



# Effects of Focal Accents on Relative Clause Attachment: Accent Effects Or Memory Effects?

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## Abstract

This study tests whether accent effects on relative clause attachment are due to 1) a preference for attaching ambiguous constituents to focused information or 2) a memory advantage for accented words. We find that the effects of accents disappear when both noun phrases are easily accessible in memory. This suggests that listeners are biased toward selecting accented noun phrases when asked about the action in the relative clause at the end-of-sentence question because of a memory advantage, and not because of focus structure.

## Previous Research

Previous studies (Schafer et al., 1996; Maynell, 1999; 2000) have found that focal accents influence processing of ambiguous relative clauses as in (1)

- (1) a. Someone shot the **SERVANT** of the actress who was on the balcony.  
b. Someone shot the servant of the **ACTRESS** who was on the balcony.

□ **Focus Attraction Hypothesis** (Schafer et al., 1996): Listeners tend to attach an ambiguous relative clause to accented noun phrases.

□ **Research Question:** What drives the effect of focal accents on relative clause attachment?

## Current Study

- Three experiments test what drives the effect of focal accents on relative clause attachment
  - Experiment 1: replicate the Schafer et al. (1996)'s study
  - Experiment 2: use sentences with a simplified semantic structure
  - Experiment 3: manipulate processing load as a within-experiment factor
- **Task:** As in Schafer et al.'s original study, participants listened to a target sentence and answered a question that asked which noun phrase is associated with the action in the relative clause (e.g. Who was on the balcony?)

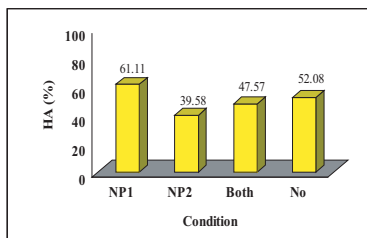
## Hypotheses

- 1) **Focus Structure Hypothesis:** If accent attachment effects are due to focus structure, one would expect no interaction with processing difficulty
- 2) **Memory Advantage Hypothesis:** If accent attachment effects are due to a memory advantage for accented words, one would expect accent effects to vary with the difficulty of the sentence.

## Experiment 1

- Experiment 1 replicated the findings of Schafer et al. (1996) using stimuli from the original experiment.
- **Conditions**  
NP1: The sun sparkled on the **PROPELLER** near the plane that the mechanic was so carefully examining.  
NP2: The sun sparkled on the propeller near the **PLANE** that the mechanic was so carefully examining.  
Both: The sun sparkled on the **PROPELLER** near the **PLANE** that the mechanic was so carefully examining.  
No: The sun sparkled on the propeller near the plane that the mechanic was so carefully examining.
- 32 test items, 60 distractor items

□ **Results** (for 36 participants)



- Focal accents on an NP reliably increased the proportion of attachment to the NP:  
**NP1 > No:** sig. ( $F(1,35)=6.62, p<.05, F2(1,31)=5.51, p<.05$ )  
**NP2 < No:** sig. ( $F(1,35)=9.27, p<.01, F2(1,31)=7.0, p<.05$ )
- Two accents seem to interact with each other:  
**Both < No:** n.s ( $F(1,35)=1.64, p>.1, F2(1,31)=1.09, p>.1$ )

## Experiment 2

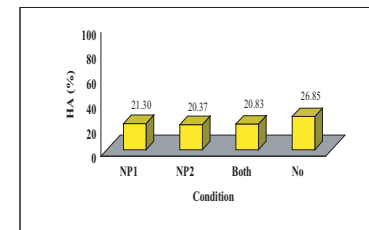
- The goal of Experiment 2 was to investigate whether the effects in Experiment 1 are due to focus structure or to memory. To this end, sentences with a simplified semantic structure were used: the phrase "click on" replaced the matrix subject and verb.
- **Conditions**  
NP1: Click on the **FATHER** of the girl who is riding a bicycle.  
NP2: Click on the father of the **GIRL** who is riding a bicycle.  
No: Click on the father of the girl who is riding a bicycle.  
Both: Click on the **FATHER** of the **GIRL** who is riding a bicycle.

□ **Memory Prediction**  
No effects of accents with a simpler structure

□ 24 test items, 46 distractor items

- **Results** (for 36 participants)
  - Overall preferences for low attachment
  - NP1 vs. No: no reliable effect of accents on NP1 ( $F(1,35)=2.33, p>.1, F2(1,23)=2.23, p>.1$ )
  - NP2 vs. No: only significant by subjects ( $F(1,35)=5.85, p<.05$ ), but not by items ( $F2(1,23)=2.69, p>.1$ )

## Experiment 2 Results



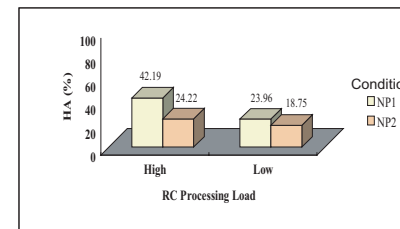
## Experiment 3

- Experiment 3 manipulated processing difficulty as a within experiment factor.
  - The location of accent (accent on NP1 vs. accent on NP2) was crossed with a processing load condition (high vs. low).
    - high processing load : long object-extracted RC
    - low processing load : short subject-extracted RC
- **Conditions**  
NP1&High: Michael knew the **FATHER** of the girl who the clerk blamed for breaking the merchandise.  
NP1&Low: Michael knew the **FATHER** of the girl who blamed the clerk.  
NP2&High: Michael knew the father of the **GIRL** who the clerk blamed for breaking the merchandise.  
NP2&Low: Michael knew the father of the **GIRL** who blamed the clerk.

□ **Memory Prediction**  
No attachment effects in the low processing load condition

□ 32 test items, 60 distractor items

- **Results** (for 48 participants)
  - There was a reliable interaction between accent and processing load ( $F(1,47)=14.79, p<.001, F2(1,31)=9.61, p<.001$ )



- High load condition  
NP1 vs. NP2: Reliable effect of accent ( $F(1,47)=25.64, p<.001, F2(1,31)=46.02, p<.001$ )
- Low load condition  
NP1 vs. NP2: No main effect of accent ( $F(1,47)=2.23, p>.1, F2(1,31)=3.09, p<.09$ )

## Conclusion

- As predicted by the memory-based account, we do not find accent attachment effects in simpler sentences.
- Seemingly focus-driven effects may be due to the perceptual salience of accented words at the end of experiment question. Listeners are biased to choose accented NPs when asked about the action in the relative clause because these NPs are more accessible.