A REFINED TYPOLOGY OF INTERNALLY HEADED RELATIVES*

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Abstract: This paper defends a two-pronged syntactic-semantic typology of I(nternally) H(eaded) R(elative construction)s, based on island (in)sensitivity and the restrictive/definite contrast. It illustrates three attested types with data from Lakhota (island insensitive, restrictive), Navajo (island sensitive, restrictive), and Japanese (island sensitive, definite). It is shown that in Lakhota and Japanese the scope of the IH is determined by the surface position of the strong quantifier that binds it, while in Navajo, the quantifier is overtly realized in the relative and construed in the matrix.

The paper makes the following contributions to existing literature on the topic: (i) It argues that the IHs of Lakhota do not undergo Head-Raising (*contra* Williamson 1987) and are merely bound un-selectively a CP-external quantifier, thus avoiding island sensitivity; (ii) it proposes that IH-binding quantifiers in Navajo undergo covert cyclic raising out of the relative into the matrix, and are sensitive to islands for this reason; (iii) it argues that Japanese IHRs do not involve the discourse variety of e-type anaphora (*contra* Shimoyama 1999), but a grammatized variety, which involves cyclic raising of a null element, an island sensitive operation.

Keywords: internally headed relative, grammatized e-type anaphora, overt/covert scope, island (in)sensitivity.

1. Introductory remarks

In the earlier theoretically-oriented literature on internally-headed relatives (IHRs), there are a number of studies that draw attention to the existence of distinct syntactic and/or semantic subtypes. In particular, Watanabe (2002), building on Bonneau (1992) and Basilico (1996), proposes a **syntactically** based typology, the criterion for classification being (in)sensitivity to syntactic islands, in the sense that the internal head (IH) may or may not occur within an island properly contained within the relative clause. In complementary fashion, Grosu (1994, 2002), Grosu and Landman (1998) propose a **semantically** based typology, the criterion for classification being whether the construction has restrictive or "definite" (in the sense of Dayal 1996) semantics (in what follows, I will indifferently refer to the latter type either as "definite relatives", or, following Grosu and Landman 1998), as "strange relatives of the third kind" (SRTKs)).

In this paper, I propose to adopt a two-pronged approach to typology, combining these two binary factors. This yields four logically possible types, of which three are attested in a number of languages. In what follows, I will focus on the IHRs of three languages, each of which illustrates one of the attested types. I propose to describe and analyze in some detail those aspects of their syntax and semantics that are relevant to the typological criteria mentioned above. The three languages are listed in (1), with their typological characterics; for completeness, I also mention the fourth logically possible type, concerning which I know of no attestation.

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(1) a. **Lakhota**: island-insensitive, semantically restrictive.
b. **Navajo**: island-sensitive, semantically restrictive.
c. **Japanese**: island-sensitive, semantically definite.
d. **?** : island-insensitive, semantically definite.

The languages mentioned in (1a)-(1c) are discussed in sections 2 - 4 respectively, with the proviso that the section on Navajo is far more tentative than those on Lakhota and Japanese, due one the one hand to important "information gaps" in the literature to which I was able to gain access, and on the other hand, to an inability to obtain the desired information from native consultants and/or field workers with access to native consultants. Section 3 will thus indicate the points left for future research. Section 5 summarizes the results of the paper and notes issues of interest for subsequent research.

2. The Lakhota type

This section is based on the data presented in Williamson (1987), except where specifically indicated otherwise.

In Lakhota, simplex nominal expressions are not very different from those of English, if we abstract away from the internal order of elements. Thus, the English DP *the two children* consists of a semantically "strong" determiner, *the*, a numeral (sometimes called a "weak" determiner, but considered by many to be a kind of adjective, an assumption I will adopt in what follows), and a noun, *children*, in that order; the corresponding Lakhota DP, *wakhąyeža nųp ki* consists of elements of the same kind, except that the linear order is reversed. To be sure, not all strong and weak determiners may co-occur in a simplex DP in English, for example, **the a quilt* is ill-formed, Lakhota exhibits a comparable restriction, the combination **owíža wą ki* being ill-formed; in both languages, we seem to be dealing with a syntactic restriction, since there is no obvious semantic reason for excluding such sequences, phrases like *a quilt* and *owíža wą* being possible predicates, and thus legitimate (first) arguments of determiners.

Insofar as complex DPs with relative clauses are concerned, the two languages differ in a number of ways. One immediate difference, of course, is that the relative constructions of English are externally headed, and those of Lakhota are internally headed[1]. A more specific difference concerns the possible placement of weak and strong determiners that are associated with the IH. The two languages do not differ insofar as semantically strong determiners are concerned, these being relative-external in both languages. They do differ, however, with respect the placement of weak determiners, which, like other adjectives, are locally associated with the nominal head, and are thus relative-external in English, and relative-internal in Lakhota. The upshot of this state of affairs is that the weak and strong determiners occur in a local syntactic configuration in English, but not in Lakhota. Correlatively, the syntactic constraint on possible combinations of the two kinds of determiners does not apply in Lakhota IHRs, as illustrated in (2) (= Williamson's (4a)), thereby confirming the assumption that the constraint at issue is formal, not semantic.

[1] While externally- and internally-headed relatives sometimes co-occur in the same language, Lakhota seems to have only the internally-headed variety, at least, if we abstract away from appositive constructions, which appear to be externally-headed. The same seems to be true of Mojave and other Yuman languages, whose IHRs belong to the general type illustrated by Lakhota (Pamela Monroe, p.c.).

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(2) [DP [CP Mary [NP owįža **wą**] kağe] **ki**] he ophevathų.
Mary quilt a make the Dem I-buy
'I bought the quilt that Mary made.'

Another interesting feature of Lakhota is a morphologically distinct indefinite article *cha,* which, as far as I can tell, appears to be in complementary distribution with *wą*, in the sense that it co-occurs only with IHRs, the latter being found elsewhere. Much like simplex indefinite expressions, IHRs marked with *cha* may be interpreted as predicates or as existential generalized quantifiers. The possibility of existential construal may be appreciated by noting that substituting *cha* for *ki* in (2) yields the interpretation 'I bought **a** quilt that Mary made'. The possibility of predicate construal is illustrated by the non-maximal IHR in the 'stacked' construction in (3), where one IHR serves as the IH of the other. Observe that the quantificational force of the entire construction is determined only by the morphemes in italics, which belong to the maximal IHR; the boldfaced *cha* in the non-maximal IHR occurs obligatorily, regardless of the quantificational force of the entire construction, and this points to the conclusion that this token of *cha* induces no quantification.

(3) [[wowapi wą Deloria owa **cha**] blawa {*cha, ki*}] …
book a Deloria wrote Ind read.I Ind the
'{A, the} book that Deloria wrote that I have read…'

For completeness, I note that *cha* and *ki* cannot locally co-occur with the same IHR (and neither can *cha* co-occur with other strong determiners, such as *ota-hča* 'most' and *iyuha (ki)* 'all (the)') presumably in virtue of the same constraint that disallows the co-occurrence of *wą* and *ki* in the same simplex nominal expression.

Notwithstanding the configurational and morpho-syntactic differences between English externally-headed relatives (EHRs) and Lakhota IHRs, both constructions have **restrictive** semantics. That is to say, the Lakhota sentence in (2) and the English sentence provided as its translation need to receive a logical translation of the kind indicated in (4) (using relational notation). This means that the CP *Mary owįža wą kağe* is interpreted just like the complex NP *quilt that Mary made*, i.e., as $\lambda x.\ QUILT(x) \wedge MADE(m,x)$, with a lambda operator binding two tokens of the same variable, in particular, one restricted by the internal/external NP, and one restricted by (the remainder of) CP.

(4) $\text{BOUGHT}(\text{I}, \sigma(\lambda x.\ \text{QUILT}(x) \wedge \text{MADE}(m,x)))$

The claim that Lakhota IHRs have restrictive semantics rests on two well-known diagnostics that distinguish restrictive relatives from SRTKs[2]: (i) they allow the entire range of quantificational forces, in particular, **existential** force, which is disallowed in SRTKs, and (ii) they allow stacking of relatives with **intersective import**. That Lakhota IHRs satisfy these two diagnostics can be appreciated by examining (3), which illustrates both points. Additional illustrations of point (i) are provided in (5a-c), where the IHRs exhibit, respectively, partitive/universal quantification, existential quantification with various weak determiners in a realis context, and existential quantification in a modal context.

[2]For completeness, I note that these diagnostics also distinguish restrictives from appositives, but we need not worry about the latter in the present context, because IHRs do not seem to support appositive semantics.

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(5) a. Ed [[*šukawakha* othehika pi] {**ota-hča, ihuya (ki)**}] wichayuha
Ed horses expensive Pl most all (the) own-them
'Ed owns {most, all (the)} horses that are expensive.
b. Ed [šukawakha *{conala, ota}* othehika pi] *cha* wichayuha
Ed horses few many expensive Pl Ind own-them
'Ed owns {few, many} horses that are expensive.'
c. [[Thaspa *wa-ži* taya yužaža*]* *cha*] wachi
apple a-Irr well wash Ind I-want
'I want an apple that is well washed.'

The fact that Lakhota IHRs end up with the same construal as English restrictive EHRs raises the question of how this result is analytically achieved. Williamson proposes that the IH undergoes raising at LF, thereby achieving a CP-external position; this puts the head NP in a CP-external position in the input to semantics in both languages, so that the common translation shown in (4) follows effortlessly. Williamson offers what she views as independent support for her Head-Raising proposal, but also brings up a fact that potentially conflicts with it, namely, that Lakhota IHRs are island-insentive. The example in (6) (essentially, her (15b)) shows that the IH of an IHR α may be internal to another IHR that is properly contained within α (the island's IH is italicized, α's IH is boldfaced). This is unexpected, in view of extensive evidence adduced in earlier literature in support of the view that covert A-bar movement of various sorts is island sensitive. I note in particular that an analysis of English restrictive relatives that does overtly precisely what Williamson's proposes to do covertly, i.e., it raises an NP from an argument position to a CP-external position which lies below a higher base-generated determiner, was proposed in a great deal of earlier literature (see Kayne 1994, and especially the modifications introduced in his account in Bianchi 1999), and these relatives are clearly island sensitive. Given much recent theorizing that views 'covert' movement as simply syntactic movement (or, as more recently proposed, re-merging), with the only difference that the lower, rather than the higher, merge position gets 'pronounced', Williamson's Raising analysis does not qualify as an optimal candidate.

(6) [[*Wichota* **wowapi wa** yawa pi cha] ob wo? ųglaka pi ki] he *L.A. Times* e
many-people paper a read Pl Ind with speak-we Pl the that *L.A. Times* is
'The paper that we talked to many people who read *(it) is the *LA Times*.'

What of Williamson's independent evidence for her LF raising hypothesis? The proposed evidence rests on the phenomenon of negative concord, whereby negative polarity items typically need to be licensed by a clause-mate token of sentential negation. This state of affairs is illustrated with Lakhota data in (7) and with Romanian data in (8) Note that the (a) subcases, which satisfy the licensing condition, are well-formed, the (b) subcases are ill-formed due to the absence of sentential negation, and the (c) subcases are out because the clause-mate requirement is not respected.

(7) a. *Šųka wąžini* ophewathų **šni**
dog a-not bought.I Neg
'I bought no dog.'
b. **Šųka wąžini* ophewathų –
dog a-not bought.I
[Purported reading: same as (7a)]

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c. *[*Tuweni* u pi] ki imuge **šni**
someone-Neg come Pl whether I-ask not
[Purported reading: I did not ask whether anyone came]

(8) a. **N**-am cumpărat *nici un câine*.
not-I-have bought neither a dog
'I bought no dog.'
b. *Am cumpărat *nici un câine*].
I-have bought neither a dog
[Purported reading: same as (8a)]
c. ***N**-am întrebat dacă *nimeni* a venit."
Neg-I-have asked whether nobody has come
[Purported reading: I did not ask whether anybody came]

Now, Williamson claims that the clause-mate condition need not, in fact, **cannot** be satisfied in **overt** representation when the negative polarity item is an IH, but can be satisfied at LF, if the Head-Raising hypothesis is adopted; these two points are supported by her with (9a) (= her (19b)) and (9b) (= her (21)) respectively.

(9) a. *[*Šųka wąžini* ophewathų **šni**] ki/cha he sape
dog a-not bought.I Neg the/Ind that black
*'The/a dog such that I did not buy any is black.'
b. [*Šųka wąžini* ophewathų] cha sape **šni**
dog a-not bought.I Ind black Neg
'No dog that I bought is black.'

However, the grammaticality of the crucial example (9b) is disputable. Regina Pustet (p.c.) informs me that she has never encountered such data in the course of many years of field work on Lakhota, and that two experienced native informants she consulted reported that (9b) is completely impossible for them, and that the only way of conveying something essentially like the intended import of (9b) is (10), in which the clause-mate requirement is satisfied in overt representation. These reports lead to a strong presumption that negative concord offers no support for the Head-Raising hypothesis, and given its conflict with independently motivated assumptions about island-sensitivity at LF, I conclude that an analysis which includes Head-Raising is on the wrong track, and thus cannot be maintained.

(10) [Šųka eya ophewathų] ki *wąžini* sape **šni**
dog some.Pl bought.I the a-not black Neg
'None of the dogs I bought is black.'

An alternative to Head-Raising that avoids the problem just noted was proposed by a number of writers, most recently by Watanabe (2002), building on Bonneau (1992). The idea is that the CP external determiner/quantifier un-selectively binds two tokens of the same variable within the relative clause, one restricted by the IH, and the other, by the predicate formed by the remainder of CP, and that un-selective binding is island-insensitive. Investigating in detail the island-insensitivity of un-selective binding exceeds the scope of this paper, and will not be undertaken here. I thus confine myself to the observation that if the view that un-selective binding is island insensitive can be maintained, it yields a preferable alternative to Williamson's analysis.

This concludes our discussion of Lakhota and of the IHR-type it represents.

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3. The Navajo type

The information I have so far been able to gather about Navajo is more fragmentary, and the conclusions derivable from it are thus perforce more tentative.

In his classic article on relative clauses in Navajo, Platero (1974) notes that Navajo has both internally and externally headed relative clauses, but stresses that the former are strongly preferred to the latter, noting that "Brame, in his excellent study of Navajo relative clauses", showed no awareness of the existence of EHRs in Navajo (the reference is to Brame 1968). This observation is echoed by a personal communication by Aryeh Faltz, who informed me that some native speakers of Navajo do not accept EHRs at all. It thus seems that the syntactic inventory of core relative clause constructions is the same in Lakhota and Navajo.

There are, however, a number of notable differences between the IHRs of the two languages. One difference concerns (in)sensitivity to islands. Platero makes it very clear that Subjacency cannot be violated in Navajo, offering (11) (= his (82)) as illustration.

(11) *[[*Hastiin* **łéechąą'í** bishxash-ęę] be'eldooh néidiitą-(n)ęę] nahał'in.
man dog bite-REL gun pick-up-REL bark
'The dog that the man who was bitten by (it) picked up the gun is barking.'

A second difference concerns the placement of strong determiners associated with the IH. While those of Lakhota were seen to be invariably CP-external, those of Navajo appear to be CP-internal. This cannot be observed in Platero's examples, because none of them exhibits overt determiners associated with the IH, but can be observed in two examples provided by Faltz (1995), one of which appears below (see (12)).

These two differences notwithstanding, there are a number of facts that point to the conclusion that the IHRs of Navajo have restrictive semantics, just like those of Lakhota. Unfortunately, not every kind of evidence that can lead to this conclusion is available in the literature to which I have had access, but the available evidence is sufficient for justifying the conclusion at issue.

The missing piece of evidence concerns the (im)possibility of existential quantification in IHRs. Platero provides numerous examples of IHRs, all without overt determiners, and all translated with definite complex DPs in English. This does not, however, permit the conclusion that the definite construal is the only possible one. Given the absence of overt definite articles, it is in principle possible that Navajo IHRs (and nominals without overt determiners in general) may be ambiguous or vague between definite and indefinite construals (as is the case, for example, with "bare" nominal phrases in Russian). Whether Navajo IHRs may, in appropriate contexts, receive an indefinite construal is thus an issue that remains to be investigated. But even in the absence of specific information on this point, we may note that there are at least two other facts that support a restrictive analysis[3].

A first argument is provided by a remark made in Barss et al. (1989: 323), which runs as follows: "The Navajo string (15) [= Platero's (82); AG] can, with some difficulty, receive a 'stacked reading', such as 'the man that the dog bit (and) that picked up the gun…' or 'the dog that bit the man (and) that picked up the gun…'." What this means is that Navajo IHRs can

[3] I note in passing that one may expect a language that has (non-appositive) relative clauses of **some** kind to possess the restrictive type among them, rather than be confined just to SRTKs, because restrictives make available a broader range of expressive options than SRTKs. In view of the fact that Navajo has just one core type (and for some speakers, no other type), we may expect this type to be the restrictive one. Some facts which suggest that this expectation is fulfilled are noted below in the text.

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stack with intersective construal, thus satisfying one of the diagnostics for restrictive status (see section 2); the hint that this reading is available "with some difficulty" need not be overly worrisome, since stacked restrictive relatives are often marginal in numerous languages, including English, explicit coordination being preferred in many cases, in particular, when the stacked clauses are relatively long and introduced by the same morphemes.

A second argument is provided by two examples in Faltz (1995), which exhibit IHRs with a universally quantified IH. I reproduce one of them in (12) (= Faltz's (106)).

(12) [Leechaa'i t'aa altso ashkii deishxashigii] nidahal'in.
dog all boy bite-REL bark
'[All the dogs that bit the boy] are barking.'

Importantly, Faltz makes clear that the CP-internal quantifier necessarily has matrix, not CP-internal, scope. Thus, this example cannot receive the interpretation that **all the contextually relevant dogs bit the boy** (and are barking), the only available interpretation being that a (possibly proper) subpart of the contextually relevant plurality of dogs bit the boy (and are barking). This implies that the set of entities that bit the boy needs to be **intersected** (possibly properly) with the set of contextually relevant dogs, forming a lambda abstract that serves of (first) argument to *t'aa altso* 'all', which is exactly what we may expect under a restrictive analysis of the construction. What this means is that the bracketed IHR in (12) needs to end up with exactly the logical translation assigned to the bracketed DP in the corresponding English translation, where *all the dogs* is CP-external in overt representation, as well as to the bracketed IHR in the Lakhota example (13), where the strong determiner is CP-external, and the nominal IH, CP-internal.

(13) [Šųka eya ophewathų iyuha ki] hena sape.
dog some.Pl bought-I all the those black
'All the dogs that I bought are black.'

The matrix scope of the universal quantifier points to a raising analysis of some sort, which, as a side bonus, ought to account for island-sensitivity as well. The raising analysis at issue cannot, however, be of the kind proposed by Kayne (1994) and Bianchi (1999) for EHRs and by Williamson (1987) for IHRs, because what needs to raise is not the NP, but the strong determiner. Recall from the discussion in section 2 that the internal/external position of NP does not affect the ability to achieve its semantic intersection with CP, and that the present case differs from the data considered by all the authors just mentioned in that the strong determiner is CP-internal, and nonetheless needs to be interpreted as though external. Faltz (1995) argues in some detail that quantification in Navajo is verbal, not nominal, in the sense that strong quantifiers do not form a constituent with property-denoting NPs, but may nonetheless un-selectively bind them (in the terminology of Partee et al. 1987, Navajo has A-quantification, not D-quantification). What this means is that the sequence *leechaa'i t'aa altso* in (12) does not form a DP constituent, and that *t'aa altso* forms a (presumably both minimal and maximal) quantifier constituent.

There are a number of proposals on the market that concern covert A-bar movement, so I will simply pick one of them. Let us then to assume that the strong quantifier undergoes cyclic movement to the right in the narrow syntax, C being a right sister of IP (in rigid SOV languages). Let us further assume that the moved quantifier ultimately incorporates into a null D unspecified (or underspecified) for quantificational force (cf. Bianchi 1999), this D being

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itself a right-sister of IP. In keeping with recent ideas of Fox and Pesetzky's, let us assume that in such cases, it is the left-most chain copy (or (re-)merger token) that gets "pronounced". This will account both for the covert status of the proposed cyclic movement and for the island effects, and will also ensure matrix scope for the quantifier.

Insofar as data without overt determiners are concerned, we may simply assume that the IH is bound by a null quantifier with definite (or, if applicable, with existential) force, and that this null quantifier follows the steps just suggested with respect to the overt universal quantifier. Just as before, the quantificational force of the IHR will be determined by the content of the null quantifier. This analysis captures the precise ways in which Navajo differs from Lakhota: shared restrictive semantics, and distinct sensitivity to islands.

In outlining this analysis, I have surreptitiously made two assumptions: (i) that IHRs with universally quantified heads allow unbounded dependencies, i.e., embedding of the IH at an arbitrary depth within the IHR, so long as island constraints are respected, an option that Platero illustrates only with respect to 'bare' IHs (see his example (50), reproduced as (14) below), and (ii) that IHRs with bare IHs are compatible with existential construals.

(14) [**Chidí** dilwo' nisin ní-(n)ęę] yícho'.
car fast think tell-REL ruin
'The car he said he thought was fast is broken down.'

Both assumptions seem reasonable, but have not been checked with consultants, and must thus be viewed as tentative, pending verification.

By way of conclusion for this section, I wish to indicate some of the potential benefits of fieldwork on the issues just mentioned, and most particularly, on the hypothesis that Navajo IHRs ought to allow existential readings (in appropriate contexts). In a focused and thorough study of a number of aspects of Quechua dialects, Hastings (2004) reports that Cuzco Quechua has IHRs with strongly quantified heads that are interpreted just like those of Navajo. Hastings considers a wide variety of quantificational options, and reports the following (arguably unexpected) fact: when the IH has no overt strong quantifier and would receive a narrow-scope ("non-specific") existential construal in a simplex independent sentence, the IHR receives the interpretation of a SRTK (much like the IHRs of Japanese, to be discussed in section 4), in the sense that the IH is construed as existentially quantified with narrow scope, and the IHR is construed as definite. A further interesting claim made by Hastings is that the interpretation of EHRs (which also exist in Cuzco Quechua) patterns (almost) exactly like that of IHRs with corresponding heads; in particular, she claims that EHRs without overt determiners have SRTK semantics, which implies a "reconstruction" effect. The facts just alluded to are illustrated in (15)-(16) (= Hastings' (2.34)-(2.35)) with respect to universally quantified heads, in (17)-(18) (= Hastings' (2.29)-(2.30)) with respect to indefinite heads with the determiner *wakin* 'some (of)' which apparently allows only a "specific" (partitive) construal, and in (19)-(20) with respect to indefinite heads without overt determiners and narrow-scope existential force.

(15) Asunta [Mayta-q plaza-pi **tukuy planta** planta-sqa-n]-ta p'iti-ra-n. **← IHR**
Asunta Mayta-Gen plaza-Loc all plant plant-NM-3sg-Acc prune-Past.3sg
'Asunta pruned all the plants that Mayta planted in the plaza.'

(16) Asunta [Mayta-q plaza-pi planta-sqa-n] **tukuy planta**-ta p'iti-ra-n. **← EHR**
Asunta Mayta-Gen plaza-Loc plant-NM-3sg all plant-Acc prune-Past.3sg
'Asunta pruned all the plants that Mayta planted in the plaza.'

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(17) [Juan-pa tayta-n-pa **wakin wasi** ruwa-sqa-n] hatun. ← **IHR**
Juan-Gen father-3sg-Gen some house make-NM-3sg big
'Some houses that Juan's father made are big.'

(18) [Juan-pa tayta-n-pa ruwa-sqa-n] **wakin wasi** hatun. ← **EHR**
Juan-Gen father-3sg-Gen make-NM-3sg some house big
'Some houses that Juan's father made are big.'

(19) [Asunta-q **pisi aqha** aqha-sqa-n]-ta apa-ra-ni. ← **IHR**
Asunta-Gen a-little cornbeer make_corn_beer-NM-3sg-Acc bring-Past-1sg
'Asunta made a little cornbeer and I brought it (the entire cornbeer that she made).'

(20) [Asunta-q aqha-sqa-n] **pisi aqha**-ta apa-ra-ni. ← **EHR**
Asunta-Gen make_corn_beer-NM-3sg a-little cornbeer-Acc bring-Past-1sg
'Asunta made a little cornbeer and I brought it (the entire cornbeer that she made).'

Hastings supports her claims about these data by pointing out that, according to her consultants, (i) (15)-(16) may be naturally continued with something like '…but she didn't touch the remainder of the plants in the plaza', that is to say, those that Mayta did not plant, (ii) (17)-(18) may be continued with something like '… but there are other houses he made and that we don't know the size of', and (iii) (19)-(20) may **not** be continued with something like '… but I left the rest of the cornbeer that Asunta made behind'[4],[5].

Given the facts just noted, it seems highly desirable to investigate the issue of indefinite quantification of Navajo IHRs (and, for that matter, of Navajo EHRs), with a view to determining the extent of the parallelism and of the non-parallelism between the relative constructions of Navajo and those of Cuzco Quechua (and/or other Quechua dialects; see swection 5).

4. The Japanese type

Insofar as the syntactic inventory of relative clause constructions is concerned, Japanese has both EHRs and IHRs, just like Navajo, but the relative prominence of these two types is precisely the opposite of that found in Navajo: EHRs are distinctly preferred, so much so that Kuno (1973), a comprehensive theoretical study that addresses what the author views as the most interesting and important topics in the grammar of Japanese, fails to even mention

[4] Hastings (footnote 12 to Chapter 3) observes that the overall behaviour of relatives in Cuzco Quechua is slightly more complex than indicated in the text. In particular, IHs with different weak determiners, such as *kinsa* 'three', which apparently are more easily amenable to a wide scope ("specific") construal, allow both Navajo-like and Japanese-like construals, as illustrated in (i).

(i) Juan [tayta-n-pa **kinsa wasi** ruwa-sqa-n]-ta muna-n.
Juan father-3sg-Gen three house make-NM-3sg-Acc like-3sg
'His father made three houses and Juan likes them.'
'Juan likes three houses that his father made.'

[5] The claim that some Cuzco Quechua IHRs follow the Japanese pattern appears to be convincingly supported by the observation, made in Hastings' section 2.5.2, that the IHRs in question allow "collecting" readings of the kind illustrated with Japanese data in section 4 (see discussion of (25a)), as illustrated by her example (2.53), reproduced as (i) below). I note it would undoubtedly be of considerable interest to check whether data analogous to (25b) can also be constructed in Cuzco Quechua, since if they can, this would greatly strengthen the claim that we are dealing with the Japanese pattern in data like (19) and (i).

(i) Asunta mikhu-ra-n [sapa irqi-q **huk t'anta** ranti-sqa-n]-ta.
Asunta eat-Past-3sg each child-Gen one bread buy-NM-3sg-Acc
'Each child bought one roll and Asunta ate them (all the rolls bought by the children).'

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the existence of IHRs. I further note that the IHRs of Japanese are subject to certain pragmatic "relevancy" constraints that do not exist for EHRs (Kuroda 1976).

Another difference between Navajo and Japanese is that the EHRs and IHRs of the latter language, in contrast to those of the former, have distinct semantics, EHRs being restrictives, and IHRs, SRTKs. This is abundantly demonstrated in Shimoyama (1999), who provides explicit data in support of the view that quantifiers locally associated with the heads of EHRs and IHRs in overt representation have the precise scope indicated by their surface position; that is to say, the heads of EHRs have matrix scope, and those of IHRs, relative-internal scope. This can be appreciated in relation to (21)-(22).

(21) Taro-wa [[Yoko-ga reezooko-ni __ irete-oita] **kukkii-o hotondo**] **← EHR**
Taro-Top Yoko-Nom refrigerator-Loc put-Aux cookie-Acc most
paatii-ni motte itta.
party-to brought
'Taro brought to the party most cookies that Yoko had put in the refrigerator.'

(22) Taro-wa [$_{DP}$[$_{CP}$Yoko-ga reezooko-ni [$_{DP}$ **kukkii-o hotondo**] irete-oita]-no]-o
Taro-Top Yoko-Nom refrigerator-Loc cookie-Acc **most** put-Aux-NM-Acc
paatii-ni motte itta. **← IHR**
party-to brought
'Yoko put most cookies in the refrigerator and Taro brought {them, *some} to the party.'

In (21), the cookies brought to the part are a majority of those put in the fridge, while in (22), they represent the totality of the cookies put in the fridge, which in turn represent a majority of some tacitly assumed sum of cookies. Shimoyama observes that the relation between the IH and the entire IHR is reminiscent of the relation between a nominal expression and an E-type anaphor that takes that expression as antecedent. On these grounds, she proposes to analyze Japanese-type IHRs as relying on the kind of E-type anaphora found in discourses, the relative clause serving as a kind of appositive that contains the antecedent, and the matrix, as a sentence that contains a null definite anaphor.

This proposal can go a long way in accounting for a number of properties of Japanese IHRs, but as pointed out by Grosu and Landman (2008), it also falls short of full adequacy in a number of ways.

On the positive side, it accounts for the fact that these IHRs cannot be existentially quantified, since existentially quantified expressions are not successful e-type anaphors, as can be gathered from the discourse in (23), where *those boys,* but not *three boys*, counts as anaphoric to the boldfaced token *three boys* (of course, a second occurrence of *three boys* may accidentally describe the same three boys as the first occurrence, but this is not implied by the version of (23) with *three boys*).

(23) **Three boys** walked into the Parliament building. One hour later, *{those, three} boys* walked out.

A second correct prediction made by Shimoyama's proposal is that stacked IHRs can convey multiple anaphoric references to some antecedent, but cannot have the effect of multiple intersection of predicates. This can be appreciated in relation to (24).

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(24) [John-ga [Mary-ga **nagai ronbum**-o kaita-no]-o yonda-no-ga]
John-Nom Mary-Nom long paper-Acc wrote-NM-Acc read-NM-Nom
LI-ni notta
LI-Loc appeared
'Mary wrote a long paper, John read it, and it appeared in *LI*.'

A third advantage of the E-type analysis is that it can account for "collecting" readings of Japanese IHRs, as can be seen by comparing the following Japanese examples with the discourses that represent their approximate English translations. Thus, the IHR in (25a) and the pronoun *them* in the translation both denote the sum of all triples of papers, each triple being having been submitted by a different student; similarly, the IHR in (25b) and *they* in the translation both denote the total sum of delegates, each delegate having been elected by a different city. A point of interest noted by Grosu and Landman is that these collecting readings need to be kept distinct from the "functional" readings (i.e., based on functions from individuals to individuals) discussed in Sharvit (1996, 1999), and illustrated in (25c). As shown in (25d), which contrasts in acceptability with (25b), functional relative constructions may not denote groups formed by collecting their outputs.

(25) a. Wasaburo-wa [[*dono gakusei-mo* **peepaa-o** **3-bon** dashita]-no]-o
Wasaburo-Top[every student term-paper-Acc 3-Cl turned-in]-NM-Acc
itiniti-de yonda.
one-day-in read
'Every student turned in three term papers and Wasaburo read *them* (= all the papers that all the students turned in) in one day.'
b. [Dono toshi-mo daigiin-o hitori-zutsu senshutsushita-no]-ga
which city-MO delegate-acc one.cl-each elected-NM-nom
Kokkai-Gijidou-ni atsumatta.
Parliament-Hall-loc gathered
'Every city elected one delegate. *They* gathered in Parliament-Hall.'
c. The single delegate that each city elected promised to faithfully defend the interests of his constituency in Parliament.
d. *The single delegate that each city elected gathered in Parliament-Hall.

On the negative side, we may note the following points:

First, when a discourse antecedent is an expression like *three children,* the assumption that there are *exactly* three children is a defeasible implicature, as illustrated in (26). In IHRs, however, this is an ineliminable implication, as shown by the oddity of the discourse in (27).

(26) Jon-ni-wa kodomo-ga san-nin iru. So-no ko-tachi-wa kyousanshugisha-da.
John-loc-top child-nom 3-cl be that-gen child-pl-top communist-cop
Da ga, Jon-ni-wa hokani futa-ri kodomo-ga i-te, ko-no ko-tachi-wa
but John-loc-top separately 2-cl child-nom be-conj this-gen child-pl-top
kyousanshugisha-de-wa nai.
communist-instr-top neg
'John has three children. Those children are communists. But John has two other children, and these children are not communists.'

(27) John-ga [Mary-ga sanko-no ringo-o muite kureta]-no-o tabeta.
John-Nom Mary-Nom three apple-Acc peeled-NM-Acc ate

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*Atode, Bill-wa sono nokori-no ringo-o tabeta.
afterwards, Bill-Top the remainder-Gen apple-Acc ate
'Mary peeled three apples and John ate them. #After that, Bill ate the rest of the apples that Mary peeled.'

A second point is that in discourse, when there is no appropriate overt antecedent, a suitable one can be created by accommodation, as illustrated in (28). In the relevant IHRs, this is not possible, as shown in (29), which has only the absurd reading that some group of students was simultaneously at the party and at hnome.

(28) Paatii-de, Jon-wa gakusei-o daremo mikake-nak-atta.
party-loc John-top student-acc no see-neg-past
Karera-wa uchi-ni i-te, shiken-no junbi-o shite-ita.
they-top home-loc be-conj test-gen preparation do-was
'At the party, John saw no students. They were at home, preparing for a test.'

(29) *[[Honno **suunin-no insei-shika** doyoobi-no paatii-ni ikanakatta] -no] -ga
only a-few-Gen grad-student Saturday-Gen party-to do-Neg-Past NM-Nom
jitsu wa uchi-de term paper-o kaite ita.
in-fact home-at term paper-Acc writing was
*'Only a few graduate students went to the party on Saturday. In fact, those very students were writing term papers at home.'

A third point is that discourse E-type anaphora is insensitive to islands. Thus, either the antecedent or the anaphor may be contained within a complex DP, as illustrated in (30). In contrast, The IH of an IHR may not occur within an island, in particular, within an EHR or an IHR, as shown in (31).

(30) a. Jon-wa [**hitsuji-o san-tou** katteiru *hitsujikai-o*] shitteiru.
John-top sheep-acc 3-cl keep shepherd-acc know
Sore-ni-wa meshitsukai-ga esa-o yatteiru.
that-dat-top servant-nom food-acc give
'John knows a shepherd who owns three sheep. The servant feeds them.'

b. Jon-wa hitsuji-o san-tou katteiru.
John-top sheep-acc 3-cl-KA keep
[**Sore-ni** yesa-o yaru *meshitsukai-wa*] kyoo-wa yasumi-da.
that-dat food-acc give servant-top today-top holiday-cop
'John has three sheep. The servant who feeds them is on holiday today.'

(31) a. *[John-ga [**subarashii ronbun**-o kaita *hito*]-o homete-ita -no]-ga
John-Nom excellent paper-Acc wrote person-Acc praised-had-C^{o}-Nom
shuppan-sareta.
publish-Pass
'The excellent paper which John had praised the person who wrote (it) was published.'

b. *[John ga [*MIT-no gakusei-ga* **subarashii ronbun**-o kaita- no]-o
John-Nom MIT-Gen student-Nom excellent paper-Acc wrote-C^{o}-Acc
posuto-doku-toshite saiyoushite-ita-no]-no shuppan-ga okureta.
post -doc -as adopted-had- C^{o}-Gen publish-Nom was-delayed]
'Publication of the excellent paper which John had hired as post-doc an MIT student who wrote (it) was delayed.'

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These various facts point to the conclusion that IHRs, despite the appearance of complete sentences, include the gap of some covert A-bar movement, and that the gap in question receives an interpretation that strictly relies on the IH. Grosu and Landman (2008, ms.) provide a formal analysis which adopts these assumptions, and which avoids the problems that confront the E-type approach, while retaining their principal advantages. I briefly outline here the gist of their analysis (for the full details, see their paper).

Grosu and Landman assume as semantic background a neo-Davidsonian theory of events and plurality, as in Landman (2000, 2004), with the following central types:

-d is the type of singular and plural individuals.

-e is the type of singular and plural of events.

-<e,d> is the type of roles like Agent, Theme, but also prepositions like WITH, FROM,…

-<e,t> is the type of sets of events, event types.

When all arguments are connected with the verb, the type of the interpretation derived by the grammar is assumed to be <e,t>. Adjunct modifiers like prepositional phrases and adverbs are semantically functions from type <e,t> into type <e,t>.

-At the IP-level default existential closure takes place over the event argument, deriving from event type α an interpretation of type t: $\exists e[\alpha(e)]$.

-Relativization-abstraction over an individual variable of type d at the CP-level, will create an abstract $\lambda x.\ \exists e[\alpha(e)]$ of type <d,t>, a predicate of individuals.

The theory of plurality assumes that the relevant semantic domains are complete atomic Boolean algebras ordered by part-of operation $\leq$ and sum operation $\sqcup$. The central notions here are:

-Pluralization as closure under sum: $*P = \{x: \text{for some } X \subseteq P: x = \sqcup X\}$

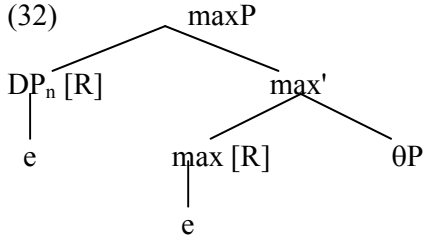
-Definiteness as maximalization: $\sigma(P) = \sqcup P$ if $\sqcup P \in P$; undefined otherwise.

-Cardinality as counting atomic parts: $|x| = |\{a \in ATOM: a \leq x\}|$

-$(a \setminus b)$ as the relative complement of b in a, the maximal part of a such that $(a \setminus b) \sqcup b = a$.

Grosu and Landman assume that in subordinate clauses with the suffix *-no*, some θP may function as complement of a null functional head, which they call Max, and which is indexed with the feature [R(ole)] (if there is no Max, CP-*no* is construable as a complement clause). They also assume that [Spec, MaxP] includes a null DP operator, which undergoes cyclic A-bar movement to the relative clause's [Spec, CP], thereby accounting for island sensitivity. This null DP (also indexed by R as a result of Spec-Head agreement) introduces the semantic relativization variable. MaxP has the schematic form in (32)

(32)



The unvalued feature R may acquire a value from a role defined on the event type that is the interpretation of θP. Semantically, max[R] and DP_n [R] are modifiers, functions from <e,t> into <e,t>. Their interpretations are specified as follows:

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(33) Let E be a variable of type <e,t> and e a variable of type e, R a role of type <e,d>:
$DP_n[R] = \lambda E \lambda e.E(e) \wedge R(e)=x_n$
$max[R] = \lambda E \lambda e.E(e) \wedge R(e) = R(\iota E)$

After valuation of [R], which means that a particular DP has been chosen as the IH, max[R] requires the valued R to be a role of the maximal contextually relevant event, so that R itself comes to denote the maximal contextually relevant sum of entities. When applying to max', $DP_n[R]$ equates the maximalized role with a variable it introduces. After instantiation of the set of events by existential closure at the IP level, abstraction over x_n at the CP level yields a singleton, forcing the external Det (which we may view as null or as denoted by *-no*) to be the definiteness operator. The complex DP in (22) ends up with the meaning in (34):

(34) $\sigma(\lambda x_n. \exists e[e = \iota (\lambda e. \exists x \in$ *COOKIE: PUTinFRIDGE(e,Yoko,x))) $\wedge$ Theme(e)=x_n])

This is, in essence, the gist of the analysis. Maximalization ensures that the valued R denotes *all* the entities that play the selected role, thus accounting for the *exactly* effects in (27), and equation excludes the possibility of accommodation, thus accounting for the oddity of (29). Note that it is not necessary to assume that the external determiner is born with definiteness content, we may also view it as underspecified, definiteness being "coerced" by the singleton status of CP, as is generally the case in SRTKs (i.e., existential quantification implicates that CP may fail to be a singleton, which conflicts with the implications of Max, i.e., that it is a singleton)

5. Summary and conclusions

In this paper, we have examined the IHRs of Lakhota, Navajo, and Japanese, as representatives of three distinct types. In two of these languages, Lakhota and Japanese, IHRs wear their quantificational scope "on their sleeves", in the sense that the scope of an overt strong determiner that binds the IH is determined by the placement of this determiner in overt representation; that is to say, CP-external placement correlates with matrix scope, and CP-internal placement, with relative-internal scope. In contrast, the overt strong determiners of Navajo occur CP-internally, but take scope in the matrix.

We have also seen that the IHRs of Lakhota may achieve abstraction over a variable without appealing to movement, thereby avoiding sensitivity to islands. Other languages in which comparable effects have been noted are the Yuman languages, in particular, Mojave (Munro 1976). The IHRs of Navajo and Japanese, on the other hand do not have this option, because their IHs are locally bound by strong determiners, and abstraction cannot take place without some operation that involves movement. I have proposed to assume that in Navajo, the strong determiner itself moves, inducing island-sensitivity and achieving matrix scope. In Japanese, on the other hand, strong determiners have rigid scope, and a variable for abstraction, made available by maxP, is created – I proposed – by the movement of a null operator. Another language that seems to have the same properties as Japanese is Korean (Grosu 2002).

As a parting thought, I note that the three languages we have examined in this paper appear to have IHRs with uniform semantics, as far as one can tell from the available evidence, and various earlier works which have recognized the existence of multiple semantic types in IHRs, have assumed a single semantic type per language (see, e.g., Basilico 1996, Watanabe 2002, Grosu 1994, 2002, Grosu and Landman 1998, 2008). However, there is no

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logical necessity that I am aware of for IHRs to be semantically uniform in every language in which they occur (note that EHRs have been argued to be semantically diverse since as early as Carlson 1977).

Hastings (2004) constitutes the first study known to me which provides explicit evidence for non-uniformity in a single language. In addition to the facts of Cuzco Quechua alluded to in section 3 and footnotes 4, 5, Hastings also notes in her Chapter 4 that Imbabura Quechua exhibits a different type of non-uniformity, IHRs typically following the Japanese pattern, but in some cases allowing the Navajo pattern as well. It would thus be of of considerable interest to undertake a follow-up study of a wider range of Quechua dialects, as well as of further data in the two dialects studied by Hastings (see, e.g., footnote 5).

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