Omaki et al (reading 09) Reading 10 is skipped

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Introduction

- In the old days, people have claimed that the parser waits to build structure until after the head (verb) has been encountered (e.g., Pritchett 1992).
- I don't think anyone believes this today, starting from the late 1990s on.
- Is there a difference in the degree of "forward prediction" in head medial vs head final languages? (Recall the papers on ungrammatical center embeddings–there the answer seems to be yes)
- Omaki will argue no: there is no difference.

Introduction

Consider:

The city that the author visited _____ was named for an explorer.

Omaki claims that:

"It has been reported that speakers of verb-final languages complete filler-gap dependencies in advance of verb information, associating the filler with the earliest structural position where a thematic role could be assigned (pre-verbal object gap creation: Nakano et al., 2002; Aoshima et al., 2004)."

This can't be true for all dependencies, because we see locality effects in head-final languages; there, it seems that dependency completion is happening at the verb.

Hypothesis/research question

is "pre-verbal gap creation is a language-general parsing procedure rather than an adaptation specific to verb-final languages"

Omaki et al will argue that it's language-general:

"we predict that English speakers should posit a gap irrespective of whether the verb ultimately licenses a direct object gap position, and that signs of reading disruption should be observed in cases where the verb does not accommodate a direct object."

Nevertheless, some differences seem to exist between head-final and medial languages as regards ability to maintain predictions.

Hypothesis/research question

“ These results suggest that the procedure for filler-gap dependency completion may be uniform across languages, and are consistent with the view that the parser predictively constructs rich representations at the earliest possible moment in advance of critical bottom–up evidence.”

Active gap filling

Fodor 1978, Stowe 1986:

2. 2.1 My brother wanted to know **who** Ruth will bring **us** home to _____ at Christmas.

2. My brother wanted to know **if** Ruth will bring **us** home to Mom at Christmas.

A gap is predicted in a (=slowdown at **us** compared to b).

Active gap filling

Traxler and Pickering (1996)

3. We like the city/book that the author wrote unceasingly and with great dedication about _____ while waiting for a contract.

Omaki et al report that there were slower first fixations in city vs book conditions. *Actually, in the Traxler et al paper it was first-pass reading times.*

An aside on the Traxler and Pickering study

Something strange in their paper: skipping (a binary 0,1 value) is analyzed as a continuous measure like reading time:

"A subsidiary analysis revealed that readers skipped the verb during their first pass through the sentence more often in plausible sentences than in implausible sentences. Readers skipped the verb 3.1 times out of 14 when the sentence was plausible, and 2.2 times out of 14 when the sentence was implausible [$F1(1,23) = 7.27$, $p < .05$, $MSe = 1.4$; $F2(1,27) = 10.00$, $p < .01$, $MSe = .87$]."

The statistical model being used makes no sense here.

Conclusion from the Traxler and Pickering type results

Omaki et al:

"The work summarized above may suggest that filler-gap dependency completion is triggered only after the parser gains access to the verb and confirms that the verb is transitive and is able to syntactically accommodate an object."

Or it may suggest that there are two different things happening

- prediction of upcoming VP, with an object argument slot
- unification of verb with object (dependency completion), and subsequent registering of the semantic anomaly (that cities cannot be written)

Evidence from Japanese that parser completes filler gap dependencies before accessing verb information

Aoshima et al 2004: See Figs 2 and 3, and Table 2 in their paper.

- Subjects slowed down when they reached the declarative complementizer; presumably expecting a Q-marker (gap site).

Evidence from Japanese that parser completes filler gap dependencies before accessing verb information

Omaki:

"These data indicate that the parser can in principle complete filler-gap dependencies before accessing verb information."

To me it seems that these data indicate that that parser is *predicting* upcoming verbs with particular subcategorization frames, not *completing* dependencies.

Hyper-active gap filling

"the presence of the subject NP allows the parser to predict the presence of a VP. Given that a VP can contain an object NP position, the parser could **project a VP with an object NP slot** and assign the filler to this object position before confirming whether the upcoming verb is a transitive verb or not."

Here, a transitive VP is predicted.

The alternative: Conservative active gap filling

Here, a VP is predicted, but no commitment made as to transitivity.

Omaki et al will reject this possibility.

Testing hyper-active vs conservative gap filling

The party that the student arrived/planned...

- Hyper-active: predict transitive verb, be surprised at *arrived*.
- Conservative: predict verb with no transitivity information, not be surprised at *arrived*.

Looking ahead, an obvious problem here is going to be: how to compare reading times at different verbs? Any ideas?

Expt 1

wrote: transitive, chatted: intransitive

b,d are control conditions (island configurations)

1. The city that the author wrote regularly about . . .
2. The city that the author who wrote regularly about . . .
3. The city that the author chatted regularly about . . .
4. The city that the author who chatted regularly about . . .

Expt 1 predictions

- Hyper-active: slowdowns in b vs a, and d vs c, but for different reasons. In the former case, plausibility mismatch, in the latter, a transitive verb is predicted, but an intransitive verb appears (transitivity mismatch). The
- Conservative: since object gap not created in either condition, a slowdown should happen in b vs a (plausibility mismatch), but no difference predicted in d vs c.

Expt 1 materials

"The subcategorization frequency of the optionally transitive verbs was not controlled, since Pickering and Traxler (2003) have demonstrated that plausibility mismatch effects are attested for optionally transitive verbs regardless of subcategorization frequency"

This probably needs a closer look.

Expt 1 results

"The results were consistent with the predictions of the hyper-active account: in the region following the verb, we observed slower reading times for intransitive verbs in non-island conditions than in corresponding island conditions."

Expt 2

wrote: transitive, chatted: intransitive

b,d are control conditions (island configurations)

1. The book that the author wrote regularly about . . .
2. The book that the author who wrote regularly about . . .
3. The book that the author chatted regularly about . . .
4. The book that the author who chatted regularly about . . .

Expt 2 predictions

- No difference between b vs a
- Slower reading time in d vs c
- Interaction expected

Expt 2 Results (first pass measures)

- YES No difference between b vs a
- YES Slower reading time in d vs c
- YES Interaction expected

"First fixation durations showed a marginal interaction of struc- ture and verb transitivity ($p = 0.06$), and first pass times showed a significant interaction ($p < 0.05$)."

Expt 3

This was a stronger manipulation, where the intransitive verbs are

remain, depart, prevail, emerge, arise, die, persist, disappear, erupt, appear, vanish, arrive

They don't allow transitive frames at all.

Note that verbs have to be re-used here: "Participants saw each intransitive verb twice across the course of the experiment, once in an island context and once in a non-island context."

Expt 3 results (first pass reading time)

(No interaction in first fixation duration)

- YES No difference between b vs a
- YES Slower reading time in d vs c
- YES Interaction expected

However, in regression path duration, huge increase in island vs non-island condition in transitive condition (no effect was expected there)

Discussion (my comments)

- It seems implausible to me that there is no difference between head-final and head-medial languages as regards prediction (although I am not sure if the authors would commit to that strong position)
- It could be that speakers of head-final languages maintain predictions better than speakers of head-medial languages
- Careful corpus and sentence completion studies are needed to pursue the question of the range of verbs that subjects might predict when the read the left context. I would have liked to see such supporting evidence for claims about what is predicted
- The connection between the surprisal idea and these filler gap studies still seems weak; it's possible that we can explain the results in terms of ERH or surprisal