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 tried [_____ to capture the code of life]

controller controllee
Subject Control

Craig Venter tried [____i to escape]
controller controllee
subject subject
Venture capitalists persuaded Craig Venter to capture the code.
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) \( \text{\textit{i}} \) tried [\text{Craig Venter}_{\text{i}} \text{ to capture the code...]} \\
(Backward control)

(2) Craig Venter_{\text{i}} \text{ tried that he}_{\text{i}} \text{ captured the code...} \\
(Copy control)
Traditional analyses too restrictive

Empirically attested:

(1) [Craig Venter\textsubscript{i} tried to capture ...] 
\begin{tabular}{ll}
controllee & controller \\
\end{tabular} 
(Tsez, Malagasy, Jakaltec, Zapotec)

(2) [Venter\textsubscript{i} persuaded to work on the code of life] 
\begin{tabular}{ll}
controllee & controller \\
\end{tabular} 
(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 Yengbi-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] Yengbi-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)
<table>
<thead>
<tr>
<th>Predicate</th>
<th>Meaning</th>
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<tbody>
<tr>
<td>kangyohata</td>
<td>‘force’</td>
</tr>
<tr>
<td>kwunyuhata</td>
<td>‘recommend’</td>
</tr>
<tr>
<td>kwuenhata</td>
<td>‘recommend’</td>
</tr>
<tr>
<td>myenglyenghata</td>
<td>‘order’</td>
</tr>
<tr>
<td>pwuthakhata</td>
<td>‘ask (as a favor)’</td>
</tr>
<tr>
<td>selthukhata</td>
<td>‘persuade’</td>
</tr>
<tr>
<td>yokwuhata</td>
<td>‘ask, request’</td>
</tr>
<tr>
<td>congyonghata</td>
<td>‘recommend/encourage’</td>
</tr>
<tr>
<td>cisihata</td>
<td>‘order’</td>
</tr>
<tr>
<td>thailuta</td>
<td>‘implore’</td>
</tr>
<tr>
<td>pwuchwukita</td>
<td>‘encourage’</td>
</tr>
</tbody>
</table>
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-ka Mary-lul  [hakkyoey  nayil  ka-tolok] seltukhaessta
*Chelswu-ka nayil  Mary-lul  [hakkyoey  ka-tolok] seltukhaessta

‘Chelswu persuaded Mary to go to school tomorrow.’
Biclausal structure: Scrambling

- scrambling patterns: NOM

Chelswu-ka [Mary-ka nayil hakkyoey 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

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<thead>
<tr>
<th></th>
<th>ACC</th>
<th>NOM</th>
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<td>arbitrary interpretation of null controller</td>
<td>✗</td>
<td>✗</td>
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<td>strict reading under ellipsis</td>
<td>✗</td>
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<tr>
<td>non-c-commanding antecedent</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>non-local antecedent</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td><em>de se</em> reading</td>
<td>✗</td>
<td>✗</td>
</tr>
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</table>
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’
  \[ V [\text{___} \text{DP} \text{ CP/IP [tolok]}] \]

- 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:

\[ \text{Chelswu-ka} \ [\text{amwuto ka-ci anh-tolok}] \text{ seltukhaessta} \]

\[ \text{Chelswu-NOM NPI go-INF NEG-COMP persuaded} \]

‘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$\text{$_i$}$-ka hakkyo-ey kaessta-ko]

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

kunye casin$\text{$_i$}$-uy chinkwu-eykey malhaessta

herself-GEN friend-DAT said

‘Chelswu said to herself$\text{$_i$}$’s friend(s) hat Yenghi$\text{$_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 casinᵢ -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.’

- 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 \[\text{VP} \text{Mary}_k\text{-ACC} [\text{CP} [\text{IP} \text{___}_k [\text{VP} \text{leave}]]\text{-COMP}] \text{persuaded}] \]
  \[
  \begin{array}{c}
  \text{A-chain}
  \end{array}
  \]

- **ACC₂** (possibly scrambled?)
  John \[\text{XP} [\text{CP} [\text{IP} \text{___}_k [\text{VP} \text{leave}]]\text{-COMP}]_j [\text{VP} \text{Mary}_k\text{-ACC} \text{ } t_j \text{persuaded}] \]
  \[
  \begin{array}{c}
  \text{A-chain}
  \end{array}
  \]

- **NOM**
  John \[\text{VP} \text{___}_k [\text{CP} [\text{IP} \text{Mary}_k\text{-NOM} [\text{VP} \text{leave}]]\text{-COMP}] \text{persuaded}] \]
  \[
  \begin{array}{c}
  \text{A-chain}
  \end{array}
  \]
Syntactic control

<table>
<thead>
<tr>
<th>Delete tail (lower element) of movement chain</th>
<th>Delete head (higher element) of movement chain</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 1/ACC 2: Forward control</td>
<td>NOM: Backward control</td>
</tr>
</tbody>
</table>

- 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 \[\text{VP} \[\text{CP} \text{Mary}_1\text{-NOM leave-COMP} \] \[\text{V}'[\text{pro}_2] \text{persuaded}]\]
  John \[\text{VP} \[\text{CP} \text{pro}_1 \text{leave-COMP}] \[\text{V}'[\text{Mary}_2\text{-ACC}] \text{persuaded}]\]

- **Shifted structure:**
  accusative DP is in the specifier of VP, control complement adjoined to V’
  John \[\text{VP} \[\text{[Mary}_1\text{-ACC}] \[\text{V}'[\text{CP} \text{DP}_2 \text{leave-COMP}] \text{persuaded}]\]
Semantic control

- **Unmarked structure:**
  control complement is in the specifier of VP, DP (including null pronominal) adjoined to V’

John \[_{VP} \left[_{CP} \left[_{IP} Mary_1-NOM \ \text{leave-COMP} \right] \right]_{V'} pro_2 \ \text{persuaded}\]

- co-indexation

John \[_{VP} \left[_{CP} \left[_{IP} pro_1 \ \text{leave-COMP} \right] \right]_{V'} Mary_2-ACC \ \text{persuaded}\]

- co-indexation
Semantic control with \textit{pro}

- \textit{Shifted structure}:
  - accusative DP is in [spec, VP],
  - control complement adjoined to V' \\

\begin{align*}
\text{John} & \left[\text{VP} \left[\text{DP} \text{Mary}_1\text{-ACC}\right] \left[\text{V'} \left[\text{CP} \left[\text{IP} \text{pro}_2 \text{leave-COMP}\right]\right]\right]\right] \text{ persuaded}\]
\end{align*}

\_\_\_co-indexation}\_\_\_
**Semantic control**

<table>
<thead>
<tr>
<th>pro in the matrix clause</th>
<th>NOM Control</th>
<th>impossible because of Condition C violation</th>
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<tbody>
<tr>
<td>pro in the embedded clause</td>
<td>ACC 2 (CP before DP)</td>
<td>ACC 1 (DP before CP)</td>
</tr>
</tbody>
</table>

- CP in [spec, VP] DP adjoined to V'
- DP in [spec, VP] CP adjoined to V’
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
  - Semantic control
  - ✔
- Which analysis is superior?
  - Structural evidence
  - Processing evidence
  - ✔
- Conclusions and outstanding questions
Syntactic vs. semantic analysis

Structural differences
Relevant structural properties

- c-command effects—discussed here
- (representation of verb frames)
## Relevant structural properties: c-command

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<th>Semantic analysis</th>
</tr>
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<tbody>
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<td>c-command between the matrix argument and the embedded subject</td>
<td>✓</td>
<td>✗</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
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<th>Syntactic analysis of NOM (backward pattern)</th>
<th>Semantic analysis of NOM (backward pattern)</th>
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<tr>
<td>embedded subject restriction</td>
<td>applies</td>
<td>does not apply</td>
</tr>
<tr>
<td>disruption of c-command</td>
<td>impossible</td>
<td>possible</td>
</tr>
<tr>
<td>distributive quantifiers</td>
<td>possible</td>
<td>impossible</td>
</tr>
</tbody>
</table>
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\textsubscript{j} Yenghi-eykey\textsubscript{k}
Chelswu-Top Swuyeng-Nom Yenghi-Dat
intephyu pat-tolok] \textsubscript{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_ decided [that there was a plan [___*j to evacuate]]*

*John convinced Mary_ [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 \textsubscript{pro} o-tolok ]
  \textit{Chelswu-NOM} \textit{home} \textit{come-COMP}

\textit{Yenghi-ka kyelsimha-tolok] \textsubscript{pro} seltukhayssta}
\textit{Yenghi-NOM decide-COMP persuaded}

(‘Chelswu persuaded Yenghi to decide to come home.’)
Intervening material

Only the syntactic analysis can handle:

*Chelswu-ka [Yenghi\textsubscript{i}–ka onul [\textsubscript{i}/pro\textsubscript{i} cipey

\underline{co-indexation}

\underline{Chelswu-NOM Yenghi-NOM today home}

\underline{nayil ka-tolok] kyelsimha-tolok] [\textsubscript{i}/pro\textsubscript{i} seltukhayssta

\underline{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]  
  Chelswu-NOM  Yenghi-ACC  Yenghi-NOM  
  hakkyo-lul  ttena-tolok]  seltukhayssta  
  school-ACC  quit-COMPL  persuaded  

(2) 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.’
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.
"The marketing department of the production, to advertise the movie, ..."
... target sentences

“...persuaded the leading actress to appear on a popular talk show”

<table>
<thead>
<tr>
<th>ACC1</th>
<th>heroine-ACC</th>
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<tr>
<td>ACC2</td>
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<td>go-comp</td>
<td>heroine-ACC</td>
<td>persuaded</td>
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<tr>
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<td>W8</td>
<td>W9</td>
<td>W10</td>
<td>W11</td>
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</tbody>
</table>
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”

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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”

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Predictions (NOM)

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

- initially processed as **mono-clausal**

- when the parser reaches the 2\textsuperscript{nd} 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 (2\textsuperscript{nd} NP-NOM), then all of the hard processing work should be over by W10 (\textit{leave}-COMP)

“last resort” gap positing:
- if a gap is not posited until W10 (\textit{leave}-COMP), there should be an additional slowdown at W10
“...persuaded the leading actress to appear on a popular talk show”

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NOM: “last resort” gap positing

“...persuaded the leading actress to appear on a popular talk show”

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## Predictions: Summary

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Reading times: ACC1 and NOM
Direct comparison of ACC1 and NOM

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NOM SLOW
Reading time at W7

ACC1 < NOM (p < 0.002)
What takes NOM longer at W7?

What happens when the parser reaches the 2\textsuperscript{nd} 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”

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Direct comparison of ACC1 and NOM

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NOM | heroine-NOM | popular | talk-show-to | go-comp | persuaded |
## Predictions: Summary

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Reading time at W10

ACC1 < NOM (p < 0.003)
W10: Predictions for NOM

- when the parser reaches the 2\textsuperscript{nd} NP-NOM (W7), the sentence
  - has to be reanalyzed as bi-clausal, and
  - a gap could \textit{logically} be posited in the main clause
- if a gap \textbf{is} posited at W7 (2\textsuperscript{nd} NP-NOM), processing work should be over at W10
- if a gap \textbf{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
- bi-clausal reanalysis and
- gap positing and filler-gap association

is more difficult in NOM at W10 than

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 Peter₁-ACC [Peter₁-NOM gehen-COMP] überzeugte

- Syntactic analysis of NOM:
  - deletion of head of A-chain
  Hans-NOM Peter₁-ACC [Peter₁-NOM gehen-COMP ] überzeugte

  OR

  Hans-NOM [ Peter₁-NOM gehen-COMP ] Peter₁-ACC überzeugte
What kind of dependency is it?

- Semantic analysis of ACC1:
  - forward co-indexation
  - marked “lightest first” ordering of arguments
  Hans-NOM \([_{\text{VP}}\ [_{\text{CP}}\ Peter_{i-}\text{-ACC}]\ [v\ [_{\text{CP}}\ pro_{i}\ \text{gehen-}\text{COMP}]\ \text{überzeugte}]\]

- Semantic analysis of NOM:
  - forward co-indexation
  - unmarked “heaviest first” ordering of arguments
  Hans-NOM \([_{\text{VP}}\ [_{\text{CP}}\ Peter_{i-}\text{-NOM}\ \text{gehen-}\text{COMP}]\ [v\ [pro_{i}\text{-ACC}]\ \text{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_{1-ACC} [ Peter_{1-NOM} gehen-COMP ] überzeugte
  OR
  Hans-NOM [ Peter_{1-NOM} gehen-COMP ] Peter_{1-ACC} überzeugte

- Semantic analysis of NOM:
  - forward co-indexation
  - unmarked “heaviest first” ordering of arguments
  Hans-NOM [_{VP} [_{CP} Peter_{1-NOM} gehen-COMP] [_{V'} [_{pro_1-ACC}] überzeugte] }
Sorting out the analyses of NOM

- One syntactic analysis
  Hans-NOM \textcolor{red}{\text{GAP}_i} [ Peter\textsubscript{i}-NOM gehen-COMP ] überzeugte
  \textit{[gap-filler dependency]}

- Other syntactic analysis and semantic analysis
  Hans-NOM [ Peter\textsubscript{i}-NOM gehen-COMP] \textcolor{red}{\text{GAP}_i} überzeugte
  \textit{[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

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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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