Constraining Focus Interpretation in Discourse

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3/18/2010
“We found 83% of students drink coffee and 90% of students always go to Starbucks.”
— results of a student survey of coffee-drinking habits
“We found 83% of students drink coffee and 90% of students **always go to Starbucks.**”

— results of a student survey of coffee-drinking habits
“She’s the highest level one I can think of.”

— she is concerned about more abstract issues than any other phonetician (from a conversation with a psycholinguist about phoneticians, 2/16/2010)
“DH only goes to Supercuts and sometimes his hair looks great and other times it doesn’t.”

— post on a Yahoo Answers page about cheap places to get haircuts
Jane only has some apples.
Jane only has some apples. (things to eat for breakfast)
Jane only has some apples.  
(kinds of fruit to put in a pie)
Jane only has some apples. *(kinds of fruit to put in a pie)*

In general, what factors determine this set?
The idea is to (temporarily) restrict the domain of evaluation for the whole sentence or even the whole discourse. The pragmatics will help in choosing a suitable universe for the evaluation of a particular sentence, but the semantics can just operate abstracting away from any such choice of a universe.

von Fintel (1998)
A question for experimental pragmatics

How do comprehenders construct relevant contexts for interpreting context-dependent meanings?

Focus operators like *only*:
How do comprehenders appropriately restrict focus alternatives on the basis of contextual information?
Jane only has some \([apples]_F\).

\{candy, cupcakes, apples, sandwiches, pears, dry-erase markers, refrigerators, pickup trucks\ldots\}
Previous mention

Mark has some candy and some apples.
Jane only has some \([\text{apples}]_F\).

\{candy, cupcakes, apples, sandwiches, pears, dry-erase markers, refrigerators, pickup trucks...\}
Same Kind mention

Mark has some **pears** and some **oranges**.

Jane only has some $[\text{apples}]_F$.

\[
\{\text{pears, oranges, apples, grapes, strawberries,}
\text{ potatoes, broccoli, cupcakes, jellybeans, \ldots}\}\]
Lexical differences

Mark has some candy and some apples. Jane also has some \([pears]_F\).

\{candy, cupcakes, apples, sandwiches, pears, dry-erase markers, refrigerators, pickup trucks...\}
Mark is painting an elaborate backdrop for the school play. Last week, he finished painting the dolphins and the sandcastle. This morning, he only started painting the [sailboat]"F.\}

\{dolphins, sandcastle, sailboat, beach ball, waves...\}
Measuring preferences for alternatives with the Visual World paradigm

target

cohort competitor
Mark has some candy and some pears.

Jane only has some apples.
Mark has some candy and some apples.

Jane only has some apples.
Outline

• Background

• Experiments 1-2: Previous mention

• Experiment 3: Lexical differences in focus processing

• Experiment 4: Embedding focus processing in discourse processing

• Conclusions
Previous mention

Is the set of alternatives you consider in a sentence like

‘Jane only has some apples’

constrained by the set of things just mentioned in the discourse?
## Experimental conditions

<table>
<thead>
<tr>
<th>Explicit Mention</th>
<th>No Mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mark has some <em>apples</em> and some <em>pears.</em></td>
<td>Mark has some <em>boots</em> and some <em>slippers.</em></td>
</tr>
<tr>
<td>Only</td>
<td>Jane only has <em>some apples.</em></td>
</tr>
<tr>
<td>No only</td>
<td>Jane has <em>some apples.</em></td>
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</table>
Explicit mention

No Mention + No Only: late disambiguation, >500 ms.

[‘Mark has some boots and some candy.’]

‘Jane has some apples.’
Explicit mention

* Mention + No Only: disambiguation \(\sim 400\) ms.

[\[
\text{Mark has some apples and some candy.} \]
\text{Jane has some apples.}
]
Explicit mention

*Mention + Only:* earliest disambiguation, ~200 ms.

...only has some apples.

[‘Mark has **some apples** and some candy.’]

‘Jane only has **some apples**.’
Explicit mention

No Mention + Only: latest disambiguation, >500 ms.

[‘Mark has some boots and some candy.’]
‘Jane only has some apples.’
Explicit mention

Average point of disambiguation

- Mention effect
- Mention-Only interaction
Mark has some pears and some apples. Jane only has some \([\text{oranges}]_F\).

\[\{\text{pears, apples, oranges, grapes, strawberries, potatoes, broccoli, cupcakes, jellybeans, \ldots}\}\]
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<td>Mark has some <em>oranges</em> and some <em>pears.</em></td>
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| Only | Jane only has *some apples.* |
Explicit and Same Kind mention

Average point of disambiguation

![Graph with bar chart showing ms from target word onset for different conditions: Explicit Mention, No Mention, Same Kind Mention. The graph indicates a significant difference (*) and a very significant difference (**) between conditions.]
Explicit and Same Kind mention

Average point of disambiguation

![Bar chart showing the average point of disambiguation for Explicit Mention, No Mention, and Same Kind Mention. The chart indicates that Same Kind Mention has the earliest point of disambiguation, followed by No Mention and then Explicit Mention.]
Previous mention: Experiments 1-2

- **Mention effect**: Expectation for explicitly mentioned items in the context of *only*.

- **Conceptual similarity bias**: Same-category items (Same Kind mention) have an advantage over Different-category items (No mention).

- Suggests listeners actively generate candidate alternatives, given the presence of *only* and the material in the preceding discourse.
Outline

- Background
- Experiments 1-2: Previous mention
- Experiment 3: Lexical differences in focus processing
- Experiment 4: Embedding focus processing in discourse processing
- Conclusions
Only

Jane only has some $[\text{apples}]_F$.

Jane has some apples.
Jane doesn’t have anything but apples.
Also

Jane also has some \([\text{apples}]_F\).

Jane has some apples.

Jane has something other than apples.
Only v. Also

- *Only*: expect subset of mentioned items
- *Also*: expect superset of mentioned items
*Only*: expect **subset** of mentioned items

*Also*: expect **superset** of mentioned items

- apples
- oranges
- pears
- red vines
- kumquats
- radishes

- *Only*: expect subset of mentioned items
- *Also*: expect superset of mentioned items
**Only v. Also**

- *Only*: expect **subset** of mentioned items
- *Also*: expect **superset** of mentioned items

*Mark has some apples and some oranges.*

*Jane only has some apples.*
Mark has some apples and some oranges.

Jane also has some pears.
### Experiment 3 conditions

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<tbody>
<tr>
<td>Also</td>
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**Only v. Also**

- **Only**: earlier disambiguation for **subset** targets
- **Also**: earlier disambiguation for **superset** targets
Different sources of expectations

- Lexical contribution: different focus operators give rise to different local expectations.

- General expectations about the coherence of a discourse?
## Experiment 3 conditions

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<td>Mark has some <em>oranges</em> and some <em>pears</em>.</td>
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<tr>
<td>Only</td>
<td>Jane only has <em>some apples</em>.</td>
<td></td>
</tr>
<tr>
<td>Also</td>
<td>Jane also has <em>some apples</em>.</td>
<td></td>
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</table>
**Only v. Also**

Mark has some apples and some oranges. Jane only/also has some...
Mark has some apples and some oranges. Jane only/also has some {pears/boots}. 

Only v. Also
Only v. Also

Average point of disambiguation
Conceptual similarity bias
- Expectation for conceptually similar items

Subset-Superset preference
- *Only*: subset/mention bias
- *Also*: superset/novelty bias
Outline

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- Experiment 4: Embedding focus processing in discourse processing
- Conclusions
Overlapping events

Neil and Judith went to the farmer’s market this morning. Neil bought tomatoes and eggplants. Judith only bought \([\text{eggplants}]_F\).

\[
\{\text{eggplants, tomatoes, celery, eggs, avocados, \ldots}\}
\]
Exclusive events

Neil and Judith have a stand at the farmer’s market. During the morning shift, Neil sold out of tomatoes and eggplants.
In the afternoon, Judith only sold out of [eggs]_{F}.

\{\text{eggplants, tomatoes, celery, eggs, avocados, \ldots}\}
### Experiment 4 conditions: Discourse type

<table>
<thead>
<tr>
<th>Overlapping</th>
<th>Neil and Judith went to the farmer’s market…</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Neil and Judith have a stand at the farmer’s market…</td>
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<table>
<thead>
<tr>
<th>Explicit Mention</th>
<th>No Mention</th>
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<tbody>
<tr>
<td>Neil…<em>tomatoes</em> and <em>eggplants</em>.</td>
<td>Neil…<em>tomatoes</em> and <em>avocados</em>.</td>
</tr>
</tbody>
</table>

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<tr>
<th>Only</th>
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</tr>
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<tbody>
<tr>
<td>No only</td>
<td>Judith…<em>eggplants</em>.</td>
</tr>
</tbody>
</table>
Discourse type

Overlapping events

Exclusive events
Summary

- Experiments 1-2: Previous mention
  Focus alternatives are constrained by explicit mention, mention of conceptual associates.

- Experiment 3: Lexical differences in focus processing
  *Only* v. *Also*—Different focus operators give rise to different local predictions.

- Experiment 4: Embedding focus processing in discourse processing
  Discourse structure and Mention interact with presence/absence of *Only*. 
Language comprehenders are really good at domain restriction (for focus alternatives, quantifiers, etc.)

lexical factors

general conceptual knowledge

processing of discourse structure
Thanks!

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RAs: Kim Leiken
    Stephanie Huston

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NIH HD-27206

For these slides:
http://www.bcs.rochester.edu/people/ckim/