

Agrammatic Comprehension

The case of WB

Project participants:

Xavier Alario
Alfonso Caramazza
Adam Szczegielniak



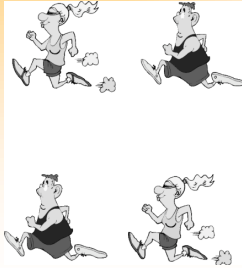
Types of stimuli

- 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

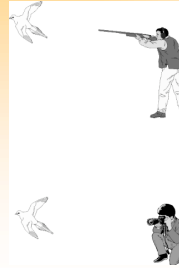
Examples of the task -reversibles



- 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 \square -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

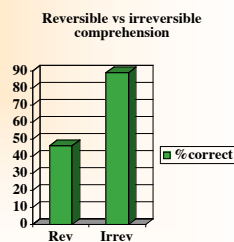
- Deletion of traces has unequal impact on clause interpretation: **rev pass<rev act<irrev**
 - In order to discriminate a passive reversible target from its foil you need to know its Deep Structure (before movement).
 - In order to discriminate an active reversible from its foil you assume regular SVO (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).

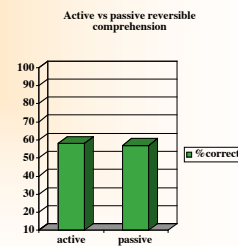
WB Comprehension Reversibles vs.. Irreversibles

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



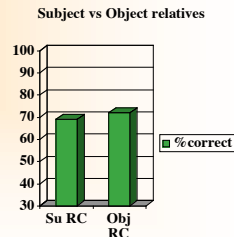
WB Comprehension: passive vs. active sentences

- 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:
 - *‘The teacher was disliked the students’
 - ‘The man was helped by the clerk’

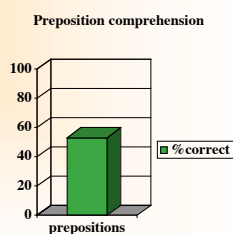
Wh and inverted questions are the only problem

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

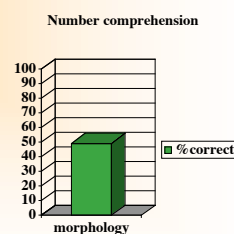
Comprehension of other structures - prepositions

- 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.