<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:15-11:00</td>
<td>Ken Ramshøj Christensen</td>
<td>Syntactic complexity and the brain</td>
</tr>
<tr>
<td></td>
<td>(University of Aarhus / CFIN)</td>
<td></td>
</tr>
<tr>
<td>11:15-12:00</td>
<td>Jørgen Feldbæk</td>
<td>Speech and language therapy for aphasic patients</td>
</tr>
<tr>
<td></td>
<td>(Hammel Neurocenter)</td>
<td></td>
</tr>
<tr>
<td>12:15-13:00</td>
<td>Douglas Saddy</td>
<td>(The perils of) Measuring language impairment</td>
</tr>
<tr>
<td></td>
<td>(University of Reading / CINN)</td>
<td></td>
</tr>
<tr>
<td>13:00-14:15</td>
<td></td>
<td>-- Lunch --</td>
</tr>
<tr>
<td>14:15-15:00</td>
<td>Anne Mette Nyvad</td>
<td>Comprehension patterns in agrammatism -</td>
</tr>
<tr>
<td></td>
<td>(University of Aarhus)</td>
<td>the peculiar case of biclausal &quot;wh&quot;-questions in Danish</td>
</tr>
<tr>
<td>15:15-16:00</td>
<td>Eelje Boef</td>
<td>The structure of embedded CP-domains: evidence from Dutch dialects</td>
</tr>
<tr>
<td></td>
<td>(Meertens Institute, Amsterdam)</td>
<td></td>
</tr>
<tr>
<td>16:15-17:00</td>
<td>Roelien Bastiaanse</td>
<td>The psychological and neural reality of syntactic movement</td>
</tr>
<tr>
<td></td>
<td>(University of Groningen)</td>
<td></td>
</tr>
<tr>
<td>18:30</td>
<td></td>
<td>-- Dinner, Restaurant Sct. Oluf, Mejlgade 33, 8000 Åhus C --</td>
</tr>
</tbody>
</table>
Comprehension patterns in agrammatism: The peculiar case of biclausal wh-structures in Danish

Anne Mette Nyvad
Department of English, SLK, Aarhus Universitet
The standard pattern

- **Spared comprehension of syntactic constructions involving subject extraction and impaired comprehension of syntactic constructions involving object extraction**

- (1a) The boy hits the woman (active)
- (1b) The boy that __ hits the woman (subject relative)
- (1c) It is the boy that __ hits the woman (subject cleft)

- (2a) The woman is hit __ by the boy (passive)
- (2b) The woman that the boy hits __ (object relative)
- (2c) It is the woman that the boy hits __ (object cleft)
The Trace-Deletion Hypothesis
(Grodzinsky 1986; 1990)

(a) Traces are deleted from Broca’s aphasics’ syntactic representations
(b) Phrasal constituents in non-theta-position are assigned a theta-role by default
(by linear considerations)

Breakdown of the above-chance performance on actives

Normal assignment

<table>
<thead>
<tr>
<th>Agent</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>[The boy]i</td>
<td>[VP __ (ti) hits</td>
</tr>
<tr>
<td></td>
<td>[the woman]]</td>
</tr>
</tbody>
</table>

Agrammatic comprehension

Breakdown of the chance-level performance on passives

Normal assignment

<table>
<thead>
<tr>
<th>Theme</th>
<th>Agent</th>
</tr>
</thead>
<tbody>
<tr>
<td>[The woman]i</td>
<td>[VP t’i hit ti by [the boy]</td>
</tr>
</tbody>
</table>

Agrammatic comprehension

Agent            Agent
The question of *wh*-questions

- (3a) Who \(_t\) chased the giraffe? (subject *who*-question)
- (3b) Who did the giraffe chase \(_t\)? (object *who*-question)
- (4a) Which horse \(_t\) chased the giraffe? (subject *which*-question)
- (4b) Which horse did the giraffe chase \(_t\)? (object *which*-question)
Revision of the Trace Deletion Hypothesis
(Grodzinsky 1995a)

- Quantification
  - [Every woman] was hit $t$ by a boy

(a) Trace-Based Account: Traces in theta-positions are deleted from agrammatic representation (or are invisible to theta-role assignment).
(b) Referential Strategy: Assign a referential NP a role by its linear position iff it has no theta-role.
Data from Van der Meulen’s (2004) study

OBJECT IN SITU
- Le roi couronne qui?
  *The king crowns who* (“Who does the king crown?”)

OBJECT MOVED
- Qui est-ce que le roi couronne tqui?
  *Who Q the king crowns* (“Who does the king crown?”)

SHORT SUBJECT
- Qui tqui couronne le roi?
  *Who crowns the king* (“Who crowns the king?”)

LONG SUBJECT
- Qui est-ce qui tqui couronne le roi?
  *Who Q crowns the king* (“Who crowns the king?”)
Van der Meulen’s (2004) Types of Movement Hypothesis (TMH)

- In Broca’s aphasia the syntactic relation between a moved item and its original position is impaired.
- The level of impairment depends on the type of syntactic movement: XP-movement affects patients’ comprehension more severely than head movement or feature movement.

- C’est le roi [CP FF [IP *quitFF* couronne l’homme]] (feature movement in subject cleft)
- *It is the king that crowns the man*
- Je vois le roi [CP FF [IP *quitFF* couronne l’homme]] (feature movement in subject relative)
- *I see the king who crowns the man*
- C’est l’homme [CP OpWH *que* [le roi couronne tOp]] (category movement in object cleft)
- *It is the man that the king crowns*
- Je vois l’homme [CP OpWH *que* [IP le roi couronne tOp]] (category movement in object relative)
- *I see the man that the king crowns*
Subjects:
- A total of ten patients who had previously been diagnosed with Broca’s aphasia were interviewed and evaluated along three parameters:
  - WAB-test
  - Lesion site in the left frontal brain regions corresponding to the areas associated with Broca’s aphasia
  - Spontaneous speech
- Four patients (one inpatient, three outpatients) met the inclusion criteria
- Four neurologically intact controls (matched wrt gender, age, education level)

Patient characteristics:

<table>
<thead>
<tr>
<th>Patient</th>
<th>Mother tongue</th>
<th>Age</th>
<th>Gender</th>
<th>MPO</th>
<th>Employment</th>
<th>Spontaneous speech</th>
<th>WAB score</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.M</td>
<td>Danish</td>
<td>61</td>
<td>F</td>
<td>6</td>
<td>Family assistant</td>
<td>Non-fluent</td>
<td>46.5</td>
</tr>
<tr>
<td>K11</td>
<td>Danish</td>
<td>65</td>
<td>F</td>
<td>14</td>
<td>Store manager</td>
<td>Non-fluent</td>
<td>51.5</td>
</tr>
<tr>
<td>AM</td>
<td>Danish</td>
<td>47</td>
<td>F</td>
<td>204</td>
<td>Nurse</td>
<td>Non-fluent</td>
<td>59</td>
</tr>
<tr>
<td>M1</td>
<td>Danish</td>
<td>45</td>
<td>F</td>
<td>19</td>
<td>Chilominder</td>
<td>Non-fluent</td>
<td>42.5</td>
</tr>
</tbody>
</table>

MPO: months post onset. This number indicates the time that has passed since the brain accident.
Western Aphasia Battery (WAB)

- **Patient KH**
  - **Spontaneous speech**
    - "Øøøh.....dreng...m-m-madam, ja...palme.....hunde...d-drage"
  - (Uuhm...boy...l-l-lady, yes...palmtree.....dogs...k-kite)
  - Time elapsed: 56 seconds

- **Repetition task**
  - Stimulus: *Det ringer på døren*
  - (It rings on door-the, ”The doorbell is ringing”)
  - Response: Øøh, ringer på
Materials and procedures

- Semantically reversible sentences based on 19 verbs:

- Two ditransitive verbs: *give* (“give”); and *vise* (“show”).

- Seven transitive verbs with a DP complement: *vaske* (“wash”); *fotografere* (“photograph”); *kysse* (“kiss”); *bære* (“carry”); *ae* (“stroke”); *slå* (“hit”); *omfavne* (“embrace”).

- Ten transitive verbs with a PP complement: *følge efter* (“follow”); *vinke til* (“wave to”); *se på* (“look at”); *smile til* (“smile at”); *pege på* (“point at”); *prikke til* (“poke”); *røre ved* (“touch”); *sparke efter* (“kick”); *trække i* (“pull at”); *skubbe til* (“shove”)
Experiment 1
Truth-value judgment task

- **Active/passive**
  - (33a) Kvinden aer drengen
    - The woman strokes the boy (“The woman is stroking the boy”)
  - (33b) Drengen bliver aet __ af kvinden
    - The boy is stroked by the woman (“The boy is being stroked by the woman”)

- **Subject/object cleft**
  - (34a) Det er kvinden, der __ aer drengen
    - It is the woman that strokes the boy (“It is the woman that is stroking the boy”)
  - (34b) Det er drengen, kvinden aer __
    - It is the boy the woman strokes (“It is the boy that the woman is stroking”)

Results of Experiment 1

Table 3. Patient results of active and passive structures*

<table>
<thead>
<tr>
<th>Patient</th>
<th>Simple declarative</th>
<th>Passive</th>
</tr>
</thead>
<tbody>
<tr>
<td>LM</td>
<td>57.9% (11/19)</td>
<td>42.1% (8/19)</td>
</tr>
<tr>
<td>KH</td>
<td>89.5% (17/19)</td>
<td>52.6% (10/19)</td>
</tr>
<tr>
<td>AM</td>
<td>94.7% (18/19)</td>
<td>47.4% (9/19)</td>
</tr>
<tr>
<td>MT</td>
<td>100% (19/19)</td>
<td>52.6% (10/19)</td>
</tr>
<tr>
<td>Mean</td>
<td>16.25/19</td>
<td>9.25/19</td>
</tr>
<tr>
<td>Total</td>
<td>85.5% (65/76)</td>
<td>48.7% (37/76)</td>
</tr>
</tbody>
</table>

*percentage correct

Table 4. Patient results of non-WH clefts*

<table>
<thead>
<tr>
<th>Patient</th>
<th>Subject extraction</th>
<th>Object extraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>LM</td>
<td>52.6% (10/19)</td>
<td>42.1% (8/19)</td>
</tr>
<tr>
<td>KH</td>
<td>84.2% (16/19)</td>
<td>73.7% (14/19)</td>
</tr>
<tr>
<td>AM</td>
<td>94.7% (18/19)</td>
<td>57.9% (11/19)</td>
</tr>
<tr>
<td>MT</td>
<td>89.5% (17/19)</td>
<td>68.4% (13/19)</td>
</tr>
<tr>
<td>Mean</td>
<td>15.25/19</td>
<td>11.5/19</td>
</tr>
<tr>
<td>Total</td>
<td>80.3% (61/76)</td>
<td>60.5% (46/76)</td>
</tr>
</tbody>
</table>

*percentage correct
Experiment 2
Picture-pointing task

- **Monoclausal wh-movement (Type I)**
  - Hvem ser manden på __?
  - *Who looks the man at* (“Who is the man looking at?”)
  - Hvem __ ser på manden?
  - *Who looks at the man* (“Who is looking at the man?”)

- **Monoclausal wh-movement (Type II)**
  - Hvem på det her billede ser manden på __?
  - *Who on this-here picture looks the man at* (“Who in this picture is the man looking at?”)
  - Hvem på det her billede __ ser på manden?
  - *Who on this-here picture looks at the man* (“Who in this picture is looking at the man?”)
Results of Experiment 2

Table 4. Patient results of the monoclausal wh-movement structures*

<table>
<thead>
<tr>
<th>Patient</th>
<th>Wh-movement I (WH = D-head)</th>
<th>Wh-movement II (WH = PP-modified D-head)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LM</td>
<td>89.5% (34/38)</td>
<td>89.5% (34/38)</td>
</tr>
<tr>
<td>KH</td>
<td>92.1% (35/38)</td>
<td>84.2% (32/38)</td>
</tr>
<tr>
<td>AM</td>
<td>94.7% (36/38)</td>
<td>94.7% (36/38)</td>
</tr>
<tr>
<td>MT</td>
<td>89.5% (34/38)</td>
<td>78.9% (30/38)</td>
</tr>
<tr>
<td>Mean</td>
<td>34.75/38</td>
<td>33/38</td>
</tr>
<tr>
<td>Total</td>
<td>91.4% (139/152)</td>
<td>86.8% (132/152)</td>
</tr>
</tbody>
</table>

*percentage correct

Table 5. Patient results of the monoclausal wh-movement structures*

<table>
<thead>
<tr>
<th>Patient</th>
<th>Type I</th>
<th>Type I</th>
<th>Type II</th>
<th>Type II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Subject &gt; object</td>
<td>Object &gt; subject</td>
<td>Subject &gt; object</td>
<td>Object &gt; subject</td>
</tr>
<tr>
<td>LM</td>
<td>84.2% (16/19)</td>
<td>94.7% (18/19)</td>
<td>89.5% (17/19)</td>
<td>89.5% (17/19)</td>
</tr>
<tr>
<td>KH</td>
<td>94.7% (18/19)</td>
<td>89.5% (17/19)</td>
<td>78.9% (15/19)</td>
<td>89.5% (17/19)</td>
</tr>
<tr>
<td>AM</td>
<td>89.5% (17/19)</td>
<td>100% (19/19)</td>
<td>89.5% (17/19)</td>
<td>100% (19/19)</td>
</tr>
<tr>
<td>MT</td>
<td>94.7% (18/19)</td>
<td>84.2% (16/19)</td>
<td>84.2% (16/19)</td>
<td>73.7% (14/19)</td>
</tr>
<tr>
<td>Mean</td>
<td>17.25/19</td>
<td>17.5/19</td>
<td>16.25/19</td>
<td>16.75/19</td>
</tr>
<tr>
<td>Total</td>
<td>90.8% (69/76)</td>
<td>92.1% (70/76)</td>
<td>85.5% (65/76)</td>
<td>88.2% (67/76)</td>
</tr>
</tbody>
</table>

*percentage correct
**Experiment 3**

**Picture-pointing task**

**Imperative wh-construction**
- Vis mig, hvem der __ vinker til kvinden
- *Show me who that wave to the woman* (“Show me who is waving to the woman”)
- Vis mig, hvem kvinden vinker til __
- *Show me who the woman waves to* (“Show me who the woman is waving to”)

**D-head wh-cleft**
- Hvem er det, der __ vinker til kvinden?
- *Who is it that waves to the woman* (“Who is it that is waving to the woman?”)
- Hvem er det, kvinden vinker til __?
- *Who is it the woman waves to* (“Who is it that the woman is waving to?”)

**Full DP wh-cleft**
- Hvilken person er det, der __ vinker til kvinden?
- *Which person is it that waves to the woman* (“Which person is it that is waving to the woman?”)
- Hvilken person er det, kvinden vinker til __?
- *Which person is it the woman waves to* (“Which person is it that the woman is waving to?”)

**Long wh-extraction**
- Hvem mener du, der __ vinker til kvinden?
- *Who think you that waves to the woman* (“Who do you think is waving to the woman?”)
- Hvem mener du, kvinden vinker til __?
- *Who think you the woman waves to* (“Who do you think that he woman is waving to?”)
# Results of Experiment 3

## Table 6. Patient results of biclausal structures containing wh-questions*

<table>
<thead>
<tr>
<th></th>
<th>Imperative (WH)</th>
<th>D-head Cleft (WH)</th>
<th>Full-DP Cleft (WH)</th>
<th>Long extraction (WH)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject extraction</td>
<td>39.5% (30/76)</td>
<td>44.7% (34/76)</td>
<td>48.7% (37/76)</td>
<td>35.5% (27/76)</td>
<td>42.1% (128/304)</td>
</tr>
<tr>
<td>Object extraction</td>
<td>59.2% (45/76)</td>
<td>60.5% (46/76)</td>
<td>61.8% (47/76)</td>
<td>55.3% (42/76)</td>
<td>59.2% (180/304)</td>
</tr>
<tr>
<td>Total</td>
<td>49.3% (75/152)</td>
<td>52.6% (80/152)</td>
<td>55.3% (84/152)</td>
<td>45.4% (69/152)</td>
<td>50.7% (308/608)</td>
</tr>
</tbody>
</table>

*percentage correct

## Table 7. Patient results of biclausal structures containing wh-questions*

<table>
<thead>
<tr>
<th>Patient</th>
<th>Subject extraction</th>
<th>Object extraction</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>LM</td>
<td>34.2% (26/76)</td>
<td>59.2% (45/76)</td>
<td>46.7% (71/152)</td>
</tr>
<tr>
<td>KH</td>
<td>40.8% (31/76)</td>
<td>55.3% (42/76)</td>
<td>48.0% (73/152)</td>
</tr>
<tr>
<td>AM</td>
<td>56.6% (43/76)</td>
<td>63.2% (48/76)</td>
<td>59.9% (91/152)</td>
</tr>
<tr>
<td>MT</td>
<td>36.8% (28/76)</td>
<td>59.2% (45/76)</td>
<td>48.0% (73/152)</td>
</tr>
<tr>
<td>Mean</td>
<td>32/76</td>
<td>45/76</td>
<td>77/152</td>
</tr>
<tr>
<td>Total</td>
<td>42.1% (128/304)</td>
<td>59.2% (180/304)</td>
<td>50.7% (308/608)</td>
</tr>
</tbody>
</table>

*percentage correct
An overview of the patterns observed

Extraction patterns

Percent correct

Subject extraction
Object extraction

Constructions

Active/passive
Non-WH cleft
WH-movement I
WH-movement II
WH-imperative
D-head WH-cleft
Full-DP WH-cleft
Long extraction
Agrammatic aphasics produce syntactic trees that are intact up to $T^\circ$ but *pruned* (or cut) from this node and up. In less severe cases, the TP is spared (i.e. only the CP-domain is impaired).

As suggested by Friedmann (2008), the TPH may also apply to agrammatic comprehension.
The results obtained in Experiments 1 and 2 suggest that the CP-layer of the main clause is relatively spared in the comprehension of the four Danish-speaking patients. An impairment of the embedded CP-domain may, however, account for the low performance level on the structures in Experiment 3.
The transmission of thematic roles

The transmission of a thematic role to the *wh*-element may be hindered, because the *wh*-operator in CP-Spec is not recoverable from the syntactic representation.

\[
\text{Who is it that kicks the man ("Who is it that is kicking the man?")}
\]

\[
\text{Who is it the man kicks ("Who is it that is kicking the man?")}
\]
THE *THAT*-TRACE EFFECT:

- **Hvem** mener du [CP [CP-Spec t] [C Ø] [IP [IP-Spec t] følger efter kvinden]]?
  *Who think you follows the woman* (“Who do you think is following the woman?”)

- **Hvem** mener du [CP t [C at] [CP [IP-Spec t ] følger efter kvinden]]?
  *Who think you that follows the woman* (“Who do you think is following the woman?”)

- **Hvem** mener du [CP [CP-Spec t ] [C Ø] manden følger efter t]?
  *Who think you the man follows* (“Who do you think the man is following?”)

- **Hvem** mener du [CP [CP-Spec t] [C at] manden følger efter t]?
  *Who think you that the man follows* (“Who do you think that the man is following?”)

→ Rizzi (1990) explains this dichotomy with reference to the ECP (i.e. the requirement that a nonpronominal head be properly head-governed)
Proposed modification of the TDH

- (a) Trace-Based Account: Traces in theta-positions are deleted from agrammatic representation (or are invisible to theta-role assignment) *iff they are not properly head-governed.*
- (b) Referential Strategy: Assign a referential NP a role by its linear position iff it has no theta-role.

**Hvem er det** $[_{CP} [_{CP-Spec \ O_{PWH}} [_{Co \ det}] [_{IP} [_{IP-Spec \ t} \text{smiler til manden}]]]]$?

*Who is it that smiles to the man* ("Who is it that is smiling to the man?")

**Hvem er det** $[_{CP} [_{CP-Spec \ O_{PWH}} [_{Co \ Ø}] [_{IP} \text{manden smiler til } \text{t}]]]$?

*Who is it the man smiles to* ("Who is it that the man is smiling to?")
NP-movement vs. *wh*-movement?

- Assuming that
  (a) the embedded CP-domain is impaired
  and that
  (b) traces are only deleted when they are not properly head-governed
does not account for the relatively poor performance on passives by the agrammatic speakers.

If, however, monoclausal topicalization structures were to turn out to display the same pattern as monoclausal *wh*-movement structures (i.e. a near-normal performance pattern), it might be argued that A-movement structures should receive a different account than A-bar movement constructions.

\[
\begin{aligned}
\text{[CP } [\text{CP-Spec } \textbf{Drengen}] [\text{CP-Spec } \textbf{bliver}] [\text{IP } [\text{IP-Spec } [\text{VP omfavnet } t \text{ af } \textbf{kvinden}]]]]
\text{The boy is embraced by the woman} \quad ("\text{The boy is embraced by the woman"")}
\end{aligned}
\]

\[
\begin{aligned}
\text{[CP } [\text{CP-Spec } \textbf{Kvinden}] [\text{CP-Spec } \textbf{peger}] [\text{IP } [\text{IP-Spec } \textbf{manden}] [\text{VP } \textbf{på } \_ \_ \_]]
\text{The woman points the man at} \quad ("\text{The man is pointing at the woman"")}
\end{aligned}
\]
Concluding remarks

- The analysis of the data proposed here embraces basic assumptions of previous hypotheses focusing on different aspects of syntactic movement as critical:
  - its *target* (cf. the impairment of the embedded CP-domain)
    - TPH
  - the *position* from which it originates (cf. proper head-government or lack thereof, depending on whether the trace in the embedded clause is in IP-Spec or a sister position to V)
    - TDH
  - its *type* (cf. the distinction between A-bar movement and NP-movement)
    - TMH
References I


