



# Head-Internal Relative Clauses in English: Evidence from NPI Licensing

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## Competing analyses of relative clauses

Two main classes of hypotheses have been proposed concerning the structure of relative clauses (RCs):

- **Head-external** analyses, on which the head of the RC is base-generated outside the RC
- **Head-internal** analyses, on which there is a representation of the head inside the RC

Bhatt (2002) argues that a head-internal structure is available for English RCs on the basis of negative polarity item (NPI) licensing. An NPI (e.g., *ever*) must be locally c-commanded by an NPI-licensor (e.g., *only*), as shown by (1).

- (1) a. Only John ever said that Tolstoy wrote *War and Peace*.  
b. ?\*Only John said that Tolstoy ever wrote *War and Peace*.

In (1a) the NPI *ever* is locally licensed by *only*, while in (1b) it is not local enough to *only* to be licensed.

Bhatt claims that (2a-b) are both acceptable, and concludes that there must be a **representation of the head *only* book inside the RC**, where it can locally license the NPI *ever*.

- (2) a. The only book that John ever said that Tolstoy wrote was *War and Peace*.  
b. The only book that John said that Tolstoy ever wrote was *War and Peace*.

## Exp. 1: NPI licensing and RC structure

**Do Bhatt's judgments generalize to a larger population of English speakers?** If they do, this will suggest that head-internal structures for RCs are available for English speakers more generally.

- Fully crossed 3 × 2 acceptability study:

- presence or absence of RC
- presence or absence of NPI-licensor (*only*)
- surface locality or non-locality of NPI (*ever*) to *only*

- (3)  $\left\{ \begin{array}{l} \text{Even} \\ \text{Only} \end{array} \right\}$  the doctor ( $ever_{local}$ ) thought that the hospital had ( $ever_{non-local}$ ) overcharged the patient.

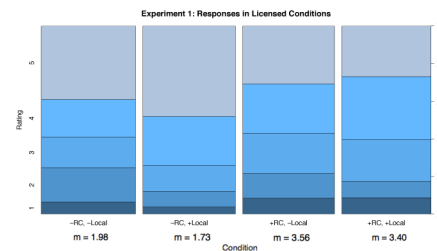
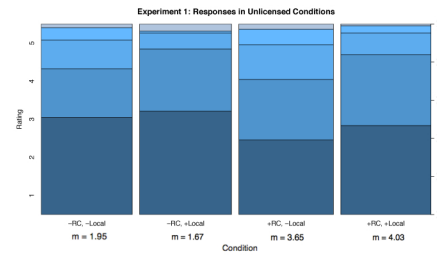
- (4) The (only) patient that the doctor ( $ever_{local}$ ) thought that the hospital ( $ever_{non-local}$ ) overcharged died.

• Participants were asked to rate sentences on a scale of 1 (least acceptable) to 5 (most acceptable).

• 190 experimental items and 64 fillers.

• Participants included 39 UCSC undergraduates.

## Experiment 1 Results



A Cumulative Link Mixed Model was run with rating as the dependent variable and a probit link. The model included all three binary factors. Random slopes were fitted for both subject and item. Significant predictors included:

- whether there was an NPI-licensor (Coef. = -1.922,  $p = 2 \times 10^{-16}$ )
- whether the NPI was local (Coef. = 0.345,  $p = 0.025$ )
- the interaction between those two factors (Coef. = -0.580,  $p = 0.009$ )

Stimuli containing unlicensed NPIs were strongly dispreferred.

When the NPI was licensed, locality to the licensor dramatically improved ratings *outside of RCs*. **In RCs, locality of the NPI did not matter.**

## Exp. 2: Subordinators and RC structure

**Are head-internal structures for RCs barred with *wh*-subordinators such as *which*, as suggested by a reviewer of Bhatt (2002:83, fn. 23)?**

- Fully crossed 2 × 2 acceptability study on a scale of 1 (worst) to 5 (best):

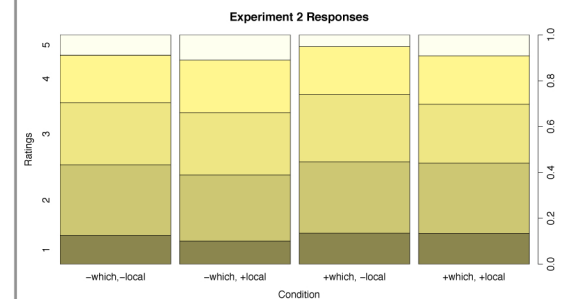
- RC introduced by *that* or *which*
- surface locality or non-locality of NPI (*ever*) to *only*

- 5) The only game  $\left\{ \begin{array}{l} \text{which} \\ \text{that} \end{array} \right\}$  Beatrix ( $ever_{local}$ ) imagined that Leif ( $ever_{non-local}$ ) played was chess.

• 64 experimental items and 34 fillers.

• 103 volunteers recruited online.

## Experiment 2 Results



A Cumulative Link Mixed Model was run with rating as the dependent variable and a probit link. The model included both binary factors. Random slopes were fitted for both subject and item.

The only significant predictor was the **interaction between locality of the NPI and rating** (Coef. = 0.17342,  $?SE = 0.07536$ ,  $p = 0.0214$ ). There was **no effect of subordinator choice** (*that* vs. *which*).

## Conclusions

In general, sentences containing NPIs are best when the NPIs are licensed, and licensed locally.

In Experiment 1, the positive effect of local NPI licensing was offset by the interaction effect. **Local NPI licensing improved non-RC structures, but did not affect the acceptability of relativization structures.**

This result bears out the predictions of head-internal analyses of RCs, suggesting that **head-internal structures for RCs are available** in the relevant population of English speakers.

The choice of subordinator (*which* vs. *that*) did not significantly affect ratings, suggesting that there exists a population of English speakers for whom the contrast cited by Bhatt's (2002:83, fn. 23) reviewer does not hold.

## Reference

Bhatt, Rajesh. 2002. "The Raising Analysis of Relative Clauses: Evidence from Adjectival Modification." *Natural Language Semantics* 10: 43-90.