

Movement and interpretation of quantifiers in internally-headed relative clauses

In internally-headed relative clauses (IHRCs), the noun notionally modified by the RC (i.e., the head) surfaces internal to the CP. Crosslinguistically, IHRCs are diverse in both semantic and syntactic respects. Many IHRC typologies divide IHRCs into two major classes, one involving covert movement of the head and one involving purely in-situ interpretation of the head. Grosu (2012) connects this distinction to a difference in the interpretation of IHRC heads and their associated quantifiers. On this view, (covert) movement of the head has semantic effects, leading to the quantifier being interpreted high even when pronounced low.

In this talk, I examine IHRCs in two West African languages, Atchan (also called Ébrié; Kwa; original fieldwork data) and Bùlì (Gur; Hiraiwa (2005) et seq.). In both languages, the syntax of IHRCs clearly involves movement; in fact, this movement is overt. Notably, the two languages differ in the interpretation of quantifiers attached to the head. These data call for a greater decoupling between syntactic movement and semantic interpretation in the typology of IHRCs. Movement of the head, I argue, enables but does not force high interpretation of quantified IHRC heads.

Left-headed IHRCs. Hiraiwa (2005), Bodomo & Hiraiwa (2010), and Hiraiwa et al. (2017) argue that many Gur languages exhibit (among other RC kinds) “left-headed” (LH) IHRCs. In these RCs, the surface head DP moves to the edge of CP but still surfaces within it (1). Hiraiwa (2005 et seq.) argues for this structure in Bùlì on the basis of pied-piping and adverb placement. Jarvis (2022) argues for a similar structure in Atchan RCs like (2) where the subject (underlined) is displaced to before the head (boxed). On the basis of idiom interpretation, NPI licensing, and extraposition, she argues that displaced-subject RCs like (2) are LH IHRCs, with the displaced subject and head occurring at the edge of (and within) the RC CP.

In both languages, the relevant IHRCs are restrictive, as diagnosed via stackability and felicity as *wh*-question answers (Hiraiwa 2005, Jarvis 2022). In both languages, LH IHRCs are islands for further A'-movement. Overall, the LH IHRC structure provides support for the idea that some IHRCs involve movement of the head, even though the head remains inside CP.

Quantifiers in LH IHRCs. In both Bùlì and Atchan, LH IHRC heads can bear all of the language's quantifiers; all postnominal quantifiers in this abstract are unambiguously on the head, not the whole RC. Crucially, quantified heads in the two languages have different interpretive effects.

In Atchan (as in English), quantifiers in LH IHRCs are restricted by the full RC. In (3), the quantifier relates the sets of chickens that J. sold and white individuals. J. can have additional unsold chickens of any color, with no effect on truth-value judgments (Scenario C-D). This interpretation is fully familiar from languages like English.

However, quantified IHRC heads have a different semantics in Bùlì. The interpretation of the Bùlì IHRC in (4) is not English-like but rather strongly reminiscent of Japanese and Washo IHRCs (Shimoyama 1999, Hanink 2020), as indicated by Hiraiwa's translation of (4) and remark that the quantifier “indicate[s] the amount of mangos that Àmòak bought but never indicate the amount that Àtìm ate” (p.220); i.e., (4) requires that Àmòak have bought all salient mangos. (Like Japanese and Washo, the English-like reading is available in Bùlì only if the quantifier is merged outside the RC, rather than on the head.) Thus, contrary to simple IHRC typologies, movement of the IHRC head does not diagnose a semantically-uniform IHRC class.

LH IHRC interpretations. Here, I address the derivation of the LH IHRC semantics in Bùlì and Atchan and how they fit into a broader typology of IHRC semantics, with two proposals.

(5) **Proposal 1: Movement can create new interpretive possibilities in IHRCs.**

Jarvis (2022) shows that Atchan LH IHRCs are derived via A'-movement of the head. Elaborating

on Grosu’s (2012) analysis of Navajo, I propose that Atchan quantified LH IHRC heads like (3) are interpreted just like raising relatives in other languages (Bhatt 2002, a.o.). The N (but, crucially, not D) reconstructs, and interpretation proceeds via Trace Conversion (Fox 2002). The quantifier is interpreted high (strikeout here indicates non-interpretation):

- (6) $\llbracket \text{Julianne}_i [\text{chicken all}]_k \text{ COMP Julianne}_i \text{ sell } [\text{chicken all}]_k \rrbracket$ all copies in (3) shown
 $= \llbracket \text{Julianne}_{\bar{i}} [\text{ehieken all}]_k \text{ COMP Julianne}_i \text{ sell } [\text{the ident chicken all}]_k \rrbracket$ reconstruction
 $= \llbracket \text{all} \rrbracket (\lambda x. \text{sell}(\iota y [\text{chicken}(y) \wedge y = x])(j))$

This semantics for Atchan RCs is fundamentally similar to familiar languages like English, though it involves additional reconstruction of the subject, and the quantifier being generated alongside the head N. (Subject displacement in Atchan LH IHRCs seems to be syntactically, not semantically, motivated, so I take the displaced subject to also reconstruct.) This results in the quantifier k^h úúmbrē taking the whole RC as its restriction. This derivation crucially relies on the machinery of reconstruction, to allow for selective interpretation of copies.

I propose that this reconstruction-involving derivation is used cross-linguistically for restrictively-interpreted IHRC semantics. This makes the concrete prediction that in-situ IHRCs with restrictively-interpreted quantifiers should involve (covert) movement and therefore be island-sensitive. This prediction is borne out for the relevant quantifiers in Navajo (Faltz 1995, Grosu 2012; though see also Bogal-Allbritten & Moulton 2017 for further discussion), where (certain) quantifiers on in-situ IHRC heads are interpreted as scoping over the whole RC, and IHRCs are crucially island-sensitive.

(7) **Proposal 2: Not all IHRC head movement is semantically motivated.**

Low interpretation of the quantifier in Buli LH IHRCs calls for a mechanism such as an E-type analysis (like Shimoyama’s (1999) account of Japanese) or long binding via an RC-external Idx head (as in Hanink’s (2020) analysis of Washo). While these analyses were developed for IHRCs where the head remains in situ, the Bùlì data confirm that these analyses can also apply if the head moves. There is no deep reason why this should not be possible.

As an example, I illustrate with Hanink’s (2020) account. Since Bùlì also has in-situ IHRCs (Hiraiwa et al. 2017), it is natural to take the entire head DP to reconstruct (though this is not obligatory). From there, the derivation is identical to Hanink’s (note that *all* here crucially does not have a generalized-quantifier type but, rather, quantifies over atoms of a possibly plural individual):

- (8) $\llbracket \llbracket [\text{mango all}]_k \text{ COMP } \dot{\text{A}}\text{m}\dot{\text{a}}\text{k} \text{ bought } [\text{mango all}]_k \rrbracket \text{ DEM} \rrbracket$ all copies in (4) shown
 $= \llbracket \llbracket [\text{mango Idx D all}]_k \text{ COMP } \dot{\text{A}}\text{m}\dot{\text{a}}\text{k} \text{ bought } [\text{mango Idx D all}]_k \text{ Idx D} \rrbracket + \text{phon. null heads} \rrbracket$
 $= \llbracket \llbracket [\text{mango Idx D all}]_k \text{ COMP } \dot{\text{A}}\text{m}\dot{\text{a}}\text{k} \text{ bought } [\text{mango Idx D all}]_k \text{ Idx D} \rrbracket \text{ reconstruct DP} \rrbracket$
 $= \iota z [\forall y \leq [\iota x [\text{mango}(x) \wedge x = z]] [\text{atom}(y) \rightarrow \text{bought}(y)(a)]]$
 $= \iota x [\forall y \leq [\iota x [\text{mango}(x)]] [\text{atom}(y) \rightarrow \text{bought}(y)(a)]]$ simplification

This returns the unique possibly plural individual of mangos of which A. bought all atoms. Here, fundamentally, it does not matter that movement of the head occurred. On this analysis, overt syntactic movement in Bùlì (to, perhaps, unambiguously identify the head for processing purposes) obscures a fundamentally internally-headed semantics. Accordingly, I expand on Grosu’s (2012) typology in suggesting that movement in LH IHRCs can occur for purely syntactic reasons, with no semantic repercussions. On Grosu’s account, island-sensitive (i.e., movement-involving) IHRCs are island-sensitive because of movement to facilitate semantic interpretation. Bùlì LH IHRCs, I argue, are island-sensitive simply because the head moves (for syntactic reasons), not because of the LH IHRCs’ semantics. More broadly, the data discussed here challenges the role of island-sensitivity in in-situ IHRC typologies (Watanabe 2004, Hiraiwa et al. 2017, Bhatt & Nash 2022), since the presence or absence of movement does not straightforwardly map onto IHRC interpretation.

Examples.

- (1) a. Àtìm dē [(dīem) mángò-tī: àtì Àmòak dà lál]
 Àtìm ate yesterday mango-REL COMP Àmòak bought DEM
 ‘Àtìm ate [the mango that Àmòak bought yesterday].’ Bùlì (Hiraiwa 2005:219)
- b. Àtìm dē [DP [CP (dīem) [mángò-tī:]_k àtì Àmòak dà [mángò-tī:]_k] lál]
- (2) a. [ʒulian [kəsə] k^hé a p^hedi] té p^hop^ho
 J. chicken COMP 3.INAN.NOM sell COP white
 ‘A/the chicken that Julianne sold is white.’ Atchan
- b. [CP ʒulian_i [kəsə]_k k^hé ʒulian_i p^hedi [kəsə]_k] té p^hop^ho
- (3) a. [CP ʒulian kəsə k^húúmrē k^hé a p^hedi] té p^hop^ho
 J. chicken all COMP 3.INAN.NOM sell COP white
 ‘All chickens that Julianne sold are white.’ Atchan
- ✓ Scenario A: J. had 3 white chickens and sold all of them.
 ✗ Scenario B: J. had 1 white and 1 black chicken and sold both of them.
 ✓ Scenario C: J. had 3 white chickens and sold 2 of them.
 ✓ Scenario D: J. had 2 white and 1 black chicken, and she sold the 2 white chickens.
- b. [CP ʒulian_i [kəsə k^húúmrē]_k k^hé ʒulian_i p^hedi [kəsə k^húúmrē]_k] té p^hop^ho
- (4) a. Àtìm dē [DP [CP mángò-tī: mé:ná àtì Àmòak dà] lál]
 Atìm ate mango-REL.PL all COMP Àmòak bought DEM
 ‘Àmòak bought all (of the) mangos and Àtìm ate them.’ Bùlì (Hiraiwa 2005:221)
- b. Àtìm dē [DP [CP (dīem) [mángò-tī: mé:ná]_k àtì Àmòak dà [mángò-tī: mé:ná]_k] lál]

References.

- Bhatt & Nash (2022). The common core of relativization in Georgian.
- Bodomo & Hiraiwa (2010). Relativization in Dàgáárè and its typological implications: Left-headed but internally-headed.
- Bogal-Allbritten & Moulton (2017). Navajo in the typology of internally-headed relatives.
- Faltz (1995). Towards a typology of natural logic.
- Grosu (2012). Towards a more articulated typology of internally-headed relative clauses: The semantics connection.
- Hanink (2020). DP structure and internally headed relatives in Washo.
- Hiraiwa (2005). Dimensions of symmetry in syntax: Agreement and clausal architecture.
- Jarvis (2022). Raising and head-external relatives in Atchan.
- Hiraiwa et al. (2017). A comparative syntax of internally-headed relative clauses in Gur.
- Shimoyama (1999). Internally headed relative clauses in Japanese and E-type anaphora.
- Watanabe (2004). Parametrization of quantificational determiners and head-internal relatives.