The Psychological Reality of Head-Final Relative Clauses

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The international workshop on relative clauses (Academia Sinica, Taipei, November 2-3, 2007)

Head-final RCs

- Mandarin Chinese:
  "catch robber Rel that sheriff"
  'the sheriff who caught the robber'

- Japanese:
  "The reporter [who ___ attacked the new senator] admitted the error.'
  Ueno & Garnsey (2007)

- Korean:
  "elderly lady-ace bus stop-to accompany-rel girl"
  'the girl that accompanied the elderly woman to the bus stop'
  Kwon (p.c.)
Head-final RCs

These RCs are **prenominal**.

Are all prenominal modifiers alike?

- Different kinds prenominal modifiers:
  - RCs:
  - Adjunct RCs:
  - Stative predicates:

抓到 強盜 的 那位 警長 catch robber Rel that sheriff ‘the sheriff who caught the robber’

抓到 強盜 的 方法 pro catch robber Rel method ‘the way to catch the robber’
Are all prenominal modifiers alike?

• Different kinds prenominal modifiers:
  - RCs:
  - Adjunct RCs:
  - Stative predicates /attributive adjs:

round DE table
‘the round table’

Are all prenominal modifiers alike?

Yes. They have distinct internal structures.

Can we distinguish different internal structures among the prenominal modifying constructions?

• Different kinds prenominal modifiers:
  - RCs:
  - Adjunct RCs:
  - Stative predicates:

theoretical implications

RC REL Head Noun
theoretical implications

- Noun-modifying constructions are composed by putting together the semantics of the elements linked by the linker.
- Since it is the semantics not the internal syntactic structure of RCs that matters, the comprehension of the NPs do not differ as long as the semantics of the prenominal RCs is not different.

target constructions

- Gapped versus gapless RCs
  - [...] head noun
  - [...] head noun
- The location of the gaps in the gapped RCs
  - Subject versus Object extractions
  - Gaps at the subject versus lower positions in possessor RCs

processing head-final RCs: garden-path

- Mandarin Chinese:
  - [S-GAP 'the sheriff who caught the robber']
  - The RC precedes the head.
- The relativizer/head appears late, so garden paths (i.e. main-clause misanalyses) may occur.
- Does this garden-path misanalysis exist?
  - YES (Lin & Bever, 2007; Hsu et al., in preparation)
  - The RC processing reported in this study has dealt with this issue.
Does this potential garden-path matter?

- Maybe. (ORCs are more likely to be misread.)

How to avoid the garden path?

- SUO in Mandarin ORCs (Hsu et al., ms)
- classifier-mismatch (Hsu et al., ms; Yoshida et al., 2004)
- RC-inducing contexts (Ishizuka et al., 2006; Hsu & Chen, 2007)
- Comparison b/w traces and pro (Kwon et al., 2006)
- Self-paced reading with specific instructions about the existence and location of the RCs (Lin & Bever, 2007)

How to solve the garden-path problem?

- The participants need to know as early as possible that what they are reading are RCs, not main clauses.

Garden path effects in head-final RCs (Mandarin)

- Garden path seems to exist; at least, the RC marker suo helps identify ORCs in Mandarin. (Hsu et al., in preparation)

Mandarin ORCs with and without SUO

<table>
<thead>
<tr>
<th>src:</th>
<th>orc:</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-GAP caught the robber REL the sheriff</td>
<td>pro infrequent</td>
</tr>
<tr>
<td>the robber shot O-GAP REL the sheriff</td>
<td>main clause? reanalysis</td>
</tr>
</tbody>
</table>

may be harder due to reanalysis

Experimental Method: Self-paced reading tasks

• Participants read RC-REL-Head_Noun as one region.

Lin & Bever (2006)
self-paced reading with potential garden path

Lin & Bever (2007)
self-paced reading without garden path

Experimental Method:
Self-paced reading tasks

Experimental Method:
Self-paced reading tasks

責怪 — — — — — — — — — — — — — —
blame

県長 — — — — — — — — — — — — — —
mayor
Experimental Method: Self-paced reading tasks

Participants read RC-REL-Head_Noun as one region.

---

REL
resident

---

grieved
greeted

---

legislator

---
Experimental Method:
Self-paced reading tasks

縣長責怪立法委員嗎？
Did the mayor blame the legislator?

Gapped versus gapless RCs
- Possessor RCs versus adjunct RCs
  Possessor RC
typhoon destroy e hut        DE farmer
typhoon BA e hut destroy   DE farmer
  Adjunct RC
  legislator cut budget   DE reason
  legislator BA budget cut DE reason

Gapped versus gapless RCs
- Possessor RCs versus adjunct RCs
  Possessor RC
typhoon destroy e hut        DE farmer
  Adjunct RC
  legislator cut budget   DE reason

target constructions
- Gapped versus gapless RCs
  [... __ ...] head noun
  [... __ ...] head noun
- The location of the gaps in the gapped RCs
  - Subject versus Object extractions
  - Gaps at the subject versus lower positions in possessor RCs

Gapped versus gapless RCs
- Possessor RCs versus adjunct RCs
Gapped versus gapless RCs

- Possessor RCs versus adjunct RCs
  - Possessor RC: typhoon BA e hut destroy DE farmer
  - Adjunct RC: legislator BA budget cut DE reason

Possessor RCs took longer to comprehend than adjunct RCs on the relativizer and the head noun.

- The gap-searching process increased the reading time.
- The gapped RCs and the adjunct/gapless RCs ought to be distinguished.

Gaps at the subject versus lower positions of possessor RCs

<table>
<thead>
<tr>
<th>Canonical</th>
<th>taifeng typhoon</th>
<th>chuik blow down</th>
<th>maowu hut</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>DE</td>
<td>farmer</td>
<td>V1</td>
</tr>
<tr>
<td>BA</td>
<td>taifeng typhoon</td>
<td>BA</td>
<td>maowu hut</td>
</tr>
<tr>
<td>N2</td>
<td>DE</td>
<td>nongren farmer</td>
<td>V1</td>
</tr>
<tr>
<td>BEI</td>
<td>maowu hut</td>
<td>bei BEI</td>
<td>chuik blow down</td>
</tr>
<tr>
<td>N1</td>
<td>DE</td>
<td>nongren farmer</td>
<td>V2</td>
</tr>
</tbody>
</table>

Head Noun

Target constructions

- Gapped versus gapless RCs
  - [ ... ___ ... ] head noun
  - [ ... .......... ] head noun
- The location of the gaps in the gapped RCs
  - Subject versus Object extractions
  - Gaps at the subject versus lower positions in possessor RCs
Gaps at the subject versus lower positions of possessor RCs

- The structural location of the gap does matter.
- The higher the gap is (e.g., at the subject position), the easier it is for the head noun to access it.

Gaps at the subject versus lower positions of possessor RCs

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target constructions

- Gapped versus gapless RCs
  
  [ ... __ ... ] head noun
  
  [ ... ... ... ] head noun

- The location of the gaps in the gapped RCs

  - Subject versus Object extractions
  
  - Gaps at the subject versus lower positions in possessor RCs
Subject versus Object extractions

- Lin & Bever (2007) doubly-embedded RCs

- Subject versus Object extractions

- Hsiao & Gibson’s (2003) effect was an artifact of dependency type. It had nothing to do with subject versus object extractions per se.

- The extraction effect in Mandarin favors subject-extracted RCs even with the garden-path confound removed.
Subject versus Object extractions
(Lin & Bever, 2007)

RTs of the lower RC regions (the shaded regions)

1. Subject vs. Object extractions (Lin & Bever, 2007)
2. RTs of the lower RC regions (the shaded regions)
3. Subject vs. Object extractions (Lin & Bever, 2007)
Subject versus Object extractions  
(Lin & Bever, 2007)

- RT Results--Double-level RCs
  RTs of lower Rel

Subject versus Object extractions  
(Lin & Bever, 2007)

- RT Results--Double-level RCs
  RTs of the doubly embedded Relativizer plus Head Noun (DE2 + HN2)

Subject versus Object extractions  
(Lin & Bever, 2007)

- Extraction effect does exist. Subject extractions were easier than object extractions. This was found on the relativizer and the head noun of the nested RCs, where processing was burdened.
General discussion

target constructions

• Gapped versus gapless RCs

\[ \ldots \text{head noun} \]
\[ \text{head noun} \]

• The location of the gaps in the gapped RCs
  - Subject versus Object extractions
  - Gaps at the subject versus lower positions in possessor RCs

theoretical predictions

• Since it is the semantics not the internal syntactic structure of RCs that matters, the comprehension of the NPs do not differ as long as the semantics of the prenominal RCs is not different.

theoretical implications

• The head searches for a gap in the RC.
• The RC has internal structure, producing accessibility differences in constructing head-gap relations.
Are all prenominal modifiers alike? No

Can we distinguish different internal structures among the prenominal modifying constructions?

- Yes. They have distinct internal structures.

General discussion

- Prenominal RCs containing gaps (i.e. extractions) are distinguishable from adjunctive RCs in processing.
- The structural position of the gap affects the comprehension of these gapped RCs.

Concluding remarks

It seems reasonable to conclude that

- head-final RCs are not merely noun-modifying clauses (i.e. not all prenominal noun-modifying constructions are alike);
- head-final RCs involve extractions that are structurally-based;
- the syntactic structure within head-final RCs matters in sentence processing.

Acknowledgments

- Funding from the National Science Council of Taiwan (NSC 95-2411-H-003-056), National Taiwan Normal University 2006 research grant
- Research assistance from Li-Hsin Ning, Larry Hong-Lin Li