligatory control

	ACC	NOM
arbitrary interpretation of null controller	✗	✗
strict reading under ellipsis	✗	✗
non-c-commanding antecedent	✗	✗
non-local antecedent	✗	✗
de se reading	✗	✗

Properties of the constructions

Properties relevant for both ACC and NOM:

- Evidence of the control relation ✓
- Evidence that the structure is biclausal, with a matrix control verb ✓
- Obligatory control ✓

Interim summary

- *selthuhata* 'persuade'

V [___ DP CP/IP [*tolok*]]

- ACC1/ACC2 and NOM instantiate obligatory object control

Properties of the NOM construction

- Evidence of the control relation ✓
- Evidence that the structure is biclausal, with the control verb as matrix ✓
- Evidence that the overt DP is in the embedded clause
- Evidence that there is a silent element in the matrix clause

Overt controller downstairs

- case-marking
- scrambling
- NPI licensing
- subject honorific agreement on the embedded predicate

Overt controller downstairs: Case marking

- case-marking determined by the lower verb

Chelswu-TOP [Yenghi-**NOM** leave-COMP] persuaded

'Chelswu persuaded Yenghi to leave.'

Overt controller downstairs: Scrambling

- the entire complement clause scrambles as a constituent

  [Yenghi-**NOM** tomorrow leave-Comp] Chelswu-NOM
  ___ persuaded

  'Chelswu persuaded Yenghi to leave tomorrow.'

Overt controller downstairs: Scrambling

- overt NP scrambles with constituents of the complement clause

[tomorrow Yenghi-**NOM** leave-Comp] yesterday Chelswu-NOM persuaded

Overt controller downstairs: Scrambling

- overt NP scrambles with constituents of the complement clause

[tomorrow Yenghi-**NOM** leave-Comp] yesterday Chelswu-NOM persuaded

- …. but not with constituents of the matrix clause

* Chelswu-NOM [tomorrow leave-Comp] yesterday Yenghi-**NOM** persuaded

Overt controller downstairs: NPI licensing

- Negative polarity items (NPIs) are licensed by clause-mate negation (Sohn 1996, Shi 1997)
- NPI in NOM is licensed by the embedded negation:

Chelswu-ka [amwuto ka-ci anh-tolok] seltukhaessta

Chelswu-NOM NPI go-INF NEG-COMP persuaded

'Chelswu persuaded nobody to go.'

(lit.: Chelswu persuaded nobody not to go)

Overt controller downstairs: Honorific agreement

- Honorific agreement is local, triggered by subject:

sensayng-nim-i ka-si-ess-ta
teacher-RESP-NOM go-HON-PAST-DEC
'The teacher went.'

- Embedded verb shows subject honorification in NOM:

Chelswu-nun [sensayng-nim-i ka-si-tolok] seltukhaessta
Chelswu-TOP teacher-RESP-NOM go-HON-COMP persuaded

- … matrix verb does not:

*Chelswu-nun [sensayng-nim-i ka-si-tolok] seltukha-~~si~~-essta
Chelswu-TOP teacher-RESP-NOM go-HON-COMP persuaded-HON

Honorific agreement consistent across all three constructions

- ACC1:

Chelswu-nun sensayng-nim-ul [___ ka-si-tolok] seltukhaessta
Chelswu-TOP teacher-RESP-ACC go-HON-COMP persuaded

- ACC 2:

Chelswu-nun [___ ka-si-tolok] sensayng-nim-ul seltukhaessta
Chelswu-TOP go-HON-COMP teacher-RESP-ACC persuaded

- NOM:

Chelswu-nun [sensayng-nim-i ka-si-tolok] seltukhaessta
Chelswu-TOP teacher-RESP-NOM go-HON-COMP persuaded

Overt controller downstairs (summary)

- case-marking
- scrambling
- NPI licensing
- subject honorific agreement on the embedded predicate

Properties of the NOM construction

- Evidence of the control relation ✓
- Evidence that the structure is biclausal, with the control verb as matrix ✓
- Evidence that the overt DP is in the embedded clause ✓
- Evidence that there is a silent element in the matrix clause

The sound of silence

Proposed structure: null upstairs controllee

Chelswu-NOM ___$_i$ [Yenghi$_i$-NOM leave-COMP] persuaded
Chelswu-NOM [Yenghi$_i$-NOM leave-COMP] ___$_i$ persuaded

Evidence:

- Binding
- Quantifier float

The sound of silence: Binding

- Reflexive binding is local (Yoon 1989)

*Chelswu-ka [Yenghi$_i$-ka hakkyo-ey kaessta-ko]

Chelswu-NOM Yenghi-NOM school-DAT went-COMP

kunye casin$_i$-uy chinkwu-eykey malhaessta

herself-GEN friend-DAT said

'Chelswu said to herself$_i$'s friend(s) hat Yenghi$_i$ went to school.'

The embedded DP cannot bind a reflexive in the matrix clause

The sound of silence: Binding

- Reflexive binding is local
- The silent controllee binds a local reflexive

Chelswu-ka ____$_i$ [Yenghi-ka ka-tolok]

Chelswu-NOM *Yenghi-NOM go-COMP*

kunye casin$_i$ -uy cipeyse seltukhaessta

herself-GEN *at home* *persuaded*

'Chelswu persuaded Yenghi, at her house, to go.'

The sound of silence

Evidence:

- Binding ✓
- Quantifier float

The sound of silence: Quantifier float

- If a quantifier follows the DP it modifies, the two must agree in case (Gerdts 1987, Choi 1988, Cho 2000)

haksayng-tul-i twul-i/*ul/*Ø kaessta

*student-PL-NOM two-NOM/*ACC/*no case went*

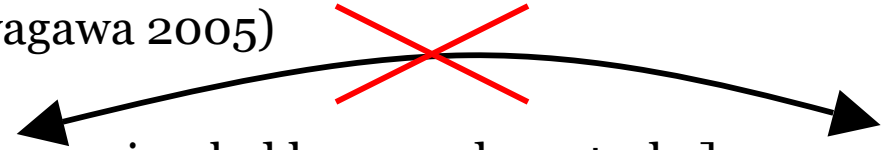
'Two students went.'

- Postnominal quantifier can be separated from the host DP (quantifier float)

Quantifier float restrictions

- Quantifier float is strictly local

  (Kang 2002, Miyagawa 2005)



*Chelswu-ka [haksayng-i hakkyo-ey kaessta-ko] sey-myeung-i
Chelswu-NOM student-NOM school-DAT went-COMP three-CL-NOM
malhaessta
said
('Chelswu said that three students went to school.')

- Case-matching quantifier must follow its host DP:

*twul-i haksayng-tul-i kaessta
two-NOM student-PL-NOM went
('Two students went.')

The sound of silence: Postnominal quantifier

- The silent element licenses a case-marked quantifier (floated quantifier)
- The case of the quantifier is determined by the matrix verb (not the embedded verb)

kunye-ka [ai-tul-i ka-tolok] __ motwu-lul/*motwu-ka

*she-NOM child-PL-NOM go-COMP all-ACC/*all-NOM*

seltukhaessta

persuaded

'She persuaded all the children to go.'

The sound of silence: Quantifier float

- *Restriction*: the floated quantifier must follow the control complement

*kunye-ka motwu-lul [ai-tul-i ka-tolok]
she-NOM all-ACC child-PL-NOM go-COMP

seltukhaessta
persuaded

'She persuaded all the children to go.'

- Why? Seems unexpected on the analysis where the gap precedes the control complement:

Chelswu-NOM ___$_i$ all [children$_i$-NOM leave-COMP] persuaded

The sound of silence: Quantifier float

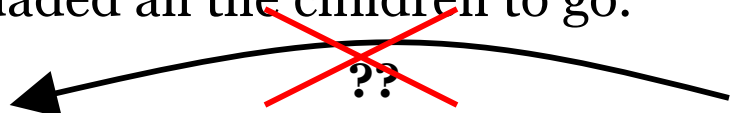
- Quantifiers float only to the right in Korean

  Cf. in ACC:

kunye-ka ai-tul-ul [___ ka-tolok] motwu-lul seltukhaessta

she-NOM child-PL-NOM go-COMP all-ACC persuaded

'She persuaded all the children to go.'



* kunye-ka motwu-lul [___ ka-tolok] ai-tul-ul seltukhaessta

she-NOM all-ACC go-COMP child-PL-NOM persuaded

- A floated quantifier must follow an overt DP?
- The position of the floated quantifier in NOM is not determined by the placement of the gap

Properties of the NOM construction

- Evidence of the control relation ✓
- Evidence that the structure is biclausal, with the control verb as matrix ✓
- Evidence that the overt DP is in the embedded clause ✓
- Evidence that there is a silent element in the matrix clause ✓

Interim summary

Two patterns in Korean object control:

- Matrix controller, silent embedded controllee (ACC1, ACC2)
- Embedded overt controller, silent matrix controllee (NOM)

ACC1: John Mary-ACC [____ leave] persuaded

ACC2: John [____ leave] Mary-ACC persuaded

NOM: John ___ [Mary-NOM leave] persuaded

NOM: John [Mary-NOM leave]___ persuaded

Question

- What is the appropriate analysis of these constructions?

Roadmap of the talk

- Two (2.5) object control constructions in Korean and their properties ✓
- Two possible analyses of Korean control
  - Syntactic control
  - Semantic control
- Which analysis is superior?
  - Structural evidence
  - Processing evidence
- Conclusions and outstanding questions

Analytical possibilities

An impossible analysis

Base-generated control structures

(1) John Mary-ACC [PRO leave] persuaded

(2) *John PRO [Mary-NOM leave] persuaded

- Problems with (2):
  - PRO is ungoverned but does not receive arbitrary interpretation
  - Condition C violation

  ☞ Base-generated analysis of the backward pattern (NOM) is untenable

Two possible analyses

- *Desideratum*: analysis must be able to handle both forward and backward patterns
  - Syntactic control (Polinsky and Potsdam 2002, Monahan 2004)
  - Semantic control (Cormack and Smith 2002, 2004)

Syntactic control

- Matrix and embedded DP form an A-chain; Control is raising into a theta-position
  - ACC: the tail of the chain is deleted → Forward Control

    John Mary-ACC [~~Mary-NOM~~ leave] persuaded

  - NOM: the head of the chain is deleted→ Backward Control

    John ~~Mary-ACC~~ [Mary-NOM leave] persuaded

Syntactic control

- ACC1

John [$_{VP}$ Mary$_k$-ACC [$_{CP}$ [$_{IP}$ ___$_k$ [$_{VP}$ leave]]-COMP] persuaded]

A-chain

- ACC2 (possibly scrambled?)

John [$_{XP}$ [$_{CP}$ [$_{IP}$ _$_k$ [$_{VP}$ leave]]-COMP]$_j$ [$_{VP}$ Mary$_k$-ACC t_j persuaded]

A-chain

- NOM

John [$_{VP}$ ___$_k$ [$_{CP}$ [$_{IP}$ Mary$_k$-NOM [$_{VP}$ leave]]-COMP] persuaded]

A-chain

Syntactic control

Delete tail (lower element) of movement chain	Delete head (higher element) of movement chain
ACC 1/ACC 2: Forward control	NOM: Backward control

- The difference between the two forward patterns is due to scrambling; it is unclear which pattern is basic
- *Main question*: What motivates the deletion of the higher element in the movement chain?

Semantic control

- Korean has subject and object *pro*-drop; the silent element in all three constructions is a null pronominal

- Overt DP is co-indexed with a null pronominal, via a meaning postulate

Semantic control

- *Unmarked structure*:

  control complement is in the specifier of VP, DP (including null pronominal) adjoined to V'

John [$_{VP}$ [$_{CP}$ Mary$_1$-NOM leave-COMP] [$_{V'}$[*pro*$_2$] persuaded]

John [$_{VP}$ [$_{CP}$ *pro*$_1$ leave-COMP] [$_{V'}$ [Mary$_2$-ACC] persuaded]

- *Shifted structure*:

  accusative DP is in the specifier of VP, control complement adjoined to V'

John [$_{VP}$ [Mary$_1$-ACC] [$_{V'}$ [$_{CP}$ DP$_2$ leave-COMP] persuaded]

Semantic control

- *Unmarked structure*:

  control complement is in the specifier of VP, DP (including null pronominal) adjoined to V'

John [$_{VP}$ [$_{CP}$ [$_{IP}$ Mary$_1$-NOM leave-COMP]] [$_{V'}$*pro*$_2$] persuaded]

co-indexation

John [$_{VP}$ [$_{CP}$ [$_{IP}$ *pro*$_1$ leave-COMP]] [$_{V'}$ Mary$_2$-ACC] persuaded]

co-indexation

Semantic control with *pro*

- *Shifted structure*:

  accusative DP is in [spec, VP],
  control complement adjoined to V'

John [$_{VP}$ [$_{DP}$Mary$_1$-ACC] [$_{V'}$ [$_{CP}$ [$_{IP}$ *pro*$_2$ leave-COMP]]] persuaded]
co-indexation

Semantic control

	CP in [spec,VP] DP adjoined to V'	DP in [spec, VP] CP adjoined to V'
pro in the matrix clause	NOM Control	impossible because of Condition C violation
pro in the embedded clause	ACC 2 (CP before DP)	ACC 1 (DP before CP)

The two analyses

- Convergence:

The syntactic and semantic analyses yield the same interpretation:

'John persuaded Mary to go.'

- Divergence:

The two analyses make different structural predictions

Roadmap of the talk

- Two (2.5) object control constructions in Korean and their properties ✓
- Two possible analyses of Korean control ✓
  - Syntactic control
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Syntactic *vs.* semantic analysis

Structural differences

Relevant structural properties

- c-command effects—discussed here
- (representation of verb frames)

Relevant structural properties: c-command

	Syntactic analysis	Semantic analysis
c-command between the matrix argument and the embedded subject	✓	✗

c-command effects

- *embedded subject restriction:*
  - Only the embedded subject, overt or silent, can be co-indexed with the matrix element
- *intervening material*:
  - An intervening clause disrupting the c-command chain should be impossible
- *distributive quantifiers*:
  - Distributive quantifiers that c-command pronouns construed as bound variables should be possible in control structures, including the NOM construction

c-command effects in the two analyses

	Syntactic analysis of NOM (backward pattern)	Semantic analysis of NOM (backward pattern)
embedded subject restriction	applies	does not apply
disruption of c-command	impossible	possible
distributive quantifiers	possible	impossible

Embedded subject restriction

- Syntactic analysis:

  If a matrix empty category c-commands a constituent of the embedded CP, only the embedded subject could be co-indexed with it

- Semantic analysis:

  Since no c-command holds, the meaning postulate should allow for the embedded agent, regardless of grammatical function, to be co-indexed with the matrix null pronominal

Embedded subject restriction

Chelswu-nun [Swuyeng-i_j Yenghi-eykey$_k$
Chelswu-Top *Swuyeng-Nom* *Yenghi-Dat*
intephyu pat-tolok] ___$_{j/*k}$ seltukhayssta
interview *pass-Comp* *persuaded*

'Chelwsu persuaded Sueng to be interviewed by Yenghi.'

*'Chelswu persuaded Yenghi that she interview Swueng.'

☞ Embedded subject restriction supports the syntactic analysis

c-command effects

- *embedded subject restriction* ✓
- *intervening material*
- *distributive quantifiers*

Intervening material

- Syntactic analysis:

  If there is a matrix empty category c-commanding the embedded subject of CP, the command chain cannot skip intervening clauses

cf. in English:

John$_j$ *decided* [*that there was a plan* [___$_{*j}$ *to evacuate*]]

John convinced Mary$_j$ [*that there was a plan* [___$_{*j}$ *to evacuate*]]

Intervening material

- Semantic analysis:

  Since no c-command holds, the null pronominal and its identifying expression can be separated by another clause

cf. in English:

John$_i$ *was shocked* [*that Mary said* [*that he*$_i$ *was a liar*]]

Intervening material

Both analyses can handle:

Chelswu-ka	[[cipey	Yenghi$_i$–ka	o-tolok]	
Chelswu-NOM	*home*	*Yenghi-NOM*	*come-COMP*	

___$_i$/*pro*$_i$	kyelsimha-tolok]	___$_i$/*pro*$_i$	seltukhaessta
	decide-COMP		*persuaded*

'Chelswu persuaded Yenghi [to decide [to come home]].'

Intervening material

Both analyses can handle:

*Chelswu-ka [[cipey ___$_{i}$/*pro*$_{i}$ o-tolok]

Chelswu-NOM home come-COMP

Yenghi$_{i}$–ka kyelsimha-tolok] ___$_{i}$/*pro*$_{i}$ seltukhayssta

Yenghi-NOM decide-COMP persuaded

('Chelswu persuaded Yenghi to decide to come home.')

Intervening material

Only the syntactic analysis can handle:

*Chelswu-ka [Yenghi$_i$–ka onul [___$_i$/*pro*$_i$ cipey

co-indexation

Chelswu-NOM Yenghi-NOM today home

nayil ka-tolok] kyelsimha-tolok] ___$_i$/*pro*$_i$ seltukhayssta

tomorrow go-COMP decide-COMP persuaded

('Chelswu persuaded Yenghi [to decide today [to go home tomorrow]].')

Semantic analysis: co-indexation should be possible with scrambling

Syntactic analysis: predicts ungrammaticality

Intervening material

- The restriction against intervening material supports the syntactic analysis

c-command effects

- *embedded subject restriction* ✓
- *intervening material* ✓
- *distributive quantifiers*

Distributive quantifiers

- Syntactic analysis:

  Distributive quantifiers should be possible

- Semantic analysis:

  True distributive quantifiers should be impossible because they would bind a pronominal

Distributive quantifiers…

… are possible in NOM (backward pattern):

Chelswu-nun	[ai-ka	may-ka
Chelswu-Top	*child-Nom*	*every-Nom*
swukcay-lul	ha-tolok]	seltukhaessta
homework-Acc	*do-Comp*	*persuaded*

'Chelswu persuaded every child to do the homework.'

☞ Distributive quantifier evidence supports the syntactic analysis

c-command effects

- *embedded subject restriction* ✓
- *intervening material* ✓
- *distributive quantifiers* ✓

☞ Primary linguistic evidence based on c-command relations supports the syntactic analysis of Korean object control

Conclusions

- The semantic analysis of Korean object control makes a number of incorrect predictions
- Primary linguistic data support the syntactic analysis of Korean object control
- Korean control patterns are accounted for within current theoretical assumptions:
  - Control as movement into a thematic position
  - Copy and delete theory of movement

Syntactic *vs.* semantic analysis

Processing differences

The three control constructions

- ACC1: Forward pattern, DP before CP
- ACC2: Forward pattern, CP before DP
- NOM: Backward pattern

Korean object control

Controller is in the accusative case

(1) Chelswu-ka Yenghi-lul [~~Yenghi-ka~~ ACC1
Chelswu-NOM *Yenghi-ACC* *Yenghi-NOM*
hakkyo-lul ttena-tolok] seltukhayssta
school-ACC *quit-COMPL* *persuaded*

(2) Chelswu-ka [~~Yenghi-ka~~ hakkyo-lul ACC2
Chelswu-NOM *Yenghi-NOM* *school-ACC*
ttena-tolok] Yenghi-lul seltukhayssta
quit-COMPL *Yenghi-ACC* *persuaded*

'Chelswu persuaded Yenghi to quit school.'

Korean object control

Controller is in the nominative case

(3) Chelswu-ka ~~Yenghi-lul~~ [Yenghi-ka NOM
Chelswu-NOM *Yenghi-ACC* *Yenghi-NOM*
hakkyo-lul ttena-tolok] seltukhayssta
school-ACC *quit-COMP* *persuaded*

(3') Chelswu-ka [Yenghi-ka hakkyo-lul
Chelswu-NOM *Yenghi-NOM* *school-ACC*
ttena-tolok] ~~Yenghi-lul~~ seltukhayssta
quit-COMPL *Yenghi-ACC* *persuaded*

'Chelswu persuaded Yenghi to quit school.'

The difference between the base and scrambled positions is unclear

Reading time study

- Self-paced reading time study
  - 40 sentences per condition (70 filler sentences)
  - 23 native Korean participants

Example target sentence:

The marketing department persuaded **the leading actress to appear on a popular talk show** to advertise the movie.

Opening frame…

ku	yenghwasa-uy	hongpothim-i	yenghwa	hongpo-lul	wuyhay
that	production-GEN	marketing-dept-NOM	movie	advertising-ACC	for
W1	W2	W3	W4	W5	W6

"The marketing department of the production, to advertise the movie, …"

… target sentences

"…persuaded the leading actress to appear on a popular talk show"

ACC1	heroine-ACC	popular	talk-show-to	go-comp	persuaded
NOM	heroine-NOM	popular	talk-show-to	go-comp	persuaded
ACC2	popular	talk-show-to	go-comp	heroine-ACC	persuaded
	W7	W8	W9	W10	W11

Where's the gap?

- ACC1:

John-NOM Mary-ACC [**GAP** leave] persuaded

- ACC2:

John-NOM [**GAP** leave] Mary-ACC persuaded

- NOM:

John-NOM **GAP** [Mary-NOM leave] persuaded

or

John-NOM [Mary-NOM leave] **GAP** persuaded

Direct comparison of ACC1 and NOM

- Because of word order differences between ACC2 and the other two constructions (NOM/ACC1), word-by-word comparisons were possible only between ACC1 and NOM

- Nonetheless, ACC1 and ACC2 patterned alike in that they were read faster than NOM in terms of
  - total reading time across the sentence
  - total reading time across the 2nd half of the sentence
  - reading time at final matrix predicate (W11)

Direct comparison of ACC1 and NOM

"…persuaded the leading actress to appear on a popular talk show"

ACC1	heroine-ACC	popular	talk-show-to	go-comp	persuaded
NOM	heroine-NOM	popular	talk-show-to	go-comp	persuaded
	W7	W8	W9	W10	W11

Predictions

- The constructions are initially analyzed as mono-clausal
  - But at some point, the structure has to be reanalyzed as bi-clausal, which entails a processing cost
- The constructions are initially analyzed as not containing a gap
  - But at some point, the structure has to be reanalyzed as containing a gap, which entails a processing cost

Predictions (ACC1)

John-NOM Mary-ACC [GAP leave-COMP] persuaded

- initially processed as mono-clausal
- NP-ACC (W7) interpreted as matrix object
- when the parser reaches *leave*-COMP (W10), the sentence
  - has to be reanalyzed as bi-clausal, and
  - a gap is posited in the embedded clause
- slowdown in reading time should occur at *leave*-COMP position (W10)

Predictions (ACC1)

"…persuaded the leading actress to appear on a popular talk show"

ACC1	heroine-ACC	popular	talk-show-to	go-comp	persuaded
	W7	W8	W9	W10 **SLOW**	W11

Predictions (NOM)

John-NOM (GAP) [Mary-NOM leave-COMP] (GAP) persuaded

- initially processed as mono-clausal
- when the parser reaches the 2nd NP-NOM (W7),
  - the sentence has to be reanalyzed as bi-clausal
  - a gap could *logically* be posited in the main clause (but native speakers find this highly implausible)
- slowdown (mono- to bi-clausal reanalysis) should occur prior to W10

Predictions: Gap positing in NOM

"first resort" gap positing:

- if a gap is posited at W7 (2nd NP-NOM), then all of the hard processing work should be over by W10 (*leave*-COMP)

"last resort" gap positing:

- if a gap is not posited until W10 (*leave*-COMP), there should be an additional slowdown at W10

NOM: "first resort" gap positing

"…persuaded the leading actress to appear on a popular talk show"

NOM	heroine-NOM	popular	talk-show-to	go-comp	persuaded
	W7 **SLOW**	W8	W9	W10	W11

NOM: "last resort" gap positing

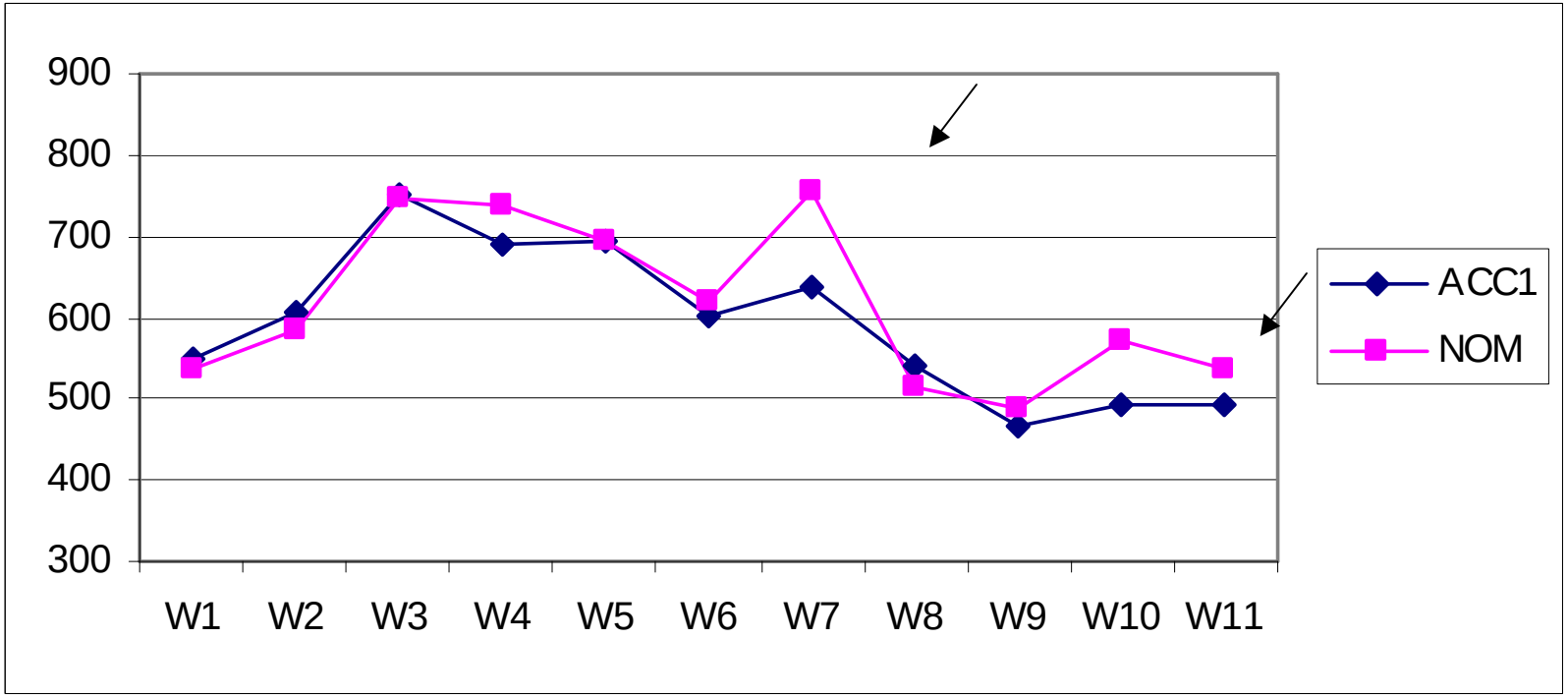
"…persuaded the leading actress to appear on a popular talk show"

NOM	heroine-NOM	popular	talk-show-to	go-comp	persuaded
	W7 **SLOW**	W8	W9	W10 **SLOW**	W11

Predictions: Summary

	ACC1	NOM: first resort gap	NOM: last resort gap
Mono- to bi-clausal reanalysis	W10	W7	W7
Gap positing	W10	W7	W10

Reading times: ACC1 and NOM



Direct comparison of ACC1 and NOM

"…persuaded the leading actress to appear on a popular talk show"

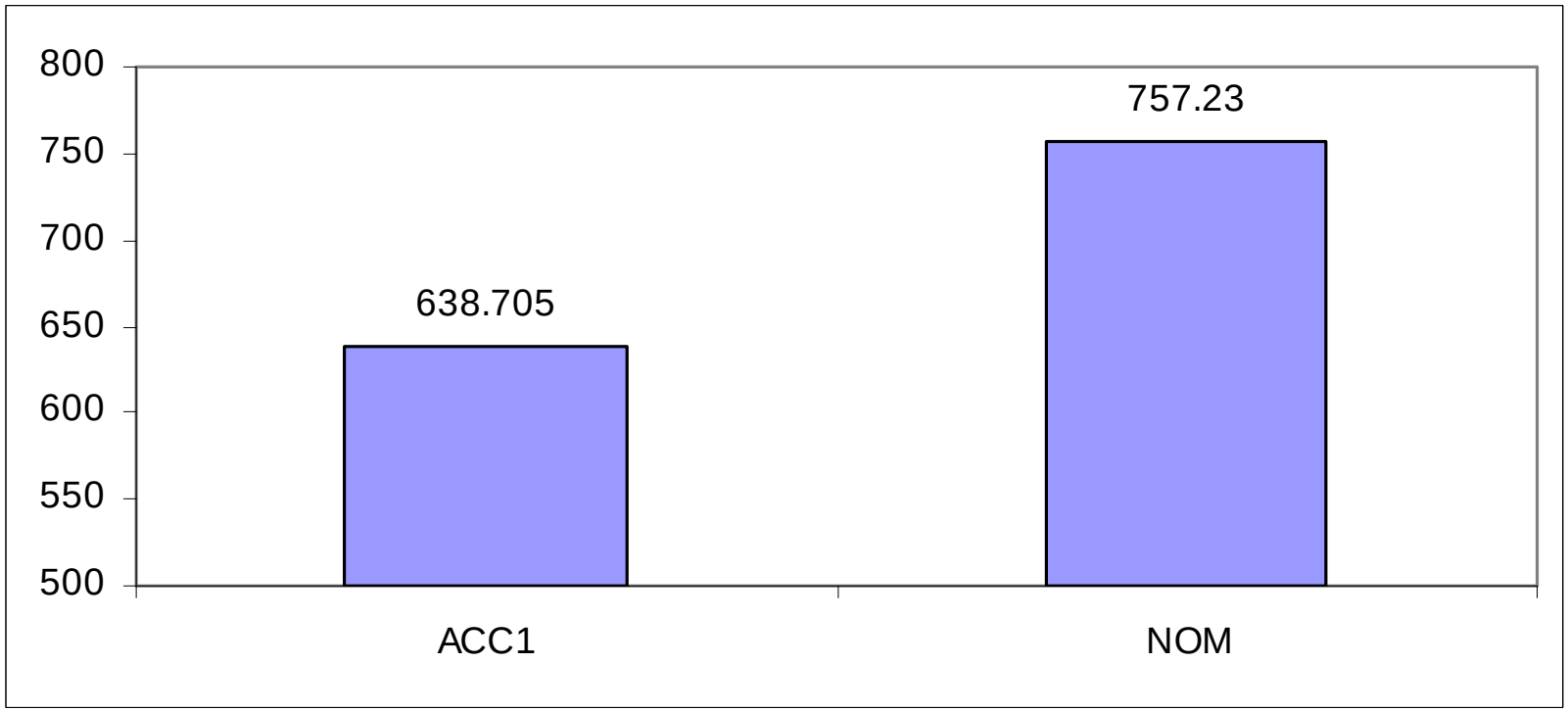
ACC1	heroine-ACC	popular	talk-show-to	go-comp	persuaded
NOM	heroine-NOM	popular	talk-show-to	go-comp	persuaded
	W7	W8	W9	W10	W11

Direct comparison of ACC1 and NOM

"…persuaded the leading actress to appear on a popular talk show"

ACC1	heroine-ACC	popular	talk-show-to	go-comp	persuaded
NOM	heroine-NOM	popular	talk-show-to	go-comp	persuaded
	W7 **NOM SLOW**	W8	W9	W10	W11

Reading time at W7



ACC1 < NOM (p <0.002)

What takes NOM longer at W7?

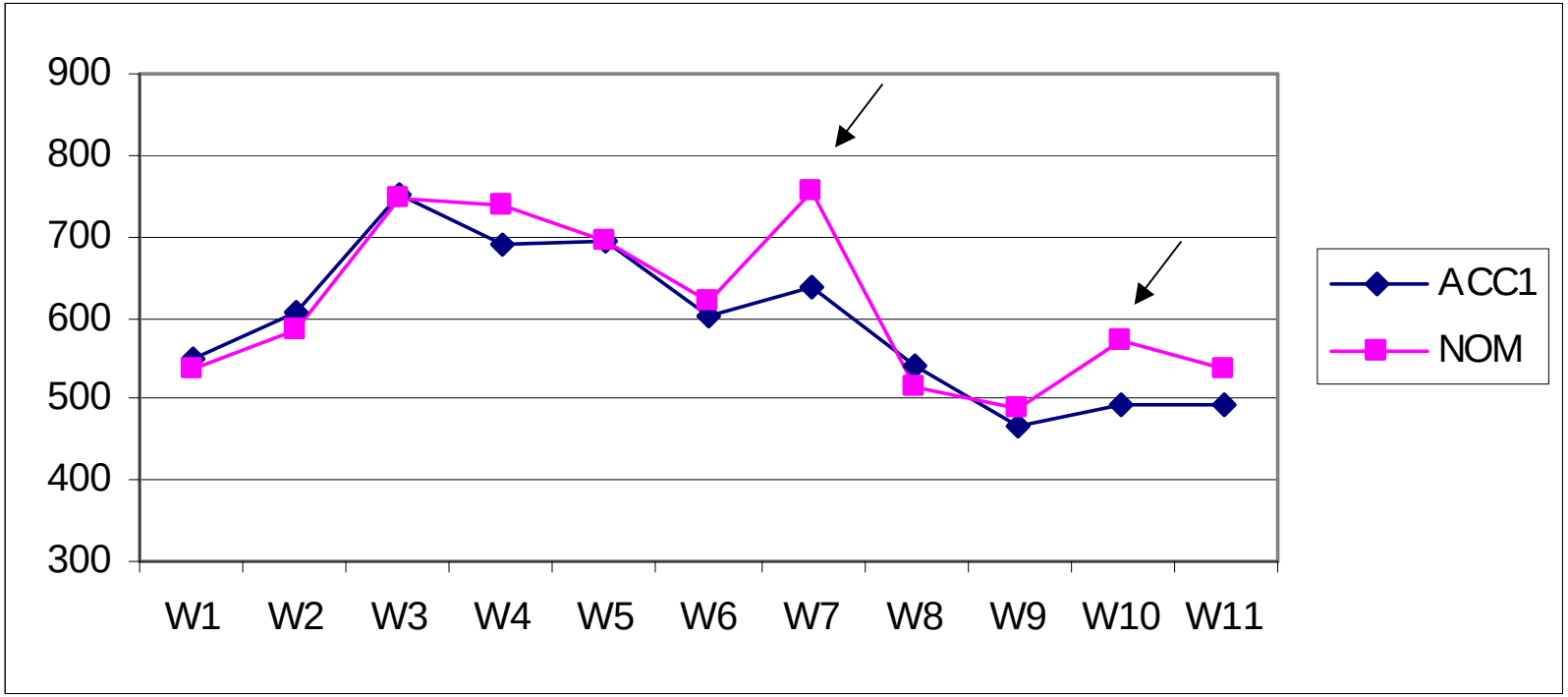
What happens when the parser reaches the 2nd nominative (NP-NOM)?

Processing effects:

- clause-boundary effect (Miyamoto 2002, 2003)
  - second NP-NOM marks the beginning of a new clause, which increases processing load

- similarity effect at second nominative (Uehara 1997)
  - difficulty in discriminating between two NP-NOMs awaiting structural assignment also delays processing

Reading times: ACC1 and NOM



Direct comparison of ACC1 and NOM

"…persuaded the leading actress to appear on a popular talk show"

ACC1	heroine-ACC	popular	talk-show-to	go-comp	persuaded
NOM	heroine-NOM	popular	talk-show-to	go-comp	persuaded
	W7 **NOM SLOW**	W8	W9	W10	W11

Direct comparison of ACC1 and NOM

"…persuaded the leading actress to appear on a popular talk show"

ACC1	heroine-ACC	popular	talk-show-to	go-comp	persuaded
NOM	heroine-NOM	popular	talk-show-to	go-comp	persuaded
	W7 **NOM SLOW**	W8	W9	W10 **NOM SLOW**	W11

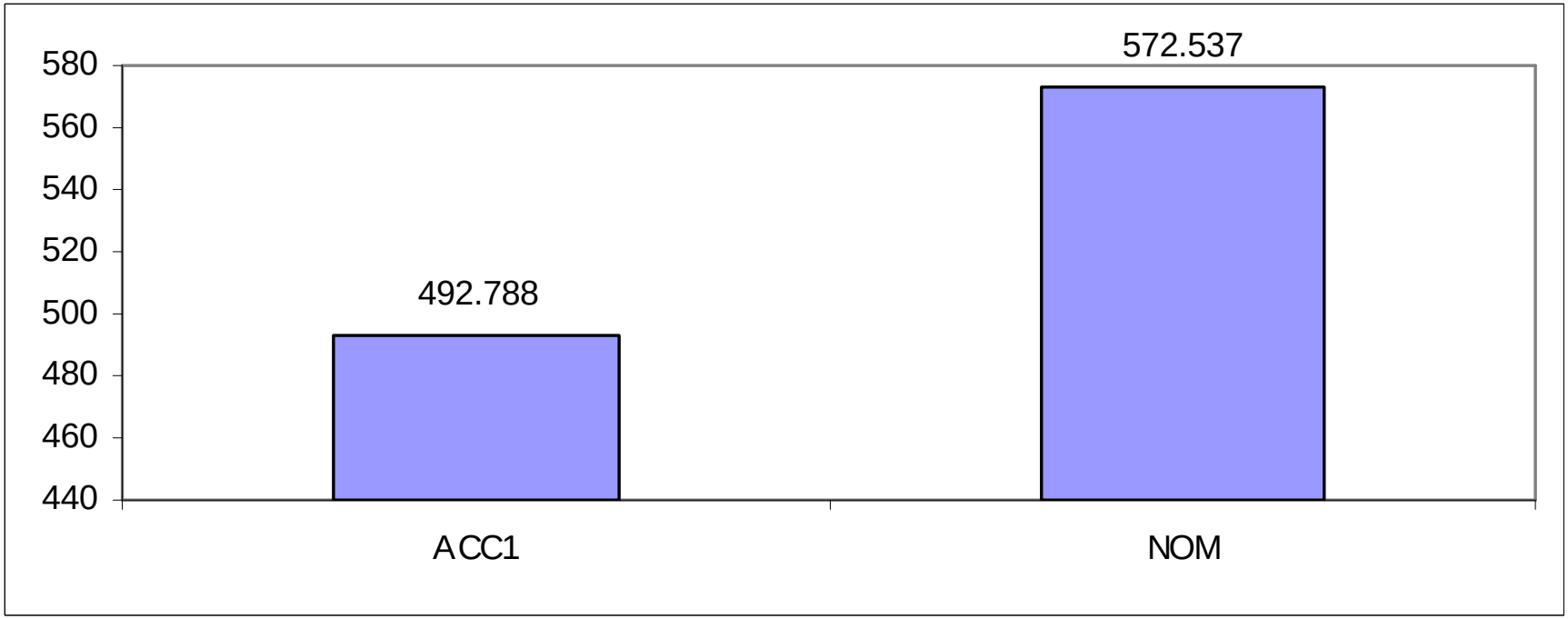
Predictions: Summary

	ACC1	NOM: first resort gap	NOM: last resort gap
Mono- to bi-clausal reanalysis	W10	W7	W7
Gap positing	W10	W7	W10

Results: Summary

	ACC1	NOM: first resort gap	NOM: last resort gap
Mono- to bi-clausal reanalysis	W10	W7	**W7**
Gap positing	W10	W7	**W10**

Reading time at W10



ACC1 < NOM ($p < 0.003$)

W10: Predictions for NOM

- when the parser reaches the 2nd NP-NOM (W7), the sentence
  - has to be reanalyzed as bi-clausal, and
  - a gap could *logically* be posited in the main clause
- if a gap is posited at W7 (2nd NP-NOM), processing work should be over at W10
- if a gap is not posited until W10, there should be an additional slowdown at W10

What takes NOM longer at W10?

Clear reading time evidence for:

- bi-clausal reanalysis at W7
- no difference from ACC1 at W8 and W9
- some additional processing cost at W10
  - should not be for bi-clausal reanalysis at this point
  - so must be for gap positing and filler-gap association

W10: Predictions for ACC1

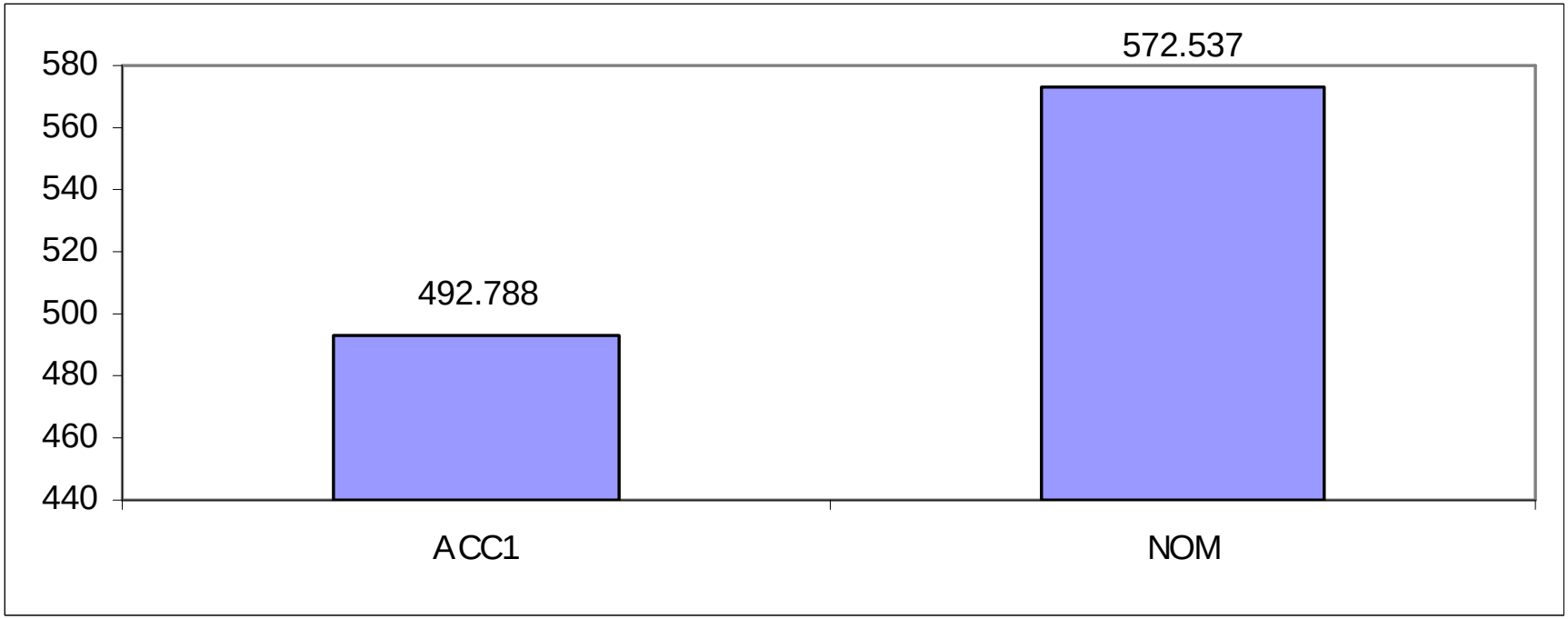
- when the parser reaches W10, the sentence
  - has to be reanalyzed as bi-clausal, and
  - a gap is posited in the embedded clause
- slowdown in reading time should occur at W10

What's going on with ACC1 at W10?

- predictions were for both
  - bi-clausal reanalysis
  - gap positing and filler-gap association

  at this point
- yet ACC1 was read faster than NOM at W10, which
  - does **not** require bi-clausal reanalysis
  - **only** requires gap positing and filler-gap association

Reading time at W10



ACC1 < NOM ($p < 0.003$)

What's going on at W10?

Clearly, something about

- gap positing and filler-gap association

is more difficult in NOM at W10 than

- bi-clausal reanalysis and
- gap positing and filler-gap association

in ACC1 at W10

What's going on at W10?

- In other words, one might expect a greater processing cost for ACC1 than for NOM at W10
- But the results are the opposite: NOM > ACC1
- Why? What extra factor makes NOM slower?

What kind of dependency is it?

- Syntactic analysis of ACC1:
  - deletion of tail of A-chain

Hans-NOM Peter$_i$-ACC [~~Peter$_i$-NOM~~ gehen-COMP] überzeugte

- Syntactic analysis of NOM:
  - deletion of head of A-chain

Hans-NOM ~~Peter$_i$-ACC~~ [Peter$_i$-NOM gehen-COMP] überzeugte

OR

Hans-NOM [Peter$_i$-NOM gehen-COMP] ~~Peter$_i$ ACC~~ überzeugte

What kind of dependency is it?

- Semantic analysis of ACC1:
  - forward co-indexation
  - marked "lightest first" ordering of arguments

Hans-NOM [$_{VP}$ [$_{CP}$ Peter$_i$-ACC] [$_{V'}$ [$_{CP}$ *pro*$_i$ gehen-COMP]] überzeugte]

- Semantic analysis of NOM:
  - forward co-indexation
  - unmarked "heaviest first" ordering of arguments

Hans-NOM [$_{VP}$ [$_{CP}$ Peter$_i$-NOM gehen-COMP] [$_{V'}$ [*pro*$_i$-ACC] überzeugte]

What kind of dependency is it?

All analyses of ACC1 and NOM posit the same filler-gap dependency

EXCEPT the syntactic analysis of NOM (backward control), which posits a gap-filler dependency in one variant

What kind of dependency is it?

- Syntactic analysis of NOM:
  - deletion of head of A-chain

Hans-NOM ~~Peter$_i$-ACC~~ [Peter$_i$-NOM gehen-COMP] überzeugte

OR

Hans-NOM [Peter$_i$-NOM gehen-COMP] ~~Peter$_i$-ACC~~ überzeugte

- Semantic analysis of NOM:
  - forward co-indexation
  - unmarked "heaviest first" ordering of arguments

Hans-NOM [$_{VP}$ [$_{CP}$ Peter$_i$-NOM gehen-COMP] [$_{V'}$ [*pro*$_i$-ACC] überzeugte]

Sorting out the analyses of NOM

- One syntactic analysis

  Hans-NOM GAP_i [$Peter_i$-NOM gehen-COMP] überzeugte

  [***gap-filler dependency***]

- Other syntactic analysis and semantic analysis

  Hans-NOM [$Peter_i$-NOM gehen-COMP] GAP_i überzeugte

  [***filler-gap dependency***]

Syntactic *vs.* semantic analysis

- The semantic analysis predicts ACC1 to be slower than NOM because of the "marked" pattern
- The syntactic analysis correctly predicts that NOM should be slower because of the gap-filler dependency
- The reading time results are consistent with the structure proposed by the syntactic analysis in which the gap precedes the complement clause

Could this be a frequency effect?

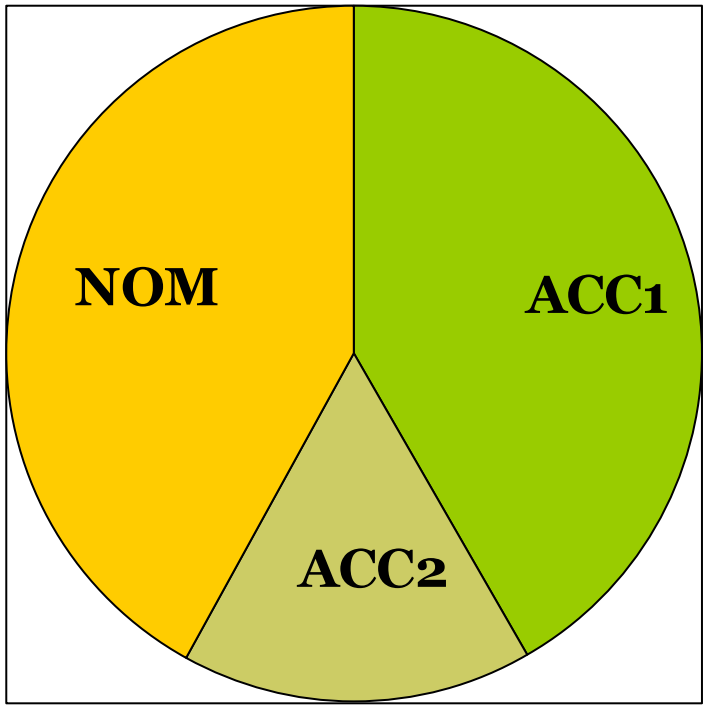
Perhaps NOM control is simply less frequent than ACC1 or ACC2 control

This might account for the slowdown in reading time

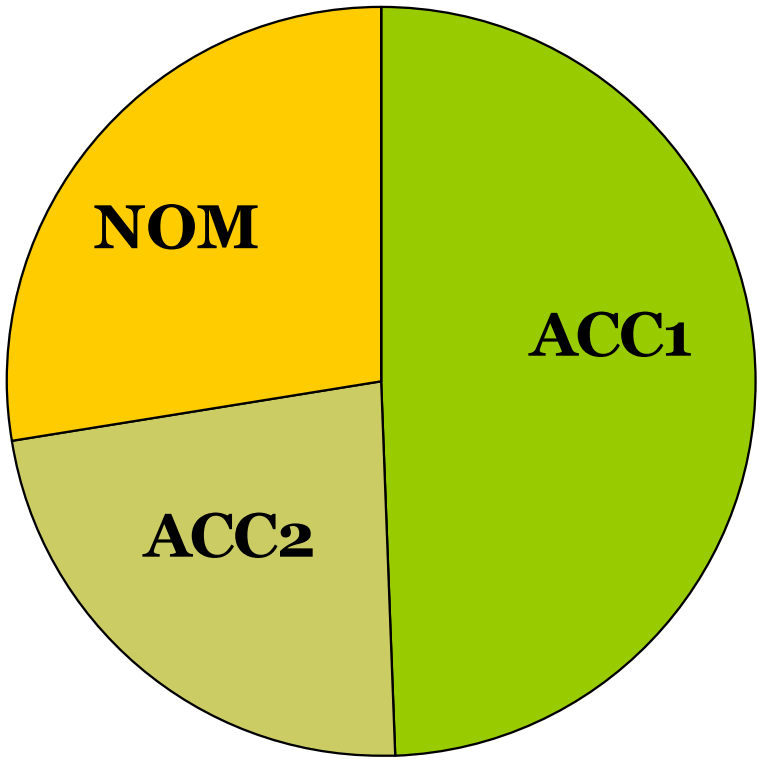
Frequency data analysis

- Two sets of corpus statistics:
  - Total number of tokens for each construction
  - Total number of obligatory control tokens for each construction
- Data from the Seejong corpus (2002)

Corpus distribution: All instances



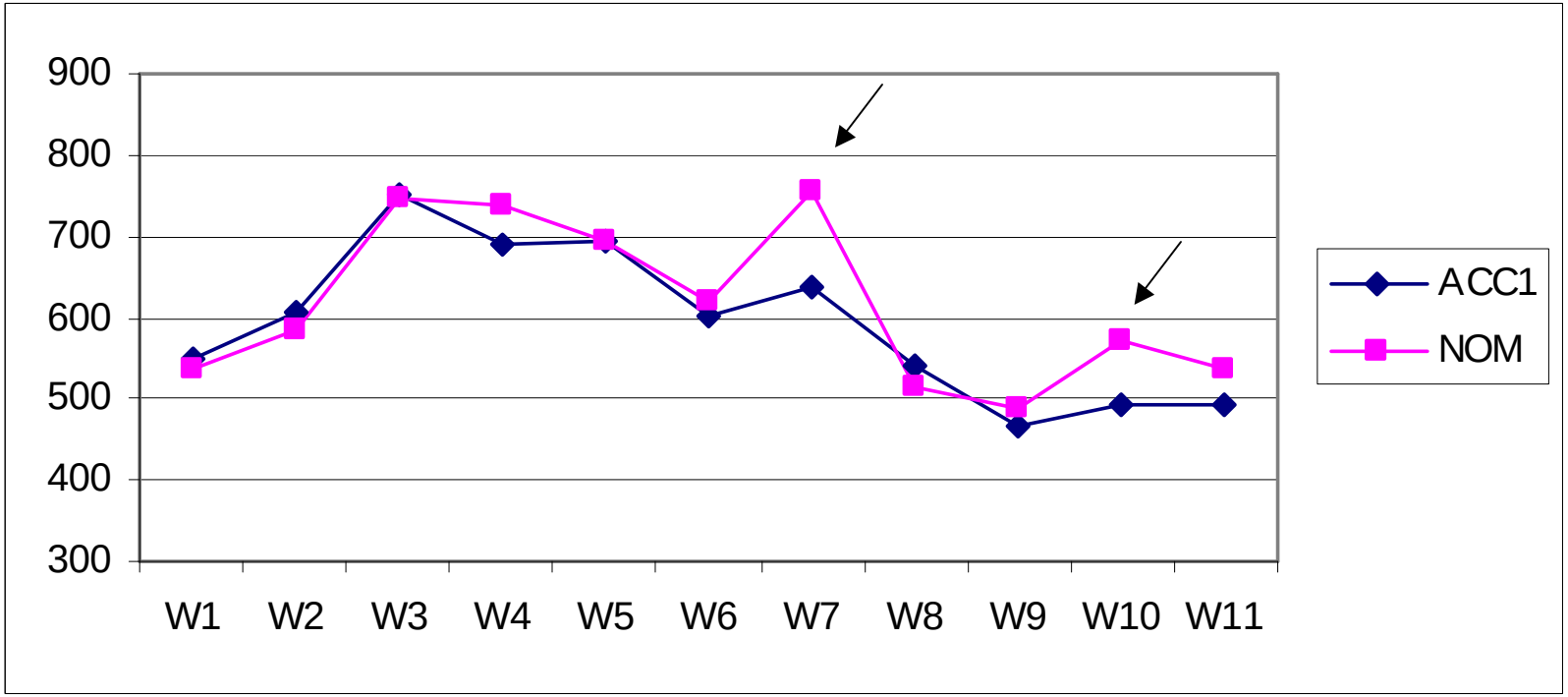
Corpus distribution: OC only



Could this be a frequency effect?

- The NP-NOM1 NP-NOM2 configuration would seem more likely to cause a slowdown in reading time at NP-NOM2 (W7) than at the embedded verb (W10)
- Recall the additional, separate effect at W10
- The effect at W10 was unlikely due to bi-clausal reanalysis
- Therefore, the W10 effect had to be related in some way to gap positing and gap-filler association

NOM causes processing difficulty



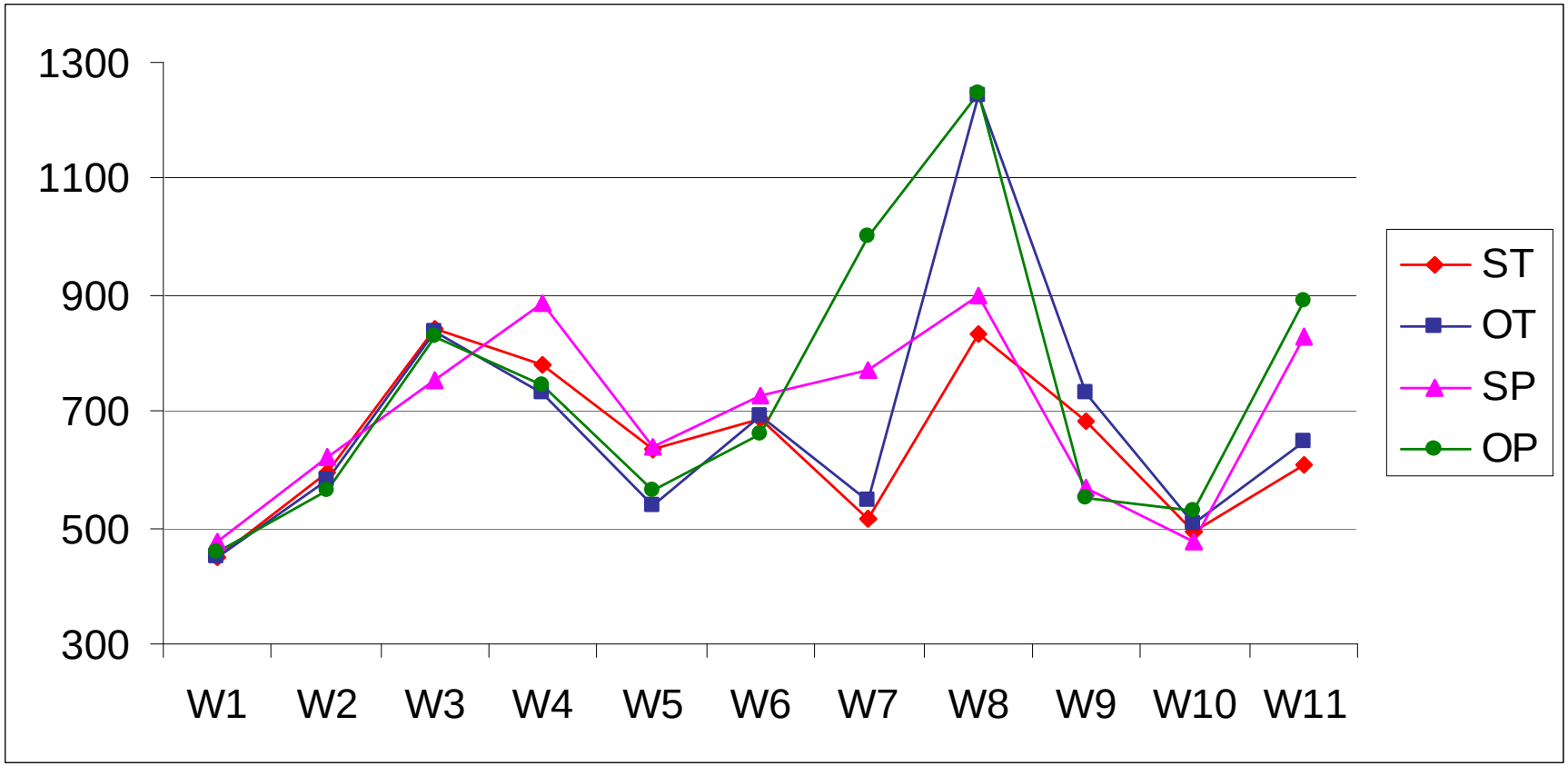
NOM causes processing difficulty

	ACC1	NOM: first resort gap	NOM: last resort gap
Mono- to bi-clausal reanalysis	W10	W7	**W7**
Gap positing	W10	W7	**W10**

Processing conclusions

- The syntactic analysis makes correct processing predictions, while the semantic analysis does not
- The parser thus seems to adopt a "last resort" strategy for positing gaps in Korean NOM control structures
- The same strategy applies in Korean pre-nominal relative clauses (ambiguous with *pro*-drop clauses), which also contain gap-filler dependencies

“Last resort” gap positing in RCs



W7: embedded clause verb
W8: head noun of main clause

Processing conclusions

- The parser thus seems to adopt a "last resort" strategy for positing gaps in Korean NOM control structures
- The same strategy applies in Korean pre-nominal relative clauses (ambiguous with *pro*-drop clauses), which also contain gap-filler dependencies
- Head-final languages *do* have filler-gap dependencies (e.g. leftward scrambling in Japanese, which invokes a "first resort" strategy for positing gaps)
- The fact that Korean seems to adopt a "last resort" strategy for object control with a NOM controller suggests that this is a gap-filler dependency

Roadmap of the talk

- Two (2.5) object control constructions in Korean and their properties
- Two possible analyses of Korean control
  - Syntactic control
  - Semantic control
- Which analysis is superior?
  - Structural evidence
  - Processing evidence
- Conclusions and outstanding questions

Conclusions

- The alternation in Korean complement-taking predicates can be accounted for as an alternation between forward and backward object control

- Korean object control alternations support the growing body of empirical evidence for backward control

Conclusions

- Backward control is possible within current theoretical assumptions:
  - Control is movement into a thematic position

John Mary [~~Mary~~ to leave] persuaded

John ~~Mary~~ [Mary to leave] persuaded

  - Control and raising are instances of a single phenomenon: a referential dependency between two elements, one of which can be deleted
  - That is, one can serve as filler, and one as gap

Conclusions

- The fact that Korean seems to adopt a "last resort" gap-positing strategy for object control with a NOM controller suggests that this is a gap-filler dependency, thus:

  John ~~Mary~~ [Mary to leave] persuaded

Outstanding questions: Korean

- What accounts for the restriction that floated quantifiers must follow the complement clause in NOM?
- What motivates the choice between the constructions examined here?
  - Preliminary evidence that the NOM and ACC constructions have differences in interpretation
- Why are most of the verbs allowing the object alternation ambiguous between control and non-control predicates?

Outstanding questions

- *Theory-internal*: On the copy and delete analysis of backward control, what forces the deletion of the higher copy?
- *Processing*: Can processing data shed more light on the choice between the semantic and syntactic analyses?
- *Cross-linguistic*: Now that we know where to look, can more "backward" predicates be found?

___ hören jetzt auf, [wir zu reden]

Und wir danken für Ihre Aufmerksamkeit!

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