Abstract

Italian RCs such as La bambina che disegna il pagliaccio ride (The girl that draws the clown smiles) are claimed to be ambiguous between a subject and an object reading (The girl that is drawing the clown is smiling vs. The girl that the clown is drawing is smiling). Since longer dependencies incur a greater processing cost than shorter ones, the parser first engages in a subject analysis, but the object interpretation is claimed to be attainable through reanalysis. There are two grammatical devices that can cue the object reading in Italian: i) the word order (i.e. OSV), and ii) the number agreement between the embedded verb and the post verbal subject (e.g. The girl-SG that draw-PL the clowns-PL smiles). However, both cues are available at an early stage of the incremental processing, respectively immediately after the two NPs or right after the first NP, therefore triggering a reanalysis at an early processing stage. Here we tested the effectiveness of a late cue in triggering a reanalysis by testing gender, which can be manipulated in the embedded clause, unlike number, capitalizing on the observation that gender and [...]
DIGGING-IN EFFECTS IN ITALIAN RELATIVE CLAUSES

Sandra Villata1, Ludovico Franco2, Paolo Lorusso3,4
1Université de Genève, Geneva (Switzerland) • 2University Nova de Lisboa (Portugal) • 3University of Florence (Italy) • 4CRIL University of Salento (Italy)

Contact: sandra.villata@unige.ch

1. BACKGROUND

- Italian relative clauses (RCs) are ambiguous between a subject and an object reading:
  (1) La bambina che disegna il pagliaccio sorede
  The girl who draws the clown smiles
  (a) The girl who is drawing the clown smiles
  (b) The clown is drawing who the girl who smiles

Two grammatical cues can impose the object reading [1].

1. Word Order (OSV): La bambina che il pagliaccio disegna
   The girl who the clown draws smiles

2. Number agreement (OVS): La bambina che il pagliaccio-pl draws
   The girl-pl who draw-pl the clown-pl smiles

- However, no study investigated:
  (a) whether participants ultimately revised their initial interpretation (no comprehension question targeting thematic roles attribution in the RC, [2])
  (b) whether cues arriving later in the sentence (i.e. after the RC) are similarly effective in triggering the object reading, or if digging-in/lingering effects arise [3,4], such that the longer the parser has been committed with the wrong analysis, the harder the reanalysis is expected to be.

2. AIM OF THE PRESENT STUDY

1. Investigating whether both word order and number agreement trigger reanalysis
2. Investigating whether digging-in effects also arise in Italian RCs, thus allowing us to disentangle predictions from two prominent models of sentence processing:
   - Cue-based retrieval model (ACT-R) [5, 6, 7]:
     - reanalysis depends on the parser’s ability to retrieve prior constituents;
     - retrieval cues successfully trigger reanalysis to the extent to which:
       (a) they uniquely point to the target element, and
       (b) the target element is sufficiently active in memory
     - the moment in which the cue is made available (early vs. late) has no role to play
   - Self-organised sentence processing model (SOPARSE) [4]:
     - each word activates a treetlet, and treetlets compete for all attachment sites;
     - the strength of syntactic attachments grows as a function of time and additional consistent linkages

- later cues are expected to be less effective than early ones in triggering reanalysis

3. METHOD

EXPERIMENT 1: THE EFFECTIVENESS OF EARLY CUES IN TRIGGERING REANALYSIS

Participants: 67 Italian-speaking adults; Task: self-paced reading + sentence comprehension; Material: 32 items

- The cue-based memory model predicts that both early and late cues will successfully trigger reanalysis
- The self-organizing parsing model predicts that late cues will be less effective in triggering reanalysis than early cues

EXPERIMENT 2: THE EFFECTIVENESS OF LATE CUES

Participants: 34 Italian-speaking adults; Task: self-paced reading + sentence comprehension; Material: 32 items

- Main effect of type of relative
- Main effect of timing cue

EXPERIMENT 3: DIRECT COMPARISON BETWEEN EARLY AND LATE CUES

Participants: 67 Italian-speaking adults; Task: self-paced reading + sentence comprehension; Material: 32 items

- Main effect of type of relative
- Main effect of timing cue

4. PREDICTIONS

- The cue-based memory model predicts that both early and late cues will successfully trigger reanalysis
- The self-organizing parsing model predicts that late cues will be less effective in triggering reanalysis than early cues

5. RESULTS

RTs INTEGRATION REGION (Reg. 4)
- Accuracy

RTs SPILLOVER REGION
- Main effect of type of relative
- Number agreement and word order are similarly effective in triggering object reanalysis

6. DISCUSSION

1. Early cues such as word order and number agreement effectively trigger reanalysis, and this to a similar extent (76% of correct responses)
2. A late gender cue does not trigger reanalysis digging-in effects: the more stable an analysis has become, the harder to undo
3. Late pragmatic cues trigger reanalysis to a certain extent (42%), thus being more effective than late pragmatic cues (55%) and other early cues (word order and number agreement) digging-in effects
4. These results provide support for the SOPARSE model: the strength of linkages between consistent representations grows as a function of time and additional consistent linkages
5. These results are incompatible with the cue-based retrieval model (ACT-R) that does not predict an effect of the moment in which the cue is made available. Moreover, reanalysis was difficult to attain even though the reanalysis cues uniquely pointed to the target element (i.e. the second NP), which was always more recent and closer (i.e. more active) to the error point than the interfering element (i.e. the first NP), two ingredients that should facilitate retrieval under recent proposals [8,9]