

Relative clause attachment in Hindi: Effects of RC length and RC placement

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RC attachment preferences and RC position differ cross-linguistically

There is considerable language-dependent variation in relative clause attachment preferences, which is puzzling given an otherwise universal preference for local attachment:

Relative clause attachment in English shows a preference for local attachment: in the *X of Y* construction (1), the RC preferentially attaches to the second noun *actress*.

- (1) Someone hit the maid of the actress who was on the balcony.

However, in Spanish (2) the preference is for non-local attachment to the first noun *criada*.

- (2) Alguien pegó a la criada de la actriz
someone hit dat the maid of the actress
que estaba en el balcón
who was on the balcony
'Someone hit the maid of the actress who was on the balcony.'

Some other languages that behave like Spanish are French (Mitchell et al. 1990), Italian (Vincenzi and Job 1993), German (Hemforth et al. 1994), and Dutch (Brysaert and Mitchell 1996).

The position of the relative clause also varies cross-linguistically. Consider the head-final language Japanese (3). Here, the *X of Y* complex can only be realized as *Y's X*, and RCs appear prenominal. In Japanese, during real time processing the RC attaches to the more local noun (Kamide and Mitchell 1997), but in offline judgements there is a reversal in attachment preference, i.e., attachment to the nonlocal noun is preferred.

- (3) a. Dareka-ga barukonii-ni iru
Someone-Nom balcony-Loc is
joyuu-no mesitukai-o utta
actress-Gen servant-Acc shot
'Someone shot the actress' servant who was on the balcony.'

RC length modulates attachment preferences, possibly due to implicit prosody

Furthermore, the length of the relative clause appears to (partly) determine attachment preferences: longer RCs are preferentially attached to the main noun – i.e., non-locally – even in languages like English (4).

This length effect has a compelling explanation in terms of implicit prosody (Fodor 2002): in the languages investigated so far, long RCs are likely to be preceded by a phrasal break. This major discontinuity at the RC's left edge prompts syntactic realignment, i.e., attachment to the non-local head.

- (4) Someone saw the maid of the actress who cried (right through the night).

RC ambiguity in Hindi

In order to understand RC attachment ambiguity better, it is vital to extend the cross-linguistic empirical base. Towards this end we investigated a relatively understudied language, Hindi.

Three important properties of Hindi:

1. RCs can occur either prenominal (5a) or postnominal (5b).
2. The *X of Y* NP complex is realized as *Y's X*, as in Japanese (Kamide and Mitchell 1997).
3. Both types of RC can in principle modify either one of *X* or *Y*.

The two optional locations of the RC in Hindi, as well as their ambiguity regarding attachment sites, allow us to investigate the effect on attachment preferences of proximity to a noun (head or modifier) as well as RC length.

- (5) a. kisii-ne (balkonii par kharīi)
someone-erg (balcony on standing)
caaye pii rahii us abhinetrii-kii us
drinking tea was that actress-K that
naukaraanii-ko maaraa
maid-ACC hit
'Someone hit that maid of that actress who was standing on the balcony drinking tea.'
- b. kisii-ne us abhinetrii-kii us
someone-erg that actress-K that
naukaraanii-ko jo (balkonii para
maid-ACC who (balcony on
kharīi) caaye pii rahii thii maaraa
standing) drinking tea was aux hit

Experiment design

60 Hindi native speakers read 24×4 ambiguous target sentences (5a,b) each followed by a question like (6) probing RC's interpretation. Target materials combined factorially the manipulations illustrated: RC's Length (short/long) and RC's Placement (participial/post-nominal).

- (6) caaye kaun pii rahii thii? (a) abhinetri (b) tea who drinking was (a) actress (b) naukaranii maid
'Who was drinking tea? (a) actress (b) maid.'

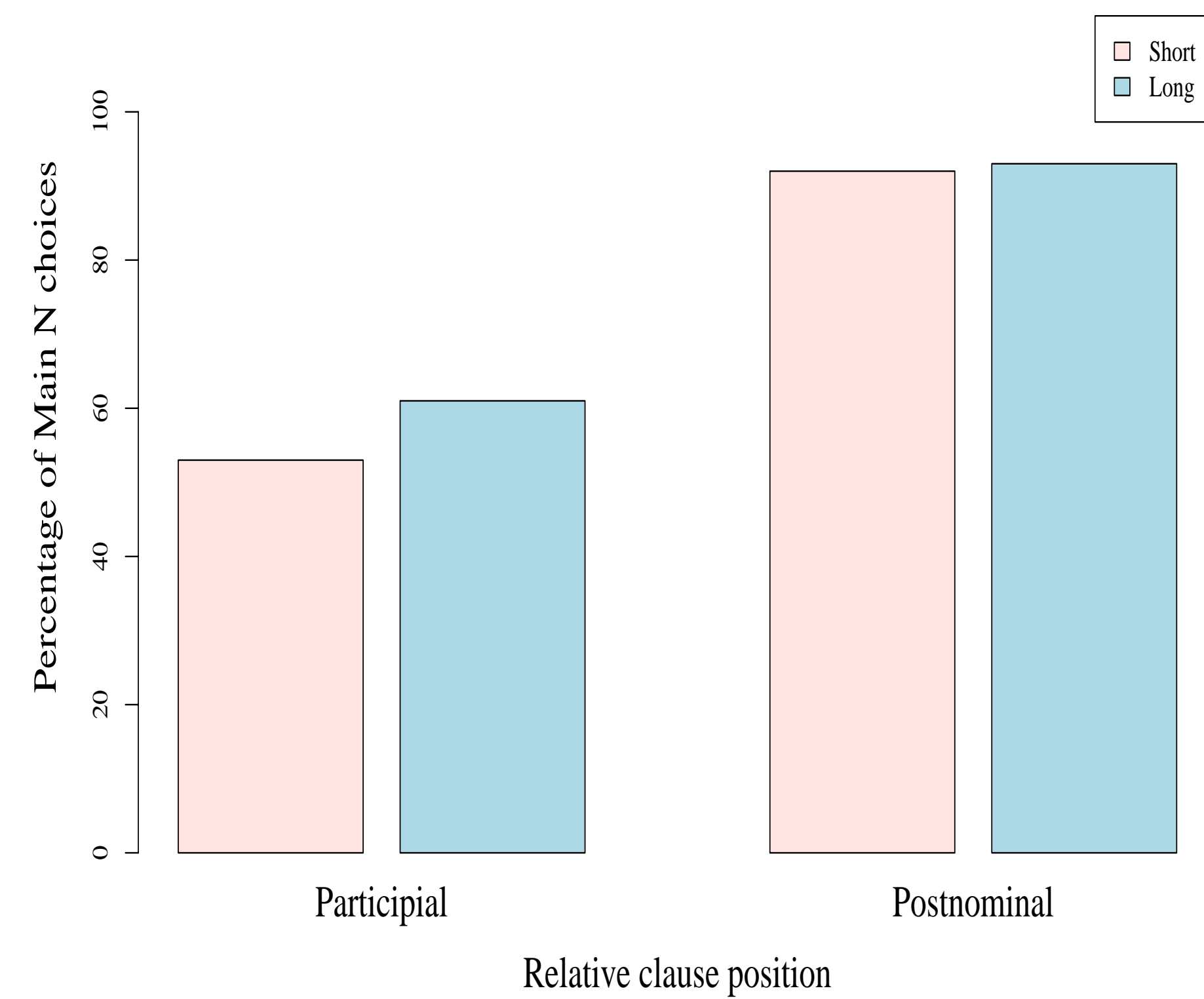
Results

An omnibus ANOVA was computed of the data expressed as percent attachment to the complex NP's head, "naukaraanii". An alternative method for binary responses is logistic regression, but this also yielded essentially identical results, so we report only the former.

The omnibus ANOVA shows a main effect of Position ($F(1)=164.75, p<0.0001$; $F(2)=132.33, p<.0001$), a by-subjects main effect of Length ($F(1)=3.84, p=0.0550$; $F(2)=2.30, p=0.145$), and a Length \times Position interaction in the by-subjects analysis ($F(1)=3.20, p=0.0789$; $F(2)=2.31, p=0.144$).

A paired comparison of length for participial and postposed RCs showed that in participial RCs, the length effect was significant by-subjects ($F(1)=4.44, p=0.0395$; $F(2)=2.65, p=0.119$). With postnominal RCs, length did not reach significance ($F(1)=0.02, p=0.885$; $F(2)=0.02, p=0.881$).

In line with findings in other languages, participial RCs are interpreted as attached to the complex NP's head: 61% for long, 53% for short. In contrast, postnominal RCs are invariably interpreted as attached to the complex NP's head noun, regardless of RC's length, at a rate of 93%:



Discussion

The results are consistent with Fodor's Implicit Prosody Hypothesis. More generally, these results provide further support for the view that human parsing decisions are driven by all available sources of linguistic knowledge, not merely structural constraints.

Underway is a study examining the overt prosody of participial and postnominal RCs, in order to determine whether prosodic differences are responsible for the apparently differential behavior of the two RC types.

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