Agrammatic Comprehension

The case of WB

Types of stimuli

- Reversibles - no semantic cue
  ‘The man is chasing the dog’
  – Agent and patient can be switched around and
    the sentence still makes sense (is semantically
    plausible).
- Irreversibles - semantic cue
  ‘The man is kicking the ball’
  – Agent and patient cannot be switched around
    because the outcome would be semantically
    impossible

The task

- Patient is shown two pictures, and a sentence is
  produced.
  – One picture depicts the action described by the
    sentence
  – The other, the foil, shows another picture which
    has:
    • Agent and patient switched around in case of reversibles
    • A different patient or verb in the case of irreversibles
- The patient has to point to the right picture

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Examples of the task - reversibles

- The subject is presented with the sentence:
  ‘The woman is chasing the man’
- This is a reversible sentence where the foil (top picture man chasing woman) has reversed the agent with the patient.

Examples of the task - irreversibles

- The subject is presented with the sentence:
  ‘The man is photographing the bird’
- This is an irreversible sentence. The foil (top picture of man shooting a bird) has the verb replaced.

Why reversibles vs. irreversibles?

- Reversibles tap into syntactic processing
  - Syntactic ordering distinguishes agent from patient. Irreversibles have semantic cues - a bird cannot take a picture. The foil in irreversibles checks if semantics intact, not syntax.
- There is a symmetry in the foil
  - The only other possible assignment of agent/patient roles in reversibles is in the foil.
- Rev - chance performance if patient is guessing
  - The target and the foil exhaust possible random assignment of [\-] roles. Like flipping a coin.

Trace Deletion Hypothesis

- Grodzinsky et. al., agrammatics are not able to compute traces.
- Default order in English: SVO
  - Active reversible sentences should be above chance.
  - Passive reversible sentences should be chance.
  - Irreversibles should be above chance.
Trace deletion in action

- Deletion of traces has unequal impact on clause interpretation: \textit{rev pass<rev act<irrev}
  - In order to discriminate a passive reversible target from its foil you need to know its Deep Structure (before movement).
  - In order to discriminate an active reversible from its foil you assume regular SVO (NP1=Agent;NP2=Patient).
  - In order to discriminate the an irreversible from its foil you only need to contrast the meaning of the Patient or of he verb.

WB- Info

- Broca’s aphasic Patient with classical agrammatic production:
  - Omits function words and verbs in production.
  - Poor morphological discrimination.
  - Poor spontaneous production.
- Comprehension:
  - Comprehends instructions.
  - Single word comprehension good (picture matching task).

WB Comprehension Reversibles vs.. Irreversibles

- Administered 140 reversibles and 80 irreversibles.
- WB is clearly much better at irreversibles than at reversibles.

WB Comprehension: passive vs. active sentences

- WB was administered 71 active reversibles and 68 passive ones.
- Irreversibles have no passive active difference.
Relative clauses

- Relative clauses
  - There are two types:
    - Object vs. Subject
  - 33 Subject RC’s
  - 29 Object RC’s
  - The foil is always the head noun.
  - Relative clauses are predicted by TDH to show an asymmetry where Object RC’s are chance and Subject RC’s above chance.
  - This is not the case with WB.
  - Object and subject RC’s the same but might be above chance if we had more N.

Does one patient disconfirm a hypothesis

- WB has the appropriate lesion
- WB exhibits ‘classical’ Agrammatic performance in production.
- Yet his comprehension performance does not follow the predictions of TDH.
- Does one patient disconfirm a hypothesis?
- NO, too many uncontrollable variables.
- But there are many patients that do not conform to TDH (Berndt et al. 1996).

Problems with TDH

- Major problems with TDH
  - Unclear patient selection.
  - But even if we conform to all the criteria of selection, we still find patients who do not conform to TDH - WB
  - Unclear what is the deficit: processing or knowledge.
    - Grammatical judgment data.
  - Unusual statistical approaches
    - Distribution resulting from collapsing data from many studies with a small N.

Can we account for Broca’s aphasics comprehension performance?

- No
  - Have to first figure out what are these theories of?
    - The object of the study
    - Linguistic competence vs. performance
- Yes
  - More data points are needed to establish a pattern
Grammaticality judgements

- WB is perfect in grammaticality judgements for sentences that he has difficulty comprehending: passive and active reversibles (Linebarger et. al 1983).
  - Examples:
    1. ‘The teacher was disliked the students’
    2. ‘The man was helped by the clerk’

  Wh and inverted questions are the only problem

Syntactic representation

- His syntactic representation is fine
  - Whatever deficit he has it cannot be due to a damaged syntactic representation, otherwise how can we account for grammatical judgments.
- Comprehension of other structures:
  - Prepositions
  - Plural

Comprehension of other structures - prepositions

- Prepositions 34 clauses were tested
  - The foil is another preposition.
  - The book is on the table vs.
  - The book is under the table

Comprehension of other structures - morphology

- 42 Morphologically contrasted clauses were presented
  - The foil is number of the object or subject
  - The workers are drilling the window vs.
  - The worker is drilling the window
WB comprehension

- WB is at chance in
  - Passive and Active reversibles
  - Object and Subject relative clauses (?)
  - Clefts
  - Morphological foils
  - Prepositional foils

- In fact there is nothing WB is not significantly above chance.

So what?

- Is there a single account for agrammatic comprehension?
- Should there be?
- Need to make detailed studies of single patients before you make generalizations.